Fish Inventory and Anadromous Cataloging in the Susitna River, Matanuska River, and Knik River Basins, 2003 and 2011

by

Jonathan M. Kirsch Joseph D. Buckwalter and Daniel J. Reed

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative		all standard mathematical	
deciliter	dL	Code	AAC	signs, symbols and	
gram	g	all commonly accepted		abbreviations	
hectare	ha	abbreviations	e.g., Mr., Mrs.,	alternate hypothesis	H _A
kilogram	kg		AM, PM, etc.	base of natural logarithm	е
kilometer	km	all commonly accepted		catch per unit effort	CPUE
liter	L	professional titles	e.g., Dr., Ph.D.,	coefficient of variation	CV
meter	m		R.N., etc.	common test statistics	(F, t, χ^2 , etc.)
milliliter	mL	at	@	confidence interval	CI
millimeter	mm	compass directions:		correlation coefficient	
		east	E	(multiple)	R
Weights and measures (English)		north	Ν	correlation coefficient	
cubic feet per second	ft ³ /s	south	S	(simple)	r
foot	ft	west	W	covariance	cov
gallon	gal	copyright	©	degree (angular)	0
inch	in	corporate suffixes:		degrees of freedom	df
mile	mi	Company	Co.	expected value	Ε
nautical mile	nmi	Corporation	Corp.	greater than	>
ounce	OZ	Incorporated	Inc.	greater than or equal to	\geq
pound	lb	Limited	Ltd.	harvest per unit effort	HPUE
quart	qt	District of Columbia	D.C.	less than	<
yard	yd	et alii (and others)	et al.	less than or equal to	≤
-	-	et cetera (and so forth)	etc.	logarithm (natural)	ln
Time and temperature		exempli gratia		logarithm (base 10)	log
day	d	(for example)	e.g.	logarithm (specify base)	\log_{2} , etc.
degrees Celsius	°C	Federal Information		minute (angular)	,
degrees Fahrenheit	°F	Code	FIC	not significant	NS
degrees kelvin	Κ	id est (that is)	i.e.	null hypothesis	Ho
hour	h	latitude or longitude	lat or long	percent	%
minute	min	monetary symbols		probability	Р
second	S	(U.S.)	\$, ¢	probability of a type I error	
		months (tables and		(rejection of the null	
Physics and chemistry		figures): first three		hypothesis when true)	α
all atomic symbols		letters	Jan,,Dec	probability of a type II error	
alternating current	AC	registered trademark	®	(acceptance of the null	
ampere	А	trademark	ТМ	hypothesis when false)	β
calorie	cal	United States		second (angular)	"
direct current	DC	(adjective)	U.S.	standard deviation	SD
hertz	Hz	United States of		standard error	SE
horsepower	hp	America (noun)	USA	variance	
hydrogen ion activity (negative log of)	pН	U.S.C.	United States Code	population sample	Var var
parts per million	ppm	U.S. state	use two-letter		
parts per thousand	ppt, ‰		abbreviations (e.g., AK, WA)		
volts	V				
watts	W				

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FISH INVENTORY AND ANADROMOUS CATALOGING IN THE SUSITNA RIVER, MATANUSKA RIVER, AND KNIK RIVER BASINS, 2003 AND 2011

By

Jonathan M. Kirsch and Joseph D. Buckwalter Alaska Department of Fish and Game, Division of Sport Fish, Anchorage

and Daniel J. Reed Alaska Department of Fish and Game, Division of Sport Fish, Nome

> Alaska Department of Fish and Game Division of Sport Fish, Research and Technical Services 333 Raspberry Road, Anchorage, Alaska, 99518-1565

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Jonathan M. Kirsch and Joseph D. Buckwalter, Alaska Department of Fish and Game, Division of Sport Fish, 333 Raspberry Rd, Anchorage, AK 99518, USA

and

Daniel J. Reed Alaska Department of Fish and Game, Division of Sport Fish, 103 E Front St, PO Box 1148, Nome, AK 99762, USA

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ABSTRACT

During August, 2003, and July-August 2011, the Alaska Department of Fish and Game, Division of Sport Fish conducted an inventory of stream fish assemblages and associated aquatic and riparian habitats in a 53,445 km² study area comprising the upper Cook Inlet basin bounded by the Alaska Range to the north and west, the Chugach Mountains to the south, and the Copper River basin to the east. We visited 357 study sites in streams ranging in size from wadeable headwaters to the mainstem Susitna River. At each site, we collected data describing some or all of the following: site location; aquatic habitat; riparian vegetation; and fish-assemblage composition. Fish were collected primarily using backpack and boat mounted electrofishers. In total, 19 fish species, representing 12 genera and 7 families were found. Anadromous fish were documented at 114 study sites. As a result of this inventory, a total stream length of 830 km of previously unlisted anadromous fish habitat was added to the State of Alaska's *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes*.

Key words: fish inventory, stream survey, anadromous, *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes*, Anadromous Waters Catalog, electrofishing, Susitna River, Knik River, Matanuska River, Skwentna River, Yentna River, Alaska, Rainy Pass, Skwentna, Palmer, Wasilla, Willow, Talkeetna, freshwater fish, Arctic lamprey, *Lampetra camtschatica*, Pacific lamprey, *Lampetra tridentata*, longnose sucker, *Catostomus catostomus*, northern pike, *Esox lucius*, humpback whitefish, *Coregonus pidschian*, pygmy whitefish, *Prosopium coulteri*, round whitefish, *Prosopium cylindraceum*, Arctic grayling, *Thymallus arcticus*, pink salmon, *Oncorhynchus gorbuscha*, chum salmon, *Oncorhynchus keta*, coho salmon, *Oncorhynchus kisutch*, rainbow trout, *Oncorhynchus mykiss*, sockeye salmon, *Oncorhynchus nerka*, Chinook salmon, *Oncorhynchus tshawytscha*, Dolly Varden, *Salvelinus malma*, burbot, *Lota lota*, threespine stickleback, *Gasterosteus aculeatus*, ninespine stickleback, *Pungitius pungitius*, slimy sculpin, *Cottus cognatus*.

INTRODUCTION

The State of Alaska is committed to conserving fish habitat. Alaska is the only state with a constitutional mandate¹ to maintain sustained yields of fish stocks (ADCCED 2009), and the Alaska Department of Fish and Game (ADF&G) has a statutory responsibility to manage the use of wild fish stocks for sustained yield (AS 16.05.730(a)). Along with proper management of harvests, protection of fully functioning and connected aquatic habitats is necessary to sustain fish stocks supporting Alaska's commercial, subsistence, personal use, and recreational fishing economies.

The Alaska State Legislature has enacted several statutes to protect fish habitat. Alaska Statute (AS) 16.05.871 (the Anadromous Fish Act), along with the Fishway Act (AS 16.05.841, which requires that fish passage be maintained in any stream "frequented by salmon or other fish"), constitute Alaska's strongest and most comprehensive instream fish-habitat protection standards. Several other Alaska statutes specifically reference fish habitat, including multiple sections in AS 41.17 (Forest Resources and Practices Act) and AS 46.15 (Water Use Act), both administered by the Department of Natural Resources, and AS 46.03.758 (Civil penalties for discharges of oil), administered by the Department of Environmental Conservation.

The Anadromous Fish Act requires ADF&G to "specify the various rivers, lakes and streams or parts of them" that are important to the spawning, rearing or migration of anadromous fish. The *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (Anadromous Waters Catalog, AWC) and its associated atlas are the media used to accomplish this specification, and are adopted as regulation under 5 AAC 95.011. Activities and uses conducted in, or otherwise affecting, either any AWC-listed water bodies (under the

¹ The Constitution of the State of Alaska; Article 8, Section 4 – Sustained Yield states "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses."

Anadromous Fish Act), or fish passage in any fish-bearing waters (under the Fishway Act) statewide, require prior approval from the ADF&G Division of Habitat, which is responsible for reviewing project plans and specifications submitted by permit applicants. Permitting biologists work closely with project applicants to ensure that project plans provide for the proper protection of fish habitat. If so, a Fish Habitat Permit is issued authorizing the activity. Permit applications may be denied if impacts to fish habitat cannot be adequately avoided, minimized, or mitigated.

Many other federal, state, and local government policies specify additional protections for anadromous fish habitat in Alaska. Like the Anadromous Fish Act, however, these only apply to those waters where anadromous fish use is explicitly documented, typically by reference to the AWC. For example, the National Marine Fisheries Service (NMFS) identifies Essential Fish Habitat (EFH) for Alaska stocks of Pacific Salmon in freshwater by reference to the AWC. Three of the U.S. Army Corps of Engineers' regional conditions for nationwide permits in Alaska specify additional requirements and restrictions for proposed projects located in or near AWC-listed water bodies. Other policies that protect AWC-listed water bodies are found in: area plans for state lands; state forest management plans; resource management plans for Bureau of Land Management (BLM) lands; federal and state regulations specifying waters closed to commercial and subsistence fishing; and city and borough ordinances.

Comprehensive fish-distribution information is required for effective land use, conservation, and restoration planning to identify sensitive and important habitats. State land management plans, such as the *Susitna Area Plan* and the *Bristol Bay Area Plan*, and more specific plans such as the *Kenai Peninsula Brown Bear Conservation Strategy*, identify management guidelines or specify geographic areas of concern based in large part on the known distribution of fish. Watershed and conservation planning efforts also rely heavily on knowledge of fish distributions and aquatic habitat characteristics and their spatial and temporal relationship to other resources and activities. Planning for habitat restoration programs, such as fish-passage enhancement, is also better informed with access to comprehensive fish-distribution information.

Resource developments, such as transportation and utility corridors, are most effectively informed if complete fish distribution data is available at project onset. If comprehensive fish-distribution information is provided during project scoping, projects can be designed to avoid habitat impacts; however, absence of comprehensive fish distribution information can lead to unintended fish habitat impacts.

All these fish-habitat conservation authorities and planning processes are limited, however, by the extent of current knowledge of fish habitats and their distribution. The Anadromous Fish Act, along with other federal, state, and local government policies that refer to the AWC, provides protection only to those waters listed in the AWC. Listing new water bodies requires site specific, direct, and unambiguous observations of anadromous fish followed by a biological and public review process. Habitat modeling, speculation, or professional judgment is not sufficient to add water bodies to the AWC.

Previous field inventories have demonstrated significant data gaps in the understanding of Alaskan freshwater fish distribution and habitat characteristics. For example, recent (2003–2008) anadromous waters cataloging work resulted in a 75% increase in the sum of the lengths of AWC-listed streams, and a 72% increase in the number of cataloged water bodies, in the Nushagak River basin. The state has limited authority to protect undocumented fish habitat.

To refine fish-habitat management in specific waters, resource agencies also need knowledge of local aquatic and riparian habitat characteristics. Since aquatic and riparian habitats vary in their sensitivity to human activities these habitat characteristics should be well understood when planning or permitting general or specific activities. Physical and biological characteristics of riparian and aquatic habitats are important factors in determining appropriate best management practices and mitigation strategies. Documenting habitat characteristics at fish-collection reaches also provides baseline information for comparison with future studies, and may contribute to improved understanding of fish–habitat associations.

Since statehood, ADF&G biologists have conducted numerous field surveys to provide information needed to manage and protect fish habitat. Typically, these surveys have targeted imminent or active development or resource extraction projects or other specific local issues (e.g., footprint of an individual project, individual species, or specific local drainages). While small scale, project driven surveys will continue to be necessary, effective and efficient management and protection of Alaska's fish habitat also requires a proactive and larger scale approach. ADF&G's Alaska Freshwater Fish Inventory (AFFI) program was implemented in 2002 to help meet this need.

The long term goal of the AFFI program is to complete a statewide baseline inventory of fish communities and associated aquatic and riparian habitats. Since 2002, we have completed AFFI projects covering 33 (Table 1) of Alaska's 139 subbasins:

HUC	Name	Year	HUC	Name	Year
19020402	Matanuska	2011	19030404	Holitna River	2009
19020501	Upper Susitna River	2003,	19030405	Stony River	2007
		2011	19030501	Aniak	2009
19020502	Chulitna River	2003,	19040301	MF-NF Chandalar Rivers	2010
		2011	19040404	Ramparts	2004
19020503	Talkeetna River	2003, 2011	19040507	Tanana Flats	2004
19020504	Yentna River	2011 2003.	19040508	Nenana River	2004
19020301		2011	19040511	Lower Tanana River	2004
19020505	Lower Susitna River	2003,	19040601	Upper Koyukuk River	2010
		2011	19040602	South Fork Koyukuk River	2010
19020601	Redoubt-Trading Bays	2002	19040701	Tozitna River	2004
19030301	Upper Nushagak River	2003,	19040801	Anvik River	2008
		2005, 2006	19040802	Upper Innoko River	2008
19030302	Mulchatna River	2006	19040803	Lower Innoko River	2008
17030302	Wulchana River	2005,	19040804	Anvik to Pilot Station	2008
		2006	19050102	Unalakleet	2009
19030303	Lower Nushagak River	2003,	19050103	Norton Bay	2004
		2005,	19050105	Imuruk Basin	2004
10020402	E	2006	19050201	Shishmaref	2004
19030402	Farewell Lake	2007	19050202	Goodhope-Spafarief Bay	2004
19030403	Takotna River	2007	19050202	Buckland River	2004

Table 1.-Completed AFFI Projects since 2002.

AFFI field surveys are typically watershed based, and follow standard AFFI protocols in sampling fish communities and aquatic and riparian habitats in all (or nearly all) non-AWC-listed streams draining at least 50 km² in the selected watersheds. All AFFI field data, along with other fish-collection records (e.g., selected records reported to ADF&G in scientific/educational fish-collection permit reports), are stored for long term usage in the AFFI database (AFFID) at the ADF&G regional office in Anchorage. ADF&G's *Fish Resource Monitor*, available at <u>http://gis.sf.adfg.state.ak.us/FlexMaps/fishresourcemonitor.html</u>, displays all AFFID sites on an interactive base map and provides public access to summary reports for all AFFID records, along with AFFI site photos.

During the summers of 2003 and 2011 we completed an AFFI field survey of stream fish assemblages and associated aquatic and riparian habitat characteristics, focusing on non-AWC-listed streams in 6 subbasins in Southcentral Alaska: the Matanuska and Knik rivers; the Upper Susitna River; the Chulitna River; the Talkeetna River; the Yentna River; and the Lower Susitna River.

Surveys in 2003 were limited to selected wadeable streams in the Susitna River basin (HUC 190205). In 2011 we expanded the study area to include HUC 19020402 and sampled additional non-AWC-listed streams including wadeable streams draining at least 50 km² that were missed in 2003 and nonwadeable streams draining at least 200 km². In 2011, we also sampled all the major rivers draining at least 1,500 km² throughout the study area and conducted an aerial survey for Chinook salmon spawners in the Upper Susitna River Subbasin upstream of Devils Canyon.

STUDY AREA AND SETTING

The 53,445 km² study area (Figure 1) comprised the upper Cook Inlet basin bounded by the Alaska Range to the north and west, the Chugach Mountains to the south, and the Copper River basin to the east. The study area was watershed based, encompassing all freshwaters draining to Cook Inlet and Knik Arm between the Lewis River to the west and the Knik River to the east, excluding any lands located within conservation unit boundaries (i.e., Denali National Park and Preserve [NP&P], Lake Clark NP&P, Denali State Park [SP] and Chugach SP). Major rivers in the study area included the Susitna, Yentna, Skwentna, Kahiltna, Deshka (Kroto Creek), Chulitna, Talkeetna, Maclaren, Tyone, Matanuska, and Knik rivers, all of which have a glacial source, except for the Tyone and Deshka rivers.

Subbasins and Major Water Bodies

Table 2 lists some physiographic characteristics of the 6 upper Cook Inlet subbasins comprising the study area. The landforms described below generally follow the physiographic boundaries delineated by Wahrhaftig (1965).

Matanuska Subbasin, HUC 19020402

The Matanuska Subbasin drains the northwestern slope of the Chugach Mountains and the southern slope of the Talkeetna Mountains. This subbasin is dominated by high and extremely rugged mountains and extensive alpine glaciers. Mountain slopes >60% are typical. The broad Matanuska and Knik valleys separate the 2 mountain ranges. Although the Matanuska Subbasin

has the greatest mean elevation of all 6 upper Cook Inlet subbasins, due to the Matanuska and Knik valley lowlands, this subbasin has a substantial area below 600 m (see Table 2)².

The Matanuska and Knik rivers drain the Matanuska Subbasin. The Matanuska River originates from glaciers in the Chugach and Talkeetna mountains. From the confluence of Caribou Creek and the South Fork Matanuska River at an elevation of about 550 m, the mainstem Matanuska River flows west then south for about 110 km to Knik Arm. The Knik River flows west for 40 km into Knik Arm from the terminus of Knik Glacier at an elevation of 150 m elevation. Clearwater side channels within the mainstem Matanuska and Knik river braid plains provide suitable habitat for spawning salmon (Curran et al. 2011).

All tributaries in the Matanuska subbasin draining $\geq 200 \text{ km}^2$ have a glacial source. Wasilla (144 km²), Jim (123 km²), and Cottonwood (63 km²) creeks are the only non-glacial streams draining $\geq 50 \text{ km}^2$ accessible to salmon in the Matanuska Subbasin³.

A waterfall located approximately 9 km upstream on Caribou Creek prevents fish movement farther upstream into the Caribou Creek drainage.

There are 2 large ($\geq 2 \text{ km}^2$) lakes in the Matanuska Subbasin: Inner Lake George (25 km²) and Gull Lake (2.3 km²).

We excluded 187 km² of the Matanuska Subbasin located in Chugach SP from our study area (Figure 1.–Study area map.).

Upper Susitna River Subbasin, HUC 19020501

Topography of the Upper Susitna River Subbasin is varied. Low rolling mountains are the most common landform, with ranges of moderately to extremely high rugged mountains, including the south slope of the Alaska Range, the Clearwater Mountains, and the north slope of the Talkeetna Mountains. Nearly level to rolling plains, thought to be the former bed of a large paleo-glacial lake, are widespread in the eastern portion of the subbasin. Broad, flat outwash plains occur at the foot of several Alaska Range glaciers in the Susitna and Maclaren River headwaters. Despite being the largest of the 6 upper Cook Inlet subbasins, the Upper Susitna River Subbasin provides the least area < 600 m elevation (Table 2), which is limited to the Susitna River valley floor downstream of the Oshetna River.

The upper Susitna River mainstem originates from glaciers in the Alaska Range at an elevation of about 850 m and flows south for approximately 110 km to the Tyone River confluence, picking up flow from 2 major tributaries, the Maclaren and Tyone rivers, in this segment. The Susitna River above the Maclaren River is unconfined and heavily braided. Downstream of the Tyone River confluence (elevation 670 m), the Susitna River swings westward and enters a more confined, single channel segment with a series of narrow, steep walled canyons for about 130 km, exiting Devils Canyon at Portage Creek (elevation 275 m). From Portage Creek, the Susitna River swings back southward through low rolling mountains for approximately 80 km to

² Elevation appears to play an important role in limiting the extent of salmon distribution in upper Cook Inlet streams and throughout Alaska as over 95% of the total length of AWC (2012 version) listed streams in this region are below the 600 m contour. The highest elevation AWC water body in upper Cook Inlet is at 963 m in the Middle Fork Chulitna River (site no. 08C04 in this study).

³ Hicks Creek and 3 Caribou Creek tributaries drain >50 km² and apparently lack glaciers, but are likely not accessible to salmon.

Talkeetna at the confluence with the Chulitna and Talkeetna rivers at an elevation of approximately 110 m.

Six of the 25 upper Susitna River tributaries draining $\geq 200 \text{ km}^2$ flow from glaciers in the Alaska Range (5) and Talkeetna Mountains (1). At least 14 are clear (no glacial flow), and 5 more appear to be moderately influenced by small remnant glaciers.

A waterfall located approximately 6 km upstream on Tsusena Creek, and another about 1 km upstream on Deadman Creek, likely prevent fish from moving farther upstream into these drainages.

There are 14 large lakes scattered across the Upper Susitna River Subbasin, including 10 in the Tyone River watershed (Lake Louise, Susitna Lake, Tyone Lake and 7 smaller lakes), Sevenmile Lake (Maclaren River), Big Lake (Watana Creek), Butte Lake (Butte Creek), and the 6 interconnected Fog Lakes (Fog Creek).

We excluded 230 km² of the Upper Susitna River Subbasin located in Denali SP from our study area (Figure 1).

Chulitna River Subbasin, HUC 19020502

The Chulitna River Subbasin drains the southern slope of the Alaska Range. Extremely high and rugged mountains with extensive alpine and valley glaciers along the western flank of the subbasin are the dominant landform. Mountain slopes >60% are typical, and slopes >100% are common along Mt. McKinley's East and South buttresses and peaks and ridges in the Mt. Hunter and Mt. Huntington vicinity. The broad, gently sloping Chulitna River lowlands drain this subbasin to the south between flanking mountain ranges. The mountains west of the Chulitna lowlands are steep, relatively high in elevation and extensively glaciated while the mountains to the east are lower in elevation, rugged, and sparsely glaciated with small, remnant alpine glaciers. A flat, low elevation wetland plain occurs in the former confluence zone of the Tokositna, Ruth, and Eldridge glaciers. Although the Chulitna lowlands, this subbasin has a substantial area below 600 m (Table 2).

The Chulitna River mainstem coalesces in the upper subbasin at Honolulu (elevation 425 m) from 3 main forks, the glacial West Fork, the mostly clear (but glacially influenced) East Fork, and the clear Middle Fork. From the confluence, the mainstem Chulitna River flows south for approximately 110 km to the confluence with the Susitna and Talkeetna rivers at an elevation of approximately 110 m, picking up flow from 4 substantial Alaska Range glacial tributaries along the way. For most of its course, the mainstem Chulitna River channel is unconfined and heavily braided, but there are at least 2 canyon segments.

Nine of the 12 Chulitna River tributaries draining $\ge 200 \text{ km}^2$ flow from glaciers in the Alaska Range to the west. The remaining 3 flow mostly clear, but are influenced by small remnant glaciers in the mountains to the east.

A waterfall located approximately 1.5 km upstream on Pass Creek likely prevents fish from moving farther up into Pass Creek.

Swan, Byers, and Spink lakes, ranging from $1-1.5 \text{ km}^2$ in area, are the largest lakes in the Chulitna River subbasin.

Sixty-nine percent $(4,625 \text{ km}^2)$ of the Chulitna River subbasin lies within Denali NP&P or Denali SP boundaries, and was therefore excluded from our study area (Figure 1).

Talkeetna River Subbasin, HUC 19020503

The Talkeetna River Subbasin drains the western end of the Talkeetna Mountains. From a crest of moderately high, rugged (slopes typically exceed 60%), heavily glaciated mountains in the east, relief of the Talkeetna River Subbasin generally decreases westward through low, rolling mountains (slope <30%), and eventually to the Susitna lowlands near the mouth of the Talkeetna River. In the east, 2 main valleys, the upper Talkeetna River valley and the Sheep River valley, drain the north and south slopes, respectively, of the highest Talkeetna Mountains peaks. Chunilna (Clear) Creek drains much of the lower mountains to the west.

The mainstem Talkeetna River originates from mountain glaciers at about 1,370 m elevation. From its source, the swift and braided upper Talkeetna River flows north initially then swings westward for 70 km to the Prairie Creek confluence at elevation 460 m. The 55 km section from Prairie Creek to Sheep River (elevation 150 m) flows to the southwest and includes a 16 km long, steep walled, whitewater canyon. From Sheep River, the Talkeetna River continues westward another 22 km and empties into the Susitna River at elevation 110 m.

Three (upper Talkeetna River, Iron Creek, and Sheep River) of the 6 Talkeetna River tributaries draining $\geq 200 \text{ km}^2$ flow from glaciers on the crest of the Talkeetna Mountains. The remaining 3 (Prairie, Disappointment, and Clear creeks) head in the lower, non-glaciated western mountains and flow clear.

A waterfall located approximately 3.5 km upstream on Disappointment Creek likely prevents fish from moving farther up into Disappointment Creek.

There are 2 large ($\geq 2 \text{ km}^2$) lakes in the Talkeetna River subbasin: Stephan Lake (3.6 km²) at the head of Prairie Creek, and; Larson Lake (2.4 km²), located in the lower Talkeetna River drainage between Sheep River and Clear Creek.

Yentna River Subbasin, HUC 19020504

Extremely high and rugged mountains with extensive alpine and valley glaciers rim the Yentna River Subbasin, from southern Alaska Range peaks in the north including McKinley (6,194 m), Foraker (5,304 m), Hunter (4,442 m), and Russell (3,557 m), to the northern Tordrillo Range peaks Torbert (3,479 m) and Gerdine (3,431 m) in the south. Along the crest of the Alaska Range and Tordrillo Mountains, slopes >60% are typical, and slopes >100% are common. Connecting the higher ranges to the north and south, a continuous rim of moderately high (1,500–2,400 m), but still very rugged, lightly glaciated mountains arcs along the western flank of the subbasin. From its western mountain crest, the Yentna River Subbasin descends steeply to broad glacial outwash plains gently sloping to the Susitna River in the southeast. Although the Yentna River Subbasin drains North America's highest peak, of the 6 subbasins comprising the study area, this subbasin has the second greatest amount of area below 600 m elevation due to the presence of the extensive Yentna lowlands (Table 2).

The mainstem Yentna River originates at the terminus of Yentna Glacier at 213 m elevation in Denali NP and flows south through a broad braid plain for 45 km to the confluence with the West Fork at 61 m elevation. The next 60 km segment coalesces to a single meandering channel (with side channels) and flows southeast to a right bank confluence with a major tributary, the

Skwentna River, at 38 m elevation. From the Kahiltna River, the Yentna River traverses the final 45 km to the Susitna River at 12 m elevation.

Eleven of the 17 Yentna River Subbasin tributaries draining $\ge 200 \text{ km}^2$ flow from glaciers in the Alaska Range or Tordrillos. The other 5 are clear, and 1 is mostly clear with some glacial influence.

No waterfalls which would prevent fish passage are documented on streams draining $> 200 \text{ km}^2$ in the Yentna River Subbasin.

There are 4 large ($\geq 2 \text{ km}^2$) lakes in the Yentna River Subbasin: Chelatna Lake (15.7 km²) at the head of Lake Creek; Shell (6.1 km²) and Hewitt lakes (2.6 km²) near Skwentna, and; Hiline Lake (2.1 km²) in the Talachulitna River drainage.

Twenty-seven percent (4,317 km²) of the Yentna River subbasin lies within Denali NP&P or Lake Clark NP&P boundaries, and was excluded from our study area (Figure 1).

Lower Susitna River Subbasin, HUC 19020505

The Susitna lowlands are the dominant landform of the Lower Susitna River Subbasin, covering over 60% of the subbasin. This level to rolling (slope generally < 5%), low elevation (sea level—300 m elevation) plain bisects the subbasin from north to south, and is contiguous with the adjacent Matanuska and Knik, Chulitna, and Yentna lowlands. The basin floor is comprised of fine textured glacio-lacustrine deposits ringed by coarse glacial tills and outwash (Nowacki et al. 2001). The eastern quarter of the subbasin drains the moderately high elevation (1,200–2,300 m), rugged (slopes frequently > 60%) western slope of the Talkeetna Mountains rimming the upper Kashwitna River catchment, with glaciers capping the northern aspect of its crest above about 1,830 m elevation. A western lobe of the Lower Susitna River Subbasin, comprising the Alexander Creek and Lewis River watersheds, drains low (300–1,200 m), rolling (slopes generally 15–60%) mountains (Beluga Mountain, Mount Susitna, and Little Mount Susitna).

Near Talkeetna, the lower Susitna River mainstem coalesces from 3 major tributaries, the upper Susitna, Chulitna, and Talkeetna rivers, draining their respective subbasins described above. From Talkeetna, the Susitna River mainstem flows south through a broad braid plain along the western toe of the Talkeetna Mountains for about 80 km to the right bank confluence with the Deshka River at about 20 m elevation, then continues another 19 km south to the right bank Yentna River confluence at about 12 m elevation. From the Yentna River mouth, the Susitna River flows another 40 km south into Cook Inlet.

Eleven of the 14 Lower Susitna River Subbasin tributaries draining $> 200 \text{ km}^2$ are clear, 2 (Kashwitna River and Sheep Creek) are mostly glacial, and 1 (Little Susitna River) is mixed.

No waterfalls which would prevent fish passage are documented on streams draining $> 200 \text{ km}^2$ in the Lower Susitna River Subbasin.

There are 8 large ($\geq 2 \text{ km}^2$) lakes in the Lower Susitna River Subbasin, including: Big (12.2 km²); Figure Eight (7.2 km²); Flat Horn (5.7 km²); Red Shirt (4.7 km²); Trapper (4.7 km²); unnamed (near Figure Eight, 3.2 km²); Nancy (3.1 km²), and; Alexander (3.0 km²) lakes.

Since there are no national or state parks intersecting the Lower Susitna River Subbasin, the entire subbasin was included in our study area.

		Ar	rea ^a	Elevatio	on (m)	Glaciated	l area ^d	Lake/p area	
			km ²				% of		% of
HUC	Name	km ²	< 600 m ^b	Max ^c	Mean ^b	km ²	HUC	km ²	HUC
19020402	Matanuska	9,070	1,820	4,016	1,208	2,033	22	53	0.6
19020501	Upper Susitna River	16,277	754	4,055	1,068	788	5	412	2.5
19020502	Chulitna River	6,712	1695	5,761	1,078	1,406	21	40	0.6
19020503	Talkeetna River	5,274	951	2,697	1,095	315	6	30	0.6
19020504	Yentna River	15,895	7,274	6,194	822	2,353	15	115	0.7
19020505	Lower Susitna River	9,579	7,593	2,377	326	83	1	224	2.3
Total		62,807	20,087	6,194	916	6,978	11	874	1.4

Table 2.-Summary characteristics of the 6 upper Cook Inlet subbasins comprising the study area.

^a Source: Watershed Boundary Dataset for Alaska. Available at: <u>http://datagateway.nrcs.usda.gov/</u> [Accessed January 5, 2011].

^b Source: National Elevation Dataset for Alaska. Available at <u>http://ned.usgs.gov/</u> [Accessed January 18, 2006].

^c Source: National Geographic TOPO! 1:63,000 scale topographic maps for Alaska. ArcGIS map service available at <u>http://www.esri.com/data/free-data/</u> [Accessed February 23, 2011].

^d *Source*: National Hydrography Dataset for Alaska. Available at <u>http://nhd.usgs.gov/</u> [Alaska dataset dated October 11, 2011 downloaded April 11, 2012].

Climate

The study area has a transitional climate from the maritime influence of the Pacific coast to the continental climate of the Interior. The maritime influence is mitigated due to sheltering from the surrounding mountains, especially the Chugach Mountains, which block warm, moist Pacific air, forming a rain shadow on the north side of the mountains. The eastern portion of the Upper Susitna River Subbasin (i.e., the Tyone River drainage), which is on a high plateau contiguous with the Copper River basin, experiences a continental climate more similar to Interior Alaska with warm summers, cold winters, and light and irregular precipitation.

Mean annual air temperature varies throughout the study area from 0-2 C (32–36 F) at low elevations, to -4 C (25 F) throughout most of the Upper Susitna River Subbasin, to less than -6 C (21 F) in the Alaska Range and Talkeetna and Chugach mountains (Jorgenson et al. 2008). Permafrost is discontinuous (50–90%) over most of the study area, but varies in extent from absent/isolated patches in the Susitna, Matanuska, and Knik lowlands to continuous (90–100%) in the eastern portion of the Upper Susitna River Subbasin (Brown et al. 1998).

Mean annual precipitation ranges from <38-76 cm in the Susitna and Matanuska valleys and along the perimeter of the Copper River basin to 152–305 cm in the Alaska Range and Talkeetna Mountains, to as high as 711+ cm along the crest of the Chugach Mountains (PRISM 2000).

FISH SPECIES PREVIOUSLY DOCUMENTED IN THE STUDY AREA

HDR (2011) summarized existing information (largely from studies conducted by ADF&G in the early 1980s for Alaska Power Authority's Susitna River hydroelectric project) on fishes of the Susitna River basin. They listed 19 documented species of anadromous and resident freshwater fish in the Susitna River drainage. Other sources document 4 additional species in the study area (see Table 3). According to HDR (2011), 2 additional undocumented species, Pacific lamprey (*Lampetra tridentata*) and Alaska blackfish (*Dallia pectoralis*) may also occur in the Susitna River drainage.

Common name	Scientific name	Common name	Scientific name
Arctic lamprey ^a	Lampetra camtschatica	coho salmon ^a	Oncorhynchus kisutch
longnose sucker ^a	Catostomus catostomus	sockeye salmon ^a	Oncorhynchus nerka
northern pike ^a	Esox lucius	Chinook salmon ^a	Oncorhynchus tshawytscha
eulachon ^a	Thaleichthys pacificus	Arctic char ^b	Salvelinus alpinus
Bering cisco ^a	Coregonus laurettae	Dolly Varden ^a	Salvelinus malma
humpback whitefish ^a	Coregonus pidschian	lake trout ^a	Salvelinus namaycush
round whitefish ^a	Prosopium cylindraceum	burbot ^a	Lota lota
pygmy whitefish ^c	Prosopium coulterii	threespine stickleback ^a	Gasterosteus aculeatus
Arctic grayling ^a	Thymallus arcticus	ninespine stickleback ^d	Pungitius pungitius
rainbow trout ^a	Oncorhynchus mykiss	sculpin ^a	Cottidae sp.
pink salmon ^a	Oncorhynchus gorbuscha	slimy sculpin ^e	Cottus cognatus
chum salmon ^a	Oncorhynchus keta	prickly sculpin ^f	Cottus asper

Table 3.-List of fish species previously found in the study area.

^a HDR 2011.

^b Havens 1988. See also: unpublished manuscript by Jack Dean, Fishery Biologist (retired), 2001, titled *Arctic char in Southcentral Alaska: a status report*, obtained from ARLIS Library, Anchorage. Arctic char are reported from Big, Flat, Never-Never, and Sara lakes (Fish Creek drainage near Wasilla) and Benka Lake (Susitna River drainage near Talkeetna).

^c Pygmy whitefish were previously found in Lake George, Knik River drainage (M. Wiedmer and J. Buckwalter, Habitat Biologists, ADF&G, Anchorage, unpublished data, 2005; see also Wiedmer et al. 2010).

^d Rich and Buckwalter (2003) documented ninespine stickleback in the Meadow Creek (Fish Creek tributary) drainage near Wasilla. Ninespine stickleback were also documented in the lower Susitna River and Little Susitna River drainages in unpublished field data prepared by Lynn Noel, ENTRIX Inc., for the Northern Rail Extension EIS and submitted to ADF&G under Fish Resource Permit No. 08-188 in 2008.

^e McPhail and Lindsey (1970) reported slimy sculpin occur in the Susitna River. Rich and Buckwalter (2003) confirmed slimy sculpin occur in the Susitna River drainage and documented slimy sculpin in the Little Susitna River and Meadow Creek (Fish Creek, near Wasilla) drainages.

^f Havens (1988) documented prickly sculpin in Big Lake (Fish Creek drainage near Wasilla). Mecklenburg et al. (2002), Morrow (1980), and McPhail and Lindsey (1970) report Seward, Alaska as the northern/western limit for prickly sculpin.

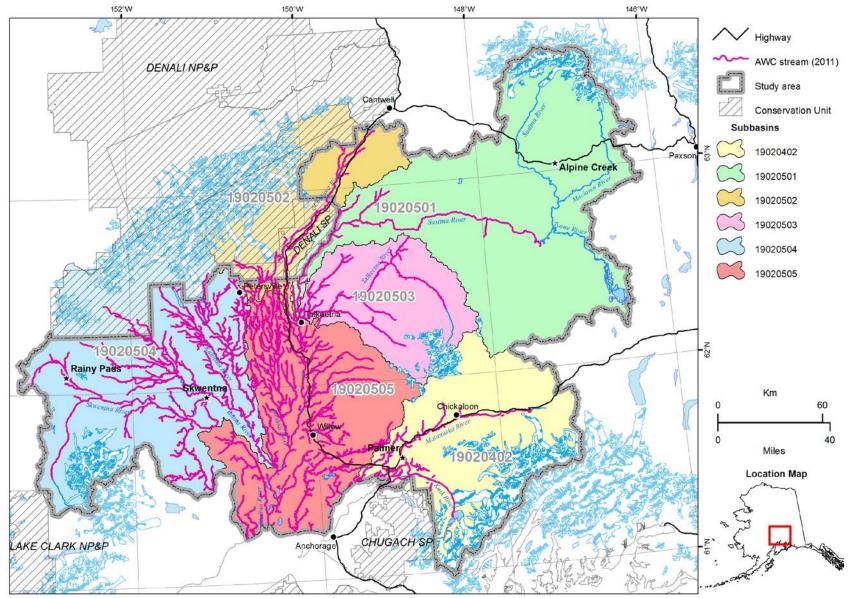


Figure 1.–Study area map.

OBJECTIVES

The overall goal of the AFFI program is to provide information needed for management of the habitats that support Alaska's freshwater fishes. This project contributed to that goal by achieving the following objectives:

- Objective 1: To maximize the spatial increase of mapped anadromous fish habitat depicted in the AWC by completing a baseline inventory of fish (with emphasis on anadromous fish) assemblages in the Susitna River, Matanuska River, and Knik River basins.
 - Task 1: Locate fish-collection reaches to maximize the spatial increase of specified anadromous fish habitat in targeted streams while minimizing the number of study sites per stream. At each reach, record GPS (Global Positioning System) coordinates and the occurrence and type of barriers to fish passage.
 - Task 2: Sample each reach using standardized fish collection techniques and sufficient sampling effort to document the presence of all common fish species occurring in the reach at the time of sampling.
 - Task 3: Record the species, life stage, number, and fork or total length of all fish collected, and record the species, life stage, and (estimated) number of visually observed (but not collected) fish from each fish-collection reach. Describe the fish collection effort and extent of area sampled.
 - Task 4: For each water body in which anadromous fish are observed, submit a nomination form to the AWC, providing sufficient information to achieve the intended result (i.e., addition, deletion, correction, or backup information).
- Objective 2: To record characteristics of aquatic and riparian habitats at each study site such that sufficient information is documented to: (a) identify well supported and adequate habitat protection stipulations for permitting of local low level disturbances; or (b) identify specific further sampling needs necessary to design adequate habitat protection stipulations or mitigation for permitting moderate or greater level disturbances.
 - Task 1: Record a suite of standard aquatic habitat parameters at each study site.
 - Task 2: Characterize the dominant riparian vegetation communities at each study site.
- Objective 3: For nonwadeable streams (Intermediate and Mainstem target streams)—To develop stopping rules to guide fish-inventory field crews in estimating when a sufficient length of stream has been sampled to meet Objective 1, Task 2.
 - Task 1: At each nonwadeable stream, record fish observations separately for a minimum of 10 spatially sequential subreaches (or as many as can be sampled in 1 day), each equivalent in length to 10 wetted channel widths. Sample additional subreaches as necessary until no new fish species are recorded from 6 consecutive subreaches.
 - Task 2:Based on field data collected at nonwadeable target streams, develop appropriate
stopping rules for single-pass electrofishing in nonwadeable Alaskan rivers.
- Objective 4: To identify locations of spawning Chinook salmon aggregations in Upper Susitna River Subbasin tributaries upstream of Devils Canyon by aerial reconnaissance.

METHODS

In 2011 we followed the methods of Buckwalter et al. (2010) as modified by Buckwalter et al. (2012). In 2003 we used a different approach to select target streams, and some fish-collection and aquatic habitat measurement procedures varied slightly from the 2011 protocol. In 2003 we deployed just 1 team of 3 to wadeable target streams; whereas, in 2011 we deployed 3 teams of 2, with 1 team sampling wadeable streams and the other 2 teams sampling nonwadeable streams and rivers.

FIELDWORK DATES AND BASES

On August 1, 2003, we conducted a 1-day aerial (helicopter) reconnaissance to locate spawning Chinook salmon in selected upper Susitna River tributaries between Devils Canyon and Jay Creek. The main 21 field sampling days in 2003 occurred during August 4–30. We based at Talkeetna during August 4–7 and 18–20, at Gracious House Lodge (Mile 82 Denali highway) during August 13–16, and at Skwentna Airstrip during August 18–30.

In 2011, the main 21 field sampling days with the full crew and helicopter support occurred during August 3–24. We based at Alpine Creek Lodge (Mile 68 Denali Highway) during August 3–16, at Palmer Airport during August 18–24, and at Puntilla Strip during August 15–17 (Headwaters-Team only).

In advance of the main August 2011 trip, we sampled several mainstem target streams that were accessible by jet boat. Three jet boat trips were conducted: 1) June 30 (Knik River; day trip); 2) July 12–14 (Yentna, Skwentna, and Kahiltna rivers); and 3) July 19–21 (mainstem Susitna River). On July 27–28, we also conducted a 2-day aerial reconnaissance trip to identify spawning Chinook salmon aggregations in Upper Susitna River Subbasin tributaries upstream of Devils Canyon (see Objective 4).

In 2011, we also conducted several short sampling trips following the main August trip. During September 12–13, a team returned to the Yentna River Subbasin by helicopter to sample remaining wadeable target streams. And from September 14–23 we conducted several day trips to wadeable sites in the Knik River drainage near Palmer, Alaska, focusing on streams crossed by East Knik River Road and ATV trails in the Knik River Public Use Area.

By conducting the core of our fieldwork during August, we believed we would maximize our chances of observing a variety of anadromous fishes, especially stream rearing species and life stages, at the upstream limits of their range, to achieve Objective 1. We presumed that anadromous fishes rearing in headwater streams (i.e., mainly age-0 and age-1 coho and Chinook salmon) would be at or near their maximum upstream distribution in the study area during August, after emerging and dispersing from their natal habitats, but prior to the onset of rapidly cooling waters in the fall, when they likely begin moving to their winter habitats. And, according to Sam Ivey (personal communication, Fishery Biologist, ADF&G Div. of Sport Fish, Palmer, June 16, 2011), the end of July is typically the best time to find adult Chinook salmon on spawning grounds in the Upper Susitna area, so we targeted this period for the 2-day aerial survey trip.

TARGET STREAMS

In 2003 we selected as target streams all streams having non-AWC-listed segments having an estimated gradient of \leq 10% and exceeding the minimum length criterion established for each

survey area. The minimum length criterion was 7.9 km for the Yentna River basin, 9.0 km for the Skwentna River basin, 5.6 km for the Lake Creek basin, 2.6 km for the Talkeetna area (including streams in the Talkeetna River basin and Lower Susitna River Subbasin), and 12 km for upper Susitna River tributaries between Fog Creek and the Tyone River. We also added several individual streams requested by fish-habitat permitting biologists to the set of target streams.

In 2011, according to the methods of Buckwalter et al. (2010), we defined 3 stream size classes based on upstream drainage (catchment) area. *Headwaters* drain at least 50 km², *Intermediate Streams* drain at least 200 km², and *Mainstems* drain at least 1500 km². From these 3 classes, we selected a prioritized set of target streams, as described below.

Headwaters Target Streams

According to the methods of Buckwalter et al. (2010), we identified and ranked all non-AWC-listed *Headwaters* target streams in the study area. A set of 160 *Headwaters* target streams remained after we removed from consideration any candidate streams that were: 1) already listed in the AWC; 2) located entirely within a conservation unit; 3) streams we had already surveyed in 2003; or 4) located upstream of known fish migration barriers (e.g., waterfalls and glaciers).

Intermediate Target Streams

Using the same methods and criteria described above for selecting and ranking *Headwaters* target streams, we selected as target streams and ranked all 41 qualifying *Intermediate* streams in the study area.

Mainstem Target Streams

We selected as target streams all 11 *Mainstem* rivers in the study area, including the Knik, Deshka, Skwentna, Yentna, Kahiltna, Susitna, Maclaren, Tyone, Chulitna, Talkeetna, and Matanuska rivers. Eight of these rivers were already listed in the AWC at the point where the drainage area first exceeded 1500 km², and 3 were not. We included the 8 AWC-listed *Mainstem* target streams to add additional anadromous species and life stages to the AWC, and to document the complete fish assemblage occurring in these streams.

FISH-COLLECTION REACHES

At each *Headwaters* and *Intermediate* target stream sampled in 2011, and target streams sampled in 2003, the crew leader selected a fish-collection reach location during slow, low level helicopter reconnaissance according to the methods of Buckwalter et al. (2010). For the *Mainstem* target streams, fish-collection reach locations were selected in the office prior to fieldwork according to the methods of Buckwalter et al. (2010) for Jet-Boat Team fish-collection reaches. We selected 1 reach on each of the 11 *Mainstem* target streams listed above. Moreover, to sample fish assemblages representing the middle and lower reaches of the largest *Mainstem* target streams, which we presumed would likely result in the addition to the AWC of new anadromous species/life stages, we identified 3 additional *Mainstem* reaches to be sampled in the Susitna River and 1 additional reach in the lower Yentna River.

Reach Length

For *Headwaters* target streams sampled in 2011 and all target streams sampled in 2003, we sampled a standard reach length of 40 channel widths (CW), with a minimum reach length of

150 m and a maximum of 300 m. We previously demonstrated that a reach length of 40 CW is likely sufficient to detect within 1 species of the estimated true species richness 90% of the time in western Alaska (middle Kuskokwim and eastern Norton Sound drainages) headwaters streams (unpublished data, Daniel Reed, ADF&G biometrician, July 2010, Nome Alaska). And a 40 CW reach is consistent with the findings of other studies in wadeable coldwater streams (e.g., Patton et al. 2000, Reynolds et al. 2003, Temple and Pearsons 2007).

Analysis of prior (2007–2010) AFFI fish collections indicated that single-pass electrofishing in a 40 CW reach typically underestimates true species richness in nonwadeable streams of Western and Interior Alaska (Buckwalter et al. 2012). Therefore, to better ensure that all common species of the extant fish assemblage were detected in nonwadeable streams, in 2011 we sampled a minimum reach length of 120 CW (or as much as we could sample in one day), and we continued to collect data (as described under Objective 3 Task 1) to develop and assess regional sampling sufficiency recommendations for Alaskan nonwadeable streams (see the *Objective 3*— *Sampling Sufficiency* section under the *Data Analysis* heading, below).

WAYPOINTS AND STATIONS

At each study site, we marked a waypoint⁴ at the habitat transect using a handheld, consumer grade GPS receiver (Garmin GPSMAP 60CSx). We referred to this point location as the Station. If fish sampling was attempted, we also marked additional GPS waypoints at the upstream and downstream ends of the fish-collection reach. If a fish-collection reach was established in the absence of a habitat transect (e.g., when we aerially observed an aggregation of adult fish spread throughout a stream segment), we referred to the upstream terminus of the fish-collection reach as the Station. We also established a Station at sites with no habitat transect and no fish-collection reach, such as: target streams lacking a suitable landing zone; target streams deemed unlikely to support anadromous fish use; target streams deemed to be inaccessible or nonwadeable; waterfalls or other definite migratory barriers (Appendix B3); or other features of interest.

FISH-COLLECTION METHODS

According to protocols of Buckwalter et al. (2012), and as detailed in Appendix A1 (wadeable streams) and Appendix A2 (nonwadeable streams), we sampled the fish assemblage in each reach by single-pass electrofishing, supplemented occasionally with other methods (i.e., visual observations, angling, dip net, beach seine, and minnow trap). Table 4 lists variables associated with fish-collection events and fish catch that were recorded at each study site.

In 2011, on behalf of the University of Alaska Museum, Fairbanks, we retained (fixed in 10% formalin solution) 182 individually tagged whole fish specimens from 26 sites, along with (right side, pectoral or pelvic) fin clips (in 95% ethanol) from 149 fish from 24 sites (Appendix II).

In 2011, we retained up to 12 specimens of optionally-anadromous fishes >250 mm fork length from each site where they were collected, including 14 humpback whitefish collected from 4 sites and 23 Dolly Varden collected from 9 sites (Appendix I2). We froze the whole fish the same day they were collected, then thawed them in the fall of 2011, took fin clips for genetic analysis (see Appendices I1 and I3), recorded biological and meristic data (Appendix J), and extracted the sagittal otolith pair. After removing any soft tissue from the otoliths, we put each

⁴ To minimize GPS error when marking waypoints, we used the waypoint-averaging mode (10 s).

pair of dry otoliths in a uniquely labeled glass sample vial and sent them to the USFWS in Fairbanks (c/o Randy Brown, Fishery Biologist) to be tested for periods of saltwater residency. If otolith-chemistry tests provide evidence of saltwater residency, we will also nominate for inclusion in the AWC the water bodies where these specimens were found, along with the downstream route to saltwater.

In 2011, on behalf of the USFWS Conservation Genetics Laboratory, Anchorage we retained (in vials with silica beads) for genetic analysis (right side, pelvic) fin clips from 97 Dolly Varden from 21 sites (Appendix I3).

AQUATIC AND RIPARIAN HABITAT ASSESSMENT

At each site where fish collection was attempted, we established a habitat transect and measured a suite of habitat variables describing water quality, channel dimensions, streamflow, and riparian vegetation according to the methods of Buckwalter et al. (2010) as modified by Buckwalter et al. (2012). Table 4 lists the variables that were typically recorded at each habitat transect, along with any associated instruments, measurement units and precision (continuous variables), and domain (list of possible values of categorical variables).

In 2003 the following methods differed from those used in 2011:

• In 2003 we used a Horiba U-10 water quality checker to measure water temperature, pH, conductivity, dissolved oxygen, and turbidity. In 2011 we used a YSI 556 meter and a Lamotte 2020e turbidimeter to measure these variables. The YSI 556 was set to display ambient conductivity (without temperature compensation), which is preferred for adjusting electrofisher output settings; however, the U-10 used an automatic temperature conversion function to calculate conductivity at 25°C, using a temperature coefficient of 2%/°C. Therefore, we converted the 2003 temperature compensated conductivity values reported by the U-10 to ambient conductivity values as:

 $L_t = L_{25}(1 + 0.02[t - 25])$, where:

 L_t = ambient conductivity at t

 L_{25} = conductivity at 25°C (value displayed on U-10)

t = water temperature at time of measurement (°C)

- In 2003 we did not record substrate embeddedness, channel entrenchment ratio, or thalweg velocity.
- We measured channel width and thalweg depth at the ordinary high water level (OHW) in 2003 and at the bankfull level in 2011.

Table 4.–List of	variables to	be collected	during fieldwork.

Variable name	Equipment	Units/Domain	Precision	Comment
Geographic information)n			
Project Code and Station ID	-	text	-	5-digit alphanumeric—see Waypoints and Visits heading in text.
Station location Upper end of reach Lower end of reach	consumer-grade GPS unit (e.g. Garmin GPSmap 60CSx or 76S)	decimal degrees: latitude (DD.DDDDD); longitude (-DDD.DDDDD)	0.00001 degrees	
Geodetic datum		Text	-	Default is WGS84.
Water-body name	Water-body name from USGS topo map	text	-	
Geographic comments	-	text	-	Describes location of study site in relation to adjacent long-term or permanent geographic features
Observers	-	list of field staff	-	
Date/time	field notebook computer	mm/dd/yyyy hh:mm:ss	1 s	Value input automatically from computer's clock when data entry is begun
Camera counter	-	sequential integers	-	List of photo filenames (last 3 digits only) associated with each station
Visit comments	-	text	-	Physical and biological conditions at the station during the visit—focus on ephemeral conditions, such as weather or stream conditions, or the dynamics of riparian conditions, that may help explain other recorded observations
Wildlife comments	-	text	-	Anecdotal wildlife observations, particularly those that relate to fish.
Water quality				
Water temperature	YSI 556 meter (2011)	°C	0.01 °C	Sample thalweg
pН	Horiba U-10 water quality checker (2003)	pH units	0.01 pH units	Sample thalweg
Dissolved oxygen		mg/L	0.01 mg/L	Sample thalweg
Conductivity		μS/cm	1 μS/cm	Ambient conductivity (not temperature corrected). Sample thalweg
Turbidity	LaMotte 2020e turbidimeter	NTU	1 NTU	Sample thalweg
Water color	-	see Appendix B4	-	

-continued-

Table 4.–Page 2 of 4.

Variable name	Equipment	Units/Domain	Precision	Comment
Channel morphology				
Channel width (wetted	30-m fiberglass tape	m	0.1 m	In wadeable channels < 30 m wide
and bankfull [BF, 2011]/OHW [2003])	laser range finder (Bushnell Yardage Pro)	m	1 m	In nonwadeable channels, or where width $> 30 \text{ m}$
Thalweg depth (wetted and BF	handheld sonar (HawkEye Digital Sonar) and clinometer (to find the BF level)	m	0.1 m	For nonwadeable channels
[2011]/OHW [2003])	graduated rod	m	0.01 m	All teams—wadeable channels
Stream gradient	clinometer (Sokkia 5x magnifying abney level with clinometer, or Suunto PM-5)	%	0.1%	Water surface angle between consistent channel features near habitat transect.
Substrate composition	-	see Appendix B4	-	3 most dominant substrate classes within scoured portion of streambed in a 5 CW (<100 m) section centered on habitat transect.
Embeddedness category (not measured in 2003)	Visual estimate	see Appendix B4	-	Estimated embeddedness of gravel, cobble, and boulder particles in, or as near to as possible, the thalweg in a 5 CW (<100 m) section centered on the habitat transect.
Entrenchment ratio category (not measured in 2003)	Visual estimate or laser range finder (floodprone width), and see channel width (BF)	1.0–1.4=entrenched; 1.41–2.2=moderately-entrenched; >2.2=slightly-entrenched	-	Entrenchment ratio (Rosgen 1994) = flood-prone width \div BF width. Flood-prone width is the width of the floodplain measured at a water level of twice the thalweg BF depth.
Stream type	see Channel width, Thalweg depth and Stream gradient	Rosgen (1994) stream types, plus the following: Lake/Pond; Slough; Beaver pond complex; Wetland; or No defined channel	-	To be determined in the office following fieldwork based on BF width and BF depth (width-to-depth ratio), gradient, entrenchment ratio, dominant substrate, and estimated sinuosity values.
Streamflow				
Stream stage	-	See Appendix B4	-	Water level relative to BF stage.
48-hour precipitation	-	none/trace, moderate, heavy	-	

-continued-

Table 4.–Page 3 of 4.

Variable name	Equipment	Units/Domain	Precision	Comment
Streamflow (continue	d)			
Thalweg velocity (not measured in	Transparent velocity-head rod (TVHR)	Head depth (mm)→mean water column velocity (m/s)	1 mm (0.1 m/s)	Wadeable streams, depth <0.9 m
2003)	Whole orange, fiberglass tape, stopwatch	m/s	0.1 m/s	Wadeable streams (alternate). Timed orange float through a 6-m length.
	consumer-grade GPS unit (Garmin GPSmap 60CSx or 76S)	m/s	0.1 m/s	Nonwadeable streams—maximum sustained GPS velocity of boat drifting in thalweg.
Meter type	-	TVHR, orange, or GPS	-	
Riparian vegetation co	ommunities			
Riparian vegetation composition	-	Viereck et al. (1992) vegetation communities	-	Dominant vegetation community recorded in 8 zones (4 zones on each bank): 0-5 m (from OHW); 5-10 m; 10- 20 m; 20-30 m
Canopy height	graduated rod (< 1.5 m); clinometer & range finder (> 1.5 m)	m	0.1 m (< 1.5 m); 0.5 m (>1.5 m)	Recorded for each of the 8 zones described above
Disturbance	-	Disturbance classes (Appendix B6)	-	
Fish-collection events				
Channel	-	main-, side-, or off-channel	-	Channel type of fish-collection event
Fish-collection method	-	backpack electrofisher, boat electrofisher, visual observations (ground, boat, or helicopter), dipnet, angling, none	-	
Waveform	electrofisher setting	DC-pulsed; DC-unpulsed	-	
Voltage		V	1 V	(LR-24 only)
Range		Low or High	-	(GPP 2.5 only)
Percent of range		0–100 %	Continuous	(GPP 2.5 only)
Frequency		pulses per second (pps)	1 pps	
Duty cycle		%	1%	(LR-24 only)
Current	electrofisher output meter	А	0.01 A (LR-24); 0.1 A (GPP 2.5)	Peak current (LR-24); average current (GPP 2.5)
Power	electrofisher output meter	W	1 W	Peak power (LR-24 only)
Electrofisher on-time	electrofisher timer	S	1 s	
Efficiency	-	excellent, good, fair, poor	-	Perceived electrofishing efficiency, relative to optimal conditions.

Table 4.–Page 4 of 4.

Variable name	Equipment	Units/Domain	Precision	Comment
Catch				
Reach length	GPS (trip computer mode, or track)	m	1 m	Indicate actual length of fish-collection reach, measured by GPS.
Species	-	list of Alaskan freshwater fish species	-	
Life stage	-	see Appendix B1	-	
Life history	-	anadromous, freshwater-resident, marine, unknown, N/A	-	
Suspect spawning	-	yes, no	-	
Barrier	-	see Appendix B3	-	
Fork length	fish measuring board	mm	1 mm	
Sex	-	male, female, blank (if sex was not determined)	-	
Anomalies	-	see Appendix B2	-	
Retained	-	Checkbox (Y/N)	-	Indicate each individual fish retained.
Tag No.	-	10-digit alphanumeric text	-	For retained specimens, indicate the tag number affixed to each fish.
Vial No.	-	10-digit alphanumeric text	-	If a tissue sample was taken, indicate the vial number.
Photo No.	Digital camera	3-digit positive integer	1	For each fish photographed, indicate the photo number (last 3 digits of the photo filename) for each photo taken. May use comma or hyphen to separate non- sequential photo numbers or indicate a range of photo numbers.
Individual fish comments	-	text	-	Comments pertaining to an individual fish (e.g., sampling injuries or mortalities, unusual features or behavior)
Additional counts	-	integerno. of fish	1 fish	
Estimated	-	yes, no	-	Indicates whether the no. of additional fish recorded above was an estimate or a direct count
Species-life-stage comments	-	text	-	Comments pertaining to an entire group of fish of the same species and life stage

DATA ANALYSIS

Stream-Size Groups

We grouped the reaches sampled based on drainage area (km²) upstream of the habitat transect to compare fish occurrence and distributions of habitat variables across stream sizes as follows: wadeable (Small) streams, $\leq 100 \text{ km}^2$; nonwadeable streams, $>100 \text{ km}^2$. For most of the data summaries and tables in the Results section and appendices, we further subdivided the nonwadeable streams into Medium (100–500 km²) and Large (>500 km²) streams.

Graphical Summaries of Frequency Distributions

We created a variety of graphs (Appendix G1) to display frequency distributions of categorical variables. We created side-by-side box plots⁵ to graphically display the distributions of selected numeric habitat variables and visualize how distributions of each variable differ within stream-size (Appendix G2) and species-occurrence (Appendix G4) groups. Likewise, we created frequency histograms to visualize how fish fork length distributions varied between species and among stream-size groups (Appendix G3). We derived catch per unit effort (CPUE) for Species A as the total number of fish of Species A collected divided by the total electrofisher on time (hours) at sites where Species A was collected and created box plots summarizing CPUE for each species, within stream-size groups (Appendix G5).

We created frequency histograms (Appendix J) to display meristics data from Dolly Varden and humpback whitefish specimens retained for an otolith-chemistry study (see Appendix I2).

Supplemental Data Analyses

When we examined side-by-side plots of numeric variables grouped by stream size (Appendix G2 and Appendix G3) and species occurrence (species found vs. not found, Appendix G4), it appeared there were some variables having distributions that differed among groups. So we ran 2-tailed randomization tests (Manley 1997) to test for differences in medians of numeric variables between stream-size groups (Small vs. Medium, Small vs. Large, and Medium vs. Large streams; 100,000 simulations each—Appendix H1 and Appendix H2) and species-occurrence groups (100,000 simulations for wadeable streams and 10,000 simulations for nonwadeable streams, Appendix H3). For most species, the sample sizes (i.e., number of reaches where the species was found or not found) in nonwadeable streams were not adequate to further subdivide the nonwadeable streams into Medium and Large sub-groups, so we did not subdivide the nonwadeable streams for Appendix G4 and Appendix H3.

We also examined the data for evidence that pairs of fish species either tended to be associated or that they demonstrated a tendency to not occur at the same sites within stream-size groups (wadeable or nonwadeable reaches). We constructed contingency tables (2x2) for each pair of species to test the null hypothesis that the occurrence of species A at a site was independent of the occurrence of species B at a site. Fisher's Exact Test was used to evaluate the null hypothesis for each pair of species because contingency table cell counts were frequently small (<5) and expected values for cell counts were frequently < 1.0 (Agresti 1990). Regardless of the significance of test results, nominal positive or negative association between each pair of species was determined by examining marginal values for each contingency table.

⁵ The box plots in this report display the median (50th percentile) as a black dot (•), and the 1st (25th percentile) and 3rd (75th percentile) quartiles as the lower and upper ends of the box. The ends of the whiskers represent the lowest value still within 1.5 IQR (interquartile range, i.e., the difference between the 3rd and 1st quartiles) of the 1st quartile, and the highest value still within 1.5 IQR of the 3rd quartile. Outliers (values beyond 1.5 IQR) are represented as open circles.

Objective 3—Sampling Sufficiency

True species richness (*TSR*) was estimated for each nonwadeable fish-collection reach where sampling sufficiency data were collected, and compared to observed species richness (*SR*), the total number of species found in a reach. For a site *i*, where data were collected over a series of n_i subreaches, *TSR* and *SR* were compared at the conclusion of each subreach beginning with the 4th subreach and continuing to the n_i th subreach.

A Horvitz-Thompson estimator (Cochran 1977) was used to estimate TSR. For each observed species *s* in *SR* in the sample of n_i subreaches for site *i*, the probability that this species was detected in one subreach was estimated:

$$\hat{p}_{s,i} = \frac{n_{s,i}}{n_i} \tag{1}$$

where $n_{s,i}$ is the number of subreaches n_i where species *s* was detected. We then calculated the probability that the species would not have been detected by sampling n_i subreaches:

$$1 - \hat{p}_s = (1 - \hat{p}_{s,i})^{n_i} \tag{2}$$

from which we can directly calculate \hat{p}_s , and estimate the probability that the species can be detected at site *i* with n_i sampled subreaches. The Horvitz-Thompson estimate of *TSR* was calculated as a sum across all detected species:

$$TSR_{H-T} = \sum_{j=1}^{SR} \frac{1}{\hat{p}_s}.$$
 (3)

The analytical formulae presented in Cochran (1977) for estimating the sampling variance of the Horvitz-Thompson estimator when p_s is estimated (not known with certainty) are not stable for small sample sizes. We are in the process of evaluating a bootstrap approach (Efron and Tibshirani 1993) for estimating variance using the type of data collected in this project.

To evaluate stopping rules for sampling sufficiency for nonwadable streams and rivers, we combined data from this experiment with our 2008 results from the lower Yukon River (Buckwalter et al. 2010), 2007 results from the upper Kuskokwim River and 2009 results from the middle Kuskokwim River (Kirsch et al. *In prep*), 2009 results from eastern Norton Sound (Kirsch et al. 2011) and 2010 results from the upper Koyukuk River and Chandalar River (Buckwalter et al. 2012). Two types of stopping rules were evaluated: fixed and adaptive.

Fixed stopping rules were evaluated for stream sampling where data are recorded after completion of sampling of the entire reach. Stopping rules of 80, 100, 120, and 140 wetted widths (8, 10, 12, and 14 subreaches) were considered.

The estimate TSR_{H-T} rounded to the nearest integer was used to indicate total species richness for each reach sampled. Observed *SR* at each stopping point was subtracted from the estimate of species richness for the entire reach to estimate the number of species undetected. The proportion of reaches, along with cumulative proportions, where an estimated 0, 1, 2, ...5 or more species were missed was calculated. Only those reaches where 9 or more subreaches were sampled were used to estimate the number of undetected species per reach when evaluating stopping sampling at 8 subreaches. Those reaches where 11 or more subreaches were sampled were used to estimate undetected species when evaluating stopping at 10 subreaches, and to provide an additional evaluation for stopping at 8. Reaches with 13 or more subreaches sampled

were used to evaluate stopping at 12 subreaches, and to provide additional evaluations for stopping at 10 and 8 subreaches. Reaches with 15 or more subreaches sampled were used to evaluate stopping at 14 subreaches, and to provide additional evaluations for stopping a 12, 10 and 8 subreaches.

Adaptive stopping rules were evaluated for stream sampling where data are recorded after completion of sampling of each subreach (10 wetted widths), and the series of data recorded for all subreaches is used to determine if additional sampling is necessary at that reach after sampling a minimum number of subreaches. Adaptive stopping rules had two criteria. First, a minimum number of subreaches were required to be sampled before sampling could be terminated. Minimums evaluated were 6, 8, 10, 12, and 14 subreaches. Second, sampling would be continued unless no new species were detected in the last 4 or 6 subreaches sampled. Adaptive stopping rules were evaluated using methods similar to those described above for fixed stopping rules. Observed species richness at a stopping point was subtracted from the estimated true species richness for the entire reach to estimate the number of species undetected.

Using data tabulated for fixed stopping rules described above, contingency table analyses (Agresti 1990) were used to look for evidence of differences between regions in application of stopping decision rules. Three contingency tables were analyzed based on the following data sources: all reaches with 9+ subreaches sampled using a stopping rule of 8 subreaches; all reaches with 11+ subreaches sampled using a stopping rule of 10; and all reaches with 13+ subreaches sampled using a stopping rule of 12 subreaches. Data were categorized into 5 geographic areas (upper + middle Kuskokwim, middle Yukon, eastern Norton Sound, upper Koyukuk and Chandalar and Susitna + Matanuska + Knik streams) by estimated number of species not detected (1 or fewer vs. 2 or more). We tested the null hypothesis that the distribution of numbers of species missed was independent of geographic area. Rejection of the null hypothesis would be evidence that different stopping rules need to be considered for the different geographic areas in the data set.

To check whether drainage area matters in application of stopping rules for nonwadeable streams, the Kolmogorov-Smirnov (KS) test (Conover 1980) was used to look for differences in drainage area between reaches where 1 or fewer vs. 2 or more species were undetected. The data examined were from 105 reaches with 9+ subreaches sampled. For each reach, the difference between estimated TSR and observed species richness after sampling 8 subreaches was calculated and rounded to the nearest integer. Reaches were then categorized as reaches where 0 or 1 species were missed or as reaches where 2 or more species were missed. The cumulative distribution of drainage area was compared between these two categories of reaches using the KS test. Detection of significant differences between distributions would be evidence that different stopping rules need to be considered for different drainage areas.

RESULTS

As a result of the 114 AWC nominations generated by these projects (60 in 2003 and 54 in 2011), a total stream distance of 830 km of previously unlisted anadromous fish habitat was added to the AWC (Figure 3 and Appendix E). Additional anadromous species or life stages were documented in 18 previously cataloged streams. Station reports and digital photos are available on the AFFI interactive mapping website at <u>http://www.adfg.alaska.gov/index.cfm?adfg=ffinventory.interactive</u>, and are also included in Appendix J of this report. We created maps to display study site locations and species found (Appendix C) and fish distribution, by species (Appendix D).

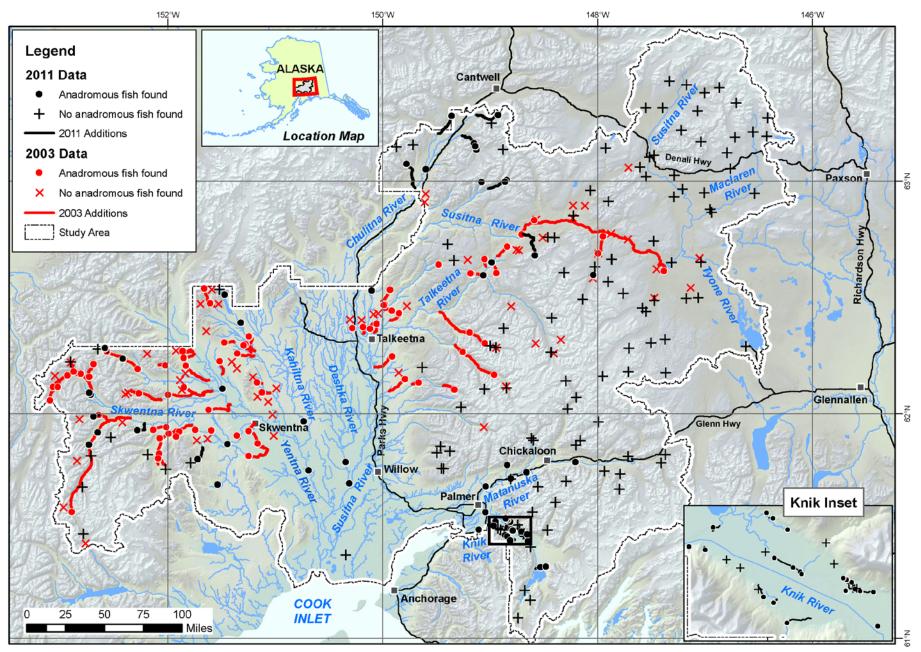


Figure 2.-Map of new or extended AWC water bodies resulting from ADF&G inventories in 2003 and 2011.

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We attempted to collect fish at a total of 275 sites (105 in 2003 and 170 in 2011). Single-pass electrofishing was the primary fish-collection method at 242 (88%) of them. Of the 242 electrofished sites, 152 were in Small streams, 63 in Medium streams, and 27 in Large streams. Of the remaining 33 sites where fish collection was attempted, 30 were sampled primarily by minnow traps (6.35 cm mesh) baited with cured salmon roe, and 3 were sampled primarily by dipnet. At 44 additional sites, we observed fish, but made no attempt to collect them (e.g., visual observations of adult salmon).

At an additional 38 sites, we marked a waypoint, took photos, and created a station record in the database, but did not attempt to collect or observe fish—28 of these sites represented waterfalls, 6 represented target streams that we flew by but did not sample (typically no suitable landing zone, or stream was unsafe to sample), and 4 represented other features of interest (i.e., Station ID FSS1103G01 Devils Canyon flyby, Station ID FSS1113C08 mining camp along the Skwentna River, Station ID FSS1101F04 ATV trail crossing a Knik River tributary).

We found at least 1 fish at 223 (92%) of the 242 electrofished sites, including representatives of 19 species and 7 families (Table 5). 11 of the 19 species were members of the salmonid family (Salmonidae—including salmon, trout, char, whitefishes, and grayling). Salmonidae was the dominant family across all 3 stream sizes, occurring at 100% of sites in Large streams and 86% of sites in Medium and Small streams sampled by electrofisher. Occurring at 92% of the electrofished sites in Large streams, 57% in Medium streams, and 50% in Small streams, Cottidae (sculpins) was the second most dominant family. We found at least 1 anadromous fish at 76 (31%) of the 242 electrofished sites.

We found 13 fish species in Small streams, 13 in Medium streams, and 16 in Large streams. In Small streams, Dolly Varden (85 sites, 56%) and slimy sculpin (75 sites, 49%) occurred at the greatest number of electrofished sites. In Small streams, we found no longnose sucker, northern pike, humpback whitefish, pygmy whitefish, or chum salmon, and only 1 Small stream had lamprey. In Medium streams, slimy sculpin (35 sites, 56%) and Dolly Varden (29 sites, 46%) occurred most frequently. And in Large streams, slimy sculpin (21 sites, 78%) and Arctic grayling (19 sites, 70%) were most ubiquitous. We found lampreys, northern pike, humpback whitefish, pygmy whitefish, pink salmon, chum salmon, and sticklebacks (threespine and ninespine) at only <5% of the electrofished sites, and, with the exception of sticklebacks, these less common species were found almost exclusively in nonwadeable streams. We found no fish at 20 electrofished sites in Small streams and at 6 in Medium streams (Table 5).

Appendix F1 summarizes occurrence (number of electrofished sites) of fish species by stream size and life stage. Round whitefish, Arctic grayling, rainbow trout, Chinook salmon, Dolly Varden, and slimy sculpin were the only species for which both juveniles and adults were reported from all 3 stream-size groups. Only adult Pacific lamprey, pink salmon, and chum salmon life stages were found (no other life stages were found for these species). No juvenile coho or sockeye salmon were found in Large streams. Adult round whitefish and burbot were found only in nonwadeable streams.

Appendix G1 shows frequency distributions of dominant riparian vegetation communities (*sensu* Viereck et al. 1992). Shrub communities dominated the riparian zone within 30 m of the edge of the stream in Small and Medium streams. In Small streams, tall, closed willow scrub (IIB1a) was the most prevalent riparian vegetation community. In Medium streams, IIB1a, along with tall,

closed alder-willow scrub (IIB1d) were co-dominant. In Large streams, IIB1d and IIB1a were dominant within 5 m of the stream, and closed, mixed spruce - paper birch forest (IC1a) and closed white spruce forest (IA1j) were co-dominant in the zone from 20 to 30 m from the stream, with the zones in between showing a transition from shrub to forest types.

Appendix G1 also shows frequency distributions of water-color, dominant substrate, embeddedness, and Rosgen (1994) stream types. The water color category we identified most frequently in Small (66%) and Medium (51%) streams was "Clear". However, most Large streams we sampled had a "Glacial, high turbidity" color (49%), followed by "Clear" (46%).

Cobble was most frequently the dominant substrate class in Small (43%) and Medium (58%) streams; however, in Large streams, gravel most frequently (35%) occurred as the dominant substrate type.

Substrate embeddedness was most frequently rated low or negligible in Small (67%) and Medium (60% streams), but was rated moderate to very high in 52% of Large streams.

In the reaches we sampled, the most prevalent level-I Rosgen (1994) stream type across all stream sizes was C, followed by B in Small and Large streams and D in Medium streams.

Average CPUE (total number of fish collected while electrofishing/total electrofisher on-time) was 84 fish/h in Small streams, 45 fish/h in Medium streams, and 44 fish/h in Large streams. When calculated separately for each species, CPUE was greatest for most species in Small streams, with a few exceptions (Appendix G5).

Supplemental Data Analyses

In Appendix G2, side-by-side box plots show distributions of selected numeric habitat variables, grouped by stream size. For each variable, Appendix H1 lists up to 3 *p*-values from randomization tests for a difference in the medians for each pair of stream-size groups. Low $(\leq 0.05) p$ -values suggest the medians differ among stream-size groups.

Median pH, turbidity, conductivity, thalweg velocity, and channel width and depth all tended to increase from Small to Large streams. For pH, Medium streams did not differ significantly from Large streams. Randomization tests suggested that Medium streams had a significantly higher median elevation and dissolved oxygen than Large or Small streams and a significantly higher stream gradient than Large streams. Water temperature was the only numeric habitat variable showing no significant difference in medians between stream-size groups.

Frequency histograms of fish fork lengths (mm), along with the number of species found per electrofished reach, grouped by stream size, are shown in Appendix G3. For each species, and for the number of species found, Appendix H2 lists up to 3 *p*-values from randomization tests for a difference in the medians for each pair of stream-size groups. Low (≤ 0.05) *p*-values suggest the medians differ among stream-size groups.

The number of species found per site ranged from 0 to 11 (Appendix G3). Randomization tests suggested that Large streams had a significantly higher median number of species per site (mean = 5.1, median = 5) than Medium (mean = 2.1, median = 2) or Small (mean = 1.9, median = 2) streams (Appendix H2).

Randomization tests also showed some apparently significant differences in median fish fork length between stream sizes (Appendix G3 and Appendix H2):

- The median length of Arctic grayling in our catch appeared to be significantly lower in Small (121 mm, *n*=160) vs. Medium (250 mm, *n*=195) and Large (220 mm, *n*=175) streams.
- The median length of juvenile coho salmon in our catch appeared to be significantly lower in Small (52 mm, n=569) vs. Medium (59 mm, n=27) streams, with Large streams in between (54.5 mm, n=24), but note the small sample sizes in Large and Medium streams.
- The median length of rainbow trout in our catch appeared to be significantly lower in Small (52 mm, *n*=73) vs. Medium (145 mm, *n*=59) and Medium vs. Large (165.5 mm, *n*=12) streams, but note the small sample size in Large streams.
- The median length of juvenile Chinook salmon in our catch appeared to be significantly greater in Large (59 mm, *n*=147) vs. Medium (50 mm, *n*=93) and Small (49 mm, *n*=164) streams.
- The median length of Dolly Varden in our catch appeared to be significantly lower in Small (94 mm, *n*=717) vs. Medium (120 mm, *n*=373) and Medium vs. Large (144 mm, *n*=81) streams.

In Appendix G4, paired box plots show distributions of selected numeric habitat variables from groups of sites where a given fish species was found versus not found, grouped by stream size. Appendix H3 lists *p*-values from randomization tests to detect a significant difference in the median values for these populations. Low (≤ 0.05) *p*-values suggest the medians differ.

Appendix H4 lists *p*-values from contingency table analyses for apparent relationships (association or avoidance) between fish species found at electrofished sites, grouped by stream size. Low (≤ 0.05) *p*-values suggest that, either an interspecific relationship occurs, or the given species may have similar (or differing) habitat preferences.

Fish-Distribution Patterns

Our inspection of species occurrence maps (Appendix D), paired boxed plots of habitat variables (Appendix G4), results of tests for a difference in the median of habitat variables between groups of sites where each species was found versus not found (Appendix H3), and results of contingency table analyses for co-occurrence of fishes (Appendix H4), suggested the following fish-distribution patterns occurred in the study area during summer:

We found **Arctic-Alaskan-brook lamprey** (the ammocoetes of these 2 sister species could not be distinguished) at only 4 sites (3 Large and 1 Small stream) located in the Lower Susitna River and Yentna River subbasins (Table 5, Appendix D1). Adult specimens collected from the Deshka River (site FSS1108D01) keyed out as Arctic lamprey^a. Although the sample size was very low, Large streams where Arctic/Alaskan-brook lamprey were found appeared to have greater median *catchment area, wetted width*, and *thalweg depth*, and lesser *elevation* and *dissolved oxygen* than where Arctic/Alaskan-brook lamprey were not found. We also did not find

^a Six adult lamprey specimens from this site were euthanized in MS-222, fixed in 10% formalin on site, and subsequently keyed out (according to the *Key to Adults of Petromyzontidae of Alaska* in Mecklenburg et al 2002) as *L. camtschatica* by Joe Buckwalter and Raye Ann Neustel. Diagnostic characteristics indicative of *L. camtschatica* included: 2 cusps on supraoral bar; posterial teeth present; 3 pairs of lateral tooth plates; 8 cusps on infraoral bar, and; cusps on tongue teeth well developed, pointed. All the adults and ammocoetes we collected from the Deshka River also had distinct silvery sides. The specimens were sent to the UA Museum in Fairbanks c/o Andres Lopez.

any Arctic/Alaskan-brook lamprey where *water temperature* was <10.84 °C, *stream gradient* was >0.25%, or *conductivity* was >81 μ S/cm. Contingency table analyses suggested that pink salmon, northern pike, and threespine stickleback tended to co-occur with Arctic/Alaskan-brook lamprey in Large streams (Appendix H4).

We collected a single adult **Pacific lamprey**^a in the Deshka River just below the ADF&G weir at site FSS1108D01 (Table 5 and Appendix D2). The AWC does not contain any specified Pacific lamprey waters within the study area; however, listing a new species in the AWC requires more than a single specimen. The sample size was insufficient to infer any habitat associations; however, the Deshka River was unique in being one of just two *clear* Large streams in the study area (the other Large clear stream was the Tyone River in the Upper Susitna Subbasin), and also had the highest *water temperature* (17.9 °C) of any site sampled in the study area.

We found **longnose sucker** at 13 Large and 5 Medium streams in the Lower Susitna River, Upper Susitna River, and Yentna River subbasins (Table 5 and Appendix D3). Both Large and Medium streams where longnose sucker were found appeared to have lower median *stream gradient* than where longnose sucker were not found (Appendix H3). Median *dissolved oxygen* also appeared to be lower in Medium streams where longnose sucker were found. And median *wetted width*, *thalweg depth*, and *catchment* area appeared to be greater in Large streams where longnose sucker were found. Contingency table analyses suggested that round whitefish tended to co-occur with longnose sucker in Medium and Large streams, as did humpback whitefish in Large streams. In Medium streams, Arctic grayling and burbot also tended to co-occur, and Dolly Varden tended not to co-occur, with longnose sucker (Appendix H4).

We found **northern pike** in 3 Large streams in the Yentna River and Lower Susitna River subbasins (Table 5 and Appendix D4). Although the sample size was very low, median *elevation* and *dissolved oxygen* appeared to be lower at these sites than at sites where no northern pike were found. We found no northern pike where *stream gradient* was >0.5%, *thalweg velocity* >1.8 m/s, or *conductivity* >106 μ S/cm. Contingency table analyses demonstrate co-occurrence of northern pike with threespine stickleback, pink salmon, and Arctic or Alaskan-brook lamprey in Large streams (Appendix H4).

We found **humpback whitefish** in 5 Large streams, including 4 sites in the Upper Susitna River subbasin and 1 site in the Yentna River subbasin (Table 5 and Appendix D5). From randomization tests, median *dissolved oxygen* appeared to be higher at sites where humpback whitefish were found than where they were not found (Appendix H3). We found no humpback whitefish where *water temperature* was greater than 10.84 °C, *stream gradient* >0.6%, or *conductivity* >101 μ S/cm. Contingency table analyses suggested that longnose sucker tended to co-occur with humpback whitefish in Large streams (Appendix H4).

We collected a single **pygmy whitefish**^b from Lake Fork Knik River, a Medium stream located in the Matanuska River subbasin (Table 5, Appendix D6). The sample size was insufficient to infer habitat associations; however, the site where we collected this specimen was located about 6 km upstream of the outlet of Inner Lake George, where 6 pygmy whitefish were collected in

^a This Pacific lamprey specimen was fixed in 10% formalin and subsequently keyed out (according to the *Key to Adults of Petromyzontidae of Alaska* in Mecklenburg et al 2002) as *L. tridentata* by Joe Buckwalter and Raye Ann Neustel. The key diagnostic characteristic indicative of *L. tridentata* was the presence of 3 cusps on the supraoral bar. A photo of this specimen showing the dentition is included in the station report for site FSS1108D01 (see Appendix J). The specimen was sent to the UA Museum in Fairbanks c/o Andres Lopez.

^b This pygmy whitefish specimen was fixed in 10% formalin and sent to the UA Museum in Fairbanks c/o Andres Lopez.

June 2005 (M. Wiedmer and J. Buckwalter, Habitat Biologists, ADF&G, Anchorage, unpublished data).

We found **round whitefish** in 12 Large, 10 Medium, and 4 Small streams scattered throughout the study area, but not in the Matanuska River Subbasin (Table 5, Appendix D7). In Small and Medium streams where we found round whitefish, the median *catchment area* appeared to be greater than where none were found. In Medium streams where we found round whitefish, median *dissolved oxygen* and *stream gradient* appeared to be lesser, and *thalweg depth*, *elevation, water temperature*, and *conductivity* greater, compared to Medium streams where we found no round whitefish. With one exception, we found no round whitefish where *stream gradient* exceeded 1%. Contingency table analyses suggested that longnose sucker tended to co-occur with round whitefish in Medium and Large streams. In Small and Medium streams, Arctic grayling and burbot tended to co-occur with round whitefish in Medium streams (Appendix H4).

We found **Arctic grayling** in 19 Large, 25 Medium, and 25 Small streams dispersed across the study area, but most prevalent in the Upper Susitna subbasin (Table 5, Appendix D8). Across all 3 stream-size groups, median *elevation* appeared to be greater in streams where Arctic grayling were found than in streams where Arctic grayling were not found. And both Small and Medium streams where Arctic grayling were found appeared to have greater median *catchment area*, and lower *dissolved oxygen, thalweg velocity, turbidity*, and *stream gradient* (Appendix H3). Median *water temperature* also appeared to be greater in Medium streams where Arctic grayling were found. Contingency table analyses suggested that Dolly Varden tended not to co-occur with Arctic grayling across all stream sizes. In Small and Medium streams, burbot, slimy sculpin, and round whitefish tended to co-occur with Arctic grayling. Also, coho and Chinook salmon tended not to co-occur with Arctic grayling in Small streams, as did sockeye salmon in Large streams (Appendix H4).

We found adult **pink salmon** in 6 Large, 1 Medium, and 1 Small streams while electrofishing (Table 5), and in one more Small stream by visual observation (Appendix D9). We found pink salmon dispersed throughout the study area at lower elevations; however, we did not find pink salmon in the Talkeetna River or Upper Susitna River subbasins. In Large streams where we found pink salmon, median *elevation* and *dissolved oxygen* appeared to be lower, and *wetted width* and *thalweg depth* greater, than in Large streams where we did not find pink salmon (Appendix H3). We did not find pink salmon in any streams above an elevation of 430 m. In Large streams, Arctic-Alaskan brook lamprey, northern pike, sockeye salmon, and threespine stickleback tended to co-occur with pink salmon, and Arctic grayling tended not to co-occur with pink salmon (Appendix H4).

We found adult **chum salmon** in 1 Medium stream while electrofishing (Table 5), and in 1 more Medium and 2 Small streams by visual observation (Appendix D10). We found chum salmon only in the Yentna River and Matanuska subbasins (although we had few sites in the Susitna lowlands, where chum salmon were likely more prevalent). We also did not find chum salmon in any streams having a *catchment area* greater than 136 km², or *elevation* greater than 536 m.

We found **coho salmon** (mostly juveniles) in 3 Large, 2 Medium, and 35 Small streams while electrofishing (Table 5), plus 17 more Small, 2 Medium, and 2 Large streams by other sampling methods (minnow traps, visual observations, dip net; Appendix D11). We found coho salmon widely dispersed throughout the study area, but not in the Upper Susitna River subbasin. In

Small streams where we found coho salmon, median *catchment area, elevation, wetted width, thalweg depth,* and *pH* appeared to be lower, and *water temperature* higher, than in Small streams where we did not find coho salmon. And in Large streams where we found coho salmon, *thalweg velocity* appeared greater than in Large streams where we found no coho salmon (Appendix H3). In Small streams, contingency table analyses suggested that *Chinook salmon,* and to a lesser extent *rainbow trout,* tended to co-occur with coho salmon, and *Arctic grayling* tended not to co-occur with coho salmon. And in Large streams, *Dolly Varden* tended to co-occur with coho salmon (Appendix H4).

We found **rainbow trout** in 6 Large, 3 Medium, and 14 Small streams while electrofishing (Table 5); rainbow trout were not found by non-electrofishing methods in any additional streams. We found rainbow trout widely dispersed throughout the study area, but not in the Upper Susitna River subbasin. In Small streams where we found rainbow trout, median *catchment area, elevation, turbidity, wetted width and thalweg depth* appeared to be lower and *water temperature* higher, than in Small streams where we did not find rainbow trout. No relationships between rainbow trout presence and habitat variables were identified in Medium streams. In Large streams where rainbow trout were found, median catchment area and thalweg depth appeared to be higher than in Large streams where rainbow trout were not found (Appendix H3). Contingency table analyses suggested that in Small streams rainbow trout tended to co-occur with *coho salmon*, and not co-occur with *Dolly Varden* (Appendix H4).

We found **sockeye salmon** (mostly adults) in 7 Large, 4 Medium and 13 Small streams while electrofishing (Table 5), plus 30 more Small, 13 Medium, and 10 Large streams by other sampling methods (minnow traps, visual observations, dip net; Appendix D13). We found sockeye salmon widely dispersed throughout the study area, but not in the Upper Susitna River subbasin. In Small streams where we found sockeye salmon, median *elevation* and *water temperature* appeared to be lower than in Small streams where we did not find sockeye salmon. In Medium streams where we found sockeye salmon, median *catchment area* and *elevation* appeared to be lower than in Medium streams where we did not find sockeye salmon. In Large streams where we found sockeye salmon, median *elevation* appeared to be lower than in Medium streams where we did not find sockeye salmon. In Large streams where we found sockeye salmon, median *elevation* appeared to be lower, and *catchment area*, *turbidity, wetted width* and *thalweg depth* higher than in Large streams where sockeye salmon were not found (Appendix H3). Contingency table analyses suggested that in Small streams sockeye salmon tended to co-occur with *threespine stickleback*, and in Large streams with *pink salmon* and *Dolly Varden*, but not co-occur with *Arctic grayling* (Appendix H4).

We found **Chinook salmon** (mostly juveniles) in 10 Large, 7 Medium and 24 Small streams while electrofishing (Table 5), plus 3 more Small, 6 Medium, and 5 Large streams by other sampling methods (minnow traps, visual observations, dip net; Appendix D14). We found Chinook salmon widely dispersed throughout the study area including several individuals in the Upper Susitna River subbasin, although none above its confluence with the Tyone River. In Small streams where Chinook salmon were found, median *elevation* appeared to be lower, and *dissolved oxygen* and *wetted width* higher than in Small streams where Chinook salmon were not found. In Medium streams where Chinook salmon were found, median *elevation* appeared to be lower than in Medium streams where Chinook salmon were not found. Median *elevation* appeared to be lower, while *conductivity* and *stream gradient* higher in Large streams where Chinook salmon were found (Appendix H3). Contingency table analyses suggested that Chinook salmon tended to co-occur with *coho salmon* and not co-occur with *Arctic grayling* in Small streams (Appendix H4).

We found Dolly Varden in 7 Large, 29 Medium, and 85 Small streams while electrofishing (Table 5), plus 10 more Small and 1 Medium streams by other sampling methods (minnow traps, We found Dolly Varden widely dispersed visual observations, dip net; Appendix D15). throughout the study area. In Small streams where Dolly Varden were found, median water temperature appeared to be lower, and pH, dissolved oxygen and stream gradient higher than in Small streams where Dolly Varden were not found. In Medium streams where Dolly Varden were found, median catchment area, elevation and water temperature appeared to be lower, while dissolved oxygen and thalweg velocity higher than in streams where Dolly Varden were not found. Water temperature appeared to be lower, while pH and dissolved oxygen higher in Large streams where Dolly Varden were found when compared to Large streams where Dolly Varden were not found (Appendix H3). Contingency table analyses suggested that Dolly Varden tended not to co-occur with Arctic grayling, rainbow trout and slimy sculpin in Small streams; longnose sucker, round whitefish, Arctic Grayling, burbot and slimy sculpin in Medium streams; and Arctic grayling in Large streams. Dolly Varden did however tend to co-occur with coho and sockeye salmon in Large streams (Appendix H4).

We found **burbot** in 11 Large, 6 Medium and 3 Small streams while electrofishing (Table 5); burbot were not found by non-electrofishing methods in any additional streams. Burbot were commonly found in the Upper Susitna River subbasin upstream of the Tyone River confluence and within the lower Yetna River and its tributaries, however to a lesser degree elsewhere within the study area. In Medium streams where burbot were found, median *dissolved oxygen*, *stream gradient* and *thalweg velocity* appeared to be lower than in Medium streams where burbot were not found. In Large streams where burbot were found, median *elevation*, *dissolved oxygen* and *stream gradient* appeared to be lower, and *catchment area*, *wetted width* and *thalweg depth* higher than in Large streams where burbot were not found (Appendix H3). Contingency table analyses suggested that burbot tended not to co-occur with *round whitefish* and *Arctic grayling* in Small streams. In Medium streams, burbot tended to not co-occur with *longnose sucker*, *round whitefish* and *Arctic grayling*, while they did tend to co-occur with *Dolly Varden* (Appendix H4).

We found **threespine stickleback** in 3 Large and 7 Small streams while electrofishing (Table 5), plus 3 more Small streams by other sampling methods (minnow traps, visual observations, dip net; Appendix D17). Threespine stickleback distribution across the study area was limited, and confined for the most part to lower elevations streams in the Susitna, Matanuska and Knik river flats with gradients at or below .5%. In Small streams where threespine stickleback were found, median *elevation* appeared to be lower than in Small streams where they were not found. In Large streams where threespine stickleback were found, median *elevation* and *dissolved oxygen* appeared to be lower than in Large streams where they were not found (Appendix H3). Contingency table analyses suggest that threespine stickleback tended to co-occur with *sockeye salmon* in Small streams, and *Arctic lamprey, northern pike* and *pink salmon* in Large streams (Appendix H4).

We found **ninespine stickleback** in 1 Large and 2 Small streams while electrofishing (Table 5); ninespine stickleback were not found by non-electrofishing methods in any additional streams. Ninespine stickleback were very limited in distribution only being found in 3 low elevation streams in the Lower Susitna River subbasin and the Yetna River subbasin. Due to low sample size (n=3), no further distributional analyses were conducted.

We found **slimy sculpin** in 21 Large, 35 Medium and 75 Small streams while electrofishing (Table 5); slimy sculpin were not found by non-electrofishing methods in any additional streams.

We found slimy sculpin widely dispersed throughout the study area, particularly in the Upper Susitna River subbasin where they were found at nearly every sample site (52 of 63 [83%]; Appendix D19). In Small streams where slimy sculpin were found, median *pH*, *dissolved oxygen*, *turbidity*, *stream gradient* and *thalweg velocity* appeared to be lower, and *water temperature* higher than in Small streams where slimy sculpin were not found. In Medium streams where slimy sculpin were found, median *pH*, *dissolved oxygen*, *turbidity*, *stream gradient* and *thalweg velocity* appeared lower, and *catchment area*, *elevation* and *water temperature* higher than in Medium streams where slimy sculpin were not found. No relationships between slimy sculpin presence and habitat variables were identified in Large streams (Appendix H3). Contingency table analyses suggested that slimy sculpin tended to co-occur with *Dolly Varden* in Small streams. In Medium streams, slimy sculpin tended to co-occur with *round whitefish* and *Arctic grayling*, and not co-occur with *Dolly Varden* (Appendix H4).

			Stream size			
			Small	Medium	Large	Total
Family	Scientific name	Common name	(<i>n</i> =152)	(<i>n</i> =63)	(<i>n</i> =27)	(<i>n</i> =242)
Petromyzontidae	Lampetra camtschatica	Arctic lamprey	0	0	1	1
	Lampetra tridentata	Pacific lamprey	0	0	1	1
	L. camtschatica or	Arctic or Alaskan-	1	0	2	3
	alaskense	brook lamprey				
Catostomidae	Catostomus catostomus	longnose sucker	0	5	13	18
Esocidae	Esox lucius	northern pike	0	0	3	3
Salmonidae	Coregonus pidschian	humpback whitefish	0	0	5	5
	Prosopium coulteri	pygmy whitefish	0	1	0	1
	Prosopium cylindraceum	round whitefish	4	10	12	26
	Coregoninae	whitefish-unspecified	0	1	4	5
	Thymallus arcticus	Arctic grayling	25	25	19	69
	Oncorhynchus gorbuscha	pink salmon	1	1	6	8
	O. keta	chum salmon	0	1	0	1
	O. kisutch	coho salmon	35	2	3	40
	O. mykiss	rainbow trout	14	3	6	23
	O. nerka	sockeye salmon	13	4	7	24
	O. tshawytscha	Chinook salmon	24	7	10	41
	Salvelinus malma	Dolly Varden	85	29	7	121
Gadidae	Lota lota	burbot	3	6	11	20
Gasterosteidae	Gasterosteus aculeatus	threespine stickleback	7	0	3	10
	Pungitius pungitius	ninespine stickleback	2	0	1	3
Cottidae	Cottus cognatus	slimy sculpin	75	35	21	131
	Cottidae	sculpin-unspecified	1	1	4	6
-	-	no fish found	20	6	0	26

Table 5.–Occurrence (number of electrofished sites) of fish species by stream size.

Objective 3—Sampling Sufficiency

Estimates of total species richness, TSR_{H-T} (Cochran 1977), were calculated for 45 reaches sampled in nonwadeable streams during the 2011 field season (Table 6).

Reach ID	Subreaches Sampled	SR^{a}	Subreach when <i>SR</i> first observed	TSR_{H-T}^{b}	TSR _{H-T} minus SR
FSS1101a01	15	3	8	3.01	0.01
FSS1101B01	13	1	2	1.00	0.00
FSS1102A01	16	5	16	6.11	1.11
FSS1102B01	15	3	10	3.55	0.55
FSS1102D01	12	8	10	11.27	3.27
FSS1103A01	12	4	10	4.17	0.17
FSS1103B01	15	5	10	5.01	0.01
FSS1103D01	10	5	4	6.16	1.16
FSS1104A01	8	5	4	5.14	0.14
FSS1104A01	13	2	3	2.00	0.14
FSS1104D01	13	3	11	3.80	0.80
FSS1104D01 FSS1105A01	12	4	5	4.01	0.00
FSS1105A01 FSS1105B01	12	4	1	2.04	0.01
	6	5	1	2.04 5.05	0.04
FSS1106A01		5			
FSS1106b01	17	5 7	11	5.70	0.70
FSS1106D01	7		1 4	7.25	0.25
FSS1107A01	5	5		5.58	0.58
FSS1107B01	8	6	6	7.12	1.12
FSS1107D01	6	8	1	8.62	0.62
FSS1108A01	12	3	3	3.00	0.00
FSS1108B01	14	1	1	1.00	0.00
FSS1108D01	5	10	4	11.96	1.96
FSS1109A01	15	8	11	9.41	1.41
FSS1109b01	13	3	7	4.09	1.09
FSS1110A01	16	5	12	5.69	0.69
FSS1110B01	16	3	7	4.66	1.66
FSS1111A01	22	3	6	3.05	0.05
FSS1111B01	17	5	15	5.78	0.78
FSS1112A01	12	1	1	1.00	0.00
FSS1112B01	19	3	9	3.15	0.15
FSS1113A01	12	5	12	5.54	0.54
FSS1113B01	28	5	12	5.71	0.71
FSS1114A01	12	7	11	8.09	1.09
FSS1114B01	12	3	7	3.54	0.54
FSS1115A01	10	2	3	2.66	0.66
FSS1115B01	12	0	1	-	NA
FSS1116b01	13	1	13	1.55	0.55
FSS1117A01	15	1	3	1.00	0.00
FSS1117b01	24	1	1	1.00	0.00
FSS1118A01	32	2	32	2.57	0.57
FSS1118b01	22	1	2	1	0
FSS1119A01	17	4	17	4.69	0.69
FSS1119B01	18	0	0	-	NA
FSS1120A01	12	2	2	2.54	0.54
FSS1120B01	18	1	1	1.00	0.00

Table 6.–Summary of sampling sufficiency data analysis for reaches sampled in nonwadeable streams in Susitna River, Matanuska River, and Knik River drainages in 2011.

Note: "-" indicates that no fish were observed at a given site and therefore no estimate of true species richness (TSR_{H-T}) could be calculated.

^a Observed species richness-the total number of species found in a reach.

^b Horvitz-Thompson estimate (Cochran 1977) of the true species richness in a reach.

Total species richness appeared likely to have been achieved in 21 of the 45 reaches sampled, including 2 reaches where 0 species were detected when 12 and 18 subreaches were sampled. In the other 19 reaches, 1 to 7 species were observed in 6 to 24 subreaches sampled.

In 21 of the 45 reaches sampled, estimates of TSR_{H-T} suggested that the estimated number of species missed during sampling was between 0.50 and 1.50. In these 21 reaches, the number of subreaches sampled varied from 5 to 32, and the number of species detected varied from 1 to 8.

In two reaches, the estimated number of species missed was between 1.50 and 2.50. Three species were observed in 16 subreaches sampled in one case, with 10 species observed in 5 subreaches sampled in the other.

In one reach, the estimated number of species missed was between 2.50 and 5.50. Eight species were observed in 12 subreaches sampled.

To evaluate both fixed and adaptive stopping rules for nonwadeable streams in Alaska, these 2011 results were combined with 4 other data sets collected during 2007–2010 (Buckwalter et al. 2010, Buckwalter et al. 2010, Kirsch et al. 2011, Kirsch et al. *In prep*). When examining the distributions of the estimated numbers of species undetected using fixed stopping rules, we detected no significant evidence to indicate that different stopping rules were necessary for the different geographic areas. No differences between geographic areas were detected using reaches with 9+ subreaches sampled and a stopping rule of 8 ($\chi^2 = 1.64$, p = 0.80), with 11+ subreaches sampled and a stopping rule of 10 ($\chi^2 = 5.34$, p = 0.25), or with 13+ subreaches sampled and a stopping rule of 12 ($\chi^2 = 4.31$, p = 0.37).

When using the KS test to compare the distributions between reaches where 1 or fewer vs. 2 or more species were undetected, we found significant evidence that reaches should be stratified by drainage area (D = 0.401, p = 0.001). After stratifying sampled reaches into those draining up to 300 km² and those draining greater than 300 km², we detected no evidence that further stratification was required. As a result, we evaluated stopping rules for nonwadeable streams for reaches in 2 strata: reaches draining ≤ 300 km²; and reaches draining > 300 km².

When evaluating fixed stopping rules for nonwadeable streams in Alaska draining $\leq 300 \text{ km}^2$, we found that a minimum of 120 stream widths (12 subreaches) should be sampled per reach to provide an estimated 90% probability of failing to detect no more than 1 of the species occurring in each reach (Table 7). Sampling 100 stream widths provides only a 80% chance of failing to detect no more than 1 species, based on estimates of species richness from reaches where 130+ stream widths were sampled. Sampling 80 stream widths provides only a 73% chance of failing to detect no more than 1 species, based on estimates of species richness from reaches where 130+ stream widths were sampled.

When evaluating fixed stopping rules for nonwadeable streams in Alaska draining $> 300 \text{ km}^2$, we found that sampling a minimum of 120 stream widths (12 subreaches) would provide an estimated 73% probability of failing to detect no more than 1 of the species occurring in each reach (Table 8). We were not able to identify a sampling intensity that would provide our target 90% chance of failing to detect no more than 1 species. Our data indicate that the required sampling effort would be in excess of 140 stream widths (14 subreaches).

	Estimated # of	stopping after 80 of stream widths		Stopping after 100 stream widths			g after 120 n widths	Stopping after 140 stream widths	
	undetected		cumulative		cumulative		cumulative		cumulative
Source data ^a	species	%	%	%	%	%	%	%	%
Reaches where 90+ stream	0	56.9%	56.9%						
widths (9+ subreaches)	1	25.5%	82.4%						
were sampled (n=51)	2	13.7%	96.1%						
- · ·	3	3.9%	100.0%						
	4	0.0%	100.0%						
	5	0.0%	100.0%						
Reaches where 110+ stream	0	56.4%	56.4%	56.4%	56.4%				
widths (11+ subreaches)	1	23.1%	79.5%	28.2%	84.6%				
were sampled (n=39)	2	15.4%	94.9%	15.4%	100.0%				
	3	5.1%	100.0%	0.0%	100.0%				
	4	0.0%	100.0%	0.0%	100.0%				
	5	0.0%	100.0%	0.0%	100.0%				
Reaches where 130+ stream	0	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%		
widths (13+ subreaches)	1	15.4%	73.1%	23.1%	80.8%	34.6%	92.3%		
were sampled (n=26)	2	19.2%	92.3%	19.2%	100.0%	7.7%	100.0%		
	3	7.7%	100.0%	0.0%	100.0%	0.0%	100.0%		
	4	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%		
	5	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%		
Reaches where 150+ stream	0	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%
widths (15+ subreaches)	1	5.6%	61.1%	16.7%	72.2%	33.3%	88.9%	33.3%	88.9%
were sampled (n=18)	2	27.8%	88.9%	27.8%	100.0%	11.1%	100.0%	11.1%	100.0%
• • • •	3	11.1%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
	4	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%

Table 7.-Estimated number of undetected species per reach for nonwadeable reaches draining 0-300 sq. km, when sampling is stopped after 80, 100, 120, and 140 stream widths.

^a Streams included in this analysis were located in the Susitna River, Matanuska River, and Knick River basins (this study) and the upper Koyukuk River and Chandalar River basins, portions of the Kuskokwim River, lower Yukon River, and eastern Norton Sound basins (sampled during 2007–2010; see Buckwalter et al. 2010, Buckwalter et al. 2012, Kirsch et al. 2011, Kirsch et al. *In prep*).

	Estimated # of	Stopping after 80 stream widths		Stopping after 100 stream widths		Stopping after 120 stream widths		Stopping after 140 stream widths	
	undetected		cumulative		cumulative		cumulative		cumulative
Source data ^a	species	%	%	%	%	%	%	%	%
Reaches where 90+ stream	0	24.1%	24.1%						
widths (9+ subreaches)	1	24.1%	48.1%						
were sampled (n=54)	2	38.9%	87.0%						
-	3	9.3%	96.3%						
	4	0.0%	96.3%						
	5+	3.7%	100.0%						
Reaches where 110+ stream	0	26.2%	26.2%	35.7%	35.7%				
widths (11+ subreaches)	1	9.5%	35.7%	21.4%	57.1%				
were sampled (n=42)	2	47.6%	83.3%	33.3%	90.5%				
- · · ·	3	11.9%	95.2%	4.8%	95.2%				
	4	0.0%	95.2%	4.8%	100.0%				
	5+	4.8%	100.0%	0.0%	100.0%				
Reaches where 130+ stream	0	23.1%	23.1%	38.5%	38.5%	38.5%	38.5%		
widths (13+ subreaches)	1	7.7%	30.8%	11.5%	50.0%	34.6%	73.1%		
were sampled (n=26)	2	53.8%	84.6%	38.5%	88.5%	23.1%	96.2%		
- · · ·	3	11.5%	96.2%	7.7%	96.2%	3.8%	100.0%		
	4	0.0%	96.2%	3.8%	100.0%	0.0%	100.0%		
	5	3.8%	100.0%	0.0%	100.0%	0.0%	100.0%		
Reaches where 150+ stream	0	11.1%	11.1%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
widths (15+ subreaches)	1	11.1%	22.2%	11.1%	44.4%	38.9%	72.2%	38.9%	72.2%
were sampled (n=18)	2	66.7%	88.9%	50.0%	94.4%	22.2%	94.4%	27.8%	100.0%
• · · ·	3	11.1%	100.0%	5.6%	100.0%	5.6%	100.0%	0.0%	100.0%
	4	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%

Table 8.–Estimated number of undetected species per reach for nonwadeable reaches draining >300 sq. km, when sampling is stopped after 80, 100, 120, and 140 stream widths.

^a Streams included in this analysis were located in the Susitna River, Matanuska River, and Knick River basins (this study) and the upper Koyukuk River and Chandalar River basins, portions of the Kuskokwim River, lower Yukon River, and eastern Norton Sound basins (sampled during 2007–2010; see Buckwalter et al. 2010, Buckwalter et al. 2012, Kirsch et al. 2011, Kirsch et al. *In prep*).

When considering adaptive stopping rules for nonwadeable streams in Alaska draining ≤ 300 km², we found that sampling a minimum of 8 subreaches and stopping only after no new species are detected in the last 4 or 6 subreaches provides an estimated 86% probability that no more than one species will be undetected in that reach (Table 9). Sampling a minimum of 10 or 12 subreaches with adaptive stopping rules provided probabilities of 88% to 90% that no more than one species will be undetected.

When considering adaptive stopping rules for nonwadeable streams in Alaska draining > 300 km², we found that sampling a minimum of 12 subreaches and stopping only after no new species are detected in the last 4 or 6 subreaches provides a 69% to 74% probability that no more than one species will be undetected in that reach (Table 10). We were not able to identify an adaptive strategy that would provide our target 90% chance of failing to detect no more than 1 species.

Minimum number of	Estimated # of undetected		o new species in subreaches		o new species in subreaches
subreaches sampled	species	%	cumulative %	%	cumulative %
sucreative sumpred	0	49.1%	49.1%	54.3%	54.3%
	1	20.0%	69.1%	23.9%	78.3%
	2	18.2%	87.3%	17.4%	95.7%
6	3	10.9%	98.2%	4.3%	100.0%
	4	1.8%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
	-		n=57		n=46
	0	57.1%	57.1%	60.5%	60.5%
	1	28.6%	85.7%	25.6%	86.0%
	2	10.2%	95.9%	11.6%	97.7%
8	3	4.1%	100.0%	2.3%	100.0%
	4	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
		1	<i>1</i> =49	<i>n</i> =43	
	0	53.8%	53.8%	55.9%	55.9%
	1	35.9%	89.7%	32.4%	88.2%
	2	10.3%	100.0%	11.8%	100.0%
10	3	0.0%	100.0%	0.0%	100.0%
	4	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
		1	n=39	1	n=34
	0	55.6%	55.6%	56.0%	56.0%
	1	33.3%	88.9%	32.0%	88.0%
	2	11.1%	100.0%	12.0%	100.0%
12	3	0.0%	100.0%	0.0%	100.0%
	4	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
		1	<i>n</i> =27		n=25

Table 9.–Estimated number of undetected species per reach, for reaches draining 0–300 sq. km, when sampling is stopped after sampling a minimum number of subreaches and finding no new species in the last 4 or 6 subreaches.

Note: Source data were those reaches where at least 1 additional subreach was sampled after the minimum number of subreaches was met. Streams included in this analysis were located in the Susitna River, Matanuska River, and Knick River basins (this study) and the upper Koyukuk River and Chandalar River basins, portions of the Kuskokwim River, lower Yukon River, and eastern Norton Sound basins (sampled during 2007–2010; see Buckwalter et al. 2010, Buckwalter et al. 2012, Kirsch et al. 2011, Kirsch et al. *In prep*).

Minimum number of	Estimated # of undetected		o new species in subreaches		o new species in subreaches
subreaches sampled	species	%	cumulative %	%	cumulative %
	0	25.5%	25.5%	28.2%	28.2%
	1	23.6%	49.1%	23.1%	51.3%
	2	34.5%	83.6%	38.5%	89.7%
6	3	10.9%	94.5%	5.1%	94.9%
	4	3.6%	98.2%	5.1%	100.0%
	5+	1.8%	100.0%	0.0%	100.0%
		1	n=55	1	n=39
	0	26.0%	26.0%	29.7%	29.7%
	1	24.0%	50.0%	24.3%	54.1%
	2	38.0%	88.0%	37.8%	91.9%
8	3	12.0%	100.0%	8.1%	100.0%
	4	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
		n=50		n=37	
	0	40.0%	40.0%	48.0%	48.0%
	1	14.3%	54.3%	8.0%	56.0%
	2	40.0%	94.3%	40.0%	96.0%
10	3	5.7%	100.0%	4.0%	100.0%
	4	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
		1	n=35	1	n=25
	0	43.5%	43.5%	50.0%	50.0%
	1	30.4%	73.9%	18.8%	68.8%
	2	21.7%	95.7%	25.0%	93.8%
12	3	4.3%	100.0%	6.3%	100.0%
	4	0.0%	100.0%	0.0%	100.0%
	5	0.0%	100.0%	0.0%	100.0%
		1	n=23	1	n=16

Table 10.–Estimated number of undetected species per reach, for reaches draining >300 sq. km, when sampling is stopped after sampling a minimum number of subreaches and finding no new species in the last 4 or 6 subreaches.

Note: Source data were those reaches where at least 1 additional subreach was sampled after the minimum number of subreaches was met. Streams included in this analysis were located in the Susitna River, Matanuska River, and Knick River basins (this study) and the upper Koyukuk River and Chandalar River basins, portions of the Kuskokwim River, lower Yukon River, and eastern Norton Sound basins (sampled during 2007–2010; see Buckwalter et al. 2010, Buckwalter et al. 2012, Kirsch et al. 2011, Kirsch et al. *In prep*).

DISCUSSION

By completing a systematic inventory of stream fish assemblages, we substantially increased AWC coverage in the study area. We also provided a snapshot of baseline conditions (i.e., fish assemblage composition and aquatic and riparian habitat characteristics) at many streams for which there was little or no prior information. Station reports listing all collected data for each site is included in Appendix K (2003) and Appendix L (2011).

Overall, fish occurrence in this study was generally consistent with prior studies. As expected for coldwater streams, salmonids and sculpins dominated our catch. And, as expected for high latitude and high elevation streams, species richness was very low. We typically found a greater number of fish species in Large (median of 5 species) streams than in Medium or Small streams (median of 2 species).

We detected a total of 19 fish species including 18 of 23 previously documented species (Table 3) and 1 (Pacific lamprey) that was expected to be present but not explicitly documented in the study area. We failed to find 5 previously documented species (eulachon, Bering cisco, Arctic char, lake trout and prickly sculpin) 2 of which (Arctic char and lake trout) were previously reported only from lakes—since we only sampled streams, it is not surprising that we did not find these 2 species. The remaining 3 previously documented species that we failed to find (eulachon, Bering cisco and prickly sculpin) are likely either especially rare or sparsely distributed across the study area, and therefore comparatively less likely to be found using rapid sampling techniques.

In general, it is usually best to use multiple gear types to get a more representative sample of the fish assemblage. However, study objectives, logistical constraints, and project budgets affect gear selection choices. Since our main objective entailed sampling fish assemblages in a large number of remote streams in a short amount of time, we decided to rely primarily on a single fish-collection gear type, single-pass electrofishing, for this project because: 1) electrofishing is considered to be the single most effective (Barbour et al. 1999, Simon and Sanders 1999, Flotemersch and Blocksom 2005) and widely applicable (Hughes et al. 2002) method in streams and rivers; 2) electrofishing typically captures more species with less size selectivity than other gear types (Hendricks et al. 1980); 3) electrofishing is a relatively safe method for biologists, and captures fishes with minimal mortality or injury to the fishes (Curry et al. 2009); 4) long reaches can be sampled relatively quickly using electrofishing is recommended as a standard fish sampling method for coldwater fishes in streams and rivers (Bonar et al. 2009).

We standardized our fish-collection effort by adopting: a systematic protocol to identify study site locations; electrofishing reach length as a multiple of channel width; and electrofishing protocols with guidelines for standardizing power output (Appendix A). Use of a standardized fish-collection protocol was not absolutely necessary to accomplish the objectives of this project, but will facilitate comparisons of fish assemblages between locations, and over time. Furthermore, standardized fish-occurrence data may be useful in developing regional models to predict fish presence. The backpack electrofishing power standardization table (Appendix A3) we prepared from data collected during this project will allow us to further reduce variability in applied power.

Since electrofishing tends to be size selective (although less so than other methods), with larger fish being more vulnerable to capture (reviewed by Reynolds [1996]), smaller fish species and

life stages are likely underrepresented in our catch. Furthermore, large fish were more likely to be observed and counted than smaller species. Smaller fish were only likely to be observed if mobilized toward the anode; however, large fish and their carcasses were usually easy to observe and count, even if they remained beyond the electrical field. Therefore, our results should not be used to infer absolute or relative abundance of fishes without correcting for differences in detectability between different types of fish and habitats.

Larger fish, and species with high vertebral counts and fine scales, such as trout, salmon, and char, are more likely to be injured by electrofishing (reviewed by Reynolds [1996]). However, in order to collect all the common fish species present, we needed to electrofish with sufficient power to capture even the smallest fish, and those having low vertebral counts or large scales. Therefore, we acknowledge that some fish were likely injured or killed as a direct or indirect result of our selecting electrofishing power output settings necessary to capture members of the entire fish assemblage. However, since our sampling efforts were restricted to single-pass electrofishing in 1–2 fish collection reaches (representing a very small fraction of a given target stream's length) per target stream, this project was not expected to significantly affect fish populations. For example, Kocovsky et al. (1997) found no population level effects in salmonids after 8 years of electrofishing in 3 Colorado streams. Furthermore, we carefully chose electrofisher output settings (Appendix A1) to minimize trauma to fish, and generally ceased electrofishing in the immediate vicinity of any observed large (> 300 mm) salmonids.

OBJECTIVE 3—SAMPLING SUFFICIENCY

Our objective was to develop stopping rules for single-pass electrofishing in nonwadeable Alaskan streams to guide fish-inventory field crews in estimating when a sufficient length of stream has been sampled to document the presence of all common fish species occurring in the reach at the time of sampling. Other investigators have recommended reach lengths of 30–40 (Maret and Ott 2003) to 85 stream widths (Hughes et al. 2002) when electrofishing for coldwater fish in nonwadeable streams. Analysis of our prior (2007–2010) AFFI fish collections in nonwadeable streams of western Alaska indicated that a 40 CW reach typically underestimates true species richness (Buckwalter et al. 2012).

Our analyses of data collected during 2007–2011 indicated that a recommended minimum reach length for nonwadeable streams in Alaska should not be independent of the drainage area of a reach. While a reach length equivalent to 120 wetted widths appears to be adequate to provide a 90% chance that the number of undetected species is no greater than 1 per reach for reaches draining \leq 300 km², we have no similar recommendation for streams draining >300 km² other than to suggest the minimum exceeds 14 wetted widths. Similarly, when considering adaptive stopping rules, we have no good recommendations for reaches draining >300 km².

The drainage area breakpoint indicated by our use of the KS test (300 km^2) is a result of an ad hoc analysis of a relatively small data set, so may not be ecologically ideal points for stratifying reaches based on drainage area. However, this stratification will serve to guide future sampling recommendations and investigations of sampling sufficiency until preferable points are identified. The ad hoc analysis clearly indicates that drainage areas of reaches need be considered when evaluating sampling sufficiency.

It is critical to note that all of our tabled results of observed species and estimated TSR are germane only to species that occur in streams during the summer and that are consistently vulnerable to the sampling gear we typically use, namely single-pass, pulsed-DC electrofishing.

All of Alaska's freshwater fishes can be effectively sampled using electrofishing, but capture efficiency varies among species and between habitats. Many factors, acting alone or cumulatively, affect electrofishing efficiency. Some examples follow: 1) Electrofishing is size selective—with all else being equal, smaller fish are less vulnerable; 2) Electrofishing is primarily a shallow water (< 2 m) activity—species that remain in deep water are less vulnerable; 3) Larval lamprey characteristically dwell in substrates, so they are likely less vulnerable to our electrofishing effort, which focuses on species that remain in the water column or on the stream bottom; 4) Northern pike may be able to detect an electrical field when they are still outside the effective radius for electrofishing and thus avoid capture (Novotny and Priegel 1974); 5). Sculpins tend to remain on the stream bottom, so they can be difficult to see or collect, especially in deeper or more turbid water. Thus, some fish species and life stages may occur in sampled reaches, but are less likely to be detected due to their size, physiology, or habitat preferences. As a result, our estimated TSR may be lower than the true species richness that could have been measured more accurately using a combination of gear types and alternate methods to target the variety of fishes in each unique habitat type.

Additional data from nonwadeable streams collected at the subreach level from different geographic areas would be highly desirable to further evaluate sampling sufficiency stopping rules and consistency between geographic areas. More data collected at the subreach level is also necessary for wadeable streams. Data necessary to evaluate potential stopping rules for field sampling needs to be in excess of the amount necessary to adequately sample for species richness. An additional, nontrivial, advantage of sampling at the subreach level is that the more detailed data provide the opportunity to estimate total species richness for a reach, allowing an ongoing assessment of quality control.

RECOMMENDATIONS

- 1. We recommend that additional sampling effort is undertaken in the Upper Susitna River subbasin, above Devils Canyon, such that a more complete picture of **Chinook salmon** distribution and habitat use is achieved.
- 2. Based on prior AFFI findings, additional **Chinook salmon rearing areas** may be found in the lower reaches of small (less than 50 km² upstream drainage) non-natal tributaries to large rivers supporting Chinook salmon that are <610 m above sea level and have moderate (0.5–1.5%) gradient. Small tributaries such as those described above were not targeted, due to their drainage area, during this project, but may indeed provide important rearing habitat for Chinook salmon across this study area.
- 3. We recommend that additional **Chinook salmon spawning** sites be located and added to the AWC in the vicinity of streams where we found juveniles, particularly within the Upper Susitna River subbasin.
- 4. More fish-collection data at the subreach level is needed from both wadeable and nonwadeable streams to test and refine sampling sufficiency (reach length) recommendations. A minimum of ten 10 CW subreaches should be sampled, with additional subreaches sampled as necessary until no new species are collected in the last 6 consecutive subreaches. More data from nonwadeable streams draining at least 1500 km² and wadeable streams is especially needed. Observations are also needed from other Alaskan regions (i.e., Southcentral, Southwest, Southeast, and North Slope).
- 5. We recommend that our electrofisher power standardization table be updated annually as our skills improve to ensure the highest level of efficiency possible while limiting fish injury and mortality.
- 6. Develop a rapid lake fish sampling protocol to be implemented, where appropriate, into the AFFI program to more fully describe freshwater fish distribution throughout Alaska.

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APPENDIX A. FIELD PROTOCOLS

The objective is to detect all the common fish species found in the reach. Fish collection should be completed within 30 minutes with a cumulative electrofishing time of *at least* 300 s. The procedure to collect fish with a backpack electrofisher (Smith-Root LR-24) is presented below.

Procedures to collect fish at wadeable sites. (adapted from McCormick and Hughes 1998).

- 1. Establish the habitat transect (Station) in a straight, representative, non-pool (preferably glide or run) channel unit, mark the first GPS waypoint at the Station, and complete habitat characterization and data entry.
- 2. Measure wetted channel width (CW, to the nearest 0.1 m) at the station. The minimum fishcollection reach length is 40 CW, or 150 m, whichever is greater. The maximum reach length for wadeable streams is 300 m.
- 3. The 2-person electrofishing team will typically begin electrofishing at the station and work their way upstream the predetermined reach length while collecting fish. If the downstream end of the reach does not coincide with the Station, the team will mark a second GPS waypoint at the downstream end of the reach. A handheld, consumer grade GPS unit in trip computer mode, range finder, hip chain, or other similarly accurate method, will be used to measure the reach length as they work their way upstream. At the upstream end of the reach, the team will mark a third GPS waypoint. If walking upstream from the Station is not practicable (e.g., due to dense riparian vegetation), the team may walk downstream, staying near a bank, the required total reach length, then begin electrofishing and work their way back up to the Station. In this case, the team will measure the curvilinear length of the channel while walking downstream on the bank, but will avoid walking in the channel or otherwise startling fish. The location of the fish collection reach in relation to the station location should be noted in the database.
- 4. Both crewmembers must wear leak free chest waders with wading belt snugly fastened, wading shoes that fit properly, electrically insulated gloves, and polarized sunglasses (preferably with amber lenses). A hat with a brim may also be helpful in reducing glare.
- 5. Make sure the electrofisher battery is securely fastened in. Check electrical connections (battery, anode, cathode). Replace the battery cover securely.
- 6. Try on the backpack unit, and make any adjustments to the suspension system to achieve a comfortable fit, with the unit snug against the operator's back and resting above the hip bones. If necessary, untangle and route the cathode (rat tail) and anode cables.
- 7. With both electrodes out of the water and clear of each other and both operators, turn the unit on and confirm the system is ready. Reset the timer to zero.
- 8. To use a smooth-DC waveform (preferred):
 - a. Set the waveform to smooth DC, and select the initial voltage setting according to the ambient (not temperature-compensated) water conductivity—Appendix A3.

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- b. Ensure that all non-target organisms are clear of the water, and begin fishing when both crewmembers are ready.
- c. Closely observe the fishes' response and attempt to maximize capture prone responses (i.e, taxis or forced swimming) and minimize responses associated with elevated trauma (i.e., immobilization, bruising, spinal deformities, or recovery period exceeding 15 seconds). Try to capture fish before they approach near to the electrodes, and remove fish quickly from the electric field.
- d. If fish exhibit symptoms of trauma, decrease the voltage by 50 V, press the Enter key, and try again. If fish are unresponsive, increase the voltage by 50 V, press the Enter key and try again.
- e. If fish are still not showing capture prone responses, or if it is necessary to extend battery life, switch to a pulsed-DC waveform.
- 9. To use a pulsed-DC waveform:
 - a. Select initial voltage setting according to the ambient (not temperature-compensated) water conductivity—see Appendix A3.
 - b. Set initial pulse frequency to 30 pulses-per-second (pps).
 - c. Set duty cycle to achieve a pulse width of 2 ms, according to the following table:

Frequency	Duty cycle (%)		
(pps)	2 ms	4 ms	
30	6	12	
35	7	14	
40	8	16	
45	9	18	
50	10	20	
60	12	24	

- d. If electrofishing is unsuccessful:
 - i. Increase the voltage by 50 V, press the enter key and try again. Stop increasing voltage when fish exhibit a forced response (twitch).
 - ii. If fish twitch, but are not showing taxis (induced movement of the fish toward the anode), increase the duty cycle to achieve a pulse width of 4 ms, according to the table in Step 9.c. Press the Enter key and try again. If necessary, repeat this step, increasing duty cycle by 10% increments until fish show taxis. If the duty cycle is increased to maximum, and taxis is still not achieved, proceed to Step iii.
 - iii. Increase the frequency by 10 pps, and press the Enter key. Adjust the duty cycle to achieve a pulse width of 2 ms for the new frequency setting (see Step 9.c), and try again. Repeat Step ii after each frequency increase. Avoid frequencies >60 pps.

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- 10. Beginning at the downstream end of the sampling reach, the electrofishing team will fish in an upstream direction, zigzagging across the channel from bank to bank in order to sample all habitat types. Depress the switch and sweep the anode slowly from side to side in the water. Electrofish intermittently to avoid herding fish, especially in glides or long pools. After electrofishing continuously for up to 5 s, quietly advance upstream approximately 2–4 m before resuming electrofishing. Alternatively, it can be effective to intentionally herd fish out of open water into shallow water or confined areas, where they are less likely to escape.
- 11. Attempt to sample the variety of habitats (deep and shallow, fast and slow, complex and simple, warmer and colder) present throughout the reach. Be sure to sample available cover (e.g., large substrate elements, large wood, debris piles, undercut banks, aquatic macrophytic beds, overhanging vegetation). Move the anode near confined cover with the power off, then depress the switch and slowly sweep the anode away from the cover to draw fish out into open. Do not attempt to sample in or near pools greater than waist deep, or where velocity is too fast to safely wade. Always move slowly and carefully to avoid startling fish and to minimize risk of falling.
- 12. The netter follows downstream of the electrofisher operator, collecting fish with a dip net with a non-conductive (e.g. fiberglass or wood) handle and placing them into a 5-gallon bucket with stream water for later processing. Try to net all fish seen. When this is not feasible (e.g., in highly productive systems), try to collect a representative sample of the fish assemblage (e.g., not just large game fish). Pay special attention to netting small and benthic fish, as well as fish that respond differently to the electric field—not just the big fish that move to the surface. Particularly when visibility is obscured by turbidity, debris, or vegetation, the netter should keep the dip net in the water downstream of the anode. The dip net opening should be near vertical, perpendicular to the current, with the dip net frame in contact with the substrate. The distance between the anode and the dip net is related to the current velocity: the faster the current, the greater the distance between the anode.
- 13. Refresh the water in the bucket periodically to minimize physiological stress prior to measuring fish. If fish in the live well begin to show signs of excessive stress (e.g., rapid gill ventilation, gaping, gulping air, loss of equilibrium, excessive mucus), stop electrofishing and process them (Appendix A4). Also process large fish (> 300 mm) immediately and record species, life stage, life history, length, sex, and external anomalies in a notebook for future transfer to the database.
- 14. Record in the database the final, or most successful, electrofisher output settings (waveform, voltage, frequency, duty cycle, electrofisher on-time, and typical peak current and power), sampling efficiency (poor, fair, good, excellent), and distance sampled, along with fish observations, including fish collected while electrofishing, as well as any additional fish observed within the reach, but not collected. If conditions prevent safe or effective electrofishing within a reach, the conditions, and their effect on sampling efficiency, should be noted in the Sampling Event tab in the database, and the length of stream that was actually sampled should be noted in Sampling Event comments.

Appendix A2.–Electrofishing protocol for nonwadeable streams.

The objective is to detect all the common fish species found in the reach. The procedure to sample with a generator powered boat electrofisher unit (Smith-Root GPP 2.5) is presented below.

Procedures to collect fish by boat electrofishing. (adapted from McCormick and Hughes 2000)

Onshore at launch site

- 1. Check generator oil and fill tank with gas (wipe up any spillage).
- 2. Attach electrodes to boat, and connect their cables to the corresponding outlet on the control box. If the fishing site is distant, keep electrodes and anode poles in boat.
- 3. Connect generator and pulsator (control box).
- 4. Confirm that all gear for the day is in the boat.
- 5. Put on a life jacket. Wear polarized sunglasses to aid vision.

At sample reach

- 1. Establish the habitat transect (Station) in a straight, representative, non-pool (preferably glide or run) channel unit, mark the first GPS waypoint at the Station, and complete habitat characterization and data entry.
- 2. Measure wetted channel width (CW, in meters) at the station—multiply by 10—this is the length of a single subreach. The minimum fish-collection reach length is 10 subreaches, plus any additional subreaches necessary until no new species are detected in the last 6 consecutive subreaches (or as much as can be sampled in a day). Record fish observations and electrofisher settings separately for each subreach under a unique sampling event code.
- 3. Check all electrical connections and suspend the electrodes in the water. The wetted surface area of the cathode(s) should be greater than that of the anode(s). Fill live well and put on dry electrically insulated gloves. Verify that all electrical switches are off, that all non-target organisms are clear of the water or 2 boat lengths away, and that both crewmembers are clear of the water and electrodes and ready to begin electrofishing. Reset the timer on the electrofisher control box to zero at the start of each subreach.
- 4. If ambient conductivity is $<300 \ \mu$ S/cm, set the Range dial to High. If ambient conductivity is $>300 \ \mu$ S/cm, set the Range dial to Low. Switch the Mode dial to DC (**Caution! The position of this switch should not be changed when the foot switch is engaged!**) and select an initial frequency of 30 pulses-per-second (pps) and an initial Percent of Range (POR) setting of 10%.
- 5. Start the generator and depress the foot pedal to begin electrofishing. Increase POR as needed to elicit a capture prone response [i.e, taxis (induced movement of the fish toward the anode) or forced swimming] from fish, while minimizing responses associated with elevated trauma (i.e., immobilization, branding, spinal deformities, or recovery period exceeding 15 seconds).

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- *Note:* Where water conductivity is high (>300 μ S/cm), avoid using POR settings in excess of 60%, which will simply increase duty cycle, but not peak voltage, and may overload the generator (Martinez and Kolz 2009). If the generator sounds labored, decrease POR and/or switch from High to Low range.
- 6. If fish taxis cannot be achieved, increase frequency to 60 pps, return the POR dial to 10%, and repeat Step 5.
- 7. Select the riverbank for fishing (river left for odd numbered target streams, river right for even), and stay along the selected bank through the entire reach, to the degree it is safely navigable. Position the boat so the bow is angled downstream and toward the bank. While drifting downstream, use oars (cataraft) to maneuver laterally in the channel to avoid obstacles and position the anode(s) into habitats providing cover for fish. Most effort should occur near the bank, where most fish are expected to occur, and at depths less than 3 m wherever possible. However, all habitat types should be sampled, zigzag between the thalweg and the bank to allocate some sampling effort to a variety of habitats throughout the channel.

With electrical current off, maneuver the boat so the anode(s) approach near to fish cover elements (e.g., large substrate elements, large wood, debris piles, undercut banks, aquatic macrophyte beds, overhanging vegetation), then begin electrofishing as the boat is slowly backed away from the cover. Electrofish intermittently to avoid herding fish, especially in glides or long pools. After electrofishing continuously for a duration of up to 10 s, drift quietly for 5–10 m before resuming electrofishing. Alternatively, it can be effective to intentionally herd fish out of open water into shallow water or confined areas, where they are less likely to escape. Do not place the boat in danger in order to fish particular habitats. Cut the generator and stow the gear before negotiating hazards.

- 8. The netter uses a dip net with non-conductive (e.g. fiberglass or wood) handle to retrieve fish, which are then deposited into a live well for later processing. Try to capture fish before they approach near to the electrodes, and remove fish quickly from the electric field. Try to net all fish seen. When this is not feasible (e.g., in highly productive systems), try to collect a representative sample of the fish assemblage (e.g., not just large game fish). Pay special attention to netting small and benthic fish, as well as fish that respond differently to the electric field—not just the big fish that move to the surface. If benthic fish are being missed, hold the net behind the anode just above the bottom so some are collected.
- 9. Change the water in the live well periodically to minimize stress prior to processing. If fish in the live well begin to show signs of excessive stress (e.g., rapid gill ventilation, gaping, gulping air, loss of equilibrium, excessive mucus), stop electrofishing, tie off or land the boat on shore, and process them. This should only be necessary on very warm days, in long reaches, or if very large numbers of fish are collected. Electrofishing may also need to cease at times to immediately process and release large fish. If fish are processed and released prior to the end of a reach (or between subreaches), be sure to release them upriver, or preferably near the opposite bank, to reduce the likelihood of recapturing them.

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- 10. Using a GPS unit in trip computer mode to monitor distance traveled, continue sampling downstream to the end of the subreach. At the end of the subreach, process the fish according to Appendix A4.
- 11. Record in the database the final, or most successful, electrofisher output settings (mode, range, POR, pulse frequency, current, electrofisher on-time, and duty cycle and power, if known), sampling efficiency (poor, fair, good, excellent), and reach length sampled, along with fish observations, including fish collected while electrofishing, as well as any additional fish observed within the reach, but not collected. If conditions prevent safe or effective electrofishing within a reach, the conditions, and their effect on sampling efficiency, should be noted in the Sampling Event tab in the database, and the length of stream that was actually sampled should be noted.
- 12. Be sure the station visit information is completely entered before leaving the site.

<i>,</i> 1	5 5						
Ambient	Target	voltage	Ambient	Target	Target voltage		
conductivity (µS/cm)	pulsed DC ^a	Smooth DC	conductivity (µS/cm)	pulsed DC	Smooth DC		
20	1155	490	170	306	130		
30	834	354	180	299	127		
40	674	286	190	294	125		
50	577	245	200	289	123		
60	513	218	210	284	121		
70	467	199	220	280	119		
80	433	184	230	276	117		
90	406	173	240	273	116		
100	385	163	250	269	115		
110	367	156	260	266	113		
120	353	150	270	264	112		
130	340	145	280	261	111		
140	330	140	290	259	110		
150	321	136	300	257	109		
160	313	133					

Appendix A3.–Recommended target voltage for standardized backpack electrofishing (constant power transfer) for predominantly juvenile salmonids in cold waters at various ambient water conductivities.

Note: Target voltage values were calculated for a Smith-Root LR-24 backpack electrofisher fitted with a standard Smith-Root rat-tail cathode (a 10-ft length of braided, 3/16 in stainless steel cable with the connected end insulated with a 6 ft length of neoprene) and a single anode pole having a standard Smith-Root 11 inch diameter 3/8 in stainless steel anode ring, and are optimized for capturing juvenile salmonids in cold, wadeable flowing waters with predominantly rocky substrates. These target voltages may not be optimal for electrofishing systems having a different internal resistance (i.e., different electrofishing system, electrode type, or if electrodes are heavily corroded), if targeting different fish species/life stages, or when electrofishing in nonwadeable waters or over predominantly fine substrates.

We prepared this power standardization table based on the power transfer theory for electrofishing (Kolz 1989), using water ambient conductivity measurements and metered electrofisher output values (peak voltage and current) selected while electrofishing to maximize capture prone responses (taxis and forced swimming) and minimize responses associated with elevated trauma (immobilization, branding, spinal deformities, or recovery period exceeding 15 seconds) in target fish. We assumed fish conductivity = 100μ S/cm.

This table provides a starting voltage setting for standardized backpack electrofishing. While electrofishing, always monitor the response of target and non-target organisms, and fine tune electrofisher operations and settings as recommended in the user's manual to achieve the desired response.

^a 30 pulses per second, 12% duty cycle (4 mS pulse width)

Appendix A4.–Procedure to process collected fish.

- 1. Anesthetize collected fish with CO₂:
 - a. Add 2 buffered CO_2 producing tablets (e.g. Alka Seltzer) to a bucket containing about 4 L of stream water.
 - b. Place a batch of fish in the bucket (Note: only a few fish should be anesthetized at a time to avoid prolonged sedation).
 - c. Leave fish in the bucket until the desired level of sedation is achieved (about 2 to 5 minutes). Determining CO_2 dosage in the field can be difficult, because, by the time the fish have responded to the sedation, the concentration of CO_2 may be too high. If the concentration is too high (onset of sedation is rapid), the fish should be moved to native water or processed immediately.
- 2. Remove 1 fish at a time from the sedation bucket and place on a length measuring tube (FL \leq 250 mm) or board (FL \geq 250 mm).
- 3. Identify all collected fish to species (Appendix B5), life stage (Appendix B1), and life history (anadromous, resident, marine/estuarine, unknown) and measure fork length to the nearest mm. Refer primarily to Pollard et al. 1997 to identify unknown salmoninae (salmon, trout, or char) and to Mecklenburg et al. 2002 for all other species. Also refer to photos of known specimens for confirmation. Check each fish for external anomalies (Appendix B2). Document any definite fish passage barriers (Appendix B3) found in or adjacent to the reach. Immediately after identification and measurement, place fish in a second bucket of fresh stream water for recovery.
- 4. Take a representative photo of each anadromous species and life stage, as well as of any rare or unusual fish, fish with anomalies, or fish where ID was uncertain. Record the photo number(s) associated with each fish in the database.
- 5. Take a fin clip from each Dolly Varden to be retained (see below) and from additional species requested by UAF. Follow the appropriate instructions for taking fin clips (USFWS instructions for Dolly Varden, UAF instructions for other species). Record the fin clip vial number in the database.
- 6. Retain the following specimens:
 - a. <u>Species unknown</u>: up to 5 (from each site) individual fish of each species and life stage that cannot be confidently identified in the field;
 - b. <u>UAF Museum</u>: requested voucher specimens (see UAF instructions);
 - c. <u>Juvenile coho salmon</u>: up to 5 from each site;
 - d. <u>Optionally-anadromous fishes for otolith study</u>: up to 12 large (> 300 mm, except for Dolly Varden, which may be any size) individuals from each study site where they are collected of each of the following species: Dolly Varden; humpback and broad whitefish; sheefish; and least and Bering cisco.

Euthanize (by a blow to the head, or an overdose of CO_2) all specimens to be retained. Tag any retained fish with a unique tag number, and record the tag number in the database. For UAF, each fish must be individually tagged. For all other retained specimens, fish of the same species and life stage that were all collected from the same reach may be retained as a

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group with a single unique tag for the group. Any juvenile coho salmon and specimens retained for the otolith study must be frozen. All other specimens should be stored in 10% formalin solution. For specimens >200 mm, make an incision through the belly wall before placing in formalin. Keep specimens cool (e.g., in fresh stream water) until they can be put in formalin or frozen. CAUTION! MINIMIZE THE CHANCE OF ATTRACTING WILDLIFE BY KEEPING RETAINED FISH INSIDE A COVERED COOLER OR HEAVY DUTY PLASTIC BAG. NEVER LEAVE SPECIMENS UNATTENDED IN THE FIELD.

- 7. While 1 crewmember processes fish, the other will enter fish observations into the appropriate fields in the database.
- 8. Release fish to still water in the fish collection reach. If additional contiguous fish collection will be conducted, release fish downstream (Headwaters Team) or upstream (Cataraft Teams), and/or along the opposite bank, to avoid their recapture.
- 9. Record the species, life stage, life history, and count, along with any comments indicating average size, behavior, anomalies, etc., of any additional fish that were observed, but not collected (e.g., visually observed adults).

APPENDIX B. LOOKUP TABLES

Appendix B1.-Fish life-stage classes and threshold fork-length values.

Code	Name	Description		
FXE	fixed egg	Eggs adhering to or buried within a substrate.		
PLE	planktonic egg	Non-adherent, buoyant or nearly so, eggs drifting with currents.		
FXA	alevin	Pre-emergent sac-fry within the interstices of the substrate.		
PLL	planktonic larvae	Hatched juveniles drifting with currents and with no, or poorly, developed volitional swimming capabilities.		
JUV	juvenile	Sexually immature free-swimming fish.		
SMT	smolt	Juvenile anadromous fish on first emigration from fresh to marine water.		
JOA	juvenile/adult	Free swimming fish whose sexual maturity is not determined.		
ADT	adult	Fish at, or approaching sexual maturity.		
ASP	adult spawning	Adults observed in the act of spawning.		
KLT	kelt	Post-spawning iteroparous anadromous fish in freshwater prior to return to marine water.		
CAR	carcass	Post-spawning adult carcass.		
NAP	not applicable	No fish observed or general information record only.		
NRD	not recorded	Life stage not recorded.		

Descriptions of fish life-stage classes.

Fork-length threshold values (mm) used to assign fish to selected life-stage classes.

	Life stage				
Species	Juvenile	Juvenile-or-adult	Adult		
lamprey-unspecified	-	-	-		
longnose sucker	<188	188–348	>348		
northern pike	<330	330–448	>448		
Alaska blackfish	<42	42-113	>113		
broad whitefish	<343	343–448	>448		
humpback whitefish	<280	280-363	>363		
least cisco	<199	199–318	>318		
round whitefish	<199	199–318	>318		
inconnu (sheefish)	<586	586-648	>648		
Arctic grayling	<190	190–328	>328		
pink salmon	-	-	-		
chum salmon	-	-	-		
coho salmon	-	-	-		
sockeye salmon	-	-	-		
Chinook salmon	-	-	-		
Dolly Varden	<83	83–	-		
burbot	<280	280-498	>498		
slimy sculpin	<51	51-68	>68		

Note: A hyphen or missing value indicates that we assigned individual fish to the indicated life stage based only on examination of morphological indicators of sexual maturity, not based on fork-length threshold values.

Appendix B2.–Fish-anomaly cl	asses.
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Code	Name	Description
AB	Absent	Absent eye, fin, tail.
BK	Blackening	Tail or whole body with darkened pigmentation.
BL	Blisters	In mouth, just under skin.
BS	Extensive black spot	Small black cysts (dots) all over the fins and body.
CO	Copepod	A parasitic infection characterized by a worm-like copepod embedded in the flesh of the fish; body extends out and leaves a sore/discoloration at base, may be in mouth gills, fins, or anywhere on body.
CY	Cysts	Fluid-filled swellings; may be either small or large dots.
DE	Deformities	Skeletal anomalies of the head, spine, and body shape; amphibians may have extra tails, limbs, and toes.
EF	Eroded fins	Appear as reductions or substantial fraying of fin surface area.
EG	Eroded gills	Gill filaments eroded from tip.
EX	Exophthalmia	Bulging of the eye.
FA	Fin anomalies	Abnormal thickenings or irregularities of rays
FU	Fungus	May appear as filamentous or "fuzzy" growth on the fins, eyes, or body.
GR	Grubs	White or yellow worms embedded in muscle or fins.
HM	Hemorrhaging	Red spots on mouth, body, fins, fin bases, eyes, and gills.
IC	Ich	White spots on the fins, skin or gills.
LE	Lesions	Open sores or exposed tissue; raised, granular, or warty outgrowths.
LI	Lice	Scale-like, mobile arthropods.
MU	Mucus	Thick and excessive on skin or gill, or as long cast from vent.
NO	None	No anomalies present.
OT	Other	Anomalies or parasites not specified.
SA	Scale anomalies	Missing patches, abnormal thickenings, granular skin
SO	Shortened operculum	Leaves a portion of the gill chamber uncovered
TU	Tumors	Areas of irregular cell growth which are firm and cannot be easily broken open when pinched. (Masses caused by parasites can usually be opened easily.)
WR	Leeches	Annelid worms which have anterior and posterior suckers. They may attach anywhere on the body.

Source: McCormick and Hughes 1998.

Code	Name	Description		
EBD	Ephemerally Fixed, Beaver Dam	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling, to be blocked by a beaver dam. Used where the location of the barrier to movement is known within 100 m.		
EDJ	Ephemerally Fixed, Debris Jam	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling, to be blocked by a debris jam. This category is restricted to small scale (?10 m) features that do not dramatically alter the overall channel type. Larger mass-wasting created barriers fall in the EGD category. Used where the location of the ultimate barrier to movement is known within 100 m.		
EGD	Ephemerally Fixed, Hydro-Geomorphically Dynamic	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling, to be blocked by current hydrological or geomorphic conditions but where evidence indicates that these landscape-scale conditions are in flux over brief (decades) geologic time. Used in areas of recent or ongoing geomorphic alteration (e.g., glacial advance or retreat, mass wasting, tectonic movements, dynamic channel formation). Used where the location of the barrier to movement is within 100 m.		
ELF	Ephemerally Fixed, Low Flow	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling, to be blocked by low streamflow, but where evidence indicates that at higher streamflow, fish could ascend further up the channel. Used where the location of the barrier to movement is known within 100 m.		
EOT	Ephemerally Fixed, Other	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling, to be blocked by a non- permanent barrier other than those listed immediately above. Used where the location of the ultimate barrier to movement is known within 100 m.		
ESS	Ephemerally Fixed, Spring Source	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling or on-site analysis, to be blocked by the emergence of ground water from an unconfined substrate. Compare to GSL. Used where the location of the barrier to movement is known within 100 m.		
GLK	Geologically Fixed, Lake Shore	Where the upstream movements of a given species appear, based on sufficient sampling or on-site analysis, to be limited by the perimeter of a geologically-stable lake shore. Used where the location of the barrier to movement is known within 100 m.		
GOT	Geologically Fixed, Other	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling or on site analysis, to be blocked by a geologically fixed barrier other than those listed immediately above. Used where the location of the ultimate barrier to movement is known within 100 m.		
GSL	Geologically Fixed, Stream Limit	Where the upstream movements of a given species appear, based on sufficient upstream and downstream sampling or on-site analysis, to be limited to the presence of surface water, and where that presence of surface water appears to be fixed in space and stable in time (compare to ELF). Spring-fed headwall pools are examples. Used where the location of the barrier to movement is known within 100 m. -continued-		

Appendix B3.–Fish-passage barrie	r classes.
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Appendix B3.–Page 2 of 2.

Code	Name	Description
GWG	Geologically Fixed, Waterfall/High Gradient	Where the upstream movements of a given species appear, based or sufficient upstream and downstream sampling or on-site analysis, to be blocked by a waterfall, cascade, or other similar geologically fixed barrier Used where the location of the barrier to movement is known within 100 m.
HCU	Human, Culvert	Where the upstream movements of a given species appear, based or sufficient upstream and downstream sampling, to be blocked by a culver through a road bed, a railroad bed, a runway, or through any other type of fill. This code includes culverts of all materials (e.g., metal, plastic, wood) and shapes (e.g., round, arched, bottomless) Used where the location of the barrier to movement is known within 100 m.
HDB	Human, Debris	Where the upstream movements of a given species appear, based or sufficient upstream and downstream sampling, to be blocked by debris placed or deposited in the stream as the direct result of human activities bu where that material was not intentionally placed to impound, filter, or diver streamflow. Examples include woody debris from logging activities, and debris flows from failed road prisms. Used where the location of the barrier to movement is known within 100 m.
HDM	Human, Dam	Where the upstream movements of a given species appear, based or sufficient upstream and downstream sampling, to be blocked by a dam weir, head gate, or other cross channel structure that impounds, filters, or diverts streamflow. This code includes structures of all materials (e.g., earth concrete, rip rap, metal, wood). Used where the location of the barrier to movement is known within 100 m.
НОТ	Human, Other	Where the upstream movements of a given species appear, based or sufficient upstream and downstream sampling, to be blocked by a human- created structure other than those listed immediately above. Used where the location of the barrier to movement is known within 100 m.
NAP	Not applicable	No fish observed. See downstream stations.
NON	None	No barrier exists at survey station.
SBU	Specific Barrier Unknown	Where a given species is collected at a downstream station and not at ar upstream station but where no specific barrier is known between the 2 stations. Used where the distributional limits are not known within 100 m.
UNK	Unknown	No information exists upstream of a sample station. Often where a species is collected at a station and no additional sampling or survey occurs upstream.

Appendix B4.-Water color, substrate, and stream-stage classes.

Water-color classes.

Code	Description	Definition
CLR	Clear	Transparent water, or nearly so.
FER	Ferric	Rust- (orange) stained.
GHT	Glacial, High Turbidity	High turbidity waters (visibility \leq 30 cm (12 in) typical of streams originating directly from glaciers (e.g., Matanuska River).
GLT	Glacial, Low Turbidity	Low turbidity waters (visibility > 30 cm) typical of systems with large lakes (settling basins) below glacial discharge (e.g., Kenai River). These waters are frequently turquoise-colored.
HUM	Humic	Tea-colored water (tannic)
MUD	Muddy	Dark water with high suspended particulate load.

Substrate classes.

Code	Name	Intermediate-axis dimensions
BED	Bedrock	> 4,096 mm. Solid rock—few or no discrete particles
BLD	Boulder	256–4,096 mm
CBL	Cobble	64–256 mm
GRV	Gravel	2–64 mm
SND	Sand	0.0625–2 mm
SCL	Silt/Clay	\leq 0.0625 mm
ORG	Organic	Incompletely-decomposed organic material

Source: adapted (Bedrock and Organic classes added) from Cummins (1962), which is based on the Wentworth (1922) scale.

Stream-stage classes.

	Ç
Code	Description
DNC	Dry, no defined channel
DDC	Dry, defined channel
LDF	Low, intermittent surface flow
LCF	Low, continuous surface flow
MED	Medium
HIH	High
WNC	Wet, no defined channel

-continued-

Appendix B4.–Page 2 of 2.

Embeddedness classes.

	Level of	
Code	embeddedness ^a	Description
NEG	Negligible	Gravel, cobble, and boulder particles have $<5\%$ of their height covered by fine sediment ^b .
LOW	Low	Gravel, cobble, and boulder particles have 5-25% of their height covered by fine sediment.
MOD	Moderate	Gravel, cobble, and boulder particles have 25-50% of their height covered by fine sediment.
HIH	High	Gravel, cobble, and boulder particles have 50-75% of their height covered by fine sediment.
VHI	Very high	Gravel, cobble, and boulder particles have >75% of their height covered by fine sediment.

Note: If the dominant substrate type is sand, silt, or clay, the level of embeddedness will be rated as Very high. If the dominant substrate type is bedrock, the level of embeddedness will be rated as Negligible.

Source: modified from Bain (1999), which was adapted from Platts et al. 1983.

^a Embeddedness (*sensu* Armantrout 1998): Degree that gravel and larger sizes of particles (boulders, cobble, or rubble) are surrounded or covered by fine sediment (e.g., less than 2 mm).

^b <2 mm, i.e., sand, silt, or clay.

Appendix B5.–Fish s	species	codes.
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SCM

chum salmon

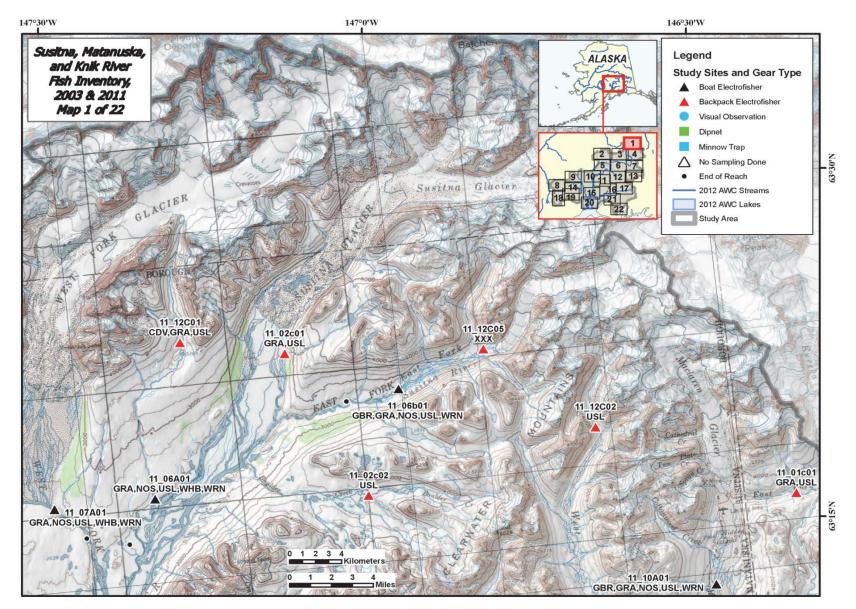
Code	Common name	Scientific name	Code	Common name	Scientific name
ACI	sturgeon-unspecified	Acipenser sp.		coho salmon	
ATG	green sturgeon	Acipenser sp. Acipenser medirostris	SCO SPI		Oncorhynchus kisutch
ATW	white sturgeon	Acipenser	SPI	pink salmon	Oncorhynchus gorbuscha
	white sturgeon	transmontanus	SSE	sockeye salmon	Oncorhynchus nerka
CAC	Arctic char	Salvelinus alpinus	TCT	cutthroat trout	Oncorhynchus clarkii
CBT	brook trout	Salvelinus fontinalis	TRB	rainbow trout	Oncorhynchus mykiss
CDV	Dolly Varden	Salvelinus malma	TRT	trout-unspecified	iteroparous
CHR	char-unspecified	Salvelinus sp.	IKI	uout-unspecified	Oncorhynchus sp.
CLK	lake trout	Salvelinus namaycush	UCR	coastrange sculpin	Cottus aleuticus
DAL	Alaska blackfish	Dallia pectoralis	UFH	fourhorn sculpin	Myoxocephalus
ERC	trout-perch	Percopsis	0111	ioumom orunpm	quadricornis
2110	dout peren	omiscomaycus	ULP	sculpin-unspecified	Cottidae
FAR	Arctic flounder	Pleuronectes glacialis	UPR	prickly sculpin	Cottus asper
FLN	righteye flounders- unspecified	Pleuronectidae	UPS	Pacific staghorn sculpin	Leptocottus armatus
FST	starry flounder	Platichthys stellatus	USH	sharpnose sculpin	Clinocottus acuticeps
GAD	cod-unspecified	Gadidae	USL	slimy sculpin	Cottus cognatus
GAR	Arctic cod	Boreogadus saida	WAK	Alaska whitefish	Coregonus nelsonii
GBR	burbot	Lota lota	WAR	Arctic cisco	Coregonus autumnalis
GPA	Pacific cod	Gadus macrocephalus	WBC	Bering cisco	Coregonus laurettae
GRA	Arctic grayling	Thymallus arcticus	WBD	broad whitefish	Coregonus nasus
GSA	saffron cod	Eleginus gracilis	WHB	humpback whitefish	Coregonus pidschian
HAM	American shad	Alosa sapidissima	WHC	humpback whitefish	C. clupeaformis / C.
HER	herrings-unspecified	Clupeidae		complex	nelsonii / C. pidschian
HPA	Pacific herring	Clupea pallasii	WHF	whitefish-unspecified	Coregoninae
IDA	salmonid, unspecified	Salmonidae	WIN	inconnu (sheefish)	Stenodus leucichthys
KNS	ninespine stickleback	Pungitius pungitius	WLC	least cisco	Coregonus sardinella
KSB	stickleback-	Gasterosteidae	WLK	lake whitefish	Coregonus clupeaformis
	unspecified		WPG	pygmy whitefish	Prosopium coulteri
KTS	threespine stickleback	Gasterosteus aculeatus	WRN	round whitefish	Prosopium
LAC	Arctic-Alaskan brook	L. camtschatica /			cylindraceum
	lamprey paired species	L. alaskense	YMA	shiner perch	Cymatogaster aggregata
LAK	Alaskan brook	Lampetra alaskense	YYP	yellow perch	Perca flavescens
	lamprey		QQQ	other species not listed	-
LAR	Arctic lamprey	Lampetra camtschatica	VVV	no collection effort	-
LMO	Atlantic salmon	Salmo salar	XXX	no fish collected or	-
LMP	lamprey-unspecified	Lampetra sp.		observed	
LPC	Pacific lamprey	Lampetra tridentata	ZZZ	general fish	-
LRV	American river lamprey	Lampetra ayresii		observation, no species information	
LWB	western brook lamprey	Lampetra richardsoni			
MIN	lake chub	Couesius plumbeus			
NOS	longnose sucker	Catostomus catostomus			
OEU	eulachon	Thaleichthys pacificus			
OLS	longfin smelt	Spirinchus thaleichthys			
OPS	pond smelt	Hypomesus olidus			
ORM	rainbow smelt	Osmerus mordax			
OSM	smelt-unspecified	Osmeridae			
OSS	surf smelt	Hypomesus pretiosus			
PIK	northern pike	Esox lucius			
SAM	Pacific salmon- unspecified	semelparous Oncorhynchus sp.			
SCK	Chinook salmon	Oncorhynchus tshawytscha			
SCM	chum salmon	Oncorhynchus keta			

Oncorhynchus keta

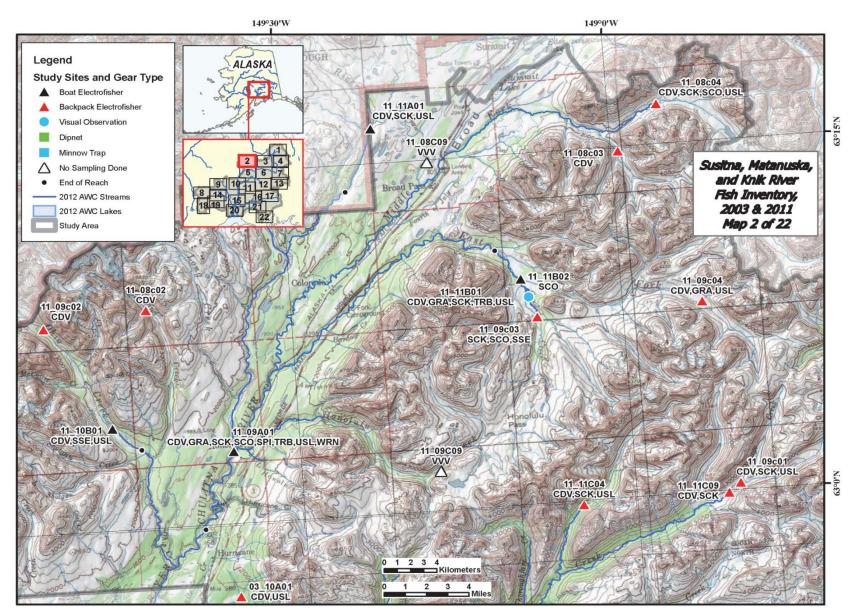
	Description
Code	Description
A	Anthropogenic Disturbance
AA	Unique
AA1	Timber Harvest
AA1a	0-1 year post-harvest
AA1b	1-5 year post-harvest
AA1c	10-20 year post-harvest
AA1d	20+ year post-harvest
AA2	Construction
AA2a	0-1 year post-construction
AA2b	1-5 year post-construction
AA2c	10-20 year post-construction
AA2d	20+ year post-construction
AA3	Enhancement/Restoration
AA3a	Bank Stabilization
AA3b	Riparian Thinning
AA3c	Fisheries Related
AA3d	Rip-Rap
AB	Repeated Seasonal
AB1	Foot Traffic
AB1a	Anglers
AB1b	Non-anglers
AB2	Vehicle Traffic
AB2a	Non-Recreational (road vehicle)
AB2b	Recreational (ATV, snowmachine)
AC	Permanent
AC1	Pervious Surfaces
AC1a	Urban/Commercial Landscaping
AC1b	Agricultural
AC1c	Gravel
AC1d	Other
AC2	Impervious Surfaces
AC2a	Parking Area
AC2b	Paved Trail/Walkway
AC2c	Concrete Wall/Abutment
Ν	Natural Disturbance
NA	Water/Flood
NA1	Slumping/Undercutting
NA1a	Wood Inputs
NA1b	Sediment Inputs
NA2	Sediment deposition from tributary
NB	Windthrow
NC	Glacial Retreat
ND	Fire
NE	Mass Wasting
NE1	Avalanche
NE2	Landslide
NE3	Debris Torrent
NE4	Natural Tree Mortality
1127	

Appendix B6.–Vegetation disturbance classes.

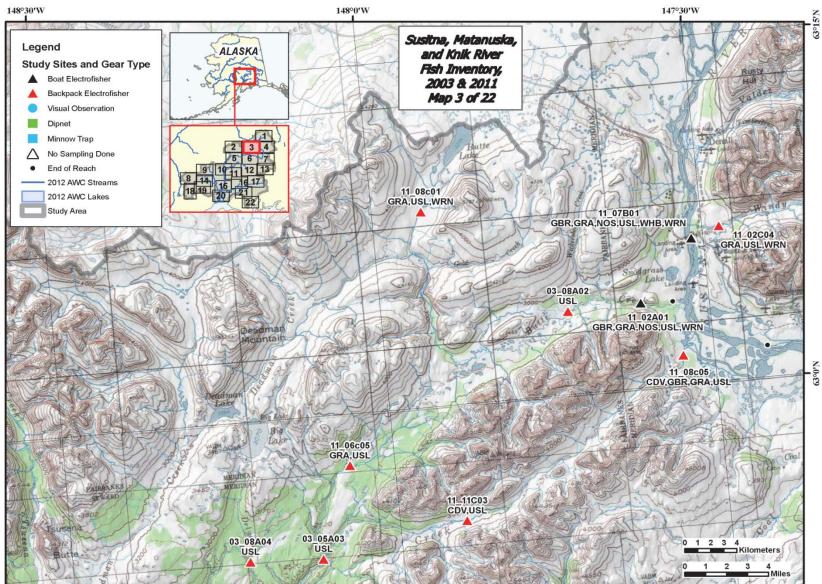
APPENDIX C. STUDY-SITE MAPS



Appendix C1.–Study site maps.

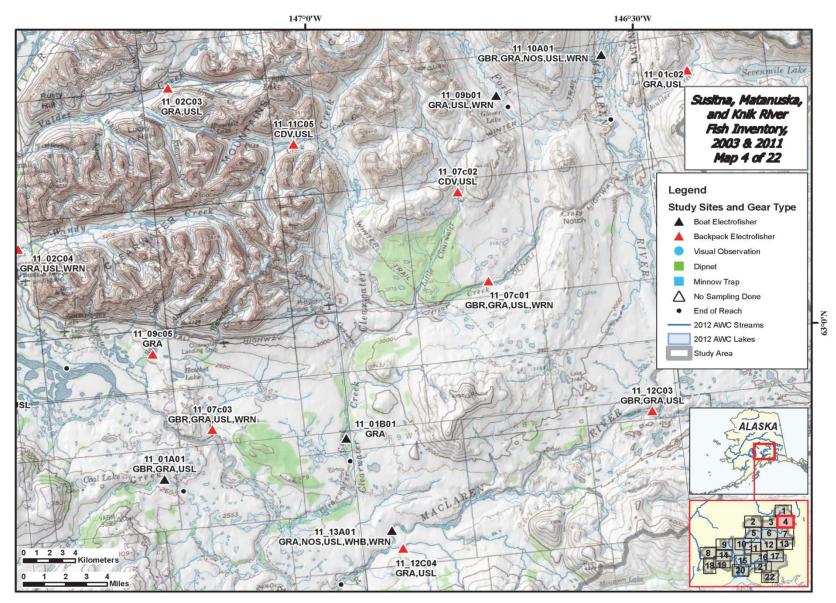


Appendix C1.–Page 2 of 23.

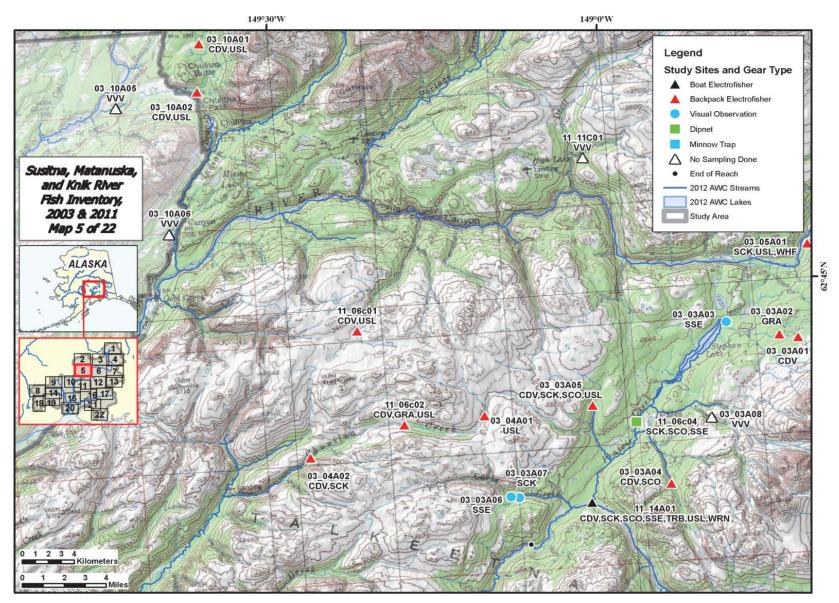


At-HTU DO B

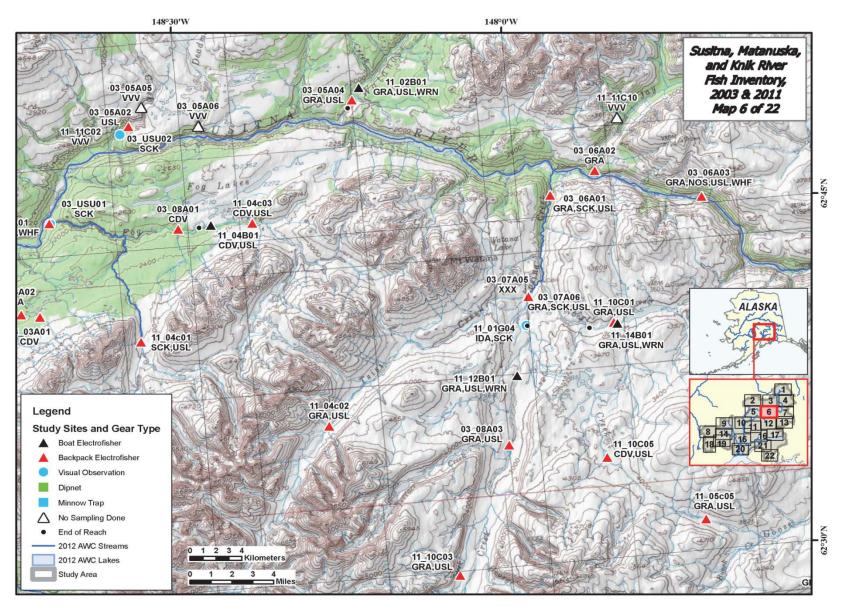
Appendix C3.–Page 3 of 23.



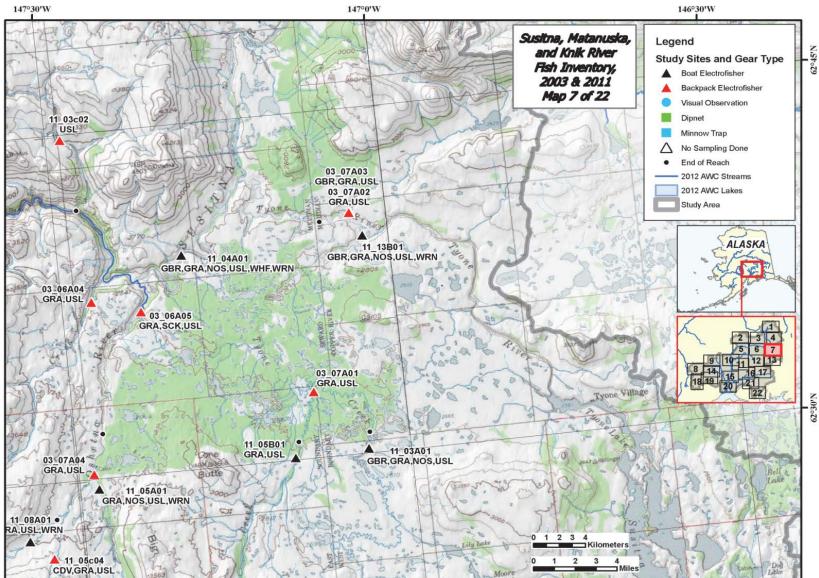
Appendix C2.–Page 4 of 23.



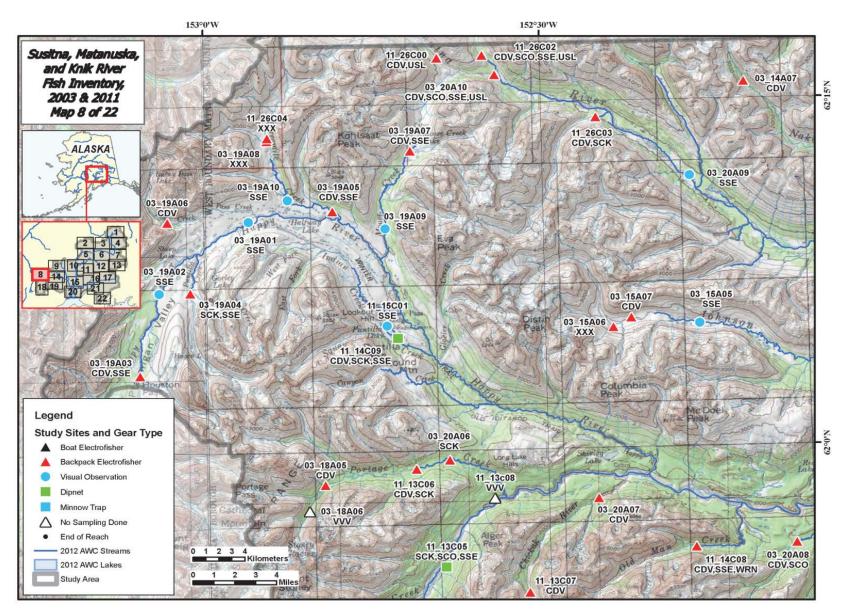
Appendix C1.–Page 5 of 23.



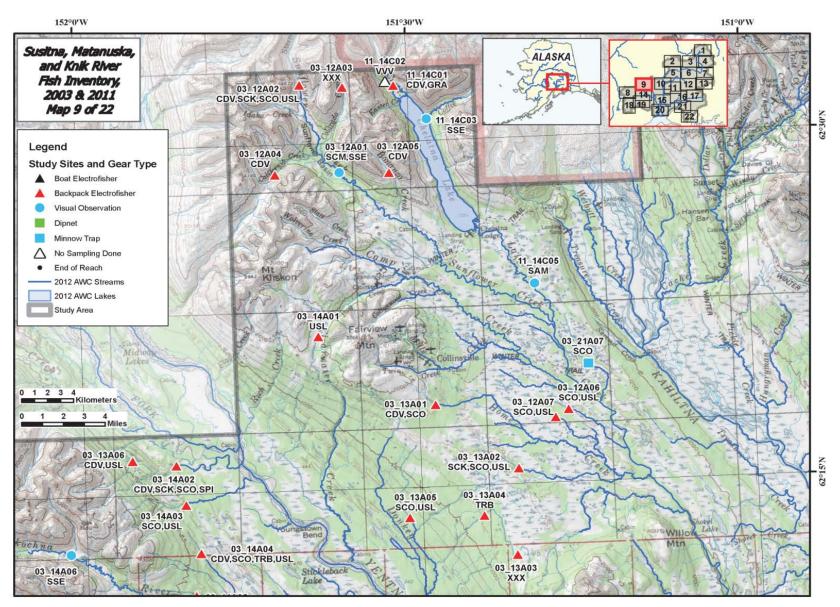
Appendix C1.–Page 6 of 23.



Appendix C1.–Page 7 of 23.

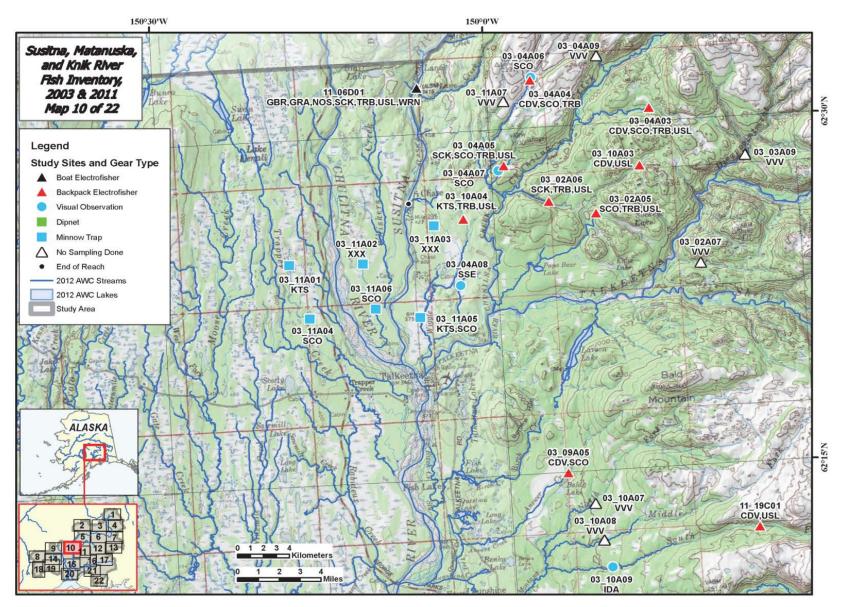


Appendix C1.–Page 8 of 23.

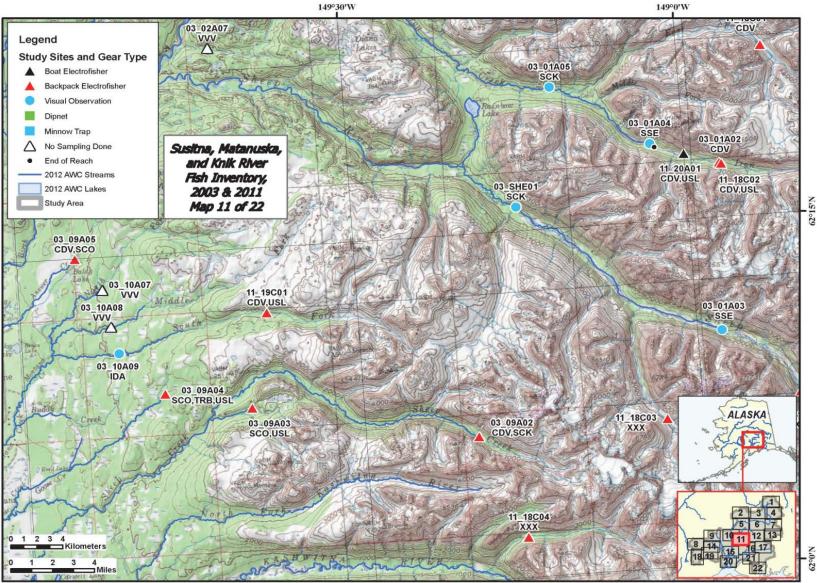


Appendix C1.–Page 9 of 23.

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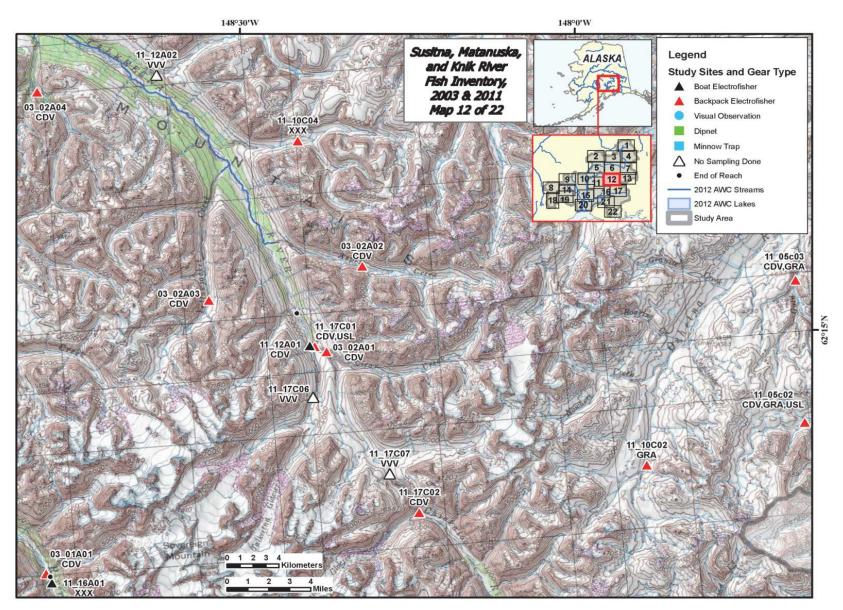


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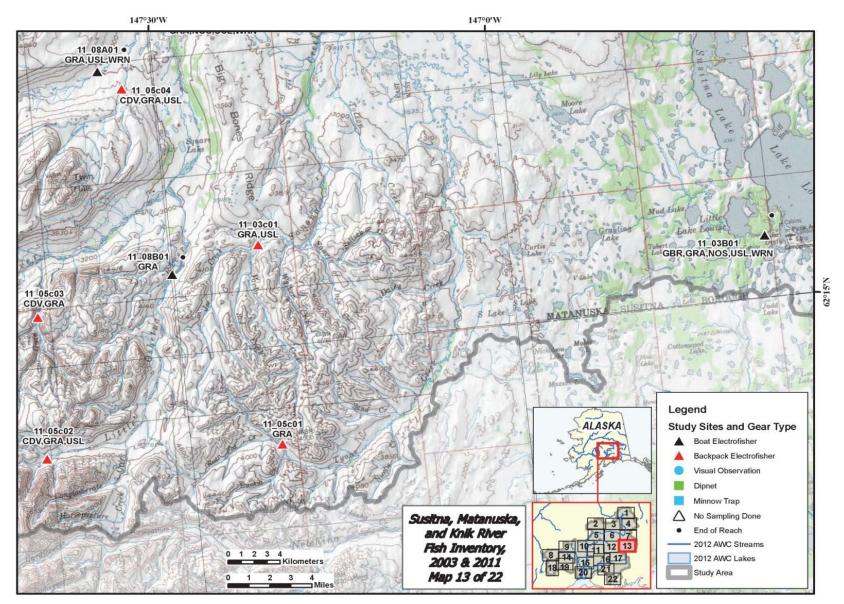




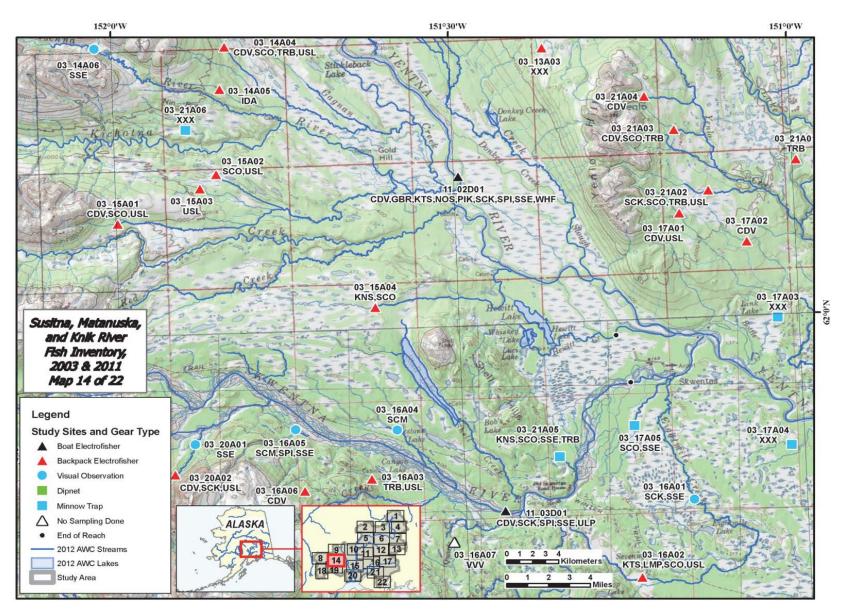
Appendix C1.–Page 11 of 23.



Appendix C1.–Page 12 of 23.

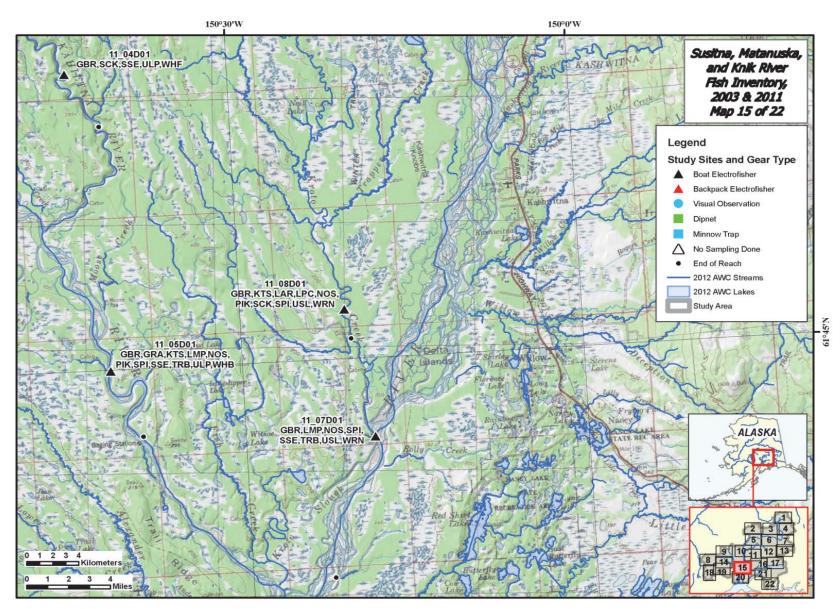


Appendix C1.–Page 13 of 23.

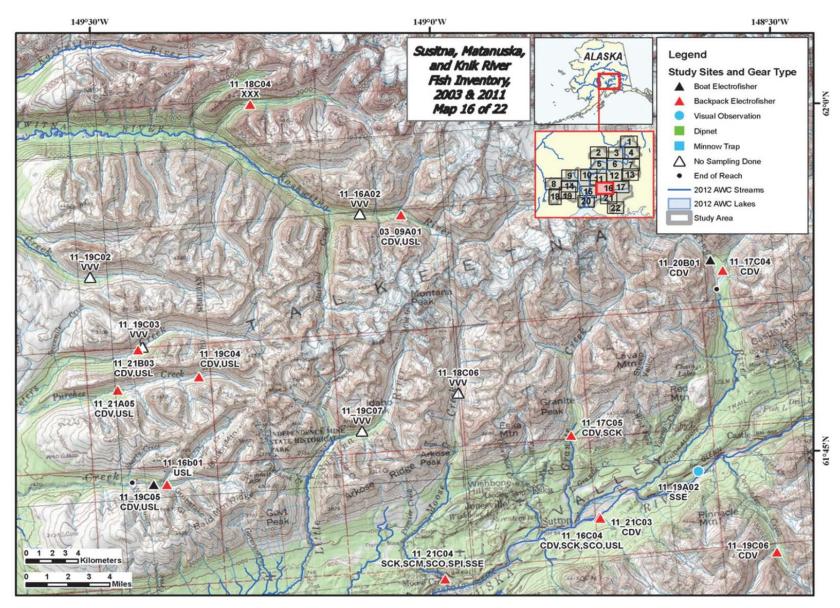


Appendix C1.–Page 14 of 23.

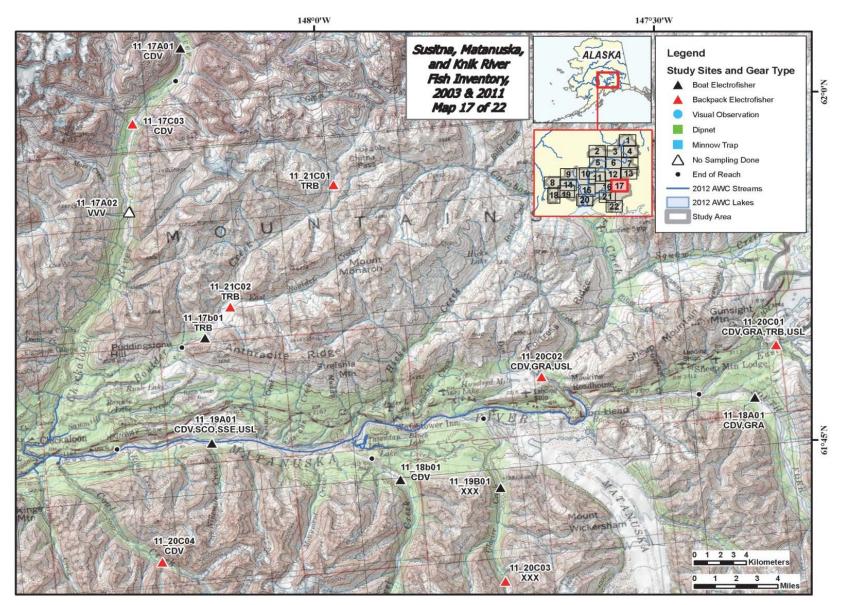
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Appendix C1.–Page 15 of 23.



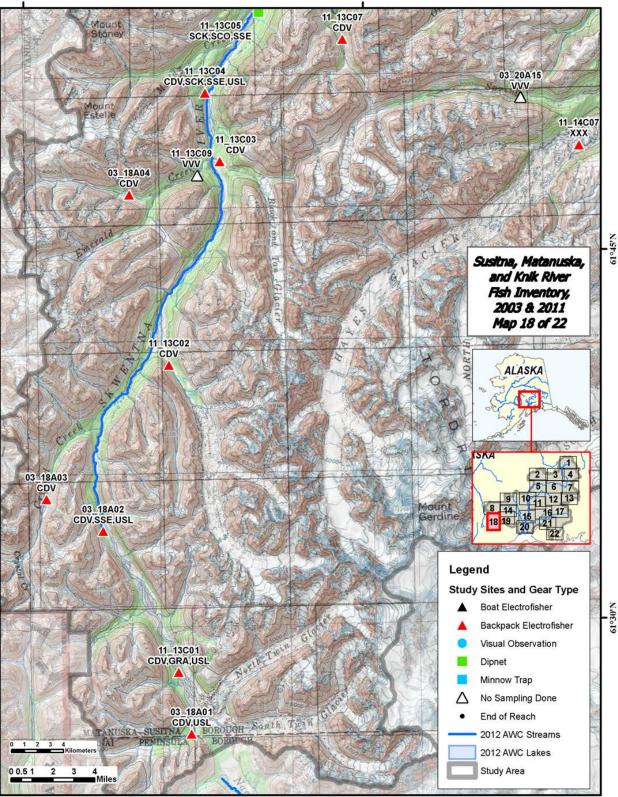
Appendix C1.–Page 16 of 23.



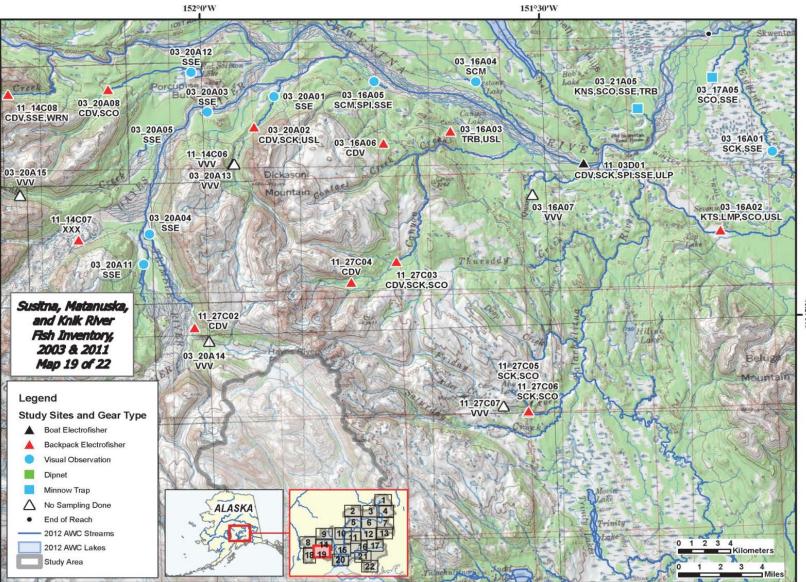
Appendix C1.–Page 17 of 23.

153°0'W

152°30'W

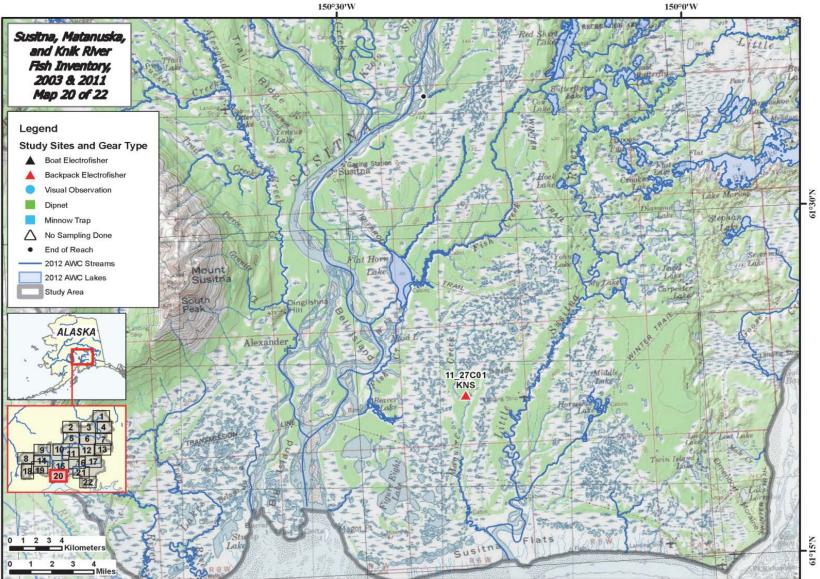


Appendix C1.-Page 18 of 23.



Appendix C1.–Page 19 of 23.

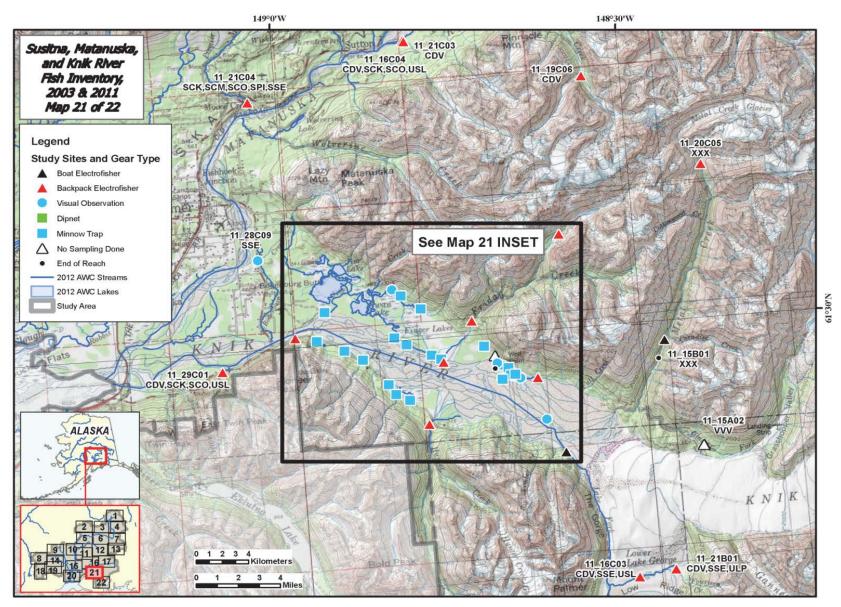
61°45'N



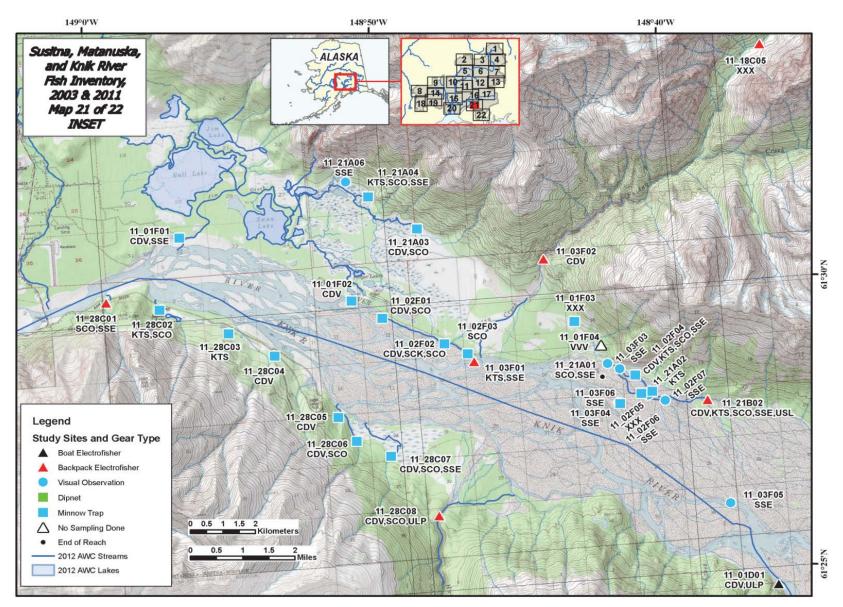
1262 - 1

98

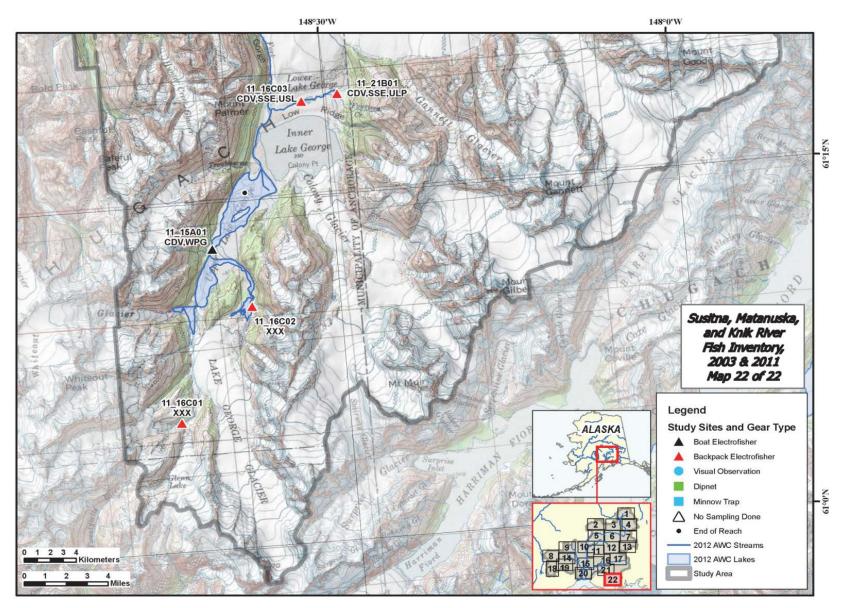
Appendix C1.–Page 20 of 23.



Appendix C1.–Page 21 of 23.

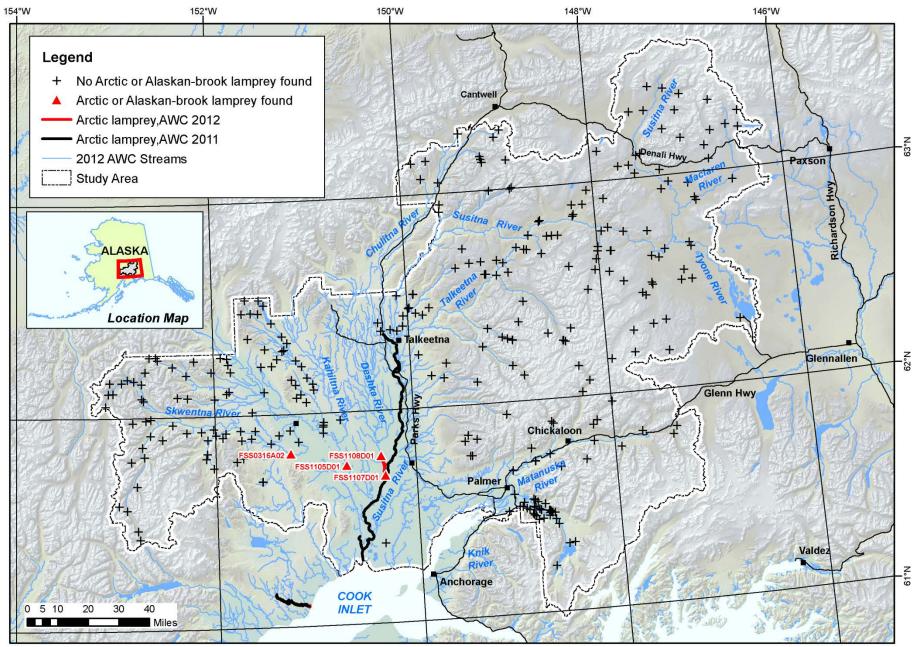


Appendix C1.–Page 22 of 23.

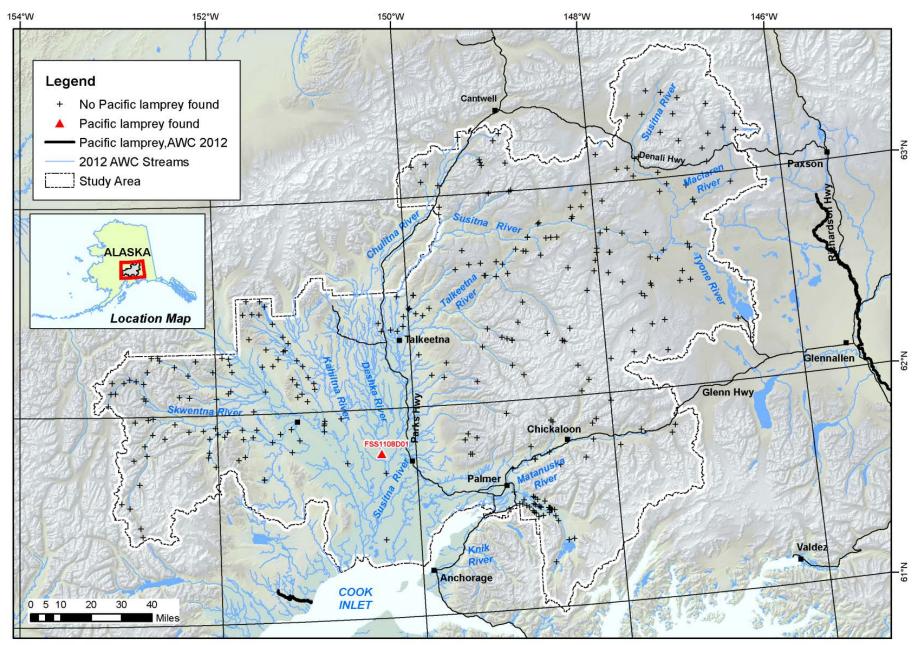


Appendix C1.–Page 23 of 23.

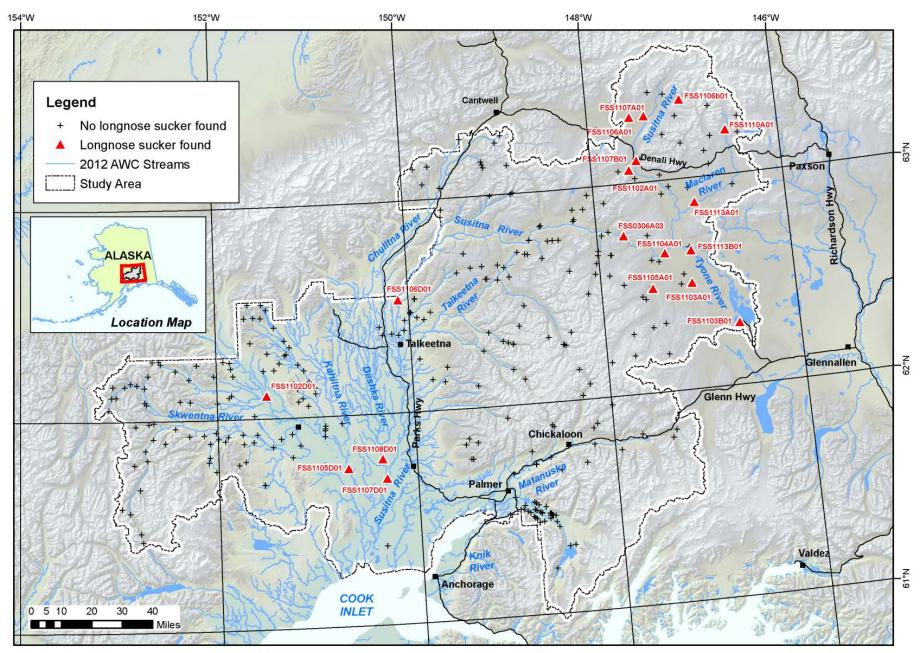
APPENDIX D. SPECIES-OCCURRENCE MAPS



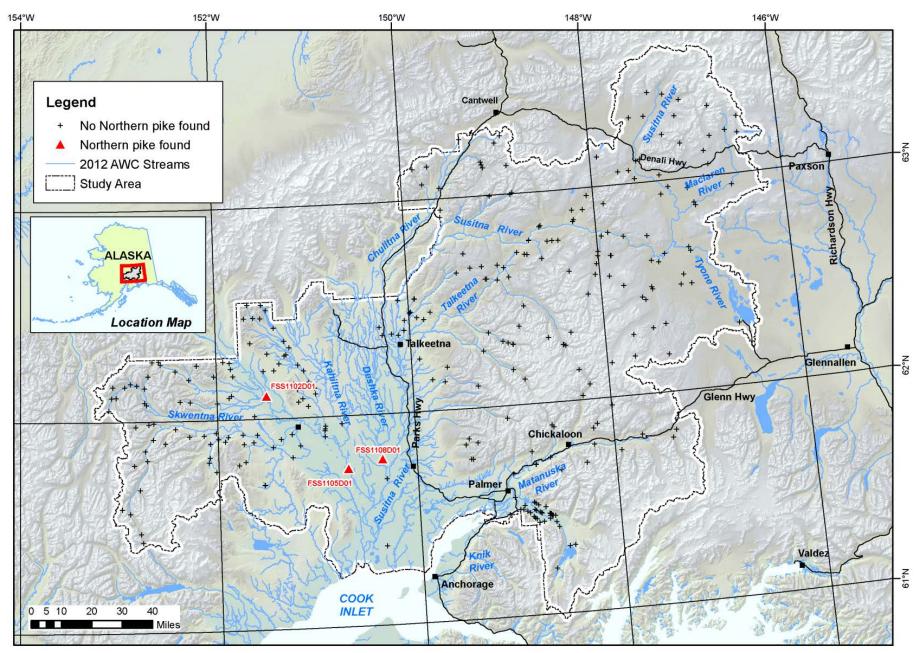
Appendix D1.-Arctic or Alaskan-brook lamprey occurrence.



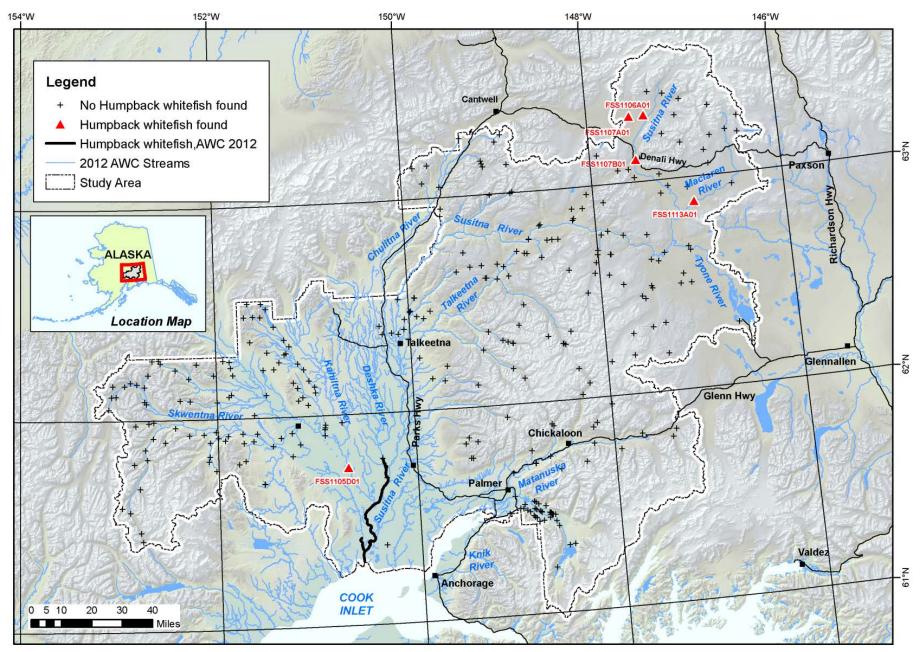
Appendix D2.-Pacific lamprey occurrence.



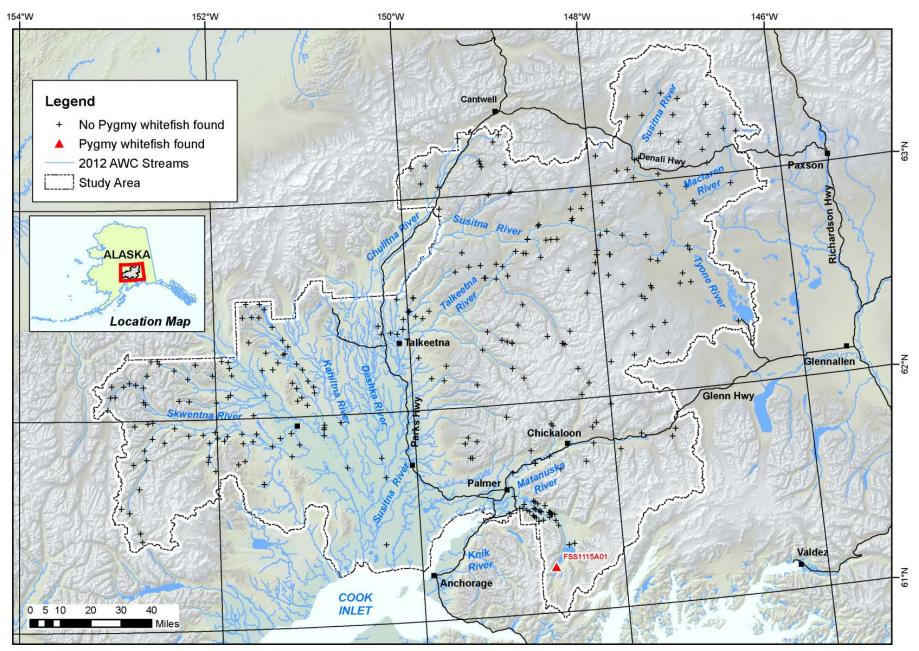
Appendix D3.–Longnose sucker occurrence.



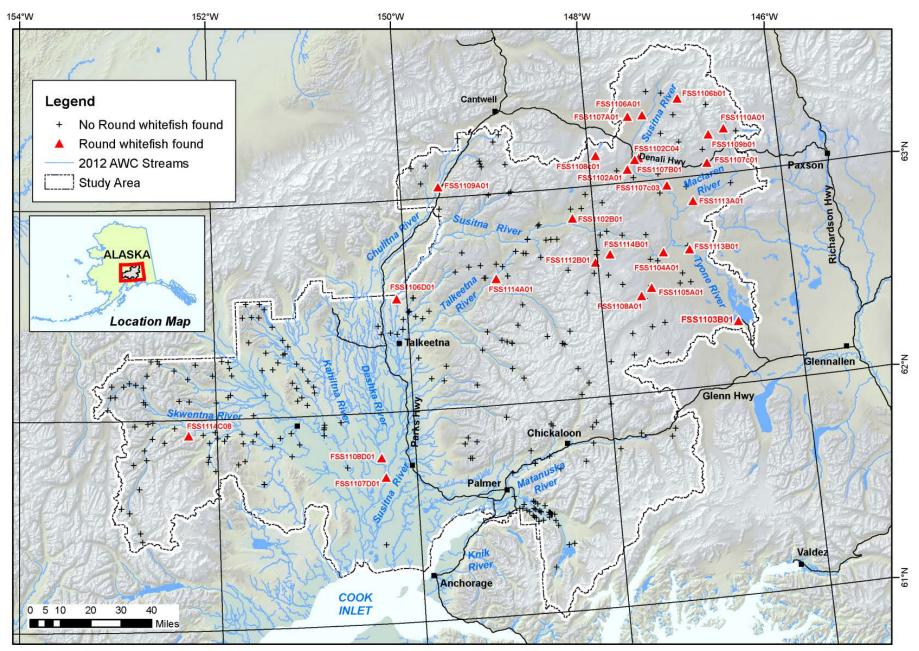
Appendix D4.–Northern pike occurrence.



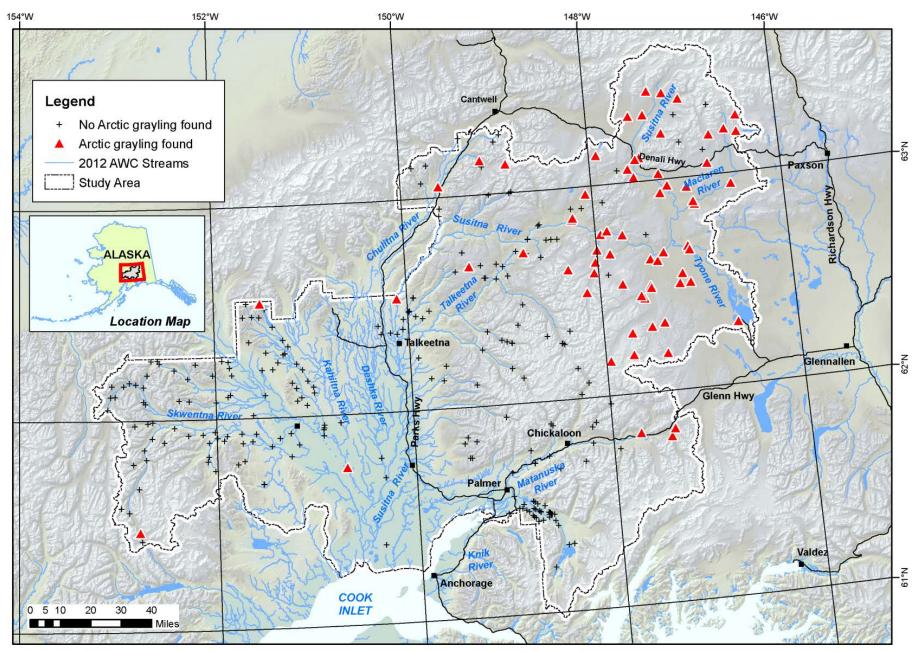
Appendix D5.-Humpback whitefish occurrence.



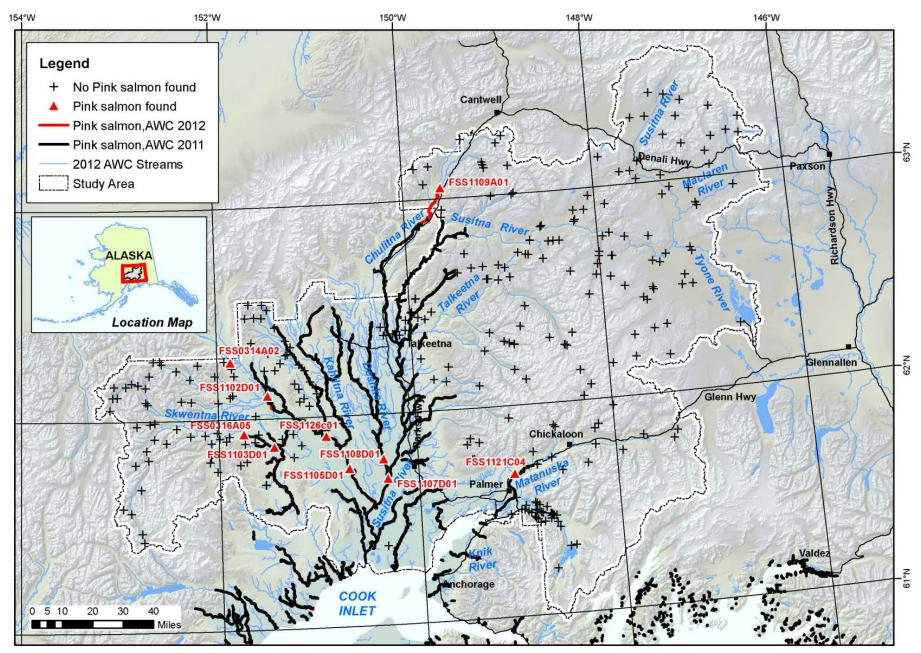
Appendix D6.–Pygmy whitefish occurrence.



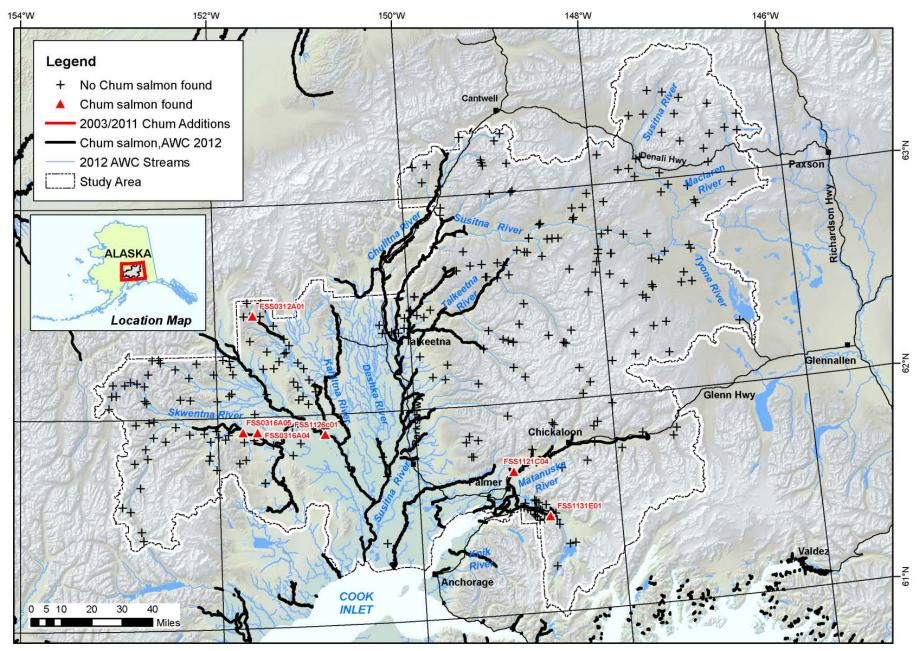
Appendix D7.-Round whitefish occurrence.



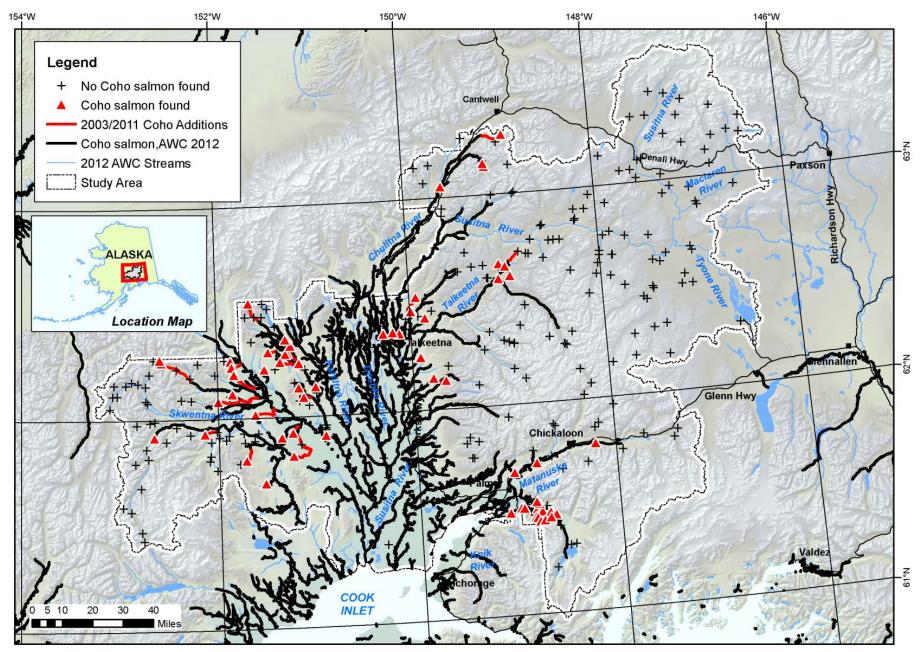
Appendix D8.–Arctic grayling occurrence.



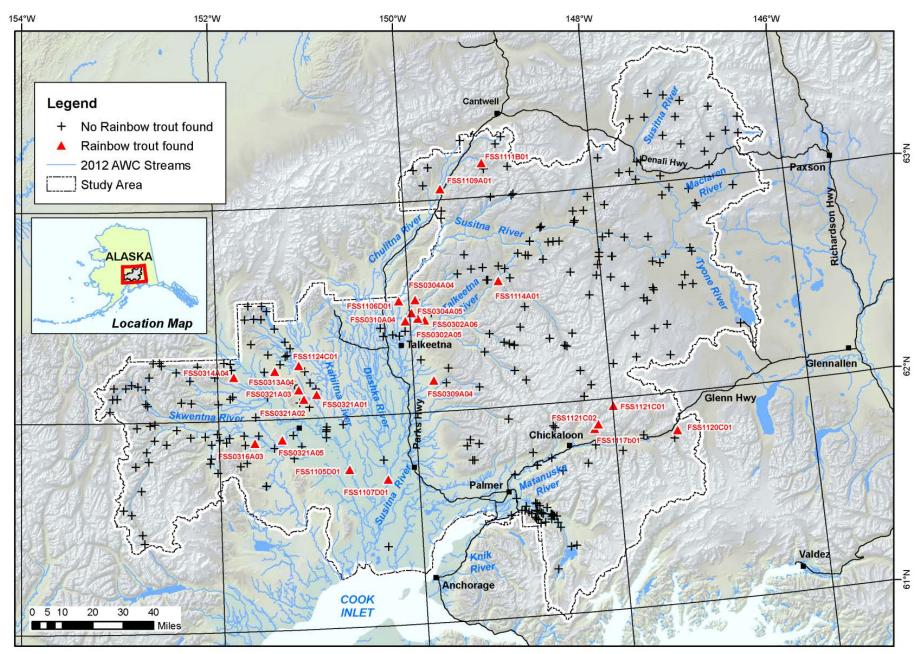
Appendix D9.–Pink salmon occurrence.



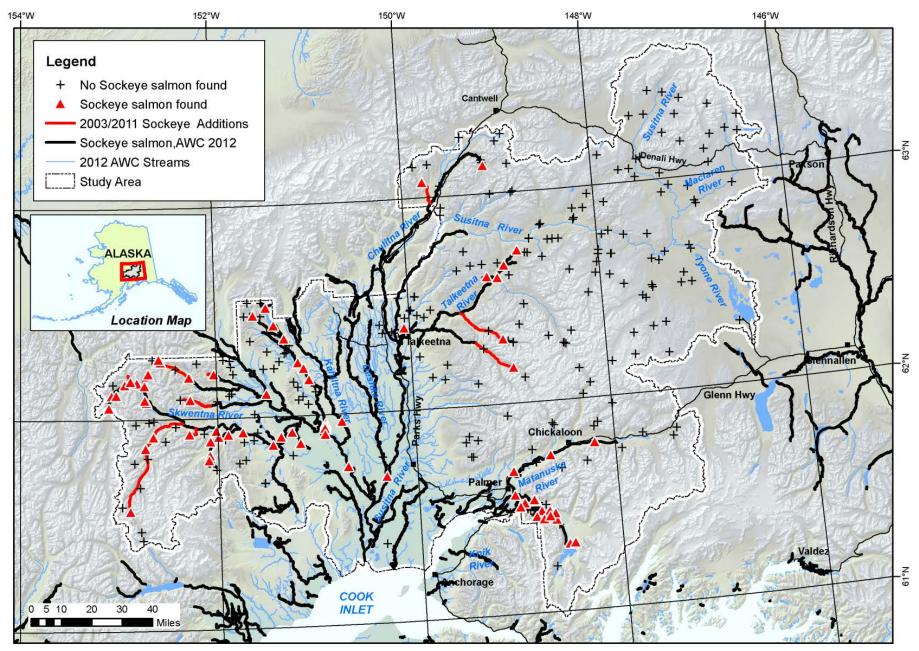
Appendix D10.–Chum salmon occurrence.



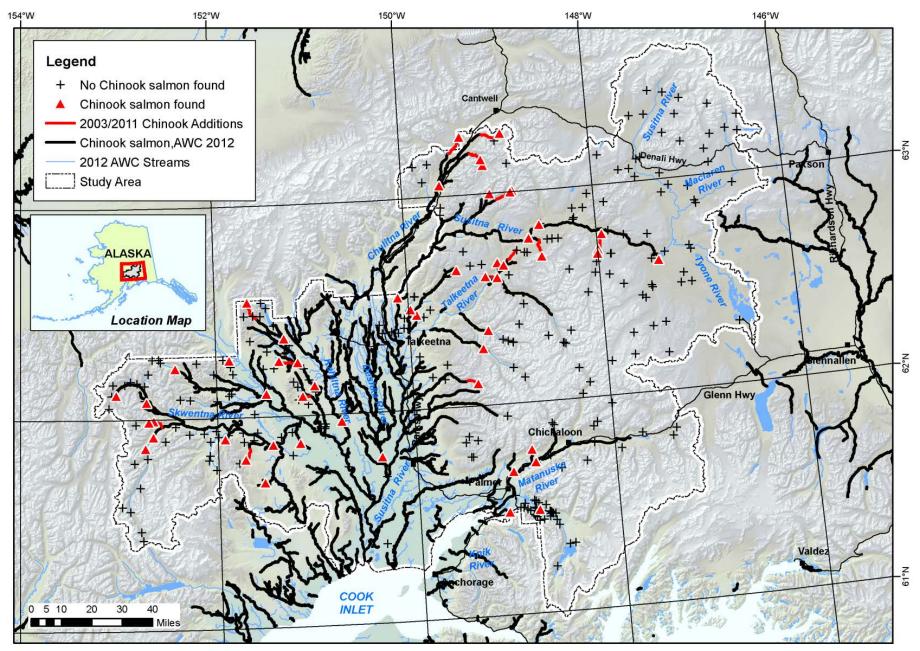
Appendix D11.–Coho salmon occurrence.



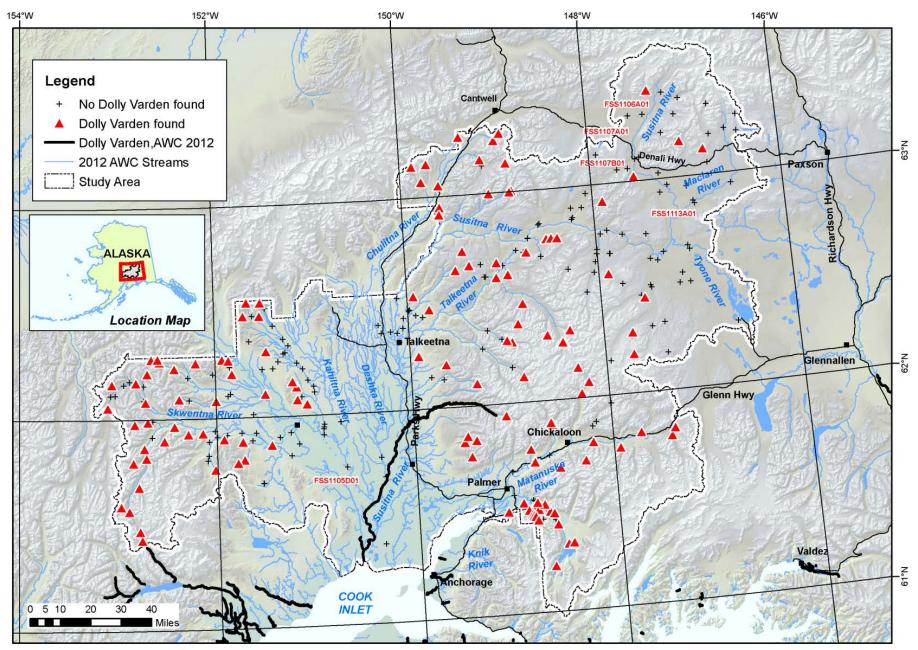
Appendix D12.-Rainbow trout occurrence.



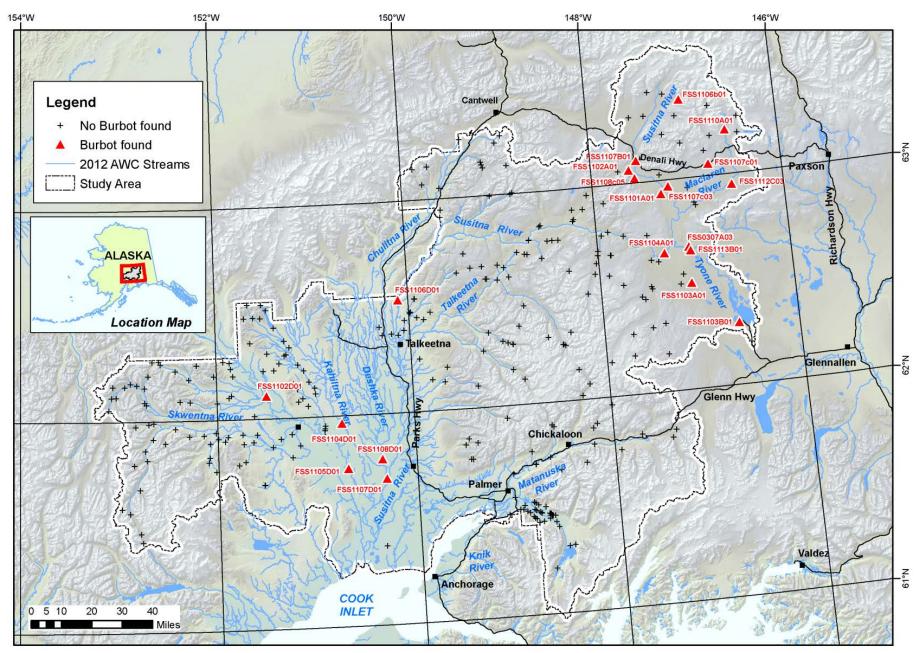
Appendix D13.–Sockeye salmon occurrence.



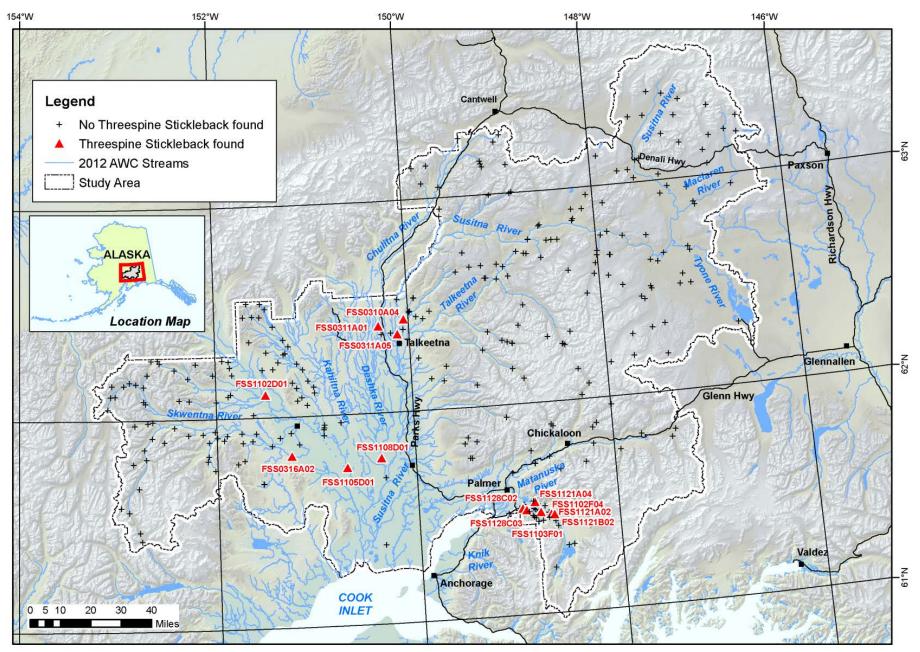
Appendix D14.-Chinook salmon occurrence.



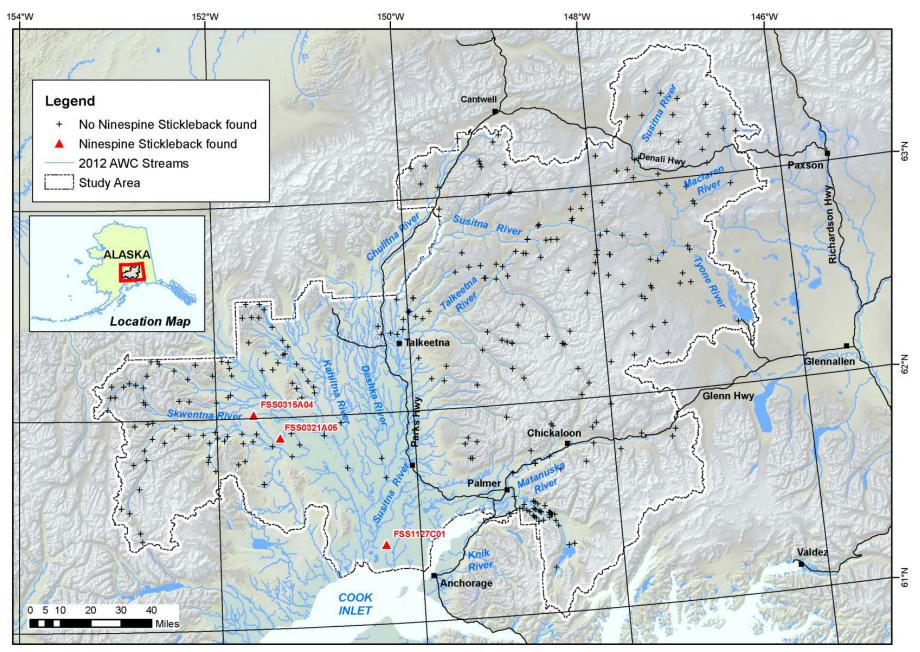
Appendix D15.–Dolly Varden occurrence.



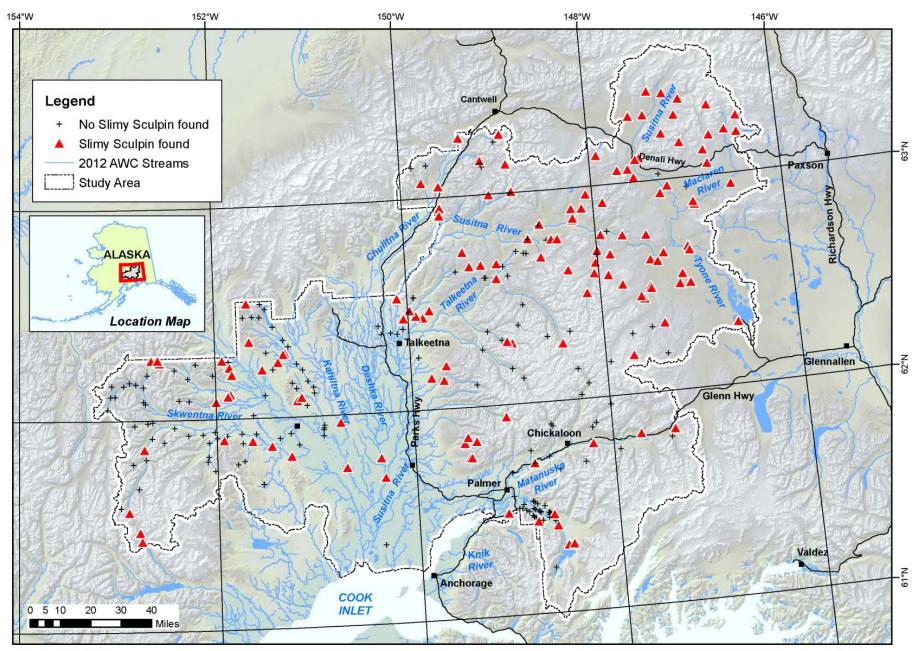
Appendix D16.–Burbot occurrence.



Appendix D17.-Threespine stickleback occurrence.



Appendix D18.–Ninespine stickleback occurrence.



Appendix D19.–Slimy sculpin occurrence.

APPENDIX E. SUMMARIES OF ANADROMOUS WATERS CATALOG NOMINATIONS

AWC nom.	Station ID	AWC stream code		New/Extend	New species/	Backup species
no.	(FSS03)	(247-41-10200)	Quad	waterbody?	activity ^a	activity
04-022	04A08	-2370-3023	Talkeetna B-1	Ν	-	Sp
04-023	11A05	-2370-3015	Talkeetna B-1	Ν	-	COr
04-024	05A01	-2969	Talkeetna Mts D-4	Ν	Kr	Кр
04-025	USU02	N/A	Talkeetna Mts D-4	\mathbf{Y}^{b}	Кр	
04-026	21A07	-2053-3170-4054	Talkeetna B-3	Y	COr	
04-027	21A05	-2053-3205-4050-5010	Tyonek D-4	Y	COr, Sr	
04-028	21A03	-2053-3170-4027-5033	Talkeetna A-3	Y	COr	
04-029	20A11	-2053-3205-4089-5255- 6020	Tyonek D-6	Y	Ss	
04-030	21A02	-2053-3170-4027-5025	Talkeetna A-3	Y	Kr, COr	
04-031	20A10	-2053-3229	Talkeetna B-6	Y	COr, Ssr	
04-032	20A08 20A12	-2053-3205-4099-5012	Tyonek D-6	Y	COr, Sp	
04-033	20A06	-2053-3205-4120	Tyonek D-8	Y	Kr	
04-034	20A03	-2053-3205-4089-5119	Tyonek D-6	Y	Sp	
04-035	20A04	-2053-3205-4089-5255- 6011	Tyonek D-6	Y	Ss	
04-036	20A02 20A01	-2053-3205-4089-5111	Tyonek D-6	Y	Kr, Ss	
04-037	19A10 19A05	-2053-3205-4112-5060	Talkeetna A-6	Y	Sp	
04-038	19A09	-2053-3205-4112-5054	Talkeetna A-6	Y	Sp	
04-039	19A04	-2053-3205-4112-5155- 6015	Mc Grath A-1	Ŷ	Kr, Sr	
04-040	19A03	-2053-3205-4112-5255	Mc Grath A-1	Y	Ssr	
04-041	18A02	-2053-3205	Tyonek C-8	Y	Sp	
04-042	17A05	-2053-3205-4009-5006	Tyonek D-4	Y	COr	
04-043	16A05	-2053-3205-4077	Tyonek D-5	Y	CHp, Ps, Sp	
04-044	16A04	-2053-3205-4064-5105- 6035	Tyonek D-5	Y	CHs	
04-045	16A02 16A01	-2053-3205-4009	Tyonek D-4	Y	COr, Kp, Ss	
04-046	15A05	-2053-3225	Talkeetna A-5	Y	Ss	
04-047	15A04	-2053-3219	Talkeetna A-4	Ŷ	COr	
04-048	15A02	-2053-3229-4009-5011	Talkeetna A-4	Ŷ	COr	
04-049	15A01	-2053-3229-4009-5105	Talkeetna A-4	Y	COr	
04-050	14A06	-2053-3229-4050	Talkeetna A-5	Y	Sp	
04-051	14A04	-2053-3229-4002-5033	Talkeetna A-4	Y	COr	
04-052	14A03	-2053-3043	Talkeetna A-4	Ŷ	COr	
04-053	14A02	-2053-3249-4103	Talkeetna B-4	Ŷ	Kr, COr, Pp	
04-054	13A05	-2053-3220-4030-5040- 6405	Talkeetna A-4	Ŷ	COr	
04-055	13A02	-2053-3170-4045-5011	Talkeetna B-3	Y	COr, Kr	
04-056	13A01	-2053-3170-4045-5201	Talkeetna B-3	Y	COr	
04-057	12A07	-2053-3170-4045-5028- 6025	Talkeetna B-3	Y	COr	

Appendix E1.–Summary of Anadromous Waters Catalog (AWC) nominations, 2003.

-continued-

11		e				
AWC					New	Backup
nom.	Station ID			New/Extend	species/	species/
no.	(FSS03)) (247-41-10200)	Quad	waterbody?	activity ^a	activity ^a
04-058	12A06	-2053-3170-4047	Talkeetna B-3	Y	COr	
04-059	12A02	-2053-3170-4067	Talkeetna B-4	Y	COr, Kr,	
	12A01				CHp, Ss	
04-060	11A06	-2381-3004	Talkeetna B-1	Y	COr	
04-061	11A04	-2361	Talkeetna B-1	\mathbf{Y}^{b}	COr	
04-062	09A05	-2300-3011-4016	Talkeetna Mts B-6	Y	COr	
04-063	09A04	-2230-3144-4520	Talkeetna Mts A-6	Y	COr	
04-064	09A03	-2200-3310	Talkeetna Mts A-6	Y	COr	
04-065	09A02	-2200	Talkeetna Mts A-5	Y	Kr	
04-066	07A06	-2810	Talkeetna Mts C-2	Y	Kr	
04-067	06A05	-2880	Talkeetna Mts C-1	Y	Kr	
04-068	04A07	-2370-3041-4049-5056	Talkeetna Mts B-6	Y	COrp, Krp	
	04A05					
04-069	04A06 04A04	-2370-3041-4049	Talkeetna Mts C-6	Y	COpr	
04-070	04A03	-2370-3041-4080	Talkeetna Mts C-6	Ν	COsr	
04-071	04A02	-2370-3041	Talkeetna Mts C-5	Y	Kr	
04-072	03A07 03A06	-2370-3297	Talkeetna Mts C-5	Y	Kp, Sp	
04-073	03A05	-2370-3301	Talkeetna Mts C-5	Y	Kr, COr	
04-074	03A04	-2370-3301-4034	Talkeetna Mts C-4	Y	COr	
04-075	03A03	-2370-3301	Talkeetna Mts C-4	Y	Sp	
04-076	02A06	-2370-3041-4050	Talkeetna Mts B-6	Y	Kr	
04-077	02A05	-2370-3041-4010-5056- 6306-7055	Talkeetna Mts B-6	Y	COr	
04-078	01A04	-2370-3180	Talkeetna Mts B-5	Y	Sp, Kp	
04-079	01A05 01A03	-2370-3090	Talkeetna Mts A-4	Y	Sn Kn	
04-079	SHE01	-2370-3090	i aikeeula ivits A-4	I	Sp, Kp	
04-080	20A05	-2053-3205-4089-5130	Tyonek D-6	Y	Ss	
04-081	19A07	-2053-3205-4112-5054	Talkeetna A-6	Ν	Sr	

 ^a AWC species codes: CH = chum salmon; CO = coho salmon; K = Chinook salmon; P = pink salmon; S = sockeye salmon. AWC activity codes: p = present; r = rearing; s = spawning.

^b This nomination did not result in a revision to the AWC. An addition to the AWC requires observation of *at least two anadromous fish* of the same species and life stage.

AWC nom.	Station ID	AWC stream code		New/ Extend	New species/	Backup species/
no.	(FSS11)	(247)	Quad	waterbody?	activity ^a	activity ^a
11-484	01F01	-50-10200-2081	Anchorage C-6	Ν	Sr	
11-485	01G04	-41-10200-2810	Talkeetna Mts C-3	Y	Кр	
11-486	02D01	-41-10200-2053	Talkeetna A-3	Ν	Sp	Kpr, Pp
11-487	02F03 02F02 02F01	-50-10200-2121	Anchorage B-5	Y	COr, Kr	
11-488	02F07 02F06	-50-10200-2155-3004	Anchorage B-5	Y	Ss	
11-489	03D01	-41-10200-2053-3205	Tyonek D-4	Ν		Kp, Pp, Sp
11-490	03F04 03F06	-50-10200	Anchorage B-5	Ν	Sr	Ss
11-491	03F05	-50-10200	Anchorage B-5	Ν		Ss
11-492	04D01	-41-10200-2053-3150	Tyonek D-2	Ν		Kp, Sp
11-493	06D01	-41-10200	Talkeetna C-1	Ν	Kr	Кр
11-494	08D01	-41-10200-2081	Tyonek D-1	Ν	ALpr, PCp	Kpr, Pp
11-495	09A01	-41-10200-2381	Healy A-6	Ν	Kr, Pp	COp
11-496	11A01	-41-10200-2381-3239- 4502	Healy B-5	Y	Krs	
11-497	14A01	-41-10200-2370	Talkeetna Mts C-5	Ν	Krs	COp, Sp
11-498	15A01	-50-10200-2160	Anchorage A-5	Ν	AWC correcti Upper Lake	
11-499	19A01	-50-10220	Anchorage D-4	Ν		Ss, COp
11-564	10B01	-41-10200-2381-3235	Healy A-6	Y	Sp	
11-565	11B01	-41-10200-2381-3260	Healy A-5	Y	Krs	
11-566	11B02	-41-10200-2381-3260- 4100	Healy A-5	Y	COp	
11-567	16C04	-50-10220-2110	Anchorage C-5	Y	Kr, COr	
11-568	17C05	-50-10220-2105	Anchorage D-5	Ν	Kr	
11-569	21C04	-50-10220-2085	Anchorage C-6	Ν	Ps, Ss	Kr, CHs, COr
11-570	26C02	-41-10200-2053-3229- 4200	Talkeetna B-6	Y	COrs, Ss	
11-571	26C03	-41-10200-2053-3229- 4127	Talkeetna A-5	Y	Kr	
11-572	27C03	-41-10200-2053-3205- 4067 41 10200 2052 2205	Tyonek D-5	Y	Kr, COr	
11-573	27C05	-41-10200-2053-3205- 4053-5046	Tyonek C-5	Y	Kr, COr	K. CU.
11-574	27C06	-41-10200-2053-3205- 4053-5046	Tyonek C-5	Y	COr	Kr, CHs, COr
11-575	28C01	-50-10200-2074	Anchorage C-6	Y	Sr, COr	
11-576	28C02	-50-10200-2078-0010	Anchorage C-6	Y	COr	
11-577	28C06	-50-10200-2120	Anchorage B-5	Y	COrs, Ss	
11-578	28C08	-50-10200-2140	Anchorage B-5	N	COs, DVs	
11-579	28C09	-50-10200-2071-3023	Anchorage C-6	N	Ss	
11-580	29C01	-50-10200-2050	Anchorage B-6	Y	COrs, Kpr	

Appendix E2.–Summary of Anadromous Waters Catalog (AWC) nominations, 2011.	

-continued-

AWC				New/	New	Backup
nom.	Station ID	AWC stream code		Extend	species/	species/
no.	(FSS11)	(247)	Quad	waterbody?	activity	activity
11-581	14C03	-41-10200-2053-3170- 4088	Talkeetna C-3	Ν		Ss
11-582	04C01	-41-10200-2696-3020	Talkeetna Mts B-3	Y	Kr	
11-583	06C04	-41-10200-2370-3301	Talkeetna Mts C-4	Ν		Ksr, COr, Sp
11-584	08C04	-41-10200-2381	Healy B-4	Y	Kr, COr	-
11-585	09C01 11C09	-41-10200-2585	Healy A-4	Y	Kr	
11-586	09C03	-41-10200-2381-3260- 4100	Healy A-5	Y	Kr, COr	
11-587	11C04	-41-10200-2585-3223	Talkeetna Mts D-5	Y	Kr	
11-588	13C04	-41-10200-2053-3205- 4220	Tyonek D-8	Y	Kr, Sr	
11-589	13C05	-41-10200-2053-3205- 4165	Tyonek D-8	Y	Kr, COr, Spr	
11-590	13C06	-41-10200-2053-3205- 4120	Tyonek D-8	Y	Kr	
11-591	14C08	-41-10200-2053-3205- 4105	Tyonek D-7	Y	Sr	
11-592	14C09	-41-10200-2053-3205- 4112-5045	Talkeetna A-6	Ν	Sr, Kr	Kp, Ss
11-593	15C01	-41-10200-2053-3205- 4112-5045-0010	Talkeetna A-6	Ν		Ss
11-623	28C07	-50-10200-2126	Anchorage B-5	Y	Sr, COr	
11-700	19A02	-50-10220-2139	Anchorage C-5	Y	Ss	
11-701	21A03 21A04 21A06	-50-10200-2081-3041	Anchorage C-5	Ν	COr, Srs	
11-702	21B01 16C03	-50-10200-2160-3051	Anchorage B-4	Y	Sp	
11-703	21B02 02F04 03F03 21A01	-50-10200-2155	Anchorage B-5	Y	COpr, Srs	
11-709	07D01	-41-10200	Tyonek C-1	Ν		Sp, Pp
11-710	05D01	-41-10200-2053	Tyonek C-2	Ν	Sp	Pp
11-711	03F01	-50-10200	Anchorage B-5	Ν	Sr	-

Appendix E2.–Page 2 of 2.

^a AWC species codes: AL = Arctic lamprey; CH = chum salmon; CO = coho salmon; DV = Dolly Varden; K = Chinook salmon; P = pink salmon; PC = Pacific lamprey; S = sockeye salmon.
 AWC activity codes: p = present; r = rearing; s = spawning.

APPENDIX F. OCCURRENCE OF FISH SPECIES AND LIFE STAGES BY STREAM SIZE

	-		Stream size			
Scientific name	Common name	Life stage	Small (n=152)	Medium (n=63)	Large (n=27)	Total (n=242)
Lampetra camtschatica	Arctic lamprey	juvenile	0	0	1	1
Lamperra camisenarica	ruette tumptey	juvenile/adult	0	0	1	1
		adult	0	0	1	1
Lampetra tridentata	Pacific lamprey	adult	0	0	1	1
Lampetra sp.	lamprey-unspecified	juvenile	1	0	2	3
Lumperra sp.	improy unspectified	juvenile/adult	0	0	2	2
		adult	0 0	0	1	1
Catostomus catostomus	longnose sucker	juvenile	0	2	6	8
	iongnose seener	juvenile/adult	0	4	11	15
		adult	0	3	11	14
Esox lucius	northern pike	juvenile/adult	0	0	2	2
2.5000 000000	normern price	adult	0	0	-	- 1
Coregonus pidschian	humpback whitefish	juvenile	0	0	2	2
coregonus prusentur	nompourn minorisi	juvenile/adult	0	0	3	3
		adult	0	0	4	4
Prosopium coulteri	pygmy whitefish	juvenile/adult	0	1	0	1
Prosopium cylindraceum	round whitefish	juvenile	1	4	7	12
		juvenile/adult	3	10	10	23
		adult	0	6	6	12
Coregoninae	whitefish-unspecified	juvenile	0	0	2	2
		adult	0	1	2	3
Thymallus arcticus	Arctic grayling	juvenile	22	20	16	58
		juvenile/adult	16	16	12	44
		adult	6	6	8	20
Oncorhynchus gorbuscha	pink salmon	adult	1	0	6	7
	1	adult spawning	0	1	0	1
		carcass	0	0	1	1
O. keta	chum salmon	adult spawning	0	1	0	1
O. kisutch	coho salmon	juvenile	35	1	0	36
		adult	1	0	3	4
		adult spawning	2	1	0	3
O. mykiss	rainbow trout	juvenile	10	2	0	12
		juvenile/adult	7	2	4	13
		adult	1	2	3	6
O. nerka	sockeye salmon	juvenile	10	1	0	11
	-	adult	1	2	7	10
		adult spawning	4	1	1	6
		carcass	2	0	0	2
O. tshawytscha	Chinook salmon	juvenile	24	7	8	39
		adult	1	1	5	7
		adult spawning	0	2	1	3
		carcass	1	1	0	2

Appendix F1.–Occurrence (no. of electrofished sites) of fish species and life stages by stream size.

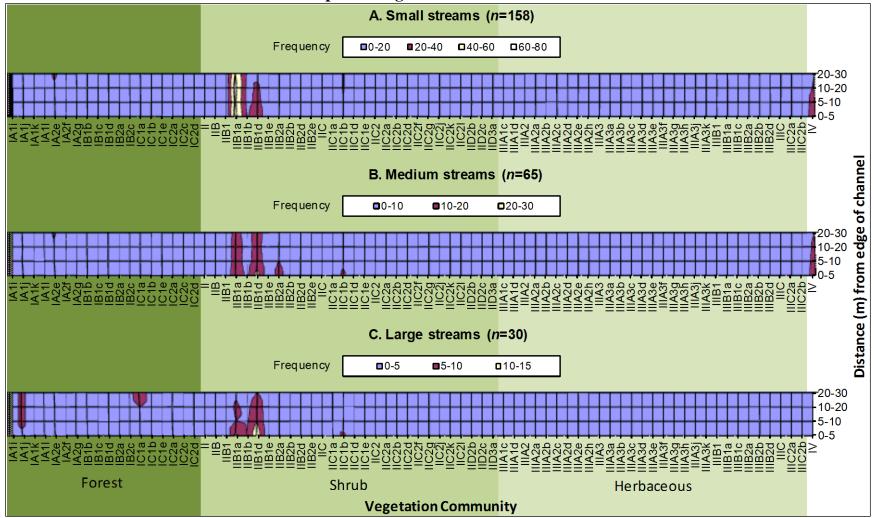
-continued-

			Stream size				
Scientific name	Common name	Life stage	Small (n=152)	Medium (n=63)	Large (n=27)	Total (n=242)	
Salvelinus malma	Dolly Varden	Juvenile	59	18	2	79	
		juvenile/adult	65	27	7	99	
		adult	20	7	2	29	
Lota lota	burbot	juvenile	3	4	9	16	
		juvenile/adult	0	4	5	9	
		adult	0	0	1	1	
Gasterosteus aculeatus	threespine stickleback	juvenile	1	0	2	3	
		juvenile/adult	4	0	1	5	
		adult	1	0	2	3	
Pungitius pungitius	ninespine stickleback	juvenile	1	0	0	1	
		juvenile/adult	1	0	0	1	
		adult	1	0	0	1	
Cottus cognatus	slimy sculpin	juvenile	43	18	16	77	
		juvenile/adult	61	27	20	108	
		adult	40	22	14	76	
Cottidae	sculpin-unspecified	juvenile	0	0	1	1	
		juvenile/adult	2	0	4	6	
		adult	0	2	2	4	
no fish found	N/A	N/A	39	33	12	84	

Appendix F1.–Page 2 of 2.

APPENDIX G. GRAPHICAL SUMMARIES OF FISH AND HABITAT VARIABLES

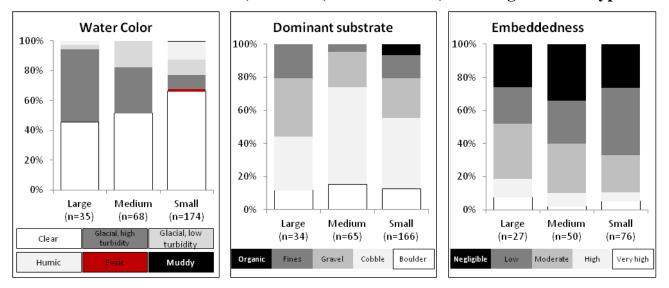
Appendix G1.–Distributions of categorical habitat variables.



Occurrence of dominant riparian vegetation communities at fish-collection reaches.

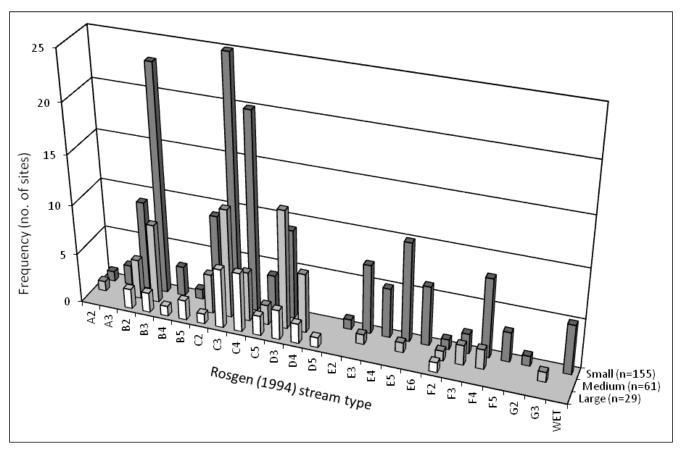
Note: Level-IV vegetation communities (Viereck et al. 1992) we observed are shown along the *x*-axis. Along the *y*-axis, vegetation communities are grouped into 4 zones according to their distance (m) from the edge of the stream channel. The count of each vegetation community type is represented by shading. Vegetation communities along both stream banks are included—so, for each site, there are 2 vegetation community counts per zone.

Appendix G1.–Page 2 of 2.

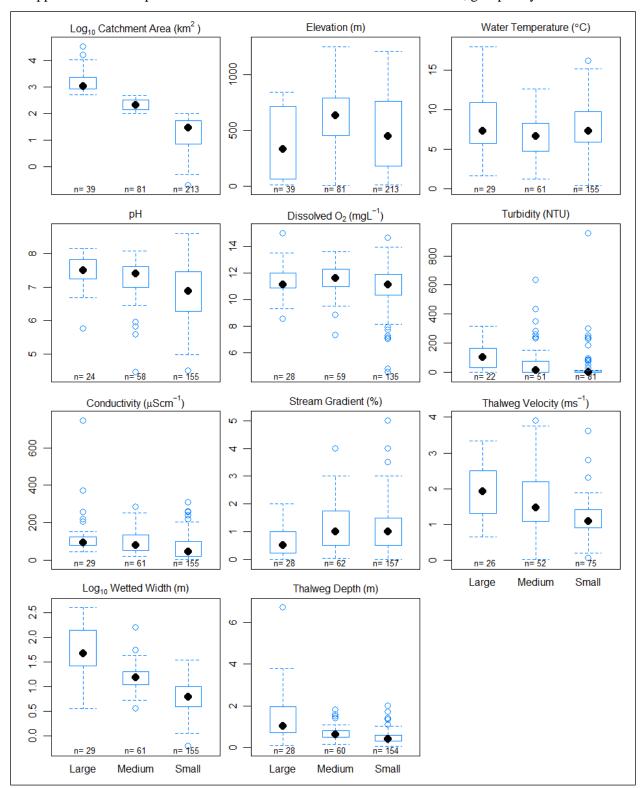


Occurrence of water color, substrate, embeddedness, and Rosgen stream types

Note: Variables grouped along the *x*-axis by stream size.



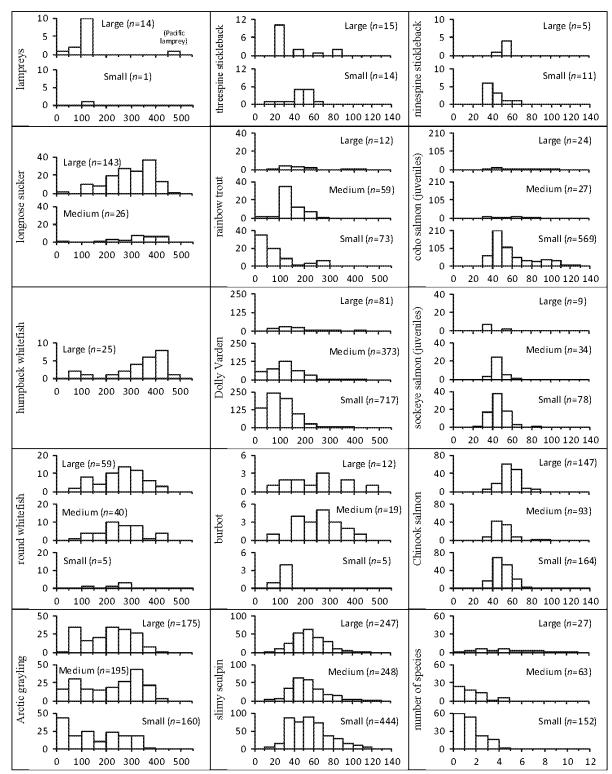
Note: Rosgen (1994) stream types (*y*-axis) by stream size (*x*-axis). Bar height (*z*-axis) represents the number of sites. *Note:* Graphical display of frequency distributions created using R statistical language (R Core Team 2012).



Appendix G2.–Box plots of selected numeric habitat variable distributions, grouped by stream size.

Note: Stream-size categories are based on drainage area (km²) upstream of each site (i.e., catchment area): Small streams, ≤100 km²; Medium streams, 100–500 km²; Large streams, >500 km².

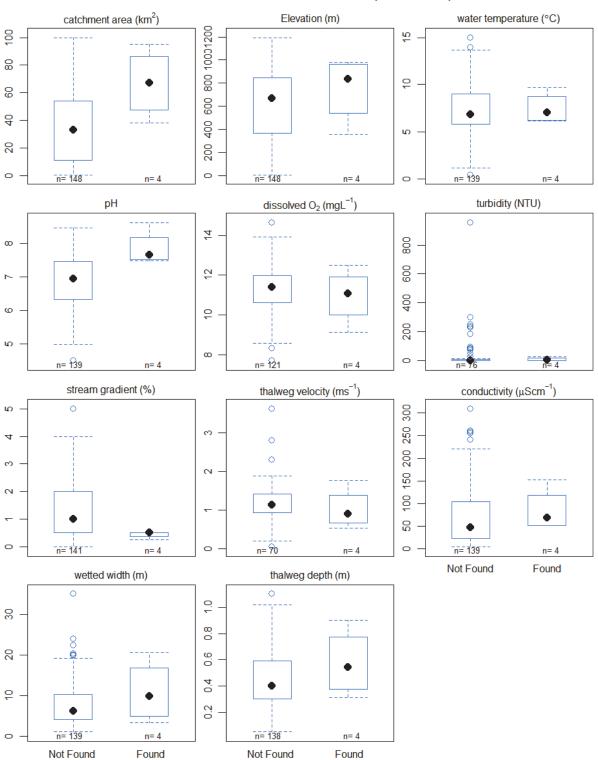
Note: Box plots created through R

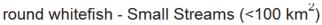


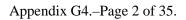
Appendix G3.–Frequency histograms of fork lengths of measured fish, and the number of species found per site, grouped by stream size.

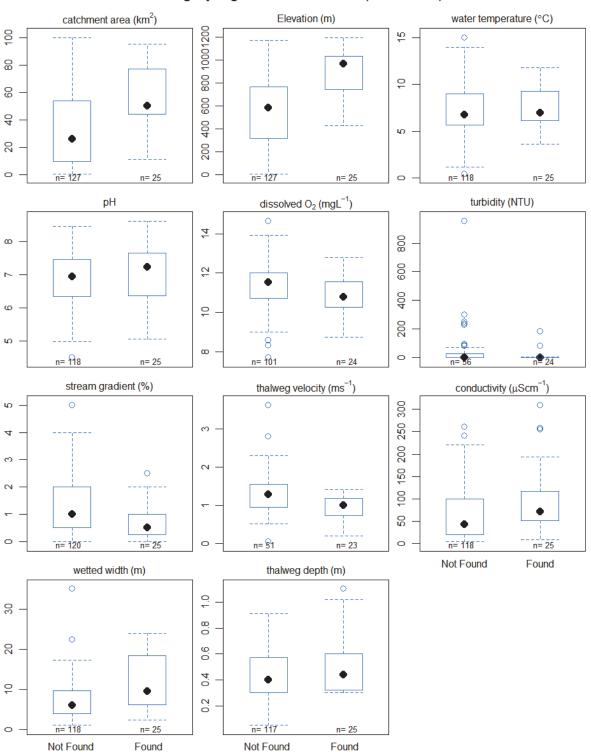
Note: x-axis shows fish fork length (mm); y-axis shows frequency (number of fish measured). Stream-size categories are based on drainage area (km²) upstream of each site (i.e., catchment area): Small streams, ≤100 km²; Medium streams, 100–500 km²; Large streams, >500 km². Individual fish lengths from all sites within each stream-size category were pooled.

Appendix G4.-Paired box plots of continuous habitat variable distributions grouped by stream size and species occurrence.

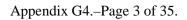


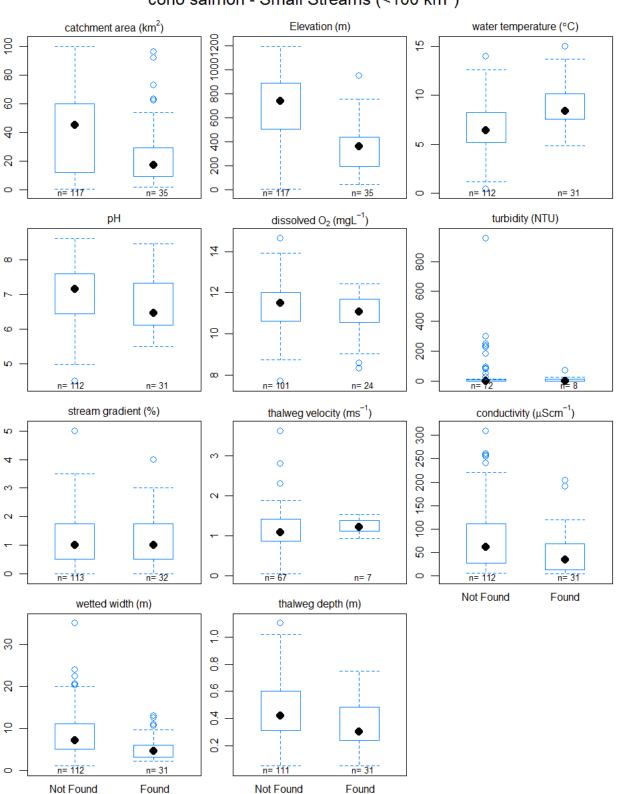




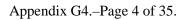


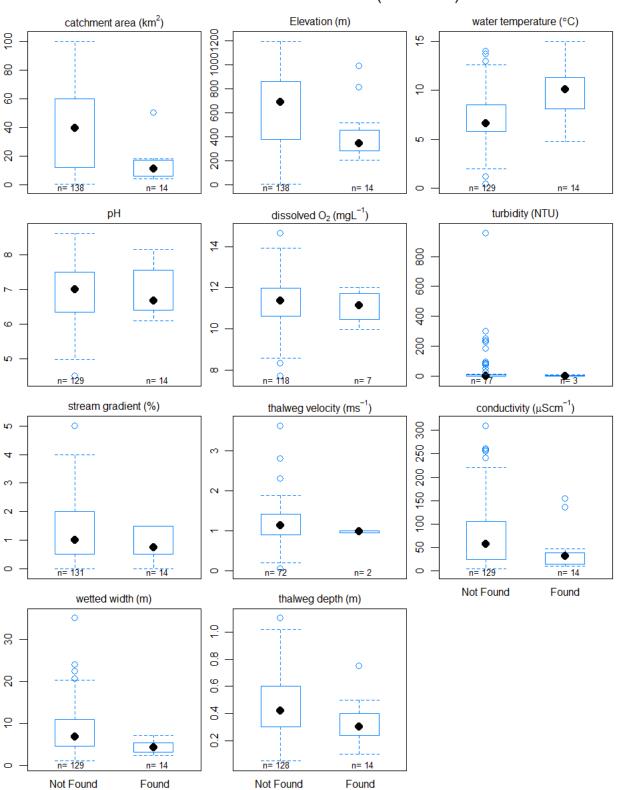
Arctic grayling - Small Streams (<100 km²)



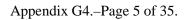


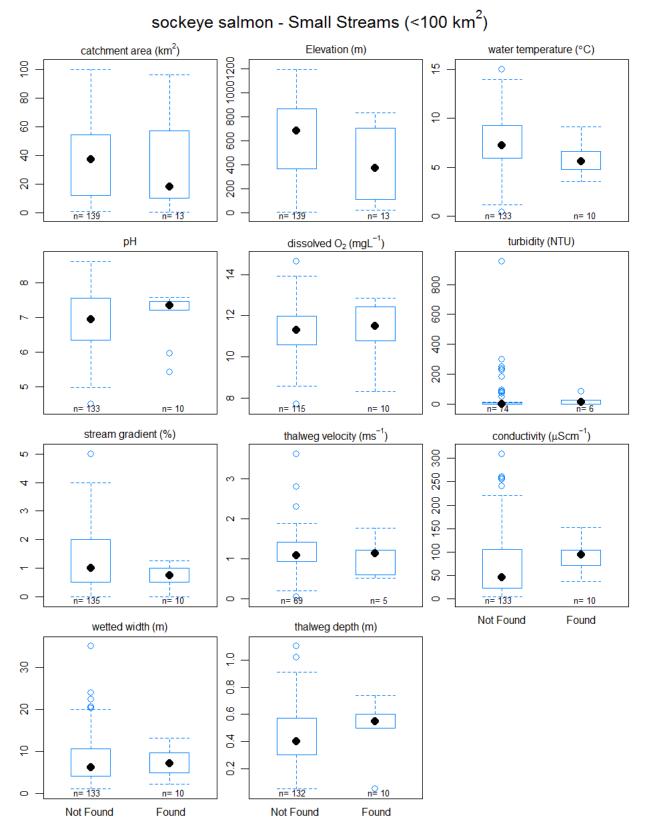
coho salmon - Small Streams (<100 km²)

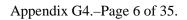


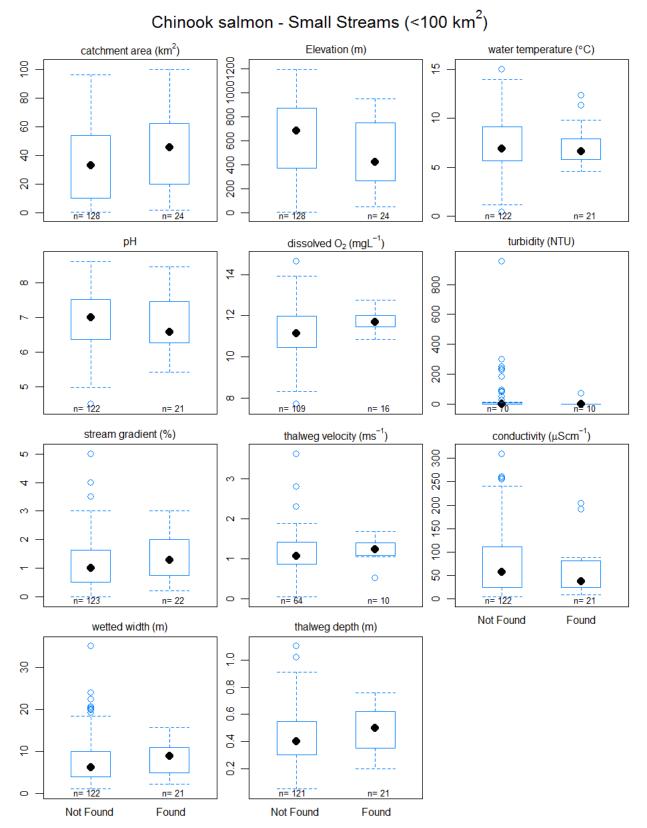


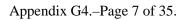
rainbow trout - Small Streams (<100 km²)

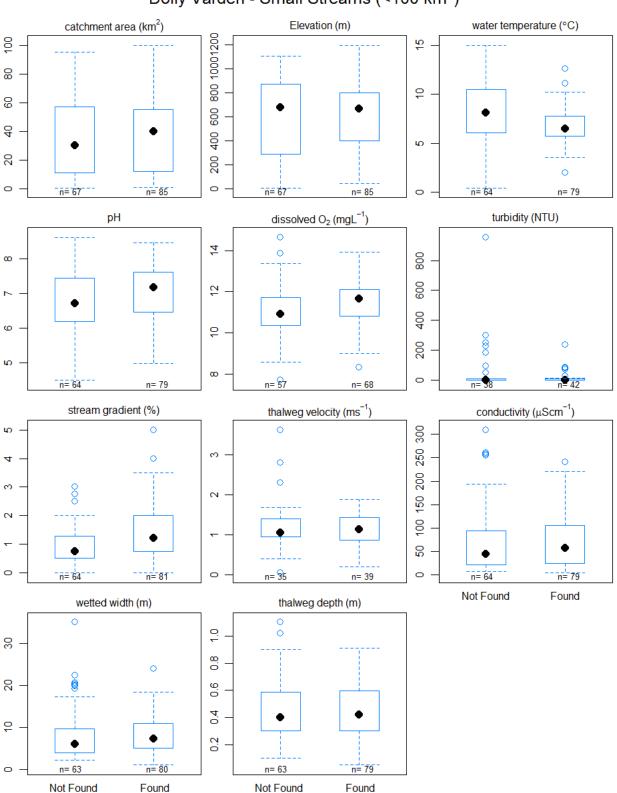




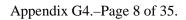


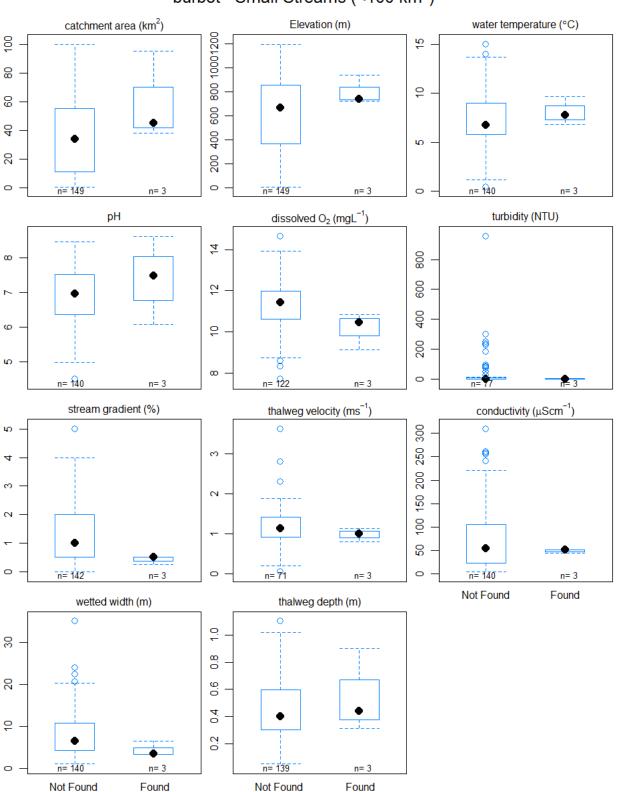




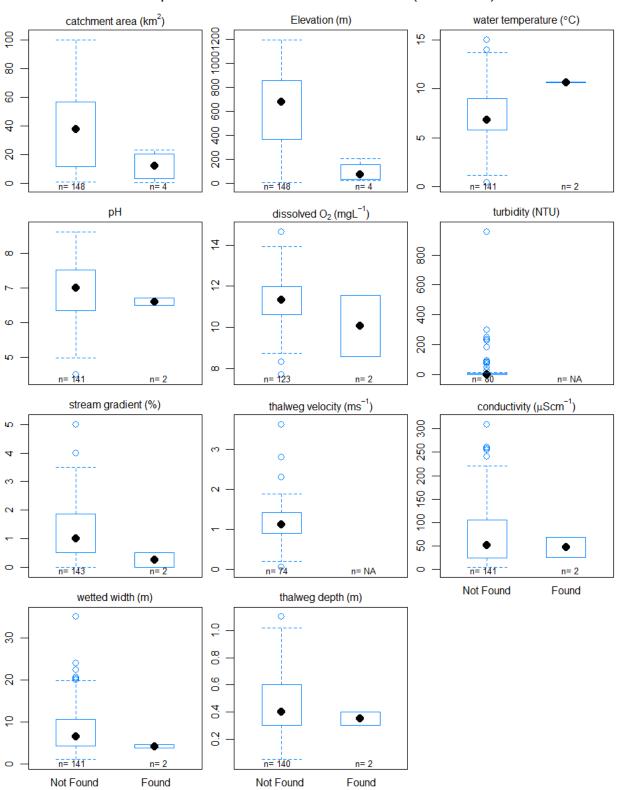


Dolly Varden - Small Streams (<100 km²)

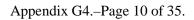


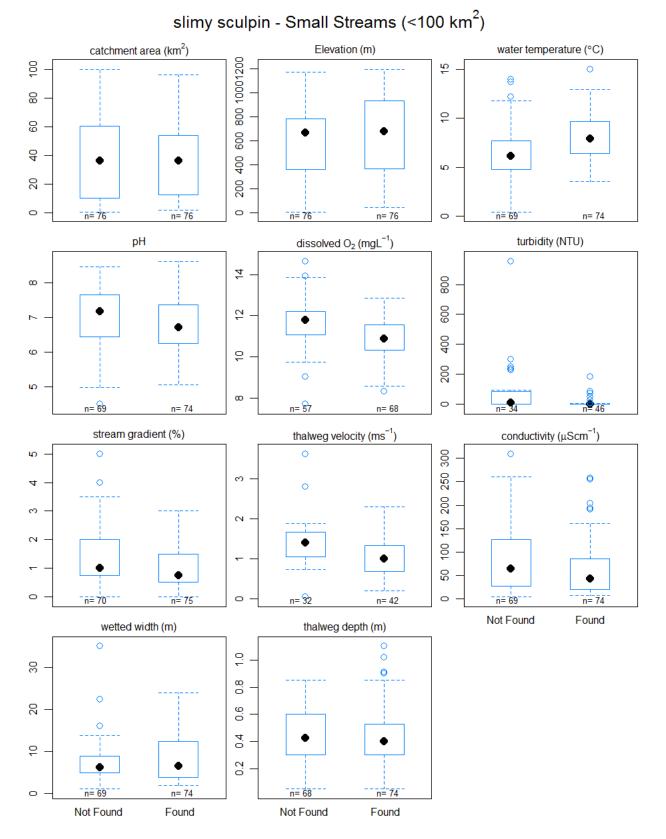


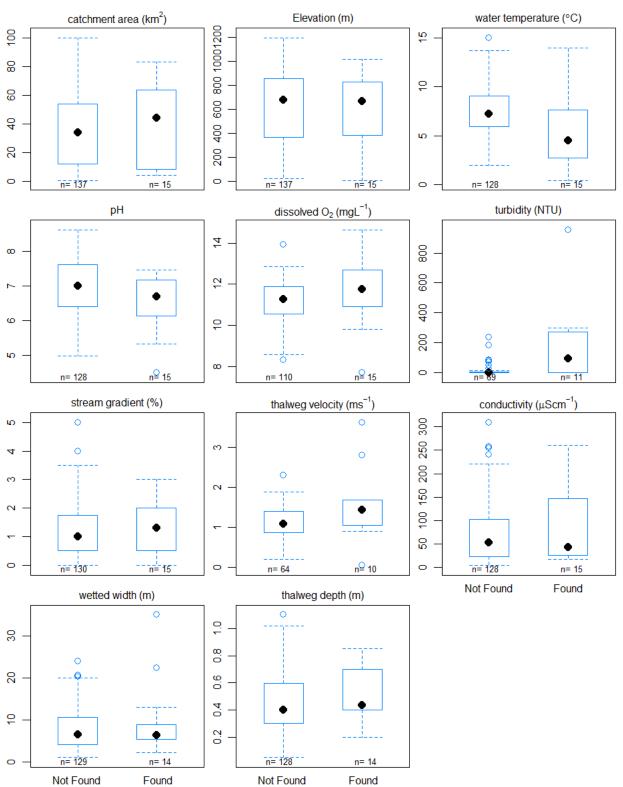
burbot - Small Streams (<100 km²)

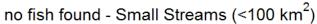


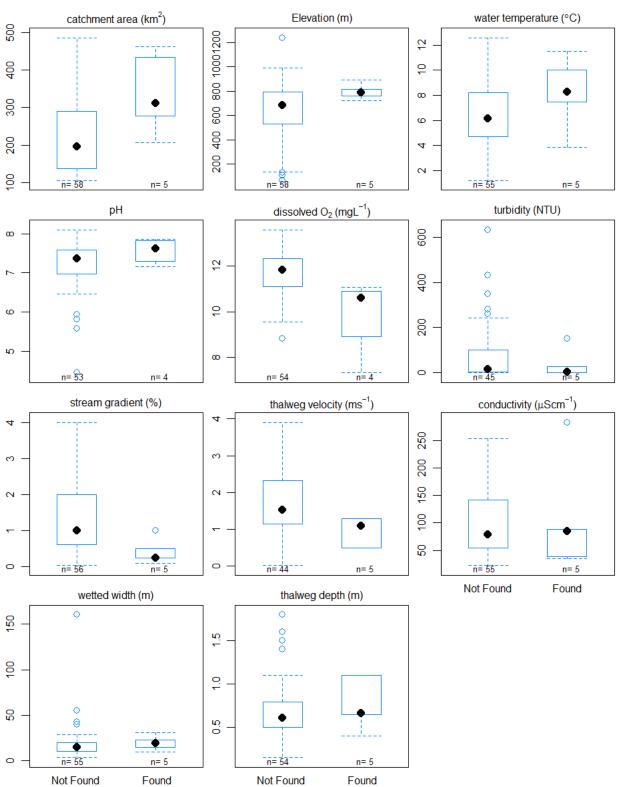




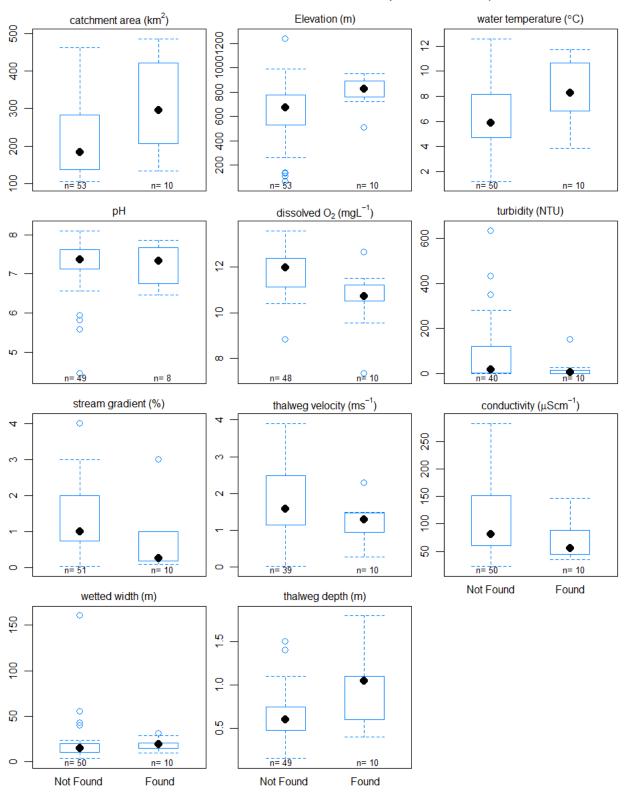








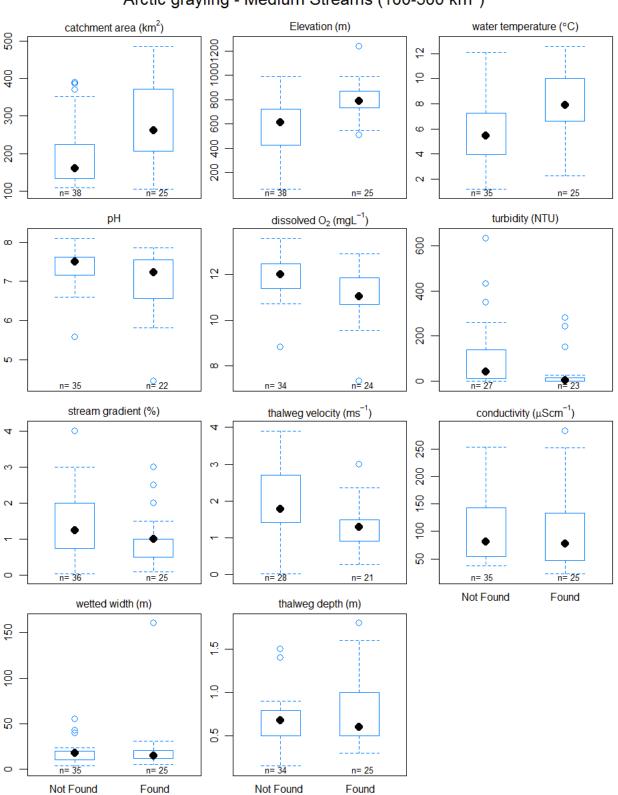
longnose sucker - Medium Streams (100-500 km²)



round whitefish - Medium Streams (100-500 km²)

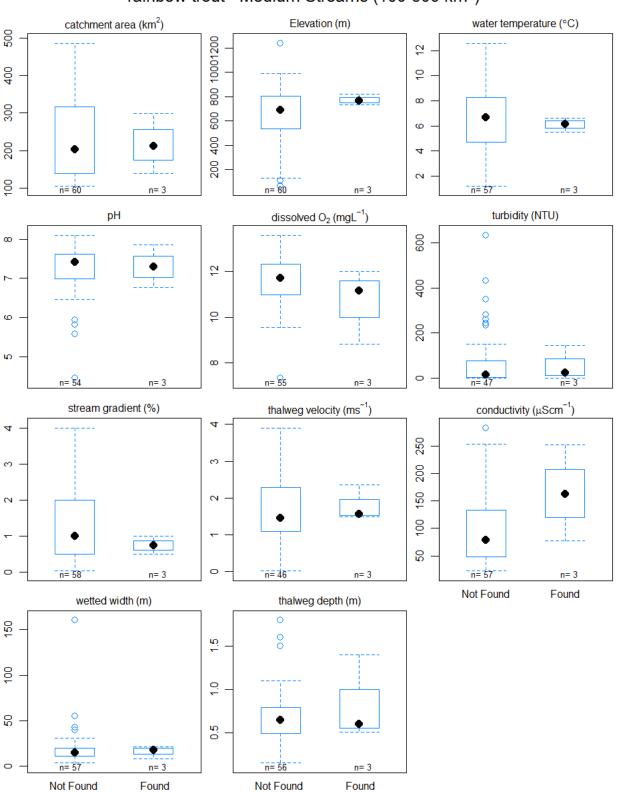
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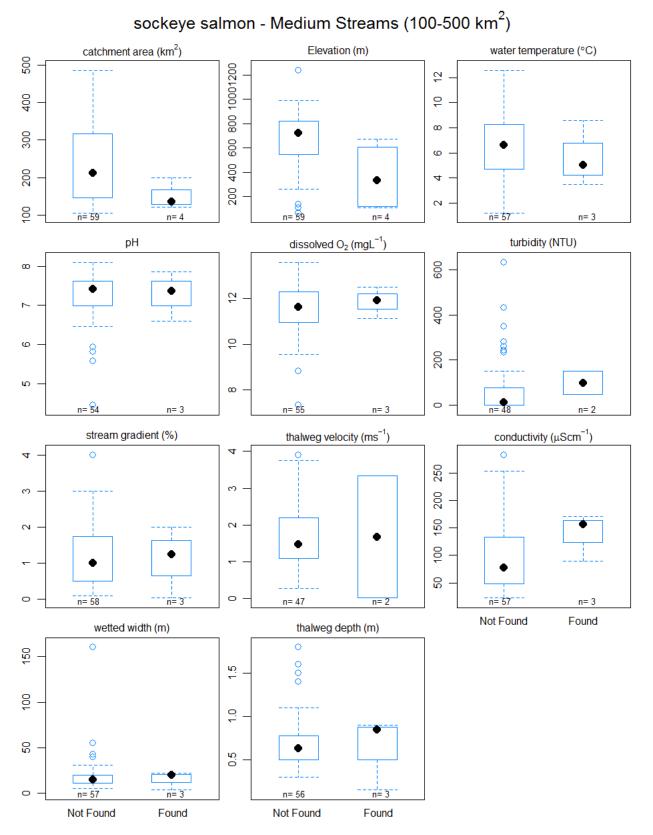
Arctic grayling - Medium Streams (100-500 km²)

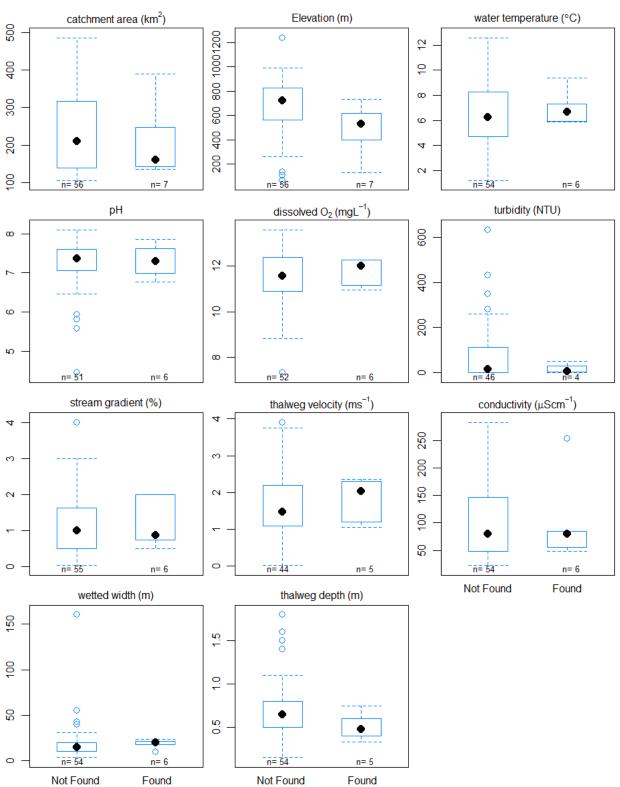
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rainbow trout - Medium Streams (100-500 km²)

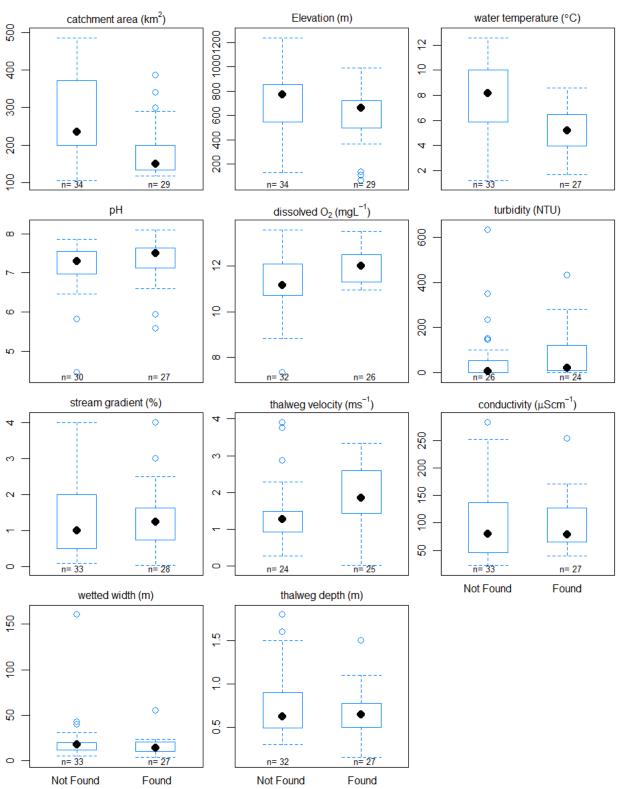
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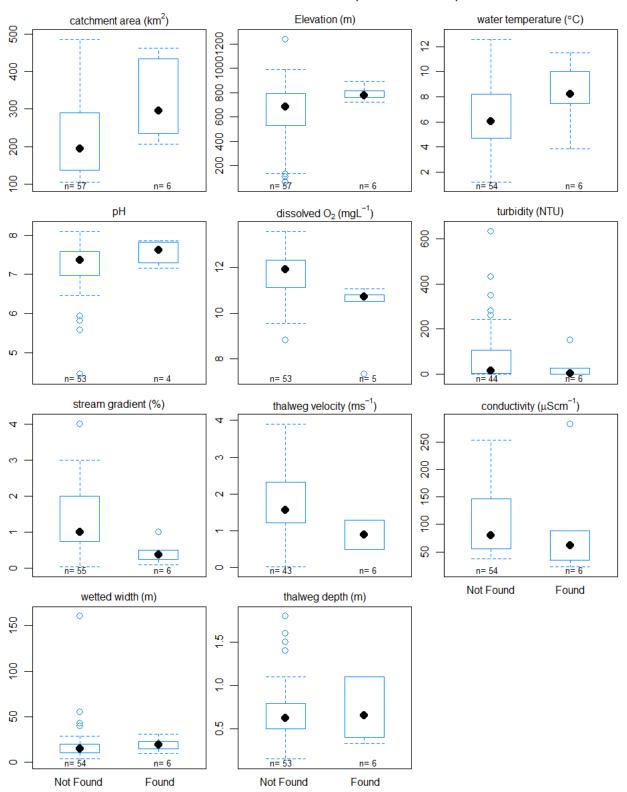
Chinook salmon - Medium Streams (100-500 km²)

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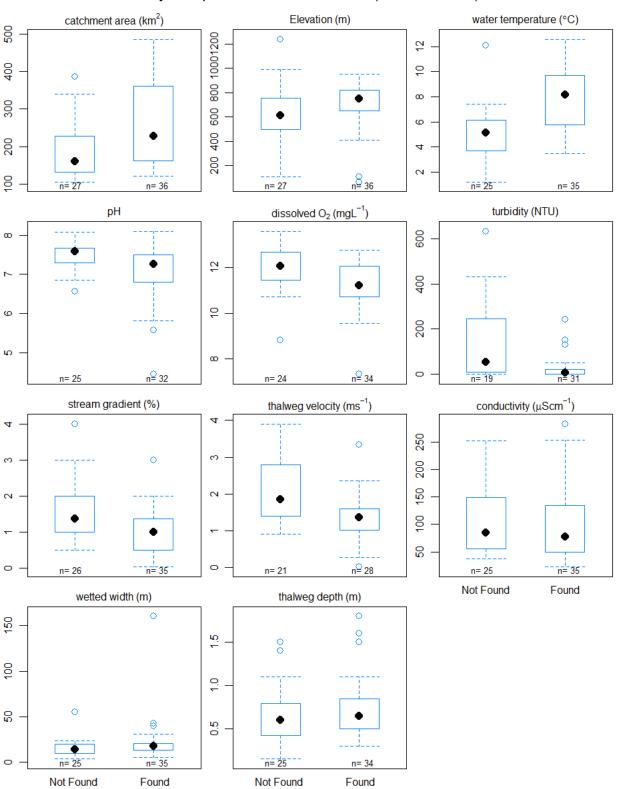
Dolly Varden - Medium Streams (100-500 km²)

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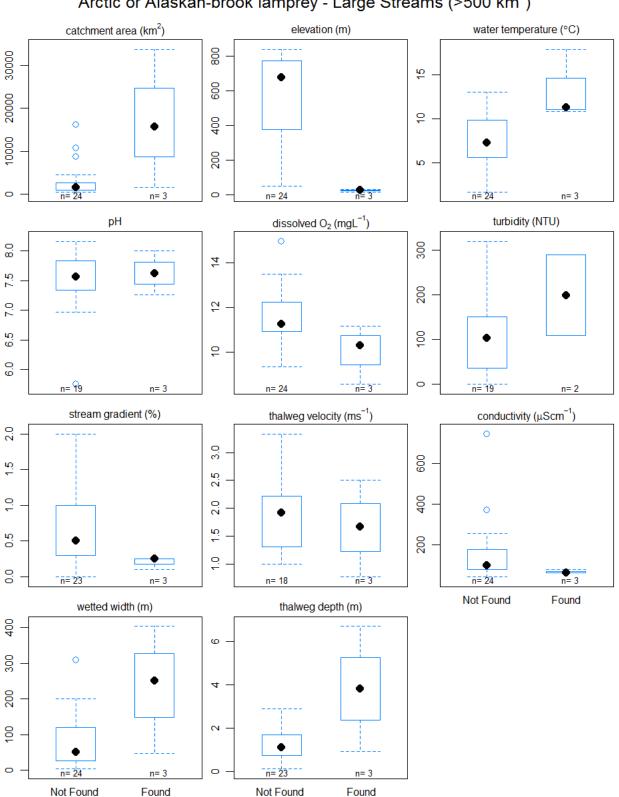


burbot - Medium Streams (100-500 km²)

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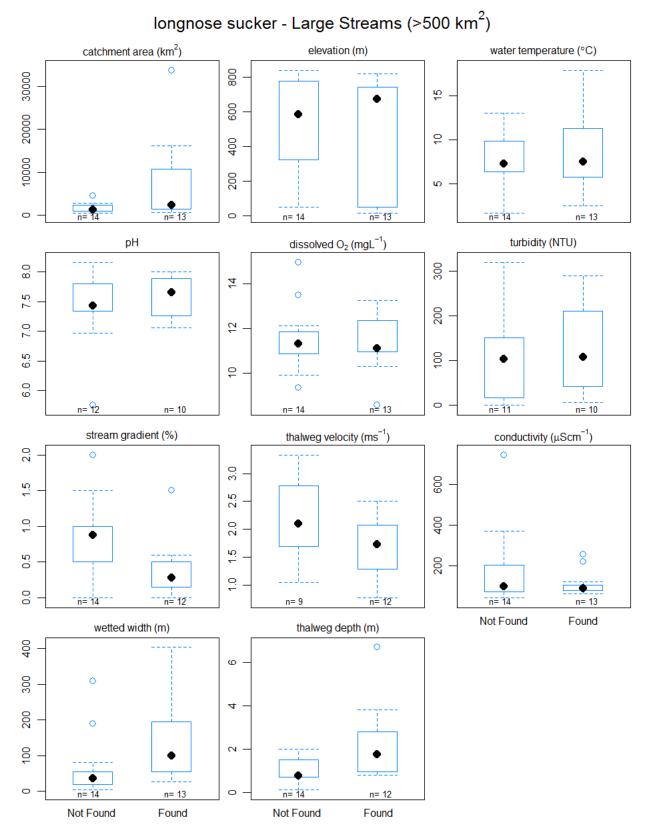


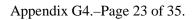
slimy sculpin - Medium Streams (100-500 km²)

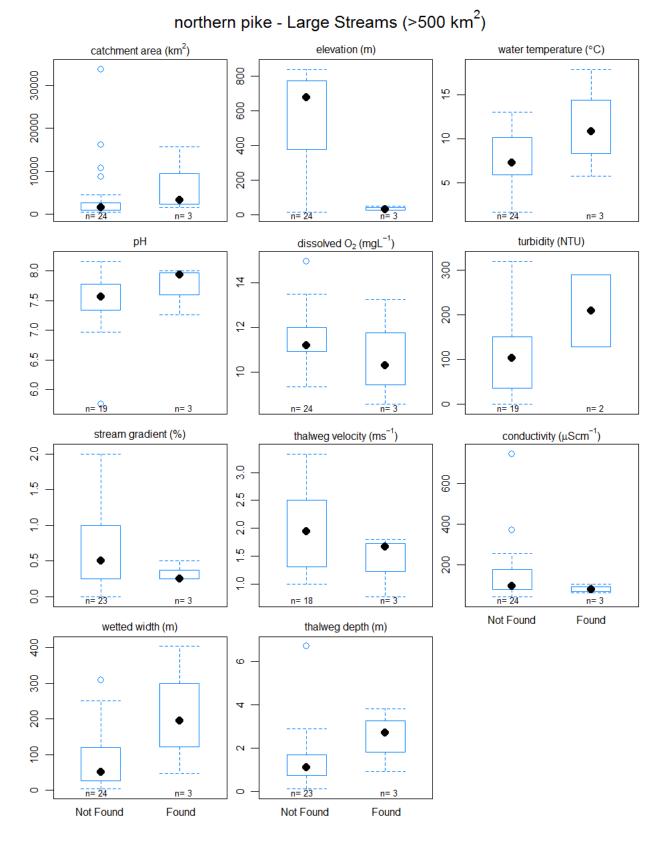


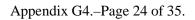


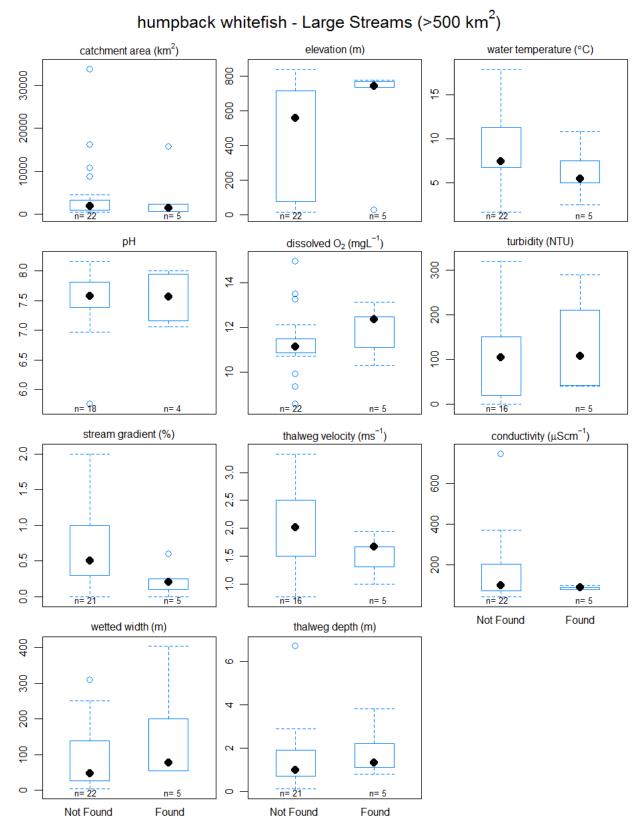
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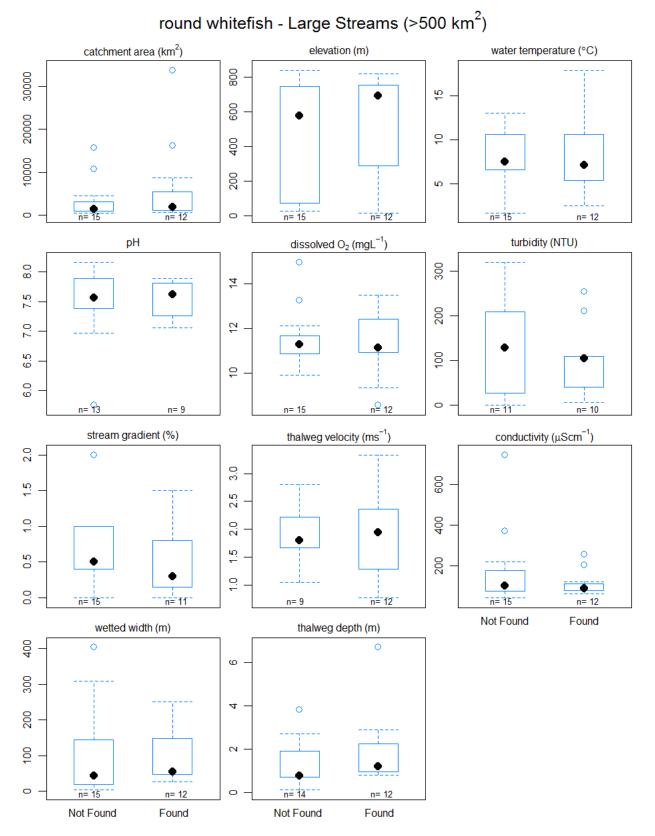




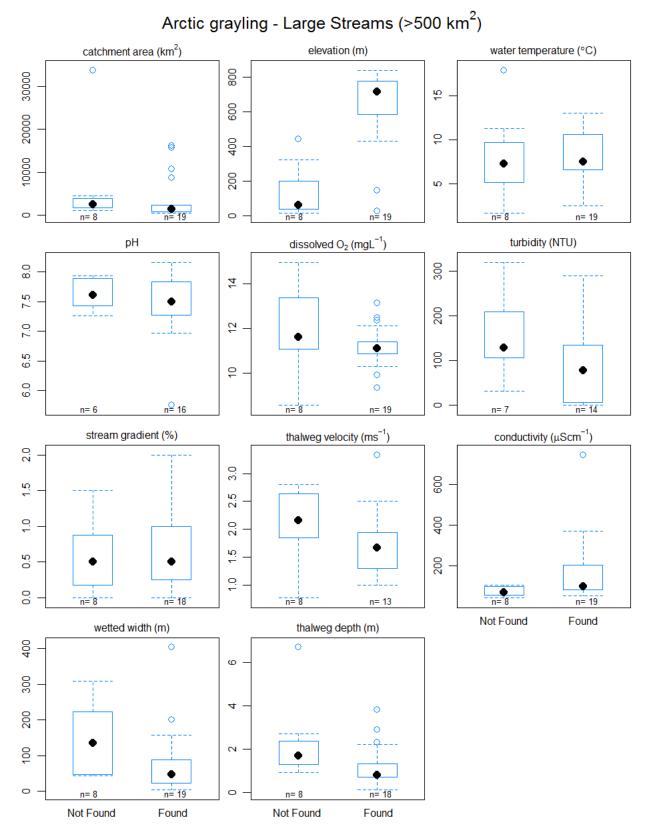


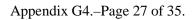


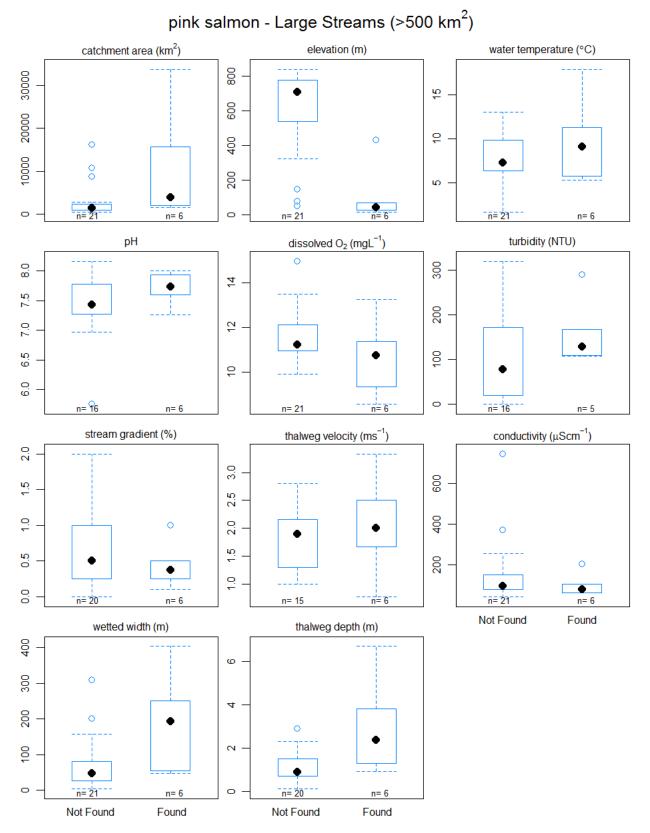
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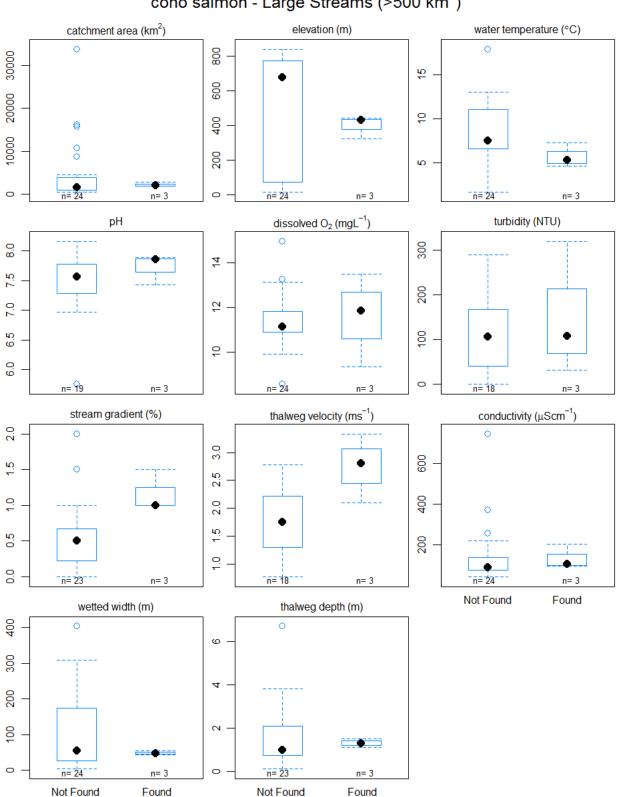
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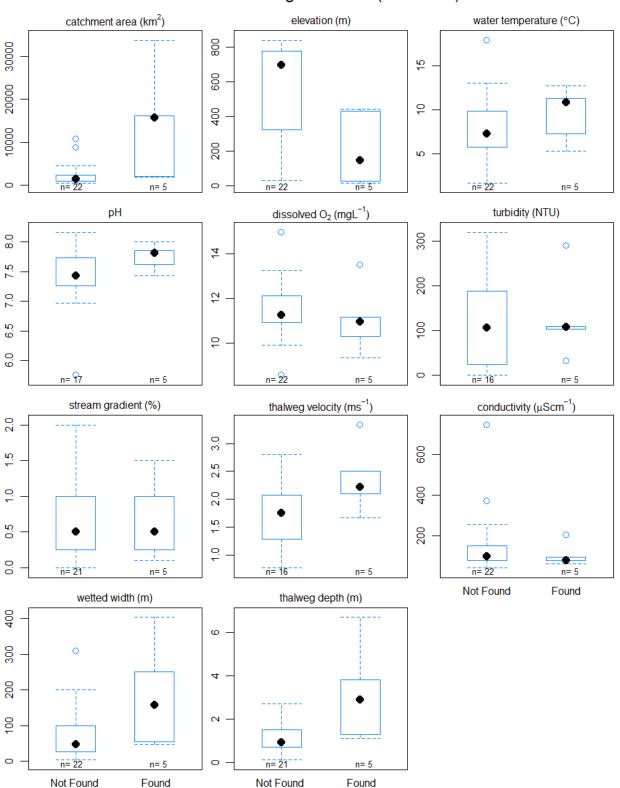




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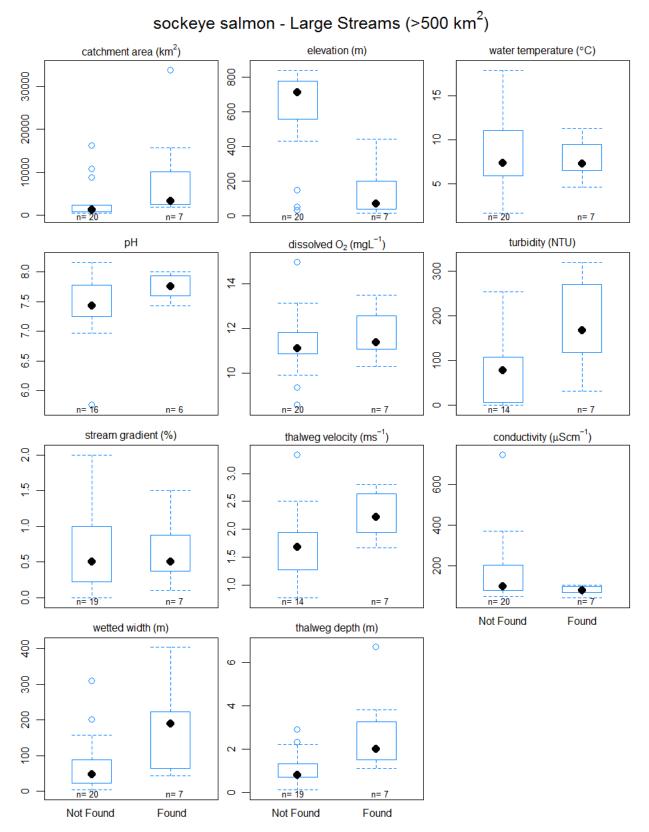


coho salmon - Large Streams (>500 km²)

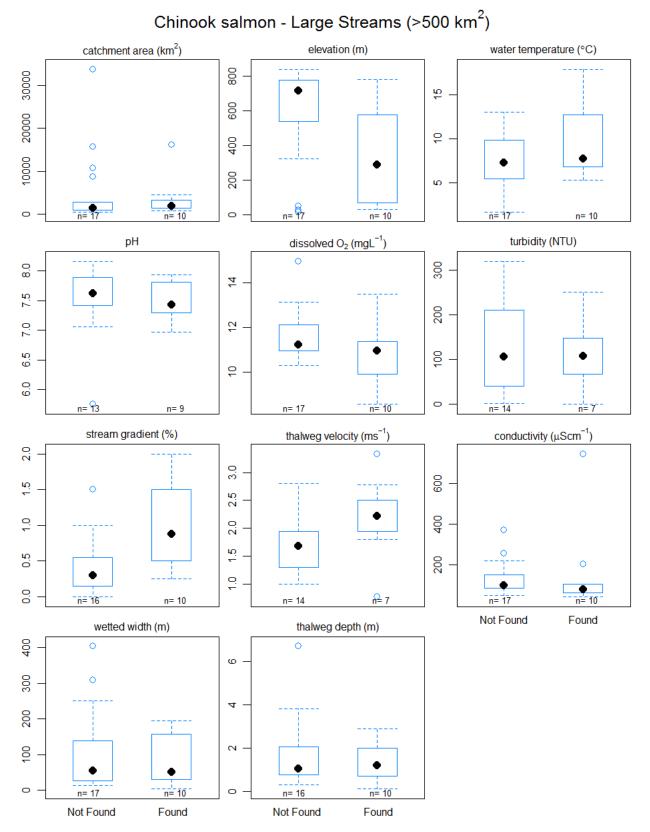


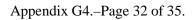
rainbow trout - Large Streams (>500 km²)

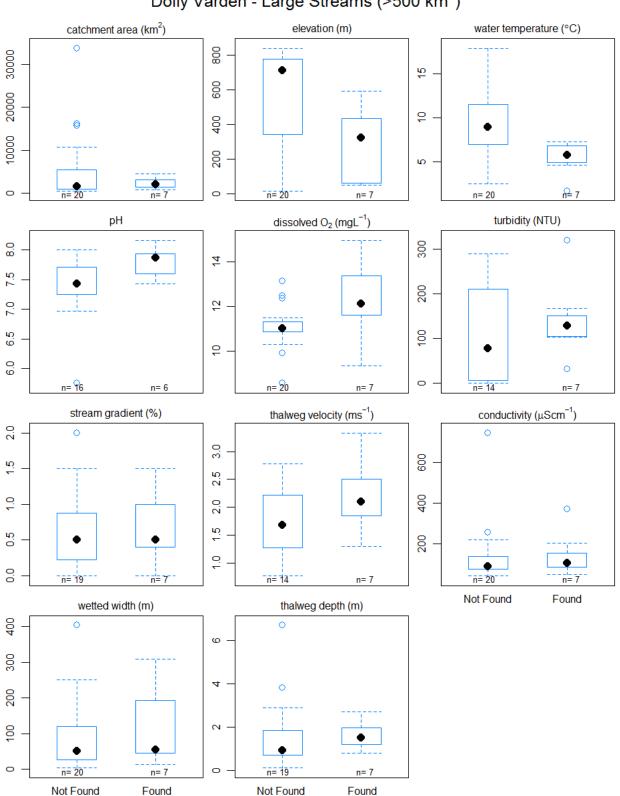
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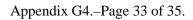
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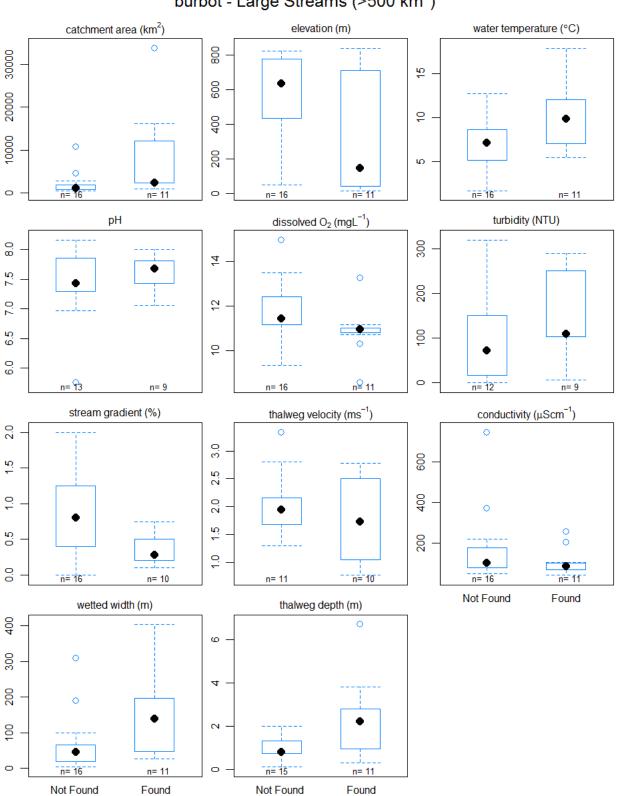






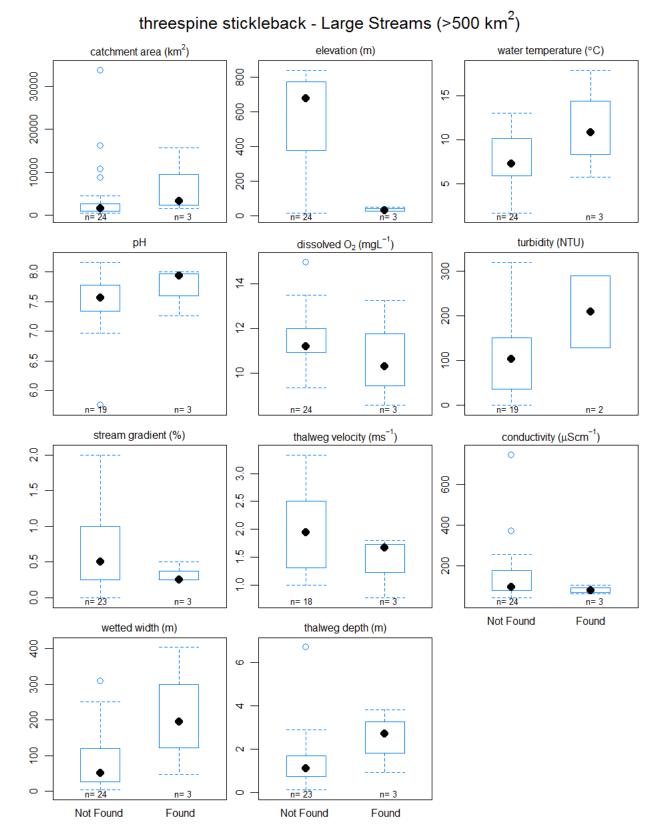
Dolly Varden - Large Streams (>500 km²)



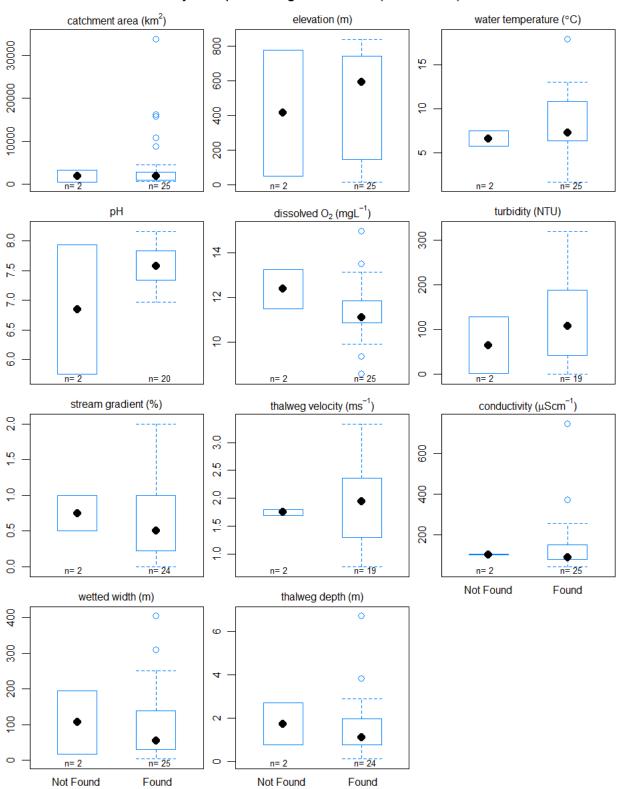


burbot - Large Streams (>500 km²)

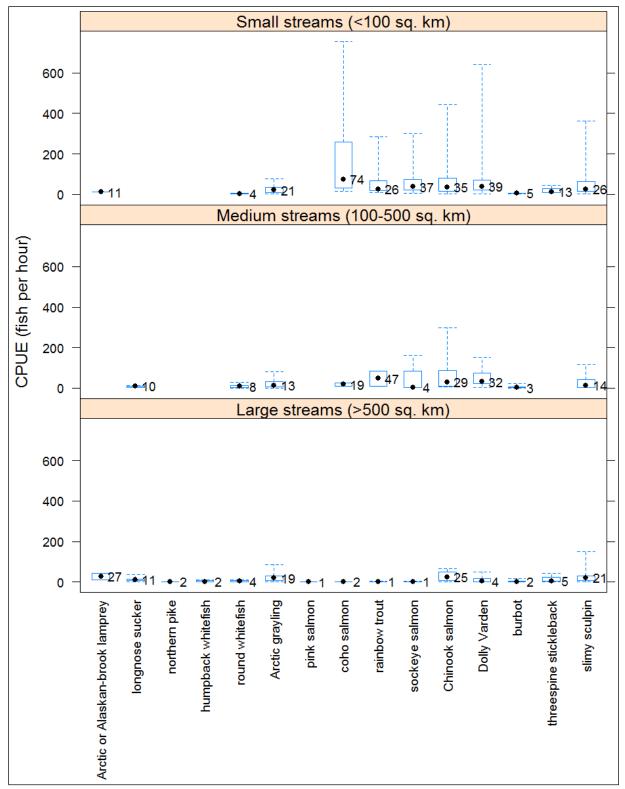
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slimy sculpin - Large Streams (>500 km²)



Appendix G5.–Box plots of electrofishing catch per unit effort, grouped by stream size.

Note: We derived a CPUE value (number of fish collected per hour of electrofisher on time) by species for each reach. Then we plotted the CPUE values grouped by species and stream size. Only CPUE values from reaches where the given species was found were included in the plots. Median CPUE is labeled on each box plot.

APPENDIX H. SUPPLEMENTAL DATA ANALYSIS

Appendix H1.–Table of *p*-values from randomization tests for differences in the median of selected numeric habitat variables between stream-size groups.

Stream-size pair	elevation	water temp.	pН	dissolved oxygen	turbidity	conductivity	stream gradient	thalweg velocity	channel width	thalweg depth
Large - Medium	<0.001	~	~	0.023	0.009	0.034	0.054	0.051	<0.001	<0.001
Large - Small	~	~	0.001	~	<0.001	<0.001	~	<0.001	<0.001	<0.001
Medium - Small	0.005	~	<0.001	0.028	<0.001	0.002	~	< 0.001	< 0.001	<0.001

Note: Low *p*-values (≤ 0.05) suggest the given habitat variable differs among the given stream-size groups. Very low *p*-values (≤ 0.005), in bold, strongly suggest a difference. Grey shading behind a *p*-value indicates the median for the larger stream-size group was less than the median for the smaller stream-size group. No shading indicates the median for the larger stream-size group was greater than for the smaller stream-size group. "~" indicates the *p*-value was > 0.05.

Appendix H 2.–Table of *p*-values from randomization tests for differences in the median of fish fork lengths, and number of species found, between stream-size groups.

Stream-size pair	longnose sucker	round whitefish	Arctic grayling	coho salmon	rainbow trout	sockeye salmon	Chinook salmon	Dolly Varden	slimy sculpin	no. of species
Large - Medium	~	~	~	~	0.020	-	<0.001	0.006	~	<0.001
Large - Small	-	-	<0.001	~	0.002	-	<0.001	<0.001	~	<0.001
Medium - Small	-	-	< 0.001	0.036	<0.001	~	~	<0.001	~	~

Note: We only tested species that were found in at least 3 reaches, and of which we measured at least 10 fish, per stream-size group. A low *p*-value (≤ 0.05) suggests the median fish length differs between the given stream-size groups. A very low *p*-value (≤ 0.05), in bold, strongly suggests a difference. Grey shading behind a *p*-value indicates the median for the larger stream-size group was less than the median for the smaller stream-size group. No shading indicates the median for the larger stream-size group was greater than for the smaller stream-size group. "~" indicates the *p*-value was >0.05. "-" indicates less than 10 fish were measured for one of the stream-size groups.

Species	catchment area	elevation	water temp	pН	dissolved oxygen	turbidity	conductivity	stream gradient	thalweg velocity	wetted width	thalweg depth
Small (≤100 km ²) streams			•					0	2		
round whitefish	0.033	~	~	~	~	~	~	~	~	~	~
Arctic grayling	0.002	<0.001	~	~	0.015	0.028	~	0.030	0.012	0.009	~
coho salmon	< 0.001	< 0.001	0.002	0.006	~	~	0.025	~	~	<0.001	0.004
rainbow trout	0.006	0.008	<0.001	~	~	0.033	~	~	~	0.010	0.010
sockeye salmon	~	0.040	0.018	~	~	~	~	~	~	~	~
Chinook salmon	~	0.023	~	~	0.049	~	~	~	~	0.049	~
Dolly Varden	~	~	<0.001	0.043	0.002	~	~	0.001	~	~	~
burbot	~	~	~	~	~	~	~	~	~	~	~
threespine stickleback	~	< 0.001	-	-	-	-	-	-	-	-	-
slimy sculpin	~	~	<0.001	0.033	< 0.001	<0.001	~	0.007	0.001	~	~
no fish found	~	~	< 0.001	~	~	< 0.001	~	~	0.036	~	~
Medium (100-500 km ²) streams											
longnose sucker	~	~	~	~	0.011	~	~	0.005	~	~	~
round whitefish	0.025	0.005	0.027	~	< 0.001	~	0.048	< 0.001	~	~	0.001
Arctic grayling	0.005	< 0.001	0.003	~	< 0.001	0.001	~	0.046	0.006	~	~
rainbow trout	~	~	~	~	~	~	~	~	~	~	~
sockeye salmon	0.028	0.011	~	~	~	~	~	~	~	~	~
Chinook salmon	~	0.040	~	~	~	~	~	~	~	~	~
Dolly Varden	0.002	0.023	< 0.001	~	0.010	~	~	~	0.004	~	~
burbot	~	~	~	~	0.010	~	~	0.006	0.006	~	~
slimy sculpin	0.017	0.009	<0.001	0.009	0.010	0.002	~	0.037	0.015	~	~
Large streams (>500 km ²)											
Arctic/Alaskan-brook lamprey	0.016	0.004	~	~	0.032	-	~	~	~	0.027	0.009
longnose sucker	0.037	~	~	~	~	~	~	0.006	~	0.016	0.010
northern pike	~	0.011	~	~	0.047	-	~	~	~	~	~
humpback whitefish	~	~	~	~	0.052	~	~	~	~	~	~
round whitefish	~	~	~	~	~	~	~	~	~	~	~
Arctic grayling	~	< 0.001	~	~	~	~	0.008	~	~	0.036	0.047
pink salmon	~	< 0.001	~	~	0.024	~	~	~	~	0.010	0.012
coho salmon	~	~	~	~	~	~	~	~	0.008	~	~
rainbow trout	0.001	~	~	~	~	~	~	~	~	~	<0.001
sockeye salmon	0.024	0.005	~	~	~	0.039	~	~	~	0.023	0.025
Chinook salmon	~	0.037	~	~	~	~	0.050	0.016	~	~	~
Dolly Varden	~	~	0.006	0.012	0.029	~	~	~	~	~	~
burbot	0.018	0.026	~	~	0.010	~	~	0.004	~	0.020	<0.001
threespine stickleback	~	0.013	~	~	0.048	-	~	~	~	~	~
slimy sculpin	~	~	~	~	~	~	~	~	~	~	~

Appendix H3.–Table of *p*-values from randomization tests for differences in the median of selected numeric habitat variables between groups of sites where each fish species was found versus not found, grouped by stream size.

Note: Low *p*-values (≤ 0.05) suggest the given habitat variable differs between sites where the species was found versus not found. Very low p-values (≤ 0.005), in bold, strongly suggest a difference. Grey shading behind a *p*-value indicates the median for sites where the species was found was less than the median for sites where the species was found. No shading behind a *p*-value indicates the median for sites where the species was found was greater. "~" indicates the *p*-value was >0.05. "-" indicates insufficient sample size (<3 reaches from where the species was found/not found).

Species ^a	LAC	NOS	PIK	WHB	WRN	GRA	SPI	SCO	TRB	SSE	SCK	CDV	GBR	KTS	USL
						Small str		$1 \text{ km}^2, n = 13$					-		
n	1	0	0	0	4	25	1	35	14	13	24	85	3	4	76
WRN	-	-	-	-	N/A	0.019	-	~	~	~	~	~	0.002	~	~
GRA	-	-	-	-	0.019	N/A	-	0.001	~	~	0.008	0.001	0.005	~	0.007
SCO	-	-	-	-	~	0.001	-	N/A	0.046	~	0.001	~	~	~	~
TRB	-	-	-	-	~	~	-	0.046	N/A	~	~	0.002	~	~	~
SSE	-	-	-	-	~	~	-	~	~	N/A	~	~	~	0.044	~
SCK	-	-	-	-	~	0.008	-	0.001	~	~	N/A	~	~	~	~
CDV	-	-	-	-	~	0.001	-	~	0.002	~	~	N/A	~	~	0.003
GBR	-	-	-	-	0.002	0.005	-	~	~	~	~	~	N/A	~	~
KTS	-	-	-	-	~	~	-	~	~	0.044	~	~	~	N/A	~
USL	-	-	-	-	~	0.007	-	~	~	~	~	0.003	~	~	N/A
						Medium str	eams (100-	$-500 \text{ km}^2, n$	= 57 sites)						
n	0	5	0	0	10	25	1	2	3	4	7	29	6	0	36
NOS	-	N/A	-	-	0.002	0.013	-	~	~	~	~	0.024	<0.001	-	~
WRN	-	0.002	-	-	N/A	< 0.001	-	~	~	~	~	< 0.001	0.007	-	0.009
GRA	-	0.013	-	-	<0.001	N/A	-	~	~	~	~	< 0.001	0.005	-	0.006
SCO	-	~	-	-	~	~	-	N/A	~	~	~	~	~	-	~
TRB	-	~	-	-	~	~	-	~	N/A	~	~	~	~	-	~
SSE	-	~	-	-	~	~	-	~	~	N/A	~	~	~	-	~
SCK	-	~	-	-	~	~	-	~	~	~	N/A	~	~	-	~
CDV	-	0.024	-	-	<0.001	<0.001	-	~	~	~	~	N/A	0.010	-	0.028
GBR	-	<0.001	-	-	0.007	0.005	-	~	~	~	~	0.010	N/A	-	~
USL	-	~	-	-	0.009	0.006	-	~	~	~	~	0.028	~	-	N/A
						Large str	eams (≥50	$0 \text{ km}^2, n = 2$	7 sites)						
n	3	13	3	5	12	19	6	3	5	7	10	7	11	3	25
LAC	N/A	~	0.025	~	~	~	0.007	~	~	~	~	~	~	0.025	~
NOS	~	N/A	~	0.016	0.002	~	~	~	~	~	~	~	~	~	~
PIK	0.025	~	N/A	~	~	~	0.007	~	~	~	~	~	~	<0.001	~
WHB	~	0.016	~	N/A	~	~	~	~	~	~	~	~	~	~	~
WRN	~	0.002	~	~	N/A	~	~	~	~	~	~	~	~	~	~
GRA	~	~	~	~	~	N/A	0.044	~	~	0.001	~	0.011	~	~	~
SPI	0.007	~	0.007	~	~	0.044	N/A	~	~	0.024	~	~	~	0.007	~
SCO	~	~	~	~	~	~	~	N/A	~	~	~	0.012	~	~	~
TRB	~	~	~	~	~	~	~	~	N/A	~	~	~	~	~	~
SSE	~	~	~	~	~	0.001	0.024	~	~	N/A	~	0.050	~	~	~
SCK	~	~	~	~	~	~	~	~	~	~	N/A	~	~	~	~
CDV	~	~	~	~	~	0.011	~	0.012	~	0.050	~	N/A	~	~	~
GBR	~	~	~	~	~	~	~	~	~	~	~	~	N/A	~	~
KTS	0.025	~	<0.001	~	~	~	0.007	~	~	~	~	~	~	N/A	~
USL	~	~	~	~	~	~	~	~	~	~	~	~	~	~	N/A

Appendix H4.–Table of *p*-values from contingency table analyses for co-occurrence of selected species at electrofished sites.

^a Species codes defined in Appendix B5.

Note: p values are based on Fisher's Exact Test. Low p values (≤ 0.05) suggest an interspecific relationship (either association or avoidance) occurs. Grey shading behind a p value indicates possible avoidance. No shading behind a p value indicates possible association. "~" indicates the p value was >0.05 (i.e., not significant). "-" indicates sample size (number of sites where the species was found) was ≤ 1 .

APPENDIX I. DISPOSITION OF FISH VOUCHER SPECIMENS AND FIN CLIPS

Caraina	Dete sille to 1	Ctation ID	Fish tag	Fin-clip vial	
Species	Date collected	Station ID	number	number	Fin clipped
Arctic lamprey	07/20/2011	FSS1107D01	157090 ^a	-	-
		FSS1108D01	157095 ^b	-	-
Pacific lamprey	07/20/2011	FSS1108D01	157095	-	-
longnose sucker	07/15/2011	FSS1105D01	05D01_2	05D01_2	rt. pelvic fin
			05D10	05D10	rt. pelvic fin
			05D11	05D11	rt. pelvic fin
	07/19/2011	FSS1106D01	157075	-	-
			157076	-	-
			157077	-	-
			157078	-	-
	08/04/2011	FSS1102A01	T000389	157005	rt. pectoral fin
	08/05/2011	FSS1103A01	T000392	157014	rt. pectoral fin
			T000394	157015	rt. pectoral fir
	08/06/2011	FSS1104A01	T000405	157026	rt. pectoral fir
			T000410	157030	rt. pectoral fir
			T000408	157032	rt. pectoral fir
	08/08/2011	FSS1106A01	T000432	157056	rt. pectoral fir
northern pike	07/20/2011	FSS1108D01	157092	-	
humpback whitefish	07/15/2011	FSS1105D01	cd	05D01_3	rt. pelvic fin
numpouer winterion	08/08/2011	FSS1106A01	T000406	157050	rt. pectoral fir
	00/00/2011	1001101	T000425	157051	rt. pectoral fir
			T000417	157052	rt. pectoral fir
			T000417 T000431	157053	rt. pectoral fir
			T000431 T000415	157054	rt. pectoral fir
			T000415 T000416	157055	rt. pectoral fin
			06A01_1	157055	n. pectoral m
			06A01_1 06A01_3	-	-
			00A01_3	-	- nt maatanal fin
			с	157076	rt. pectoral fir
			с	06A01_4	rt. pectoral fir
			с	157078	rt. pectoral fin
	00/00/0011			06A01_6	rt. pectoral fin
	08/09/2011	FSS1107A01	07A01_1	-	-
			07A01_2	-	-
			c	07A01_3	rt. pectoral fir
			c	07A01_4	rt. pectoral fir
			c	07A01_5	rt. pectoral fir
		FSS1107B01	с	157073	rt. pectoral fir
			с	157074	rt. pectoral fin
			с	157075	rt. pectoral fir
			с	157079	rt. pectoral fir
			с	157077	rt. pectoral fin
pygmy whitefish	08/17/2011	FSS1115A01	T000447	157072	rt. pectoral fir

Appendix I1.–Fish voucher specimens and fin clips sent to University of Alaska Museum, Fairbanks.

a .			Fish tag	Fin-clip vial	T ' 1 ' 1
Species	Date collected	Station ID	number	number	Fin clipped
round whitefish	07/19/2011	FSS1106D01	157079	-	-
			157080	-	-
	07/20/2011	FSS1107D01	157091	-	-
		FSS1108D01	157094	-	-
	08/04/2011	FSS1102A01	T000391	157004	rt. pectoral fin
		FSS1102B01	T000381	157002	rt. pectoral fin
			T000400	157003	rt. pectoral fin
		FSS1102C04	T000388	157012	rt. pectoral fin
	08/05/2011	FSS1103B01	T000403	157019	rt. pectoral fin
			T000411	157020	rt. pectoral fin
			T000377	157021	rt. pectoral fin
			T000379	157022	rt. pectoral fin
	08/06/2011	FSS1104A01	T000407	157027	rt. pectoral fin
			T000409	157033	rt. pectoral fin
			T000412	157034	rt. pectoral fin
whitefish-unspecified	08/06/2011	FSS1104A01	T000422	157036	rt. pectoral fin
Arctic grayling	07/15/2011	FSS1105D01	05D12	05D12	rt. pelvic fin
	07/19/2011	FSS1106D01	157081	-	-
	08/03/2011	FSS1101A01	T000360	156984	rt. pectoral fin
			T000361	156985	rt. pectoral fin
		FSS1101C01	T000356	156980	rt. pectoral fin
			T000357	156981	rt. pectoral fin
			T000358	156982	rt. pectoral fin
			T000359	156983	rt. pectoral fin
	08/04/2011	FSS1102B01	T000398	156998	rt. pectoral fin
			T000385	156999	rt. pectoral fin
			T000382	157000	rt. pectoral fin
			T000383	157001	rt. pectoral fin
		FSS1102C04	T000396	157006	rt. pectoral fin
			T000387	157009	rt. pectoral fin
			T000389	157010	rt. pectoral fin
			T000390	157011	rt. pectoral fin
	08/06/2011	FSS1104A01	T000413	157028	rt. pectoral fin
coho salmon	08/08/2011	FSS1106C04	T000442	157057	rt. pectoral fin
			T000438	157058	rt. pectoral fin
			T000441	157059	rt. pectoral fin
			T000444	157060	rt. pectoral fin
			T000435	157061	rt. pectoral fin
			T000440	157062	rt. pectoral fin
			T000436	157063	rt. pectoral fin
			T000439	157064	rt. pectoral fin
			T000443	157065	rt. pectoral fin
			T000437	157066	rt. pectoral fin

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-continued-

Date collected	Station ID	Fish tag number	Fin-clip vial number	Fin clipped
07/15/2011	FSS1105D01	05D06	05D06	rt. pelvic fin
07/12/2011	FSS1102D01	02D01_3	02D01_3	rt. pelvic fin
		02D01_4	02D01_3	rt. pelvic fin
		02D01_5	02D01_3	rt. pelvic fin
07/19/2011	FSS1106D01	157073	-	-
06/30/2011	FSS1101D01	T000083	-	-
		T000085	55515	rt. pelvic fin
		T000086	55504	rt. pelvic fin
		T000087	55507	rt. pelvic fin
		T000088	55501	rt. pelvic fin
		T000089	55497	rt. pelvic fin
		T000090	55508	rt. pelvic fin
		T000091	55511	rt. pelvic fin
		T000092	55513	rt. pelvic fin
		T000093	55500	rt. pelvic fin
		T000094	55496	rt. pelvic fin
07/12/2011	FSS1102D01	T000095	55499	rt. pelvic fin
07/13/2011	FSS1103D01	03D01-1	03D01-1	rt. pelvic fin
08/06/2011	FSS1104B01	T000419	157037	rt. pectoral fin
		T000421	157038	rt. pectoral fin
		T000420	157039	rt. pectoral fin
		T000418	157040	rt. pectoral fin
	FSS1104C03	T000430	157041	rt. pectoral fin
		T000393	157042	rt. pectoral fin
		T000429	157043	rt. pectoral fin
		?e	157044	rt. pectoral fin
		? ^e		rt. pectoral fin
		T000428	157046	rt. pectoral fin
			157047	rt. pectoral fin
		T000424	157048	rt. pectoral fin
		$T000434^{f}$	157049	rt. pectoral fin
08/14/2011	FSS1112A01	g		rt. pectoral fin
		05D04		rt. pelvic fin
				rt. pelvic fin
07/19/2011	FSS1106D01		_	-
			-	-
			157016	rt. pectoral fin
				rt. pectoral fin
				rt. pectoral fin
	FSS1103B01			rt. pectoral fin
				rt. pectoral fin
				rt. pectoral fin
08/06/2011	FSS1104A01	T000404	157029	rt. pectoral fin
	07/15/2011 07/12/2011 07/19/2011 06/30/2011 07/12/2011 07/13/2011 08/06/2011 07/15/2011 07/19/2011 07/19/2011 07/19/2011 07/20/2011	07/15/2011 FSS1105D01 07/12/2011 FSS1102D01 07/19/2011 FSS1106D01 06/30/2011 FSS1101D01 07/12/2011 FSS1102D01 07/12/2011 FSS1102D01 07/13/2011 FSS1103D01 08/06/2011 FSS1104B01 FSS1104B01 FSS1104B01 08/14/2011 FSS1104C03 08/14/2011 FSS1105D01 07/19/2011 FSS1106D01 07/20/2011 FSS1108D01 08/05/2011 FSS1103B01 FSS1103B01 FSS1103B01	Date collected Station ID number 07/15/2011 FSS1105D01 05D06 07/12/2011 FSS1102D01 02D01_3 02D01_2 02D01_5 07/19/2011 FSS1106D01 157073 06/30/2011 FSS1101D01 T000083 7000085 T000086 T000087 7000089 T000090 T000090 7000091 T000091 T000091 7000092 T000093 T000093 7000093 T000094 T000091 70712/2011 FSS1102D01 T000095 07/13/2011 FSS1103D01 03D01-1 08/06/2011 FSS1103D01 03D01-1 08/06/2011 FSS1104B01 T000418 FSS1104C03 T000420 T000421 7000423 T000423 T000423 7000424 T000434 T000434 08/14/2011 FSS1105D01 05D04 07/15/2011 FSS1103B01 157074 07/19/2011 FSS1103B01 157093 08/	Date collected Station ID number number 07/15/2011 FSS1105D01 05D06 05D06 07/12/2011 FSS1102D01 02D01_3 02D01_3 027/19/2011 FSS1106D01 157073 - 06/30/2011 FSS1101D01 T000083 - 7000085 55515 T000086 55504 7000087 55507 T000088 55501 7000090 55508 T000090 55508 7000091 55511 T000092 55513 7000092 55513 T000093 55500 7000093 55500 T000093 55500 7000094 55496 07/12/2011 FSS1102D01 7000419 157037 7000421 FSS1103D01 03D01-1 03D01-1 03D01-1 03D01-1 08/06/2011 FSS1104D03 T000419 157037 T000421 157038 7000424 FSS1104D03 T000430 157041 T000429 157043 ? ^e 157044

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-continued-

Species	Date collected	Station ID	Fish tag number	Fin-clip vial number	Fin clipped
burbot (cont.)	08/06/2011	FSS1104A01	T000402	157031	rt. pectoral fin
	(cont.)	(cont.)	T000423	157035	rt. pectoral fin
	08/08/2011	FSS1106B01	T000448	157067	rt. pectoral fin
	08/09/2011	FSS1107C01	T000449	157068	rt. pectoral fin
			T000450	157069	rt. pectoral fin
	08/12/2011	FSS1110A01	T000445	157070	rt. pectoral fin
threespine stickleback	07/12/2011	FSS1102D01	02D01_1	02D01_1	rt. pelvic fin
-			02D01_2	02D01_2	rt. pelvic fin
	07/15/2011	FSS1105D01	05D01_1	05D01_1	rt. pelvic fin
slimy sculpin	06/30/2011	FSS1101D01	T000084	55514	rt. pelvic fin
	07/13/2011	FSS1103D01	03D01-2	03D01-2	rt. pelvic fin
	07/15/2011	FSS1105D01	05D07	05D07	rt. pelvic fin
			05D08	05D08	rt. pelvic fin
			05D09	05D09	rt. pelvic fin
			05D13	05D13	rt. pelvic fin
			05D14	05D13	rt. pelvic fin
			05D15	05D13	rt. pelvic fin
	07/19/2011	FSS1106D01	157082	-	-
			157083	-	-
			157084	-	-
			157085	-	-
			157086	-	-
			157087	-	-
			157088	-	-
			157089	-	-
	08/03/2011	FSS1101A01	T000365	156986	rt. pectoral fin
			T000366	156987	rt. pectoral fin
			T000367	156988	rt. pectoral fin
		FSS1101C01	T000368	156989	rt. pectoral fin
			T000371	156990	rt. pectoral fin
			T000372	156991	rt. pectoral fin
			T000373	156992	rt. pectoral fin
			T000374	156993	rt. pectoral fir
			T000375	156994	rt. pectoral fin
			T000396	156995	rt. pectoral fin
			T000397	156996	rt. pectoral fin
	08/04/2011	FSS1102C01	T000380	156997	rt. pectoral fin
		FSS1102C04	T000451	157007	rt. pectoral fin
			T000395	157008	rt. pectoral fin
			T000378	157013	rt. pectoral fir

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Note: "-" indicates no fin clip was taken from the specimen. A total of 182 whole specimens and 149 fin clips were sent to the UAF Museum.

^a Batch of 11 specimens in a bag with a single tag attached. No fin clips taken.

^b Batch of 9 specimens in a bag with a single tag attached. No fin clips taken.

^c Sagittal otoliths extracted and sent to Randy Brown (Fishery Biologist, USFWS, Fairbanks) for chemical analysis (see Appendix I2). Fish carcasses were destroyed.

^d This row represents 2 fish collected at the same site. Fin clips from both fish were combined in vial 05D01_3.

^e Fish tag number not recorded.

^f In addition to the individual specimens listed, a small bag of Dolly Varden young-of-the-year collected from this site was sent to the UAF museum.

^g Batch of 10 specimens in a bag labeled with the Station ID. Fin clips from all 10 specimens were combined in vial 157071.

00/12/2011		Otolith vial number	Fin clip vial number ^a
08/13/2011	FSS1111C03	662	b
		663	b
08/16/2011	FSS1114A01	648	b
		649	b
		650	b
		651	b
		652	b
		658	b
08/19/2011	FSS1116C03	664	b
08/21/2011	FSS1118A01	646	b
		659	b
08/22/2011	FSS1119A01	665	b
08/23/2011	FSS1120A01	647	b
		660	b
		661	b
09/12/2011	FSS1126C02	653	b
		654	b
		655	b
		656	b
		657	b
09/14/2011	FSS1128C08	644	b
		645	b
09/19/2011	FSS1129C01	666	b
07/14/2011	FSS1105D01	05D01_1	05D01_3
		05D01_2	05D01_3
08/08/2011	FSS1106A01	06A01_2	157076
		06A01_4	06A01_4
		06A01 5	157078
		06A01 6	06A01_6
08/09/2011	FSS1107A01		07A01_3
			07A01_4
			07A01_5
	FSS1107B01		157073
	122110/201		157074
			157075
			157079
			157079
	08/19/2011 08/21/2011 08/22/2011 08/23/2011 09/12/2011 09/14/2011 09/19/2011 07/14/2011	08/19/2011 FSS1116C03 08/21/2011 FSS1118A01 08/22/2011 FSS1119A01 08/23/2011 FSS1120A01 09/12/2011 FSS1126C02 09/14/2011 FSS1128C08 09/19/2011 FSS1129C01 07/14/2011 FSS1105D01 08/08/2011 FSS1106A01	649 650 651 652 658 08/19/2011 FSS1116C03 664 08/21/2011 FSS1118A01 646 08/22/2011 FSS1119A01 665 08/23/2011 FSS1120A01 647 660 661 09/12/2011 FSS1126C02 653 654 655 655 656 657 09/14/2011 FSS1128C08 644 645 09/19/2011 FSS1128C08 644 645 09/19/2011 FSS1129C01 666 07/14/2011 FSS1105D01 05D01_1 05D01_2 08/08/2011 FSS1105D01 05D01_1 05D01_2 08/08/2011 FSS1106A01 06A01_2 06A01_4 06A01_5 06A01_4 06A01_5 06A01_6 08/09/2011 FSS1107A01 07A01_3 07A01_4 07A01_4

Appendix I2.-Otoliths sent to USFWS, Fairbanks.

Note: Both sagittal otoliths were extracted from each optionally-anadromous fish specimen >250 mm long and sent to Randy Brown (Fishery Biologist, USFWS, Fairbanks) for chemical analysis to identify evidence of periods of possible saltwater residency.

^a Fin clips from the Dolly Varden specimens were sent to the UAF Museum (see Appendix I1) for genetic analysis. Fin clips from the humpback whitefish specimens were sent to the USFWS Conservation Genetics Lab in Anchorage for genetic analysis (see Appendix I3).

^b Dolly Varden fin clips from each site were combined into a single vial labeled with the last 5 digits of the Station ID.

Date collected	Station ID	Number of fish clipped	Fin-clip vial number
06/30/2011	FSS1101D01	10	01D01
08/06/2011	FSS1104B01	4	04B01
08/06/2011	FSS1104C03	7	04C03
08/07/2011	FSS1105C02	1	05C02
08/07/2011	FSS1105C03	1	05C03
08/08/2011	FSS1106C01	9	06C01
08/08/2011	FSS1106C02	12	06C02
08/09/2011	FSS1107C02	3	07C02
08/10/2011	FSS1108C03	12	08C03
08/13/2011	FSS1111C03	2	11C03
08/16/2011	FSS1114A01	6	14A01
08/19/2011	FSS1116C03	1	16C03
08/21/2011	FSS1118A01	2	18A01
08/22/2011	FSS1119A01	1	19A01
08/23/2011	FSS1120A01	3	20A01
08/24/2011	FSS1121B01	9	21B01
08/24/2011	FSS1121B03	1	21B03
09/12/2011	FSS1126C02	5	26C02
09/14/2011	FSS1128C08	2	28C08
09/19/2011	FSS1129C01	1	29C01
09/23/2011	FSS1103F02	5	03F02
Total		07	

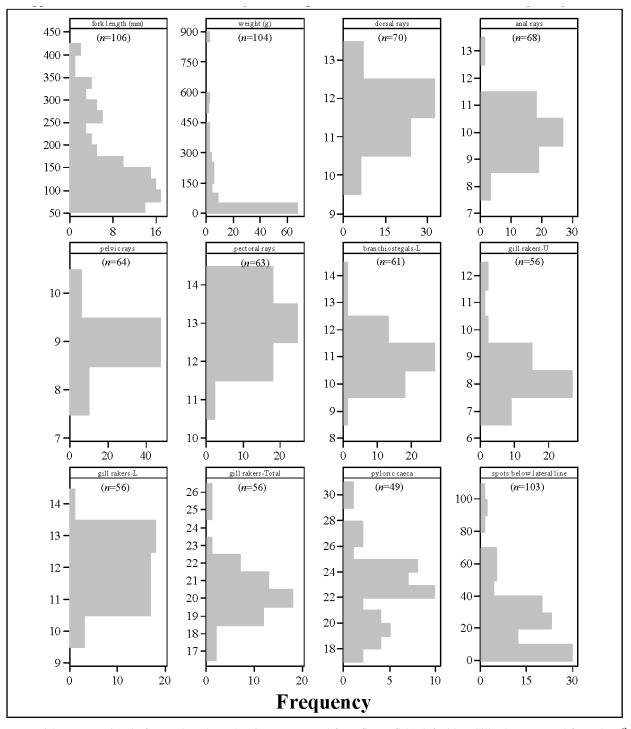
Appendix I3.-Dolly Varden fin clips sent to USFWS Conservation Genetics Lab, Anchorage.

Total

97

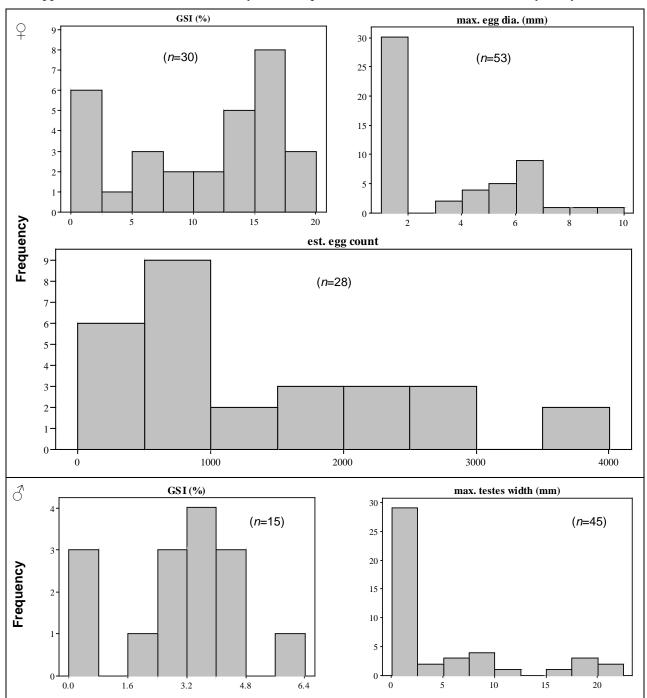
Note: The right pelvic fin was clipped.

APPENDIX J. MERISTIC AND GONAD DATA FROM RETAINED DOLLY VARDEN AND HUMPBACK WHITEFISH SPECIMENS



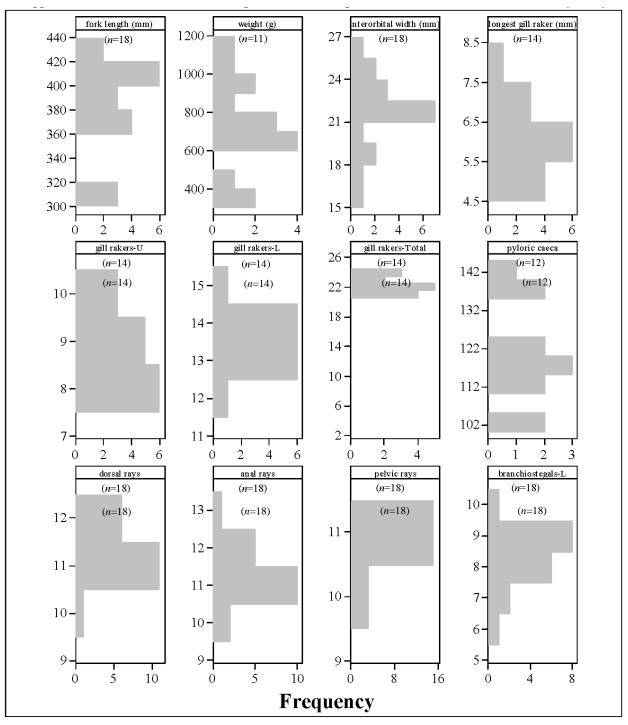
Appendix J1.-Meristic data from Dolly Varden specimens retained for otolith-chemistry study.

Note: Fish were previously frozen then thawed. Fin rays counted from fin on fish's left-side. Gill rakers counted from the 1st arch on the fish's right side. Rakers in the angle between the upper and lower limb were included with the lower-limb count.



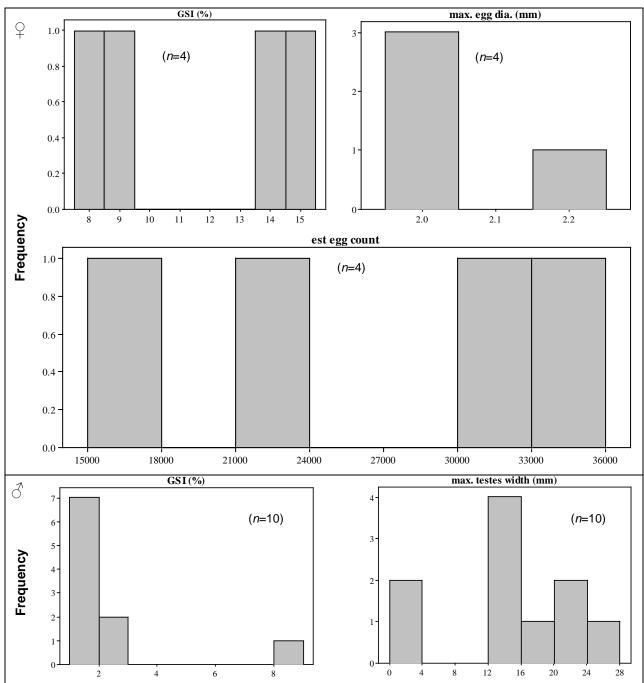
Appendix J2.-Gonad data from Dolly Varden specimens retained for otolith-chemistry study.

Notes: Fish were previously frozen, then thawed. Top panel shows gonad data for female, and bottom panel male, specimens. *GSI* (gonado-somatic index) is gonad mass as a percent of total body mass. Egg count was estimated as total ovary weight \times no. of eggs counted from a sample taken from a transverse section through the center of an ovary \div ovary sample weight.



Appendix J3.-Meristic data from humpback whitefish specimens retained for otolith-chemistry study.

Note: Fish were previously frozen then thawed. Fin rays counted from fin on fish's left-side. Gill rakers counted from the 1st arch on the fish's right side. Rakers in the angle between the upper and lower limb were included with the lower-limb count.

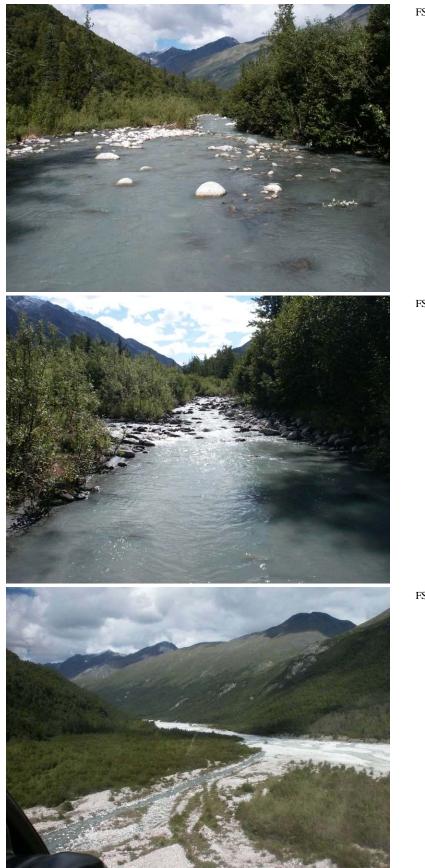


Appendix J4.-Gonad data from humpback whitefish specimens retained for otolith-chemistry study.

Notes: Fish were previously frozen, then thawed. Top panel shows gonad data for female, and bottom panel male, specimens. *GSI* (gonado-somatic index) is gonad mass as a percent of total body mass. Egg count was estimated as total ovary weight \times no. of eggs counted from a sample taken from a transverse section through the center of an ovary \div ovary sample weight.

APPENDIX K. 2003 STATION REPORTS AND PHOTOS

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/04/2003 12:34 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.12074 -148.85482 Coordinates 62.12074 -148.85482 Elevation NED (m)(ft): 678 2224 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts A-4 Legal Description (MTRS): S024N003E35 Waterbody Name: Sheep River **Anadromous Waters Catalog Number:** Geographic Comments: Side channel. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): Water Temp (C): DO (mg/L): Conductivity (µS/cm): pH: Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 3 **Entrenchment: Catchment Area(sq. km):** 1 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Boulder Width 9.0 7.3 Subdominant Substrate 1: Cobble **Thalweg Depth** 0.20 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Tall Alder-Willow Shrub Open Tall Alder-Willow Shrub Closed Tall Alder-Willow Shrub 5 - 10 Open Tall Alder-Willow Shrub 10 - 20 Open Tall Alder-Willow Shrub Closed Tall Alder-Willow Shrub 20 - 30 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Life History: Unknown Species: Dolly Varden Life Stage: juvenile/adult **Total Fish Count:** 5 Fish Measured: 1 Fork Lengths (mm) Min: 109 Max: 109 Mean: 109 Median: 109 Sampling Method (No. of fish): PEF (1) VOG (4) Comments: Additional fish observed averaged about 100 mm F.L. Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: **Transparency:**



FSS0301A003.jpg

FSS0301A004.jpg

FSS0301A005.jpg

Station Info Observers: Joe Buckwalter, J Johnson Date/Time: 08/04/2003 4:14 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.28946 -148.94875 Coordinates -148.94875 62.28946 Elevation NED (m)(ft): 757 2484 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts B-4 Legal Description (MTRS): S025N003E05 Waterbody Name: Iron Creek Anadromous Waters Catalog Number: Geographic Comments: Sampled clear tributary. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): Water Temp (C): 7.20 DO (mg/L): Conductivity (µS/cm): 68 pH: 6.99 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2 **Entrenchment: Catchment Area(sq. km):** 1 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Cobble Width 3.0 Subdominant Substrate 1: Gravel **Thalweg Depth** 0.30 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Low Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub 5 - 10 Closed Low Willow Shrub 10 - 20 Closed Low Willow Shrub Closed Tall Willow Shrub 20 - 30 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 **Mean:** 75 Median: 75 Sampling Method (No. of fish): PEF (1) **Comments:** Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



FSS0301A007.jpg

FSS0301A008.jpg

Station Info Observers: Joe Buckwalter, J Johnson Date/Time: 08/04/2003 11:49 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.16893 -148.96389 Coordinates -148.96389 62.16893 Elevation NED (m)(ft): 472 1549 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts A-4 Legal Description (MTRS): S024N003E18 Waterbody Name: Sheep River **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 400 **Catchment Area(sq. km): Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult Life History: Anadromous Total Fish Count: 12 Fork Lengths (mm) Min: Max: Median: Fish Measured: Mean: Sampling Method (No. of fish): VOH (12) Suspected Spawning: Yes **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity:** Price pygmy meter **Turbidity: Electrofisher:** Water Quality: **Transparency:**

Station Info				
Observers: Joe Buckwalter, J Johnson			Date/Tir	ne: 08/04/2003 3:26 PM
StationLatitudeLongitudeCoordinates62.30647-149.04903	Sample Coordinates	Latitude 62.30647	Longitude -149.04903	
Elevation NED (m)(ft): 623 2044 Coordinate Determination Method: Non-Differen USGS Quadrangle: Talkeetna Mts B-5	ntial GPS Field Mea Legal Descript		Datum: NA : S026N002E	
Waterbody Name: Iron Creek Anadromous Waters Catalog Number: Geographic Comments: Station waypoint marked w	while flying.			
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):DWater Color:Turbidity (N		Conductivity halweg Velo	ν (μS/cm): ocity (m/s)(ft/s	рН:):
Stream Channel				
Stream Gradient (%):EntrenchmeCatchment Area(sq. km):212Embeddedr				
		minant Sub		
Width Thalweg Depth		inant Subst inant Subst		
Rosgen Class:	Subdom	illant Subst	Tate 2:	
Riparian Vegetation Communities (Viered	ck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>R</u>	ight Bank V	egetation Typ	Canopy Height(m)
0 - 5				
5 - 10				
10 - 20 20 - 30				
Key To Fish Sampling Methods				
(VOH) Visual Observation, Helicopter				
Fish Observations				
Species: sockeye salmon Life Stage:	adult	Life His	tory: Anadron	nous
Total Fish Count:2Fish Measured:FoSampling Method (No. of fish):VOH (2)Comments:About 25 more observed downstream.	ork Lengths (mm)	Min:		Mean: Median: Suspected Spawning: Yes
Instruments				
Stream Gradient:	Channel 1	Depths:		
Stream Velocity: Price pygmy meter	Channel	Widths:		
Turbidity:				
	Electrofis	her:		

Station Info				
Observers: Joe Buckwalter, J Johnson			Date/Time:	: 08/04/2003 3:21 PM
Station Latitude Longitude Coordinates 62.35210 -149.19194 Elevation NED (m)(ft): 485 1591	Sample Coordinates	Latitude 62.35210	Longitude -149.19194	
Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna Mts B-5 Waterbody Name: Iron Creek Anadromous Waters Catalog Number: Geographic Comments: Station waypoint marked	Legal Descrip		Datum: NAD8): S026N001E12	
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):Water Color:Turbidity (DO (%): NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%): Entrenchr Catchment Area(sq. km): 493 Embedded Channel Dimensions (m): Bankfull OHW	lness: Wetted D	ominant Sub		
Width Thalweg Depth		ninant Subs ninant Subs		
Rosgen Class:	Subus			
Riparian Vegetation Communities (Viero	eck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5	Canopy	Right Bank V	Vegetation Type	Canopy Height(m)
5 - 10 10 - 20 20 - 30				
Key To Fish Sampling Methods				
(VOH) Visual Observation, Helicopter				
Fish Observations Species: Chinook salmon Life Stage	e: adult	Life Hi	story: Anadromo	us
•	Fork Lengths (mm)		Max: Me	ean: Median: spected Spawning: Yes
Instruments				
Stream Gradient:	Channel	Depths:		
Stream Velocity: Price pygmy meter	Channel	Widths:		
Turbidity:	Electrof	isher:		

Water Quality:

Transparency:

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/05/2003 8:55 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.26436 -148.41267 Coordinates 62.26436 -148.41267 Elevation NED (m)(ft): 988 3241 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts B-3 Legal Description (MTRS): S025N006E07 Waterbody Name: Clear Creek **Anadromous Waters Catalog Number:** Geographic Comments: Upper Talkeetna River tributary. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): **Water Temp (C): 3.70** DO (mg/L): Conductivity (µS/cm): 66 **pH:** 8.08 Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2.5 **Entrenchment: Catchment Area(sq. km):** 133 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 13.0 Subdominant Substrate 1: Gravel Thalweg Depth 0.70 Subdominant Substrate 2: Boulder Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 3 0 - 5 Closed Tall Alder-Willow Shrub Closed Tall Alder-Willow Shrub 3 3 3 Closed Tall Alder-Willow Shrub 5 - 10 Closed Tall Alder-Willow Shrub 10 - 20 Closed Tall Alder-Willow Shrub 3 20 - 30 Closed Tall Alder-Willow Shrub 3 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Resident Fish Measured: 3 Fork Lengths (mm) Min: 150 Max: 205 **Total Fish Count:** 3 Mean: 177 Median: 177 Sampling Method (No. of fish): PEF (3) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 135 Max: 135 Mean: 135 Median: 135 Sampling Method (No. of fish): PEF (1)

Comments: Instruments

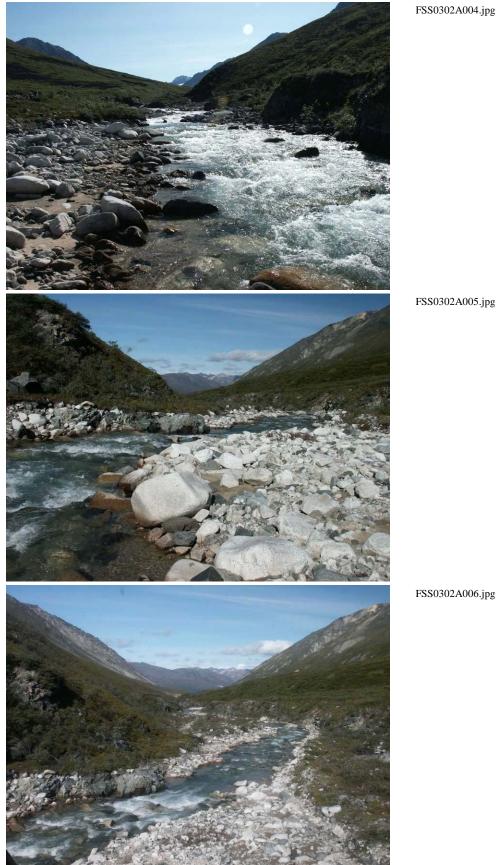
Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: Visual estimate
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



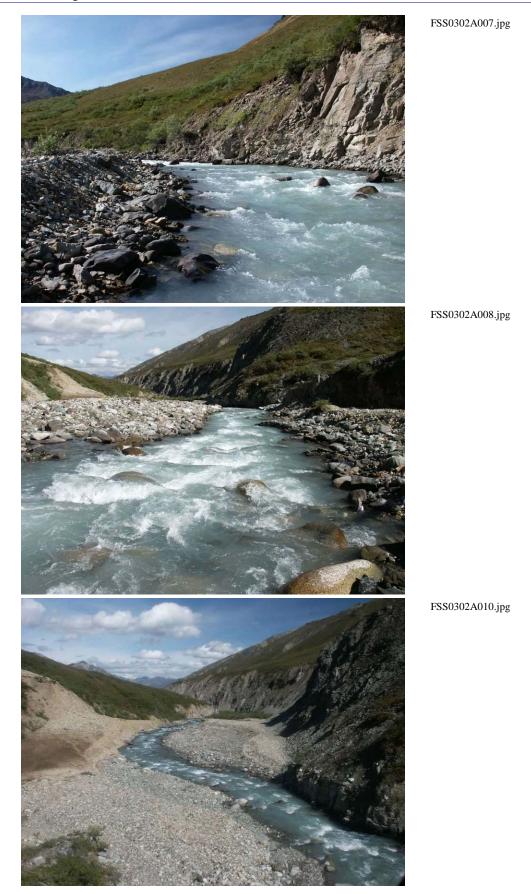
FSS0302A002.jpg

FSS0302A003.jpg

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/05/2003 11:17 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.32368 -148.34822 Coordinates -148.34822 62.32368 Elevation NED (m)(ft): 1170 3839 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Quadrangle:** Talkeetna Mts B-3 Legal Description (MTRS): S026N006E21 Waterbody Name: Aspen Creek Anadromous Waters Catalog Number: Geographic Comments: Headwater tributary of Talkeetna River. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): Water Temp (C): 4.00 DO (mg/L): Conductivity (µS/cm): 57 **pH:** 8.08 Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 1.52 4.99 **Stream Channel** Stream Gradient (%): 3.5 **Entrenchment: Catchment Area(sq. km):** 70 **Embeddedness:** OHW Wetted **Channel Dimensions (m):** Bankfull Dominant Substrate: Cobble Width 9.6 7.6 Subdominant Substrate 1: Boulder **Thalweg Depth** 0.77 0.37 Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 1 1 Open Low Willow Shrub Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 1 Open Low Willow Shrub 1 10 - 20 Open Low Willow Shrub Open Low Willow Shrub 1 1 20 - 30 Open Low Willow Shrub 1 Open Low Willow Shrub 1 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Resident Fork Lengths (mm) Min: Max: Median: **Total Fish Count:** 2 **Fish Measured:** Mean: Sampling Method (No. of fish): VOG (2) Suspected Spawning: Yes Comments: Spawning colors. About 200 mm F.L. Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price AA meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



Station Info		
Observers: Joe Buckwalter, Jeff Davis, J Johnson	Date/Time: 08/05/2003 12:01 PM	
StationLatitudeLongitudeCoordinates62.30804-148.58047	SampleLatitudeLongitudeCoordinates62.30804-148.58047	
Elevation NED (m)(ft): 1092 3583		
Coordinate Determination Method: Non-Differen USGS Quadrangle: Talkeetna Mts B-4	ntial GPS Field Measurement Datum: NAD83 Legal Description (MTRS): S026N005E29	
Waterbody Name: Yellowjacket Creek	Legal Description (MTRS). 50201005125	
Anadromous Waters Catalog Number:		
	lkeetna River. Coordinates derived from GPS track file.	
Visit Comments: Not wadeable - width estimated.		
Wildlife Comments:		
Water Quality \ Stream Flow		
Water Temp (C): 6.00 DO (mg/L): I Water Color: Glacial, Low Turbidit Turbidity (N	DO (%): Conductivity (μS/cm): 101 pH: 8.39 NTU): Thalweg Velocity (m/s)(ft/s):	
Stream Channel		
Stream Gradient (%): 3.5EntrenchmCatchment Area(sq. km): 66Embeddedu		
	Wetted Dominant Substrate: Boulder	
Width Thalweg Depth	10.0 Subdominant Substrate 1: Cobble Subdominant Substrate 2: Gravel	
	e gradient, riffle dominated channel, with infrequently spaced pools. Very	
stable plan and profile. Stable banks	S.	
stable plan and profile. Stable banks Riparian Vegetation Communities (Vieree		
Riparian Vegetation Communities (Viered Dist. from	ck et al. 1992) Canopy Canopy	
Riparian Vegetation Communities (Viered Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	ck et al. 1992) Canopy Height(m) <u>Right Bank Vegetation Type</u> Canopy Height(m)	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated	ck et al. 1992) Canopy Height(m) Right Bank Vegetation Type Unvegetated Canopy Height(m)	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated	ck et al. 1992) Canopy Height(m) Right Bank Vegetation Type Unvegetated Unvegetated Unvegetated	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Height(m) Unvegetated Open Tall Willow Shrub Height(m)	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated	ck et al. 1992) Canopy Height(m) Right Bank Vegetation Type Unvegetated Unvegetated Unvegetated	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Height(m) Unvegetated Open Tall Willow Shrub Height(m)	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Height(m) Unvegetated Open Tall Willow Shrub Height(m)	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods	Canopy Height(m) Canopy Right Bank Vegetation Type Canopy Height(m) Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 1	Canopy Height(m) Canopy Right Bank Vegetation Type Canopy Height(m) Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub	
Riparian Vegetation Communities (Viered Dist. from Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Unvegetated (VOG) Visual Observation, Ground Unvegetated	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 1 Fish Measured: For Sampling Method (No. of fish): VOG (1)	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Unvegetated (VOG) Visual Observation, Ground Unvegetated	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 1 Fish Measured: For Sampling Method (No. of fish): VOG (1) Comments: About 140 mm F.L.	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Unvegetated (VOG) Visual Observation, Ground Unvegetated	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 1 Fish Measured: For Sampling Method (No. of fish): VOG (1) Comments: About 140 mm F.L. Instruments	Canopy Canopy Height(m) Right Bank Vegetation Type Canopy Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub (VOG) Visual Observation, Ground S juvenile/adult Life History: Unknown ork Lengths (mm) Min: Max: Mean:	
Riparian Vegetation Communities (Viered Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated 20-30 Unvegetated Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 1 Fish Measured: Feast Sampling Method (No. of fish): VOG (1) Comments: About 140 mm F.L. Instruments Stream Gradient:	Canopy Right Bank Vegetation Type Canopy Height(m) Right Bank Vegetation Type Height(m) Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Open Tall Willow Shrub VOG) Visual Observation, Ground S juvenile/adult Life History: Unknown Median: ork Lengths (mm) Min: Max: Mean: Median:	
Riparian Vegetation Communities (Viered Dist. from Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated 20 - 30 Unvegetated 20 - 30 Unvegetated Vegetated Vegetated <td colsp<="" td=""><td>Canopy Right Bank Vegetation Type Canopy Height(m) Right Bank Vegetation Type Height(m) Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Open Tall Willow Shrub (VOG) Visual Observation, Ground : juvenile/adult Life History: Unknown Median: ork Lengths (mm) Min: Max: Median: Channel Depths: Channel Widths: Visual estimate</td></td>	<td>Canopy Right Bank Vegetation Type Canopy Height(m) Right Bank Vegetation Type Height(m) Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Open Tall Willow Shrub (VOG) Visual Observation, Ground : juvenile/adult Life History: Unknown Median: ork Lengths (mm) Min: Max: Median: Channel Depths: Channel Widths: Visual estimate</td>	Canopy Right Bank Vegetation Type Canopy Height(m) Right Bank Vegetation Type Height(m) Unvegetated Unvegetated Open Tall Willow Shrub Open Tall Willow Shrub Open Tall Willow Shrub (VOG) Visual Observation, Ground : juvenile/adult Life History: Unknown Median: ork Lengths (mm) Min: Max: Median: Channel Depths: Channel Widths: Visual estimate



Station Info	
Observers: Joe Buckwalter, Jeff Davis, J Jo	hnson Date/Time: 08/05/2003 1:05 PM
StationLatitudeLongitudeCoordinates62.46716-148.80995	SampleLatitudeLongitudeCoordinates62.46716-148.80995
Elevation NED (m)(ft): 799 2621 Coordinate Determination Method: Non- USGS Quadrangle: Talkeetna Mts B-4 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Coordinates derived Visit Comments: Wildlife Comments:	Legal Description (MTRS): S028N003E36
Water Quality \ Stream Flow	
Water Temp (C): 7.70 DO (mg/L):	DO (%):Conductivity (μS/cm): 146pH: 8.44dity (NTU):Thalweg Velocity (m/s)(ft/s):
Stream Channel	
	enchment: eddedness:
Channel Dimensions (m): Bankfull O	
Width Thalweg Depth	9.6 7.7 Subdominant Substrate 1: Gravel 0.43 Subdominant Substrate 2: Boulder
	oderate gradient, riffle dominated channel, with infrequently spaced pools. Very
Riparian Vegetation Communities (Viereck et al. 1992)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	CanopyCanopyHeight(m) <u>Right Bank Vegetation Type</u> Height(m)
0 - 5 Closed Tall Willow Shrub	3 Closed Tall Willow Shrub 3
5 - 10 Closed Tall Willow Shrub	3 Closed Low Alder-Willow Shrub 1
10 - 20 Closed Tall Willow Shrub	3 Closed Low Alder-Willow Shrub 1
20 - 30 Closed Tall Willow Shrub	3 Closed Low Alder-Willow Shrub 1
Key To Fish Sampling Methods	
(PEF) Backpack Electrofisher	(VOG) Visual Observation, Ground
Fish Observations Species: Dolly Varden Life Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOG (1) Comments: About 200 mm F.L.	Stage: adult Life History: Resident Fork Lengths (mm) Min: Max: Mean: Median:
Instruments	
Instruments Stream Gradient: handheld optical clinom	ter Channel Depths: graduated wading rod
Stream Gradient:handheld optical clinomStream Velocity:Price AA meter	Channel Widths: measuring tape
Stream Gradient: handheld optical clinom	



FSS0302A011.jpg

FSS0302A012.jpg

Station Info
Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/05/2003 3:14 PM
StationLatitudeLongitudeSampleLatitudeLongitudeCoordinates62.43602-149.84711Coordinates62.43602-149.84711Elevation NED (m)(ft):29697197162.43602-149.84711
Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts B-6 Legal Description (MTRS): S027N003W16 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Downstream of Sockeye Lake.
Visit Comments: Wildlife Comments:
Water Quality \ Stream Flow
Water Temp (C): 15.00DO (mg/L):DO (%):Conductivity (µS/cm): 47pH: 7.55Water Color: ClearTurbidity (NTU):Thalweg Velocity (m/s)(ft/s):
Stream Channel
Stream Gradient (%):0Entrenchment:Catchment Area(sq. km):6Embeddedness:
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Sand/Silt/Clay (legacy)
Width4.03.3Subdominant Substrate 1: GravelThalweg Depth0.75Subdominant Substrate 2:
Rosgen Class: E5 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.
Riparian Vegetation Communities (Viereck et al. 1992)
Dist. fromCanopyCanopyBank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation TypeHeight(m)
0-5 Unvegetated Unvegetated
5-10 Unvegetated Unvegetated
10 - 20 Unvegetated Subarctic Lowland Sedge Wet Meadow
20 - 30 Unvegetated Subarctic Lowland Sedge Wet Meadow
Key To Fish Sampling Methods
(PEF) Backpack Electrofisher (VOG) Visual Observation, Ground
Fish Observations
Species: Pacific salmon-unspecifiedLife Stage: juvenileLife History: AnadromousTotal Fish Count:40Fish Measured:Fork Lengths (mm)Min:Max:Mean:Median:
Sampling Method (No. of fish): VOG (40) Comments: Average F.L. was about 45 mm.
Species: coho salmonLife Stage: juvenileLife History: AnadromousTotal Fish Count: 3Fish Measured: 3Fork Lengths (mm)Min: 42Max: 55Mean: 48Sampling Method (No. of fish):PEF (3)Comments:
Species: rainbow troutLife Stage: juvenile/adultLife History: ResidentTotal Fish Count:1Fish Measured:1Fork Lengths (mm)Min:115Mean:115Median:115Sampling Method (No. of fish):PEF (1)Comments:Fork Lengths (mm)Fork Lengths (mm)Fork Lengths (mm)ForkFork Lengths (mm)Fork
Species: rainbow trout Life Stage: juvenile Life History: Resident Total Fish Count: 2 Fish Measured: 2 Fork Lengths (mm) Min: 85 Mean: 87 Median: 87 Sampling Method (No. of fish): PEF (2) Comments: Image: Comment state stat

Appendix K10.–Page 2 of 3.

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count: 5
 Fish Measured: 2
 Fork Lengths (mm)
 Min: 20
 Max: 31
 Mean: 25
 Median: 25

 Sampling Method (No. of fish): PEF (2) VOG (3)
 Comments: Average F.L. was about 40 mm.
 Keen the second sec

Instruments

Stream Gradient: handhe	eld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity: Price A	AA meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher: Si	mith-Root LR-24
Water Quality: Horiba U-	-10	Transparency:	



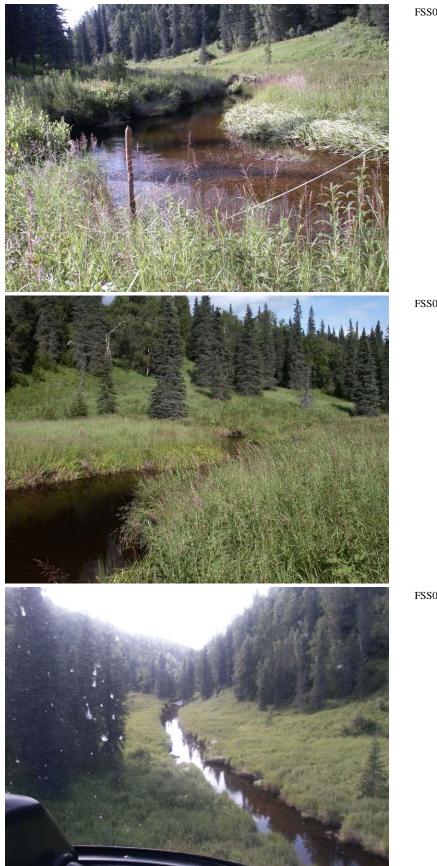
Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/05/2003 4:40 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.44634 -149.91679 Coordinates -149.91679 62.44634 Elevation NED (m)(ft): 327 1073 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts B-6 Legal Description (MTRS): S027N004W12 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Left bank tributary to Clear Creek. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.30 DO (mg/L): DO (%): Conductivity (µS/cm): 15 **pH:** 7.33 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment: Catchment Area(sq. km):** 17 **Embeddedness: Bankfull OHW** Wetted **Channel Dimensions (m):** Dominant Substrate: Gravel Width 7.1 7.2 Subdominant Substrate 1: Sand/Silt/Clay (legacy) Thalweg Depth 0.40 Subdominant Substrate 2: Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 1 0 - 5 Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb 1 Bluejoint-Herb 5 - 10 10 - 20 Bluejoint-Herb 1 Bluejoint-Herb 20 - 30 Open White Spruce Forest 20 Bluejoint-Herb **Kev To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 11 Fork Lengths (mm) Min: 36 Max: 45 **Total Fish Count:** 14 **Mean: 39** Median: 40 Sampling Method (No. of fish): PEF (14) Suspected Spawning: Yes Comments: Average F.L. of additional fish was about 35 mm. Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 113 Max: 113 Mean: 113 **Median:** 113 Sampling Method (No. of fish): PEF (1) **Comments: Species:** slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 59 **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 53 Max: 66 Mean: 60 Sampling Method (No. of fish): PEF (3) **Comments:**

Species: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 2Fork Lengths (mm)Min: 33Max: 36Mean: 34Median: 34Sampling Method (No. of fish):PEF (6)Comments:Average F.L. of additional fish was about 33 mm.

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price AA meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0302A020.jpg

FSS0302A021.jpg

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/05/2003 2:33 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.39595 -149.69581 Coordinates 62.39595 -149.69581 Elevation NED (m)(ft): 228 748 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts B-6 Legal Description (MTRS): S027N002W29 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Embeddedness: Catchment Area(sq. km): Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations**

No Fish Found

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

FSS0302A014.jpg



Station Info		
Observers: Joe Buckwalter, Jeff Davis, J	J Johnson	Date/Time: 08/06/2003 9:20 AM
StationLatitudeLongitudeCoordinates62.70746-148.73398	Sample Coordinates	Latitude Longitude 62.70746 -148.73398
Elevation NED (m)(ft): 764 2507		
Coordinate Determination Method: No	on-Differential GPS Field N	Measurement Datum: NAD83
USGS Quadrangle: Talkeetna Mts C-4	Legal Descr	iption (MTRS): S030N004E09
Waterbody Name:		
Anadromous Waters Catalog Number:		
Geographic Comments:		
Visit Comments: Gradient estimated - ve	getation too dense to meas	ure.
Wildlife Comments:		
Water Temp (C): 7.70 DO (mg/L):	DO (%): arbidity (NTU):	Conductivity (μS/cm): 105 pH: 7.79 Thalweg Velocity (m/s)(ft/s):
	. ,	
Water Temp (C): 7.70DO (mg/L):Water Color: ClearTuStream Channel	. ,	
Water Temp (C): 7.70 Water Color: ClearDO (mg/L): TuStream Channel Stream Gradient (%): 1E	urbidity (NTU):	
Water Temp (C): 7.70 Water Color: ClearDO (mg/L): TuStream ChannelStream Gradient (%): 1ECatchment Area(sq. km): 7	nrbidity (NTU):	Thalweg Velocity (m/s)(ft/s):
Water Temp (C): 7.70DO (mg/L):Water Color: ClearTuStream ChannelStream Gradient (%): 1ECatchment Area(sq. km): 7	ntrenchment: mbeddedness: OHW Wetted	
Water Temp (C): 7.70 DO (mg/L): Water Color: Clear Tu Stream Channel Stream Gradient (%): 1 E Catchment Area(sq. km): 7 E Channel Dimensions (m): Bankfull	ntrenchment: mbeddedness: OHW Wetted 0.9 1.1 Subd	Thalweg Velocity (m/s)(ft/s): Dominant Substrate: Sand/Silt/Clay (legacy)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Open White Spruce Forest	15	Closed Tall Willow Shrub	2
20 - 30	Open White Spruce Forest	15	Open White Spruce Forest	15

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

```
      Species: Dolly Varden
      Life Stage: juvenile/adult
      Life History: Unknown

      Total Fish Count:
      2
      Fish Measured:
      2
      Fork Lengths (mm)
      Min:
      109
      Max:
      137
      Mean:
      123

      Sampling Method (No. of fish):
      PEF (2)
      Comments:
      Vertical Part of the second second
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Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	Smith-Root LR-24
Water Quality: Ho	oriba U-10	Transparency:	



Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 10:36 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.71027 -148.76184 Coordinates -148.76184 62.71027 Elevation NED (m)(ft): 703 2306 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Quadrangle:** Talkeetna Mts C-4 Legal Description (MTRS): S030N004E08 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.80 DO (mg/L): DO (%): Conductivity (µS/cm): 99 pH: 7.75 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2.5 **Entrenchment:** Catchment Area(sq. km): 11.2 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble Width 2.2 2.4 Subdominant Substrate 1: Gravel 0.34 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open White Spruce Forest		Open White Spruce Forest	
5 - 10	Open White Spruce Forest		Open White Spruce Forest	
10 - 20	Open White Spruce Forest		Open White Spruce Forest	
20 - 30	Open White Spruce Forest		Open White Spruce Forest	

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Arctic grayling	Life Stage: juvenile		Life History: Resident			
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 43	Max: 47	Mean: 45	Median: 45
Sampling Method (No. of fish): PEF (2)						
Comments:						

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod		
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape		
Turbidity:		Electrofisher: Smith-Root LR-24		
Water Quality: Horiba U-10		Transparency:		



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Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 8:49 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.72200 -148.83977 Coordinates -148.83977 62.72200 Elevation NED (m)(ft): 569 1867 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts C-4 Legal Description (MTRS): S030N003E02 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km):** 34 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOH (2) Suspected Spawning: Yes **Comments:** Instruments S ths: S lths:

Stream Gradient:	Channel Depths	
Stream Velocity:	Price pygmy meter	Channel Widths
Turbidity:		Electrofisher:
Water Quality:		Transparency:

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 1:07 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.60857 -148.94177 Coordinates -148.94177 62.60857 Elevation NED (m)(ft): 757 2484 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts C-4 Legal Description (MTRS): S029N003E17 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 9.50 DO (mg/L): DO (%): Conductivity (µS/cm): 191 **pH:** 8.45 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 4 **Entrenchment:** Catchment Area(sq. km): 19 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Boulder 3.8 3.7 Width Subdominant Substrate 1: Cobble 0.24 **Thalweg Depth** Subdominant Substrate 2: Gravel Rosgen Class: A2 Steep, entrenched, cascading, step/pool streams. Very stable. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Tall Alder-Willow Shrub 3 Closed Tall Alder-Willow Shrub 3 5 - 10 Closed Tall Alder-Willow Shrub 3 Closed Tall Alder-Willow Shrub 3 10 - 20 Closed Tall Alder-Willow Shrub 3 Closed Tall Alder-Willow Shrub 3 20 - 30 Open White Spruce Forest 20 Open White Spruce Forest 20 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count: 2** Fish Measured: 2 Fork Lengths (mm) Min: 124 Max: 127 Median: 125 **Mean:** 125 Sampling Method (No. of fish): PEF (2) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Median: 68 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 68 Max: 68 **Mean:** 68 Sampling Method (No. of fish): PEF (1) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 26 Fish Measured: 10 Fork Lengths (mm) Min: 36 Max: 46 **Mean:** 41 Median: 41 Sampling Method (No. of fish): PEF (26) Suspected Spawning: Yes

Comments: Average F.L. of additional fish was about 47 mm.

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0303A014.jpg



Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 2:18 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.66884 -149.05033 Coordinates -149.05033 62.66884 Elevation NED (m)(ft): 682 2238 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Quadrangle:** Talkeetna Mts C-5 Legal Description (MTRS): S030N002E22 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 9.50 DO (mg/L): DO (%): Conductivity (µS/cm): 191 **pH:** 8.45 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 3 **Entrenchment:** Catchment Area(sq. km): 23 **Embeddedness:** OHW Wetted **Channel Dimensions (m):** Bankfull Dominant Substrate: Cobble Width 3.8 3.7 Subdominant Substrate 1: Boulder 0.24 **Thalweg Depth** Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	3	Open Spruce-Balsam Poplar	20
5 - 10	Closed Balsam Poplar-White Spruce Forest	20	Open Spruce-Balsam Poplar	20
10 - 20	Closed Balsam Poplar-White Spruce Forest	20	Open Spruce-Balsam Poplar	20
20 - 30	Closed Balsam Poplar-White Spruce Forest	20	Open Spruce-Balsam Poplar	20

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

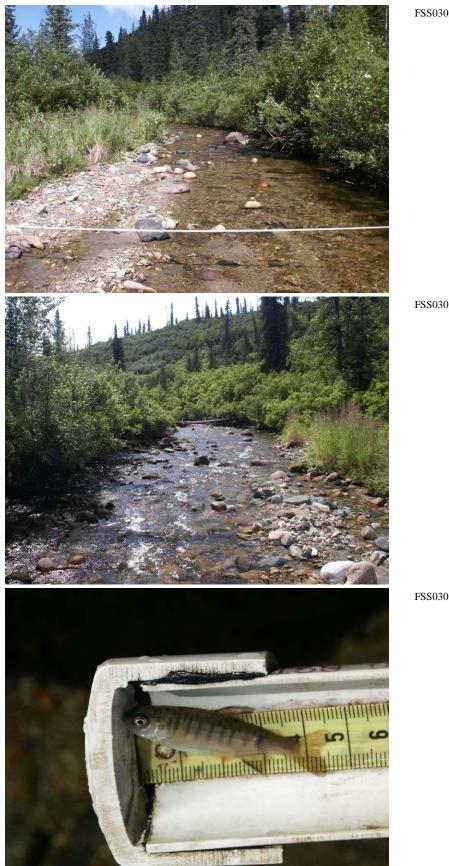
Fish Observations

Species: Dolly Varden	Life Sta	ge: adult	Life Hi	story: Resid	lent	
Total Fish Count: 8	Fish Measured: 8	Fork Lengths (mm)	Min: 148	Max: 240	Mean: 170	Median: 194
Sampling Method (No. of	f fish): PEF (8)				Suspected S	pawning: Yes
Comments:						
Species: Dolly Varden	Life Sta	ge: juvenile/adult	Life Hi	story: Unkn	own	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 138	Max: 138	Mean: 138	Median: 138
Sampling Method (No. of	f fish): PEF (1)					
Comments:						
Species: Chinook salmon	Life Sta	ige: juvenile	Life Hi	story: Anad	romous	
Species: Chinook salmon Total Fish Count: 16		0 0		•	romous Mean: 45	Median: 46
1	Fish Measured: 10	0 0		•	Mean: 45	Median: 46 pawning: Yes
Total Fish Count: 16	Fish Measured: 10 f fish): PEF (16)	Fork Lengths (mm)		•	Mean: 45	
Total Fish Count: 16 Sampling Method (No. or	Fish Measured: 10 f fish): PEF (16) of additional fish was	Fork Lengths (mm)	Min: 42	Max: 51	Mean: 45 Suspected S	
Total Fish Count: 16 Sampling Method (No. or Comments: Average F.L.	Fish Measured: 10 f fish): PEF (16) of additional fish was Life Sta	Fork Lengths (mm) a about 50 mm. age: juvenile	Min: 42 Life Hi	Max: 51	Mean: 45 Suspected S	
Total Fish Count: 16 Sampling Method (No. or Comments: Average F.L. Species: coho salmon	Fish Measured: 10 f fish): PEF (16) of additional fish was Life Sta Fish Measured: 12	Fork Lengths (mm) a about 50 mm. age: juvenile	Min: 42 Life Hi	Max: 51	Mean: 45 Suspected S romous Mean: 47	pawning: Yes

Appendix K17.–Page 2 of 4.

Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 110 Max: 110 Total Fish Count: 1 Fish Measured: 1 Mean: 110 **Median:** 110 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 62 Max: 62 **Mean:** 62 Median: 62 Sampling Method (No. of fish): PEF (1) **Comments:** Instruments

Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



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Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 3:51 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.60604 -149.17093 Coordinates -149.17093 62.60604 Elevation NED (m)(ft): 604 1982 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-5 Legal Description (MTRS): S029N002E18 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Waterfalls upstream at station 03A07 is a barrier to all fish species and life stages. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): pH: Conductivity (µS/cm): Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Embeddedness:** Catchment Area(sq. km): 42 **Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult Life History: Anadromous **Total Fish Count: 2** Fork Lengths (mm) Min: Median: Fish Measured: Max: Mean: Sampling Method (No. of fish): VOH (2) Comments: About 10 more observed downstream. **Instruments Stream Gradient: Channel Depths: Channel Widths:** Stream Velocity: Price pygmy meter **Turbidity: Electrofisher:** Water Quality: **Transparency:**

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 3:49 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.60695 -149.18317 Coordinates -149.18317 62.60695 Elevation NED (m)(ft): 666 2185 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-5 Legal Description (MTRS): S029N001E13 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km):** 34 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: Chinook salmon Life Stage: adult Life History: Anadromous **Total Fish Count: 2** Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOH (2) Comments: Chinook observed in falls plunge pool. Instruments

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:
Water Quality:		Transparency:

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Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 8:41 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.65413 -148.87344 Coordinates -148.87344 62.65413 Elevation NED (m)(ft): 707 2320 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts C-4 Legal Description (MTRS): S030N003E27 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable Fish Measured: Fork Lengths (mm) Min: Median: **Total Fish Count:** 0 Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: Turbidity: Electrofisher:** Water Quality: **Transparency:**

FSS0303A001.jpg



Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/06/2003 4:07 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.47181 -149.61885 Coordinates -149.61885 62.47181 Elevation NED (m)(ft): 373 1224 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts B-6 Legal Description (MTRS): S028N002W34 Waterbody Name: Disappointment Creek **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Total Fish Count:** 0 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: Turbidity: Electrofisher:** Water Quality: **Transparency:**

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Station Info				
Observers: Joe Buckwalter, Jeff Davis, J J	ohnson		Date/Time:	08/07/2003 9:08 AM
StationLatitudeLongitudeCoordinates62.66673-149.21414	Sample Coordinate		Longitude -149.21414	
Elevation NED (m)(ft): 896 2940				
Coordinate Determination Method: Non-			Datum: NAD83	
USGS Quadrangle: Talkeetna Mts C-5 Waterbody Name: Chunilna Creek Anadromous Waters Catalog Number: Geographic Comments: Local name: Clean		ription (MTRS):	S030N001E26	
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 10.30DO (mg/L):Water Color: ClearTurk	DO (%): bidity (NTU):	Conductivity Thalweg Velo	(µS/cm): 20 city (m/s)(ft/s):	pH: 7.60
Stream Channel				
	renchment: beddedness:			
Channel Dimensions (m): Bankfull (OHW Wetted	Dominant Subs	trate: Gravel	
Chamiler Dimensions (III): Dankrun (dominant Substr	ate 1: Cobble	
Width	6.5 5.1 Sub	dominant Substi		
•		dominant Substr	ate 2: Boulder	

Dist. from		Canopy		Canopy
Bank (m)	Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5	Open Tall Willow Shrub	3	Open Tall Willow Shrub	3
5 - 10	Closed Low Willow Shrub	1	Closed Low Willow Shrub	1
10 - 20	Closed Low Willow Shrub	1	Closed Low Willow Shrub	1
20 - 30	Closed Low Willow Shrub	1	Closed Low Willow Shrub	1

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: slimy sculpin	Life Sta	age: adult	Life H	istory: Resid	dent	
Total Fish Count: 2 Sampling Method (No. o Comments:	Fish Measured: 2 of fish): PEF (2)	Fork Lengths (mm)	Min: 72	Max: 79	Mean: 75	Median: 75
Species: slimy sculpin	Life Sta	age: juvenile/adult	Life H	istory: Resid	lent	
Total Fish Count: 5 Sampling Method (No. 6 Comments:	Fish Measured: 5 of fish): PEF (5)	Fork Lengths (mm)	Min: 50	Max: 61	Mean: 54	Median: 55
Species: slimy sculpin	Life Sta	age: juvenile	Life H	istory: Resid	lent	
Total Fish Count: 2 Sampling Method (No. o Comments:	Fish Measured: 2 of fish): PEF (2)	Fork Lengths (mm)	Min: 24	Max: 46	Mean: 35	Median: 35

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0304A003.jpg

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 10:34 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.64464 -149.47969 Coordinates -149.47969 62.64464 Elevation NED (m)(ft): 599 1965 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-5 Legal Description (MTRS): S030N001W33 Waterbody Name: Chunilna Creek **Anadromous Waters Catalog Number:** Geographic Comments: Local name: Clear Creek. Visit Comments: Stream not wadeable - width, depth estimated. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 9.80 DO (mg/L): DO (%): Conductivity (µS/cm): 35 pH: 7.67 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 3 **Entrenchment:** 100 Catchment Area(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder 10.0 Subdominant Substrate 1: Cobble Width 0.70 Thalweg Depth Subdominant Substrate 2: Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) **<u>Right Bank Vegetation Type</u>** Height(m) Left Bank Vegetation Type 0 - 5 Closed Tall Alder-Willow Shrub 3 Closed Tall Alder-Willow Shrub 3 5 - 10 Closed Black Cottonwood Forest 20 10 - 20 Closed Black Cottonwood Forest 20 20 - 30 Closed Black Cottonwood Forest 20 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 69 Max: 69 Mean: 69 Median: 69 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 11 Fork Lengths (mm) Min: 49 Max: 63 Total Fish Count: 11 Mean: 55 Median: 56 Sampling Method (No. of fish): PEF (11) Suspected Spawning: Yes **Comments:** Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths: Visual estimate
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:



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FSS0304A006.jpg

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 12:59 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62,50982 -149,75799 Coordinates 62.50982 -149.75799 Elevation NED (m)(ft): 486 1594 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-6 Legal Description (MTRS): S028N003W13 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.00 DO (mg/L): DO (%): Conductivity (µS/cm): 41 **pH:** 7.63 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): 14 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Gravel Width 6.9 6.0 Subdominant Substrate 1: Cobble 0.21 **Thalweg Depth** Subdominant Substrate 2: Boulder Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Open White Spruce Forest 15 Open White Spruce Forest 15 5 - 10 Open White Spruce Forest 15 15 Open White Spruce Forest 10 - 20 Open White Spruce Forest 15 Open White Spruce Forest 15 20 - 30 Open White Spruce Forest 15 Open White Spruce Forest 15 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 92 Max: 92 **Mean: 92** Median: 92 Sampling Method (No. of fish): PEF (1) **Comments:** Species: coho salmon Life Stage: adult Life History: Anadromous Median: Total Fish Count: 3 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (3) Comments: Photos 16,17. Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 35 Fish Measured: 11 Fork Lengths (mm) Min: 35 Max: 48 Mean: 40 Median: 41 Sampling Method (No. of fish): PEF (35) Suspected Spawning: Yes Comments: Average F.L. of additional fish was about 40 mm. Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 110 Max: 110 Mean: 110 Median: 110 Sampling Method (No. of fish): PEF (1) **Comments:**

Species: rainbow trout Life Stage: juvenile Life History: Resident Max: 89 Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 61 **Mean:** 71 Median: 75 Sampling Method (No. of fish): PEF (6) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 11 Fish Measured: 1 Fork Lengths (mm) Min: 62 Max: 62 **Mean:** 62 Median: 62 Sampling Method (No. of fish): PEF (1) VOG (10) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 46 Fork Lengths (mm) Min: 46 Max: 46 Total Fish Count: 1 Fish Measured: 1 **Mean:** 46 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher: S	Smith-Root LR-24
Water Quality: Ho	oriba U-10	Transparency:	





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FSS0304A020.jpg

FSS0304A022.jpg

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 2:51 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.53476 -149.93348 Coordinates -149.93348 62.53476 Elevation NED (m)(ft): 516 1693 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-6 Legal Description (MTRS): S028N004W12 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 9.00 DO (mg/L): DO (%): Conductivity (µS/cm): 39 **pH:** 7.65 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): 14 **Embeddedness:** Bankfull OHW **Channel Dimensions (m):** Wetted Dominant Substrate: Gravel Width 8.8 5.5 Subdominant Substrate 1: Cobble 0.24 **Thalweg Depth** Subdominant Substrate 2: Boulder Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Ty	<u>ype</u>	Canopy Height(m)
0 - 5	Closed Tall Alder Shrub	5	Closed Tall Alder Shrub		5
5 - 10	Closed Tall Alder Shrub	5	Closed Tall Alder Shrub		5
10 - 20	Closed Tall Alder Shrub	5	Closed Tall Alder Shrub		5
20 - 30	Closed Tall Alder Shrub	5	Closed Tall Alder Shrub		5
·	sh Sampling Methods kpack Electrofisher				
Species: Do Total Fish	olly Varden Count: 1 Fish Measu Method (No. of fish): PEF		Life History: Unkno a) Min: 109 Max: 109	own Mean: 109	Median: 109
Species: co	ho salmon	Life Stage: juvenile	Life History: Anadr	omous	

 Total Fish Count:
 4
 Fish Measured:
 4
 Fork Lengths (mm)
 Min:
 43
 Max:
 46
 Mean:
 44
 Median:
 44

 Sampling Method (No. of fish):
 PEF (4)
 Def (4)<

- <u>1</u>		8 J				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 32	Max: 67	Mean: 47	Median: 49
Sampling Method (No. o	of fish): PEF (4)				Suspected S	pawning: Yes
Comments:						

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



1100-1105.			
Station Info			
Observers: Joe Buckwalter, Jeff Davis, J Johns	on	Date/Time: 08/07	7/2003 3:50 PM
Station Latitude Longitude Coordinates 62.47401 -149.98050	Sample Coordinates	LatitudeLongitude62.47401-149.98050	
Elevation NED (m)(ft): 286 938 Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna Mts B-6 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Upper end of reach passes thro herbacious, graminoid meadow Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 12.30 DO (mg/L): Water Color: Clear Turbidity Stream Channel Stream Gradient (%): 1.5 Entrence Catchment Area(sq. km): 15 Embedd Channel Dimensions (m): Bankfull OHW Width 7.1	Legal Descript bugh a drained beaver p w. DO (%): 0 y (NTU): 1 hment: 1 edness: 7 Wetted Do 4.6 Subdom	tion (MTRS): S028N004W34 pond. Gradient in this portion is 1% a Conductivity (µS/cm): 34 pH: Thalweg Velocity (m/s)(ft/s):	und vegetation is
Thalweg Depth		ninant Substrate 2:	ad floodalains
Rosgen Class: C4 Low gradient, meandering, po	-	aviai channels with broad, well-define	
Riparian Vegetation Communities (Vie			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>R</u>	Right Bank Vegetation Type	Canopy Height(m)
0-5 Closed Tall Willow Shrub	2 0	Closed Tall Willow Shrub	2
5 - 10 Closed Tall Willow Shrub	2 0	Closed Tall Willow Shrub	2
10 - 20 Closed Tall Willow Shrub	2 C	Closed Tall Willow Shrub	2
20 - 30 Closed Tall Willow Shrub	2 0	Closed Tall Willow Shrub	2
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher(VOH) Visual Observation, Helicopter	(VOG)	Visual Observation, Ground	
Fish Observations Species: Chinook salmon Life Sta	ge: adult	Life History: Anadromous	
Total Fish Count: 3 Fish Measured: Sampling Method (No. of fish): VOG (3) Comments:	Fork Lengths (mm)	•	Median:
Total Fish Count:4Fish Measured:4Sampling Method (No. of fish):PEF (4)Comments:	ge: juvenile Fork Lengths (mm)		Median: 51
Species: coho salmonLife StaTotal Fish Count:6Fish Measured:Sampling Method (No. of fish):VOH (6)Comments:	ge: adult Fork Lengths (mm)	Life History: Anadromous Min: Max: Mean:	Median:

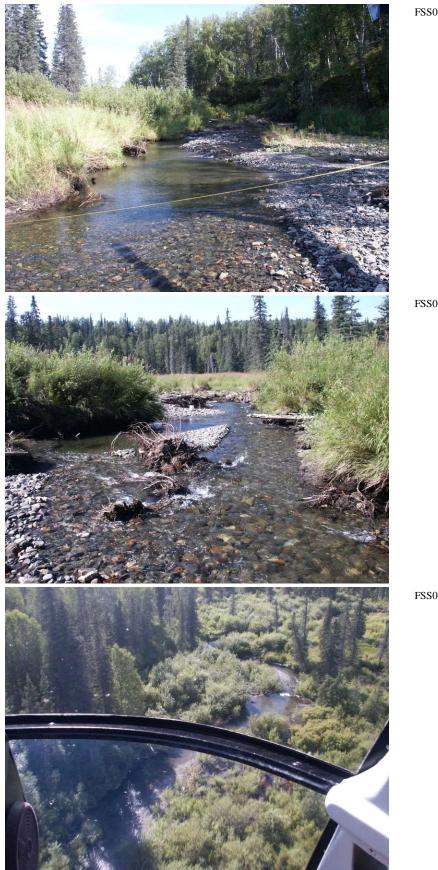
Appendix K26.–Page 2 of 3. Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 34 Fish Measured: 9 Fork Lengths (mm) Min: 34 **Max:** 58 **Mean:** 42 Median: 46 Sampling Method (No. of fish): PEF (9) VOG (25) Suspected Spawning: Yes Comments: Observed in pool along right bank. Average F.L. of additional fish was about 50 mm. Species: rainbow trout Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 60 Max: 60 **Mean:** 60 Median: 60 Sampling Method (No. of fish): PEF (1) **Comments: Species:** slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 33 **Max:** 34 **Mean:** 33 Median: 33 Sampling Method (No. of fish): PEF (2) **Comments:** Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Channel Widths: measuring tape

Transparency:

Stream Velocity: Price pygmy meter **Turbidity:** Electrofisher: Smith-Root LR-24

Water Quality: Horiba U-10

-continued-237



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FSS0304A030.jpg

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 2:00 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62,53673 -149,93179 Coordinates -149.93179 62.53673 Elevation NED (m)(ft): 516 1693 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-6 Legal Description (MTRS): S028N004W12 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 14 **Catchment Area(sq. km): Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: coho salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 4 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOH (4) Suspected Spawning: Yes **Comments:** Instruments

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:
Water Quality:		Transparency:

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 3:22 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.47054 -149.98946 Coordinates 62.47054 -149.98946 62.47108 -149.98689 Elevation NED (m)(ft): 283 928 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts B-6 Legal Description (MTRS): S028N004W34 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km):** 15 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: coho salmon Life Stage: adult Life History: Anadromous Fork Lengths (mm) Min: Median: Total Fish Count: 10 Fish Measured: Max: Mean: Sampling Method (No. of fish): VOH (10) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity:** Price pygmy meter **Turbidity: Electrofisher:** Water Quality: **Transparency:**

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 4:35 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.38940 -150.05579 Coordinates 62.38940 -150.05579 Elevation NED (m)(ft): 147 482 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna B-1 Legal Description (MTRS): S027N004W32 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 4 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOH (1) Comments: Observed by J. Johnson. Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity:** Price pygmy meter **Turbidity: Electrofisher:**

Water Quality:

Transparency:

Station Info Observers: Joe Buckwalter, Jeff Davis, J Johnson Date/Time: 08/07/2003 11:21 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62,54936 -149,83186 Coordinates -149.83186 62.54936 Elevation NED (m)(ft): 443 1453 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-6 Legal Description (MTRS): S028N003W04 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Total Fish Count:** 0 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: Turbidity: Electrofisher:** Water Quality: **Transparency:**

FSS0304A007.jpg



Station Info							
Observers: Joe Buckwa	alter, John Wells, Jim L	azar		Date/Time: 08/13/2003 1:06 PM			
Station Latitude Coordinates 62.77432	Longitude -148.70844	Sample Coordinates	Latitude 62.77432	Longitude -148.70844			
Elevation NED (m)(ft):	426 1398						
Coordinate Determination	on Method: Non-Dif	ferential GPS Field Me	easurement	Datum: NAD83			
USGS Quadrangle: Talk	Legal Descrip	Legal Description (MTRS): S031N004E16					
Waterbody Name: Fog							
Anadromous Waters Ca	talog Number: 247-4	1-10200-2696					
Geographic Comments:							
	estimated. Velocity m tions in 40.1 seconds.	easured in thalweg (de	pth 2.0 ft) at	50% of depth with AA meter. 71			
Wildlife Comments:							
Water Quality \ Stre	am Flow						
Water Quality \ Strea Water Temp (C): 9.40	am Flow DO (mg/L): 12.03	DO (%):	Conductivit	y (μ S/cm): 81 pH: 7.12			
	DO (mg/L): 12.03	()		y (μS/cm): 81 pH: 7.12 ocity (m/s)(ft/s): 1.20 3.94			
•	DO (mg/L): 12.03	()					
Water Temp (C): 9.40 Water Color: Clear Stream Channel	DO (mg/L): 12.03 Turbidit	y (NTU):					
Water Temp (C): 9.40 Water Color: Clear Stream Channel Stream Gradient (%): 2	DO (mg/L): 12.03 Turbidit 2 Entrend	y (NTU):					
Water Temp (C): 9.40 Water Color: Clear Stream Channel Stream Gradient (%): 2 Catchment Area(sq. km)	DO (mg/L): 12.03 Turbidit 2 Entrend): 390 Embedd	y (NTU): chment: dedness:	Thalweg Vel	ocity (m/s)(ft/s): 1.20 3.94			
Water Temp (C): 9.40 Water Color: Clear Stream Channel Stream Gradient (%): 2	DO (mg/L): 12.03 Turbidit 2 Entrend): 390 Embedd a): Bankfull OHV	y (NTU): chment: dedness: V Wetted D	Thalweg Vel Dominant Sul	ocity (m/s)(ft/s): 1.20 3.94			
Water Temp (C): 9.40 Water Color: Clear Stream Channel Stream Gradient (%): 2 Catchment Area(sq. km) Channel Dimensions (m	DO (mg/L): 12.03 Turbidit 2 Entrend): 390 Embedd n): Bankfull OHV Width	y (NTU): chment: dedness: V Wetted D 18.0 Subdo	Thalweg Vel Dominant Sul minant Subs	ocity (m/s)(ft/s): 1.20 3.94			
Water Temp (C): 9.40 Water Color: Clear Stream Channel Stream Gradient (%): 2 Catchment Area(sq. km) Channel Dimensions (m Thalweg	DO (mg/L): 12.03 Turbidit 2 Entrend): 390 Embedd a): Bankfull OHV Width 5 Depth	y (NTU): chment: dedness: V Wetted D 18.0 Subdo Subdo	Thalweg Vel Dominant Sub minant Subs minant Subs	ocity (m/s)(ft/s): 1.20 3.94			

Riparian Vegetation Communities (Viereck et al. 1992)

)ist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)	
0 - 5	Closed Tall Alder-Willow Shrub	3	Closed Tall Alder-Willow Shrub	4	
5 - 10	Closed Tall Alder-Willow Shrub	3	Closed White Spruce Forest	25	
10 - 20	Closed Balsam Poplar-White Spruce Forest	20	Closed White Spruce Forest	25	
20 - 30	Closed Balsam Poplar-White Spruce Forest	20	Closed White Spruce Forest	25	

(PEF) Backpack Electrofisher (VOG)			Visual Observation, Ground				
Fish Observations							
	cies: Chinook salmon Life Stage: juvenile		Life History: Anadromous				
Total Fish Count: 5		0 5		Max: 91	Mean: 71	Median: 73	
Sampling Method (No. of	f fish): PEF (4) VOO	G (1)					
Comments: Fork length of	of additional fish was	about 60 mm.					
Species: slimy sculpin	Life Stage: adult		Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 87	Max: 87	Mean: 87	Median: 87	
Sampling Method (No. of	f fish): PEF (1)						
Comments:							
Species: slimy sculpin	Life Stage: juvenile/adult		Life H				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 53	Max: 53	Mean: 53	Median: 53	
Sampling Method (No. of	f fish): PEF (1)	0					
Comments:							

Appendix K31.-Page 2 of 4.

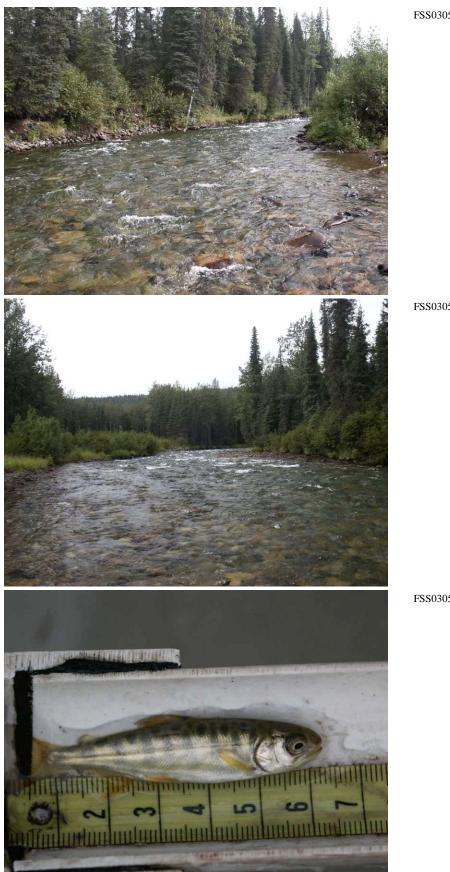
 Species: whitefish-unspecified
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 Fork Lengths (mm)
 Min:
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOG (1)
 VOG (1)
 Total representation of the substant of the substan

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths: Visual estimate
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:



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FSS0305A003.jpg

FSS0305A004.jpg

FSS0305A009.jpg



Station Info

Observers: Joe Buckwalter, John Wells, Jim Lazar	Date/Time: 08/13/2003 3:21 PM				
Station Latitude Longitude Sam	· · · · · · · · · · · · · · · · · · ·				
02.01000 110.07020	rdinates 62.84005 -148.57626				
Elevation NED (m)(ft): 496 1627					
Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83					
	al Description (MTRS): S032N005E29				
Waterbody Name: Tsusena Creek					
Anadromous Waters Catalog Number:					
Geographic Comments: Waterfall about 2 km upstream at and life stages.	station 05A05 is a barrier to upstream migration of all species				
Visit Comments: Stream not wadeable. Width, depth estim	ated.				
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 8.20 DO (mg/L): 12.31 DO (%):	Conductivity (µS/cm): 42 pH: 7.16				
Water Color: Clear Turbidity (NTU):	Thalweg Velocity (m/s)(ft/s):				
Stream Channel					
Stream Gradient (%): 2 Entrenchment:					
Catchment Area(sq. km): 369 Embeddedness:					
Channel Dimensions (m): Bankfull OHW Wetted	Dominant Substrate: Boulder				
Width 43.0	Subdominant Substrate 1: Cobble				
Thalweg Depth1.50	Subdominant Substrate 2: Gravel				
Rosgen Class: B2 Moderately entrenched, moderate gradien stable plan and profile. Stable banks.	t, riffle dominated channel, with infrequently spaced pools. Very				

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder Shrub	4	Closed Tall Alder-Willow Shrub	2
5 - 10	Closed Balsam Poplar-White Spruce Forest	24	Closed Spruce-Paper Birch Forest	20
10 - 20	Closed Balsam Poplar-White Spruce Forest	24	Closed Spruce-Paper Birch Forest	20
20 - 30	Closed Balsam Poplar-White Spruce Forest	24	Closed Spruce-Paper Birch Forest	20

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: slimy sculpin	Life Sta	age: adult	Life H	istory: Resid	lent	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 84	Max: 84	Mean: 84	Median: 84
Sampling Method (No. of	f fish): PEF (1)					
Comments:						
G1 ,,, 1 ,, 1	T 10 G	• • • • • •	T 10 TT		•	
Species: slimy sculpin	Life Sta	age: juvenile/adult	Life H	istory: Resid	lent	
Total Fish Count: 1	Life Sta Fish Measured: 1	Fork Lengths (mm)		•		Median: 52
1 5 1	Fish Measured: 1	0 1		•		Median: 52

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths: Visual estimate
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: He	oriba U-10	Transparency:

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FSS0305A012.jpg

FSS0305A013.jpg

Station Info				
Observers: Joe Buckwalter, John Wells, Jim L	azar		Date/Time:	08/13/2003 4:21 PM
StationLatitudeLongitudeCoordinates62.89774-148.12112	Sample Coordinates	Latitude 62.89774	Longitude -148.12112	
Elevation NED (m)(ft): 640 2100				
Coordinate Determination Method: Non-Dif			Datum: NAD8	3
USGS Quadrangle: Talkeetna Mts D-3	Legal Descrip	otion (MTRS)	: S032N007E03	
Waterbody Name: Watana Creek				
Anadromous Waters Catalog Number:				
Geographic Comments: Visit Comments: Main channel not wadeable.				
sediment into channel. Wate recent, probably triggered by	•	ly turbid below	w landslides. Land	lslides appear to be
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 10.20DO (mg/L): 11.38Water Color: ClearTurbidit	DO (%): ty (NTU): 1.00	e e	y (μS/cm): 131 ocity (m/s)(ft/s):	pH: 7.49
Stream Channel				
	chment: dedness:			
Channel Dimensions (m): Bankfull OHV	W Wetted D	ominant Sub	strate: Gravel	
Width	19.5 Subdo	minant Subst	rate 1: Sand/Silt/	Clay (legacy)
Thalweg Depth	0.70 Subdo	minant Subst	rate 2: Boulder	
Rosgen Class: C4 Low gradient, meandering, p	oint-bar, riffle/pool, al	luvial channel	s with broad, well	-defined floodplains.
Riparian Vegetation Communities (Vi	ereck et al. 1992)			
Dist. from	Canopy			Canopy

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Alder-Willow Shrub	3
5 - 10	Closed Tall Willow Shrub	2	Closed White Spruce Forest	25
10 - 20	Closed Tall Willow Shrub	2	Closed White Spruce Forest	25
20 - 30	Closed White Spruce Forest	15	Closed White Spruce Forest	25

Key To Fish Sampling Methods

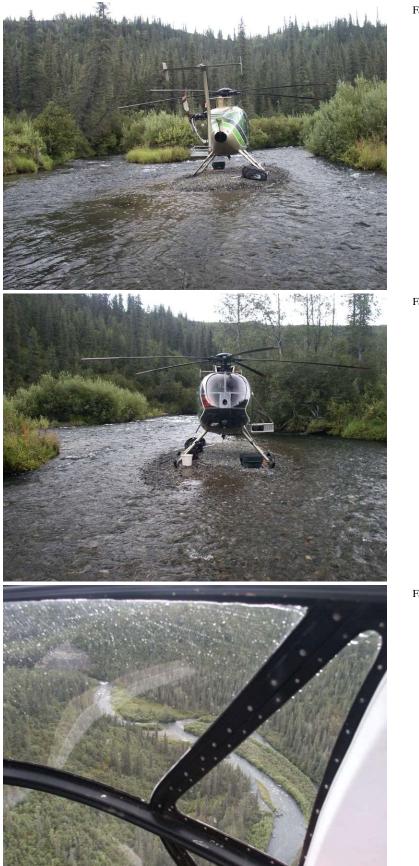
(PEF) Backpack Electrofisher

Fish Observations

Species: slimy sculpin	Life Sta	ige: juvenile	Life H	istory: Resid	dent	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 44	Max: 45	Mean: 44	Median: 44
Sampling Method (No. o	f fish): PEF (2)					
Comments:						

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths	: Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths	: Visual estimate
Turbidity: Horiba	U-10	Electrofisher:	Smith-Root LR-24
Water Quality: He	oriba U-10	Transparency:	



FSS0305A015.jpg

FSS0305A016.jpg

FSS0305A017.jpg

Station Info					
Observers: Joe Buckwalter, John W	Vells, Jim Lazar			Date/Time:	08/13/2003 5:38 PM
StationLatitudeLongituCoordinates62.84628-148.235		Sample Coordinates	Latitude 62.84628	Longitude -148.23525	
Elevation NED (m)(ft): 508 1667					
Coordinate Determination Method	: Non-Differential	GPS Field Me	asurement	Datum: NAD83	
USGS Quadrangle: Talkeetna Mts I	D-3	Legal Descrip	tion (MTRS)	: S032N006E24	
Waterbody Name:					
Anadromous Waters Catalog Numl					
Geographic Comments: Left-bank	tributary to Watana	Creek			
Visit Comments:					
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 9.50 DO (mg/	L): 11.54 DO ((0/_)•	Conductivity	γ (μS/cm): 255	pH: 7.64
Water Color: Clear	Turbidity (NTU		•	ocity (m/s)(ft/s):	F 227, 1001
Water Color: Clear			•	a ,	P
Water Color: Clear		() : 1.00]	•	a ,	
Water Color: Clear Stream Channel	Turbidity (NTU): 1.00 7	•	a ,	
Water Color: Clear Stream Channel Stream Gradient (%): 2 Catchment Area(sq. km): 23	Turbidity (NTU Entrenchment:	:	Thalweg Velo	a ,	
Water Color: Clear Stream Channel Stream Gradient (%): 2 Catchment Area(sq. km): 23	Turbidity (NTU Entrenchment: Embeddedness	: tted D	Thalweg Velo	ocity (m/s)(ft/s):	
Water Color: Clear Stream Channel Stream Gradient (%): 2 Catchment Area(sq. km): 23 Channel Dimensions (m): Bank	Turbidity (NTU Entrenchment: Embeddedness): 1.00 7 : : tted Do .0 Subdon	Chalweg Velo ominant Sub ninant Subst	strate: Boulder	

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	3	Closed Tall Willow Shrub	3
5 - 10	Closed White Spruce Forest	4	Closed White Spruce Forest	20
10 - 20	Closed White Spruce Forest	4	Closed White Spruce Forest	20
20 - 30	Closed White Spruce Forest	20	Closed White Spruce Forest	20

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 126 Max: 145 **Mean:** 135 Median: 135 Sampling Method (No. of fish): PEF (2) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 63 Total Fish Count: 1 Fish Measured: 1 Max: 63 **Mean:** 63 Median: 63 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity: Horiba U-10	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



FSS0305A019.jpg

FSS0305A020.jpg

FSS0305A021.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/13/2003 2:52 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.85316 -148.55460 Coordinates -148.55460 62.85316 Elevation NED (m)(ft): 636 2087 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-4 Legal Description (MTRS): S032N005E20 Waterbody Name: Tsusena Creek **Anadromous Waters Catalog Number:** Geographic Comments: Waterfalls. Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Total Fish Count:** 0 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: Turbidity: Electrofisher:** Water Quality: **Transparency:**

FSS0305A010.jpg



Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/13/2003 3:45 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.83625 -148.47088 Coordinates 62.83625 -148.47088 Elevation NED (m)(ft): 594 1949 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-3 Legal Description (MTRS): S032N005E26 Waterbody Name: Deadman Creek **Anadromous Waters Catalog Number:** Geographic Comments: Impassable waterfalls. Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Embeddedness: Catchment Area(sq. km): Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** No Fish Found

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

FSS0305A014.jpg



Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Station Latitude Longitude Coordinates 62,76548 -147.94932 Coordinates 62,76548 -147.94932 Elevation NED (m)(ft): 577 1893 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeema Mts D-2 Legal Description (MTRS): S031N008E22 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Visit Comments: Wildlife Comments: Width, depth estimated. Wildlife Comments: Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Subdominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Coobble Thalweg Depth					
Station Latitude Longitude Coordinates 62.76548 -147.94932 Coordinates 62.76548 -147.94932 Elevation NED (m)(ft): 577 1893 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-2 Legal Description (MTRS): S031N008E22 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Visit Comments: Visit Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Cathment Area(sq. km): 1042 Stream Gradient (%): 2 Entrenchment: Cool Subdominant Substrate 1: Cobble Mith 20.0 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks.	Station Info				
Coordinates 62.76548 -147.94932 Coordinates 62.76548 -147.94932 Elevation NED (m)(ft): 577 1893 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-2 Legal Description (MTRS): S031N008E22 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Widtife Comments: Water Temp (C): 10.40 D0 (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Widt 20.0 Subdominant Substrate 1: Coble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) <td< th=""><th>Observers: Joe Buckwalter, John Wells, Jim Lazar</th><th></th><th></th><th>Date/Time:</th><th>08/14/2003 10:00 AM</th></td<>	Observers: Joe Buckwalter, John Wells, Jim Lazar			Date/Time:	08/14/2003 10:00 AM
Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-2 Legal Description (MTRS): S031N008E22 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Visit Comments: Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks.		-		0	
USGS Quadrangle: Talkeetna Mts D-2 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	Elevation NED (m)(ft): 577 1893				
Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks.	Coordinate Determination Method: Non-Different	ial GPS Field Me	easurement	Datum: NAD83	3
Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	USGS Quadrangle: Talkeetna Mts D-2	Legal Descrip	tion (MTRS	: S031N008E22	
Geographic Comments: Visit Comments: Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Water Quality \ Stream Flow Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth No.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks.	Waterbody Name: Kosina Creek				
Visit Comments: Stream not wadeable. Width, depth estimated. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	0				
Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)					
Water Quality \ Stream Flow Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	Visit Comments: Stream not wadeable. Width, depth	estimated.			
Water Temp (C): 10.40 DO (mg/L): 10.85 DO (%): Conductivity (µS/cm): 73 pH: 7.38 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Coble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	Wildlife Comments:				
Stream Gradient (%): 2 Entrenchment: Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Stable banks.		. ,			рН: 7.38
Catchment Area(sq. km): 1042 Embeddedness: Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	Stream Channel				
Width 20.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)					
Thalweg Depth 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	Channel Dimensions (m): Bankfull OHW V	Vetted D	ominant Sub	strate: Boulder	
 Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Ver stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992) 	Width	20.0 Subdo	ninant Subst	rate 1: Cobble	
stable plan and profile. Stable banks. Riparian Vegetation Communities (Viereck et al. 1992)	Thalweg Depth	0.70 Subdo	ninant Subst	rate 2: Sand/Silt/C	Clay (legacy)
		gradient, riffle do	minated chan	nel, with infrequer	tly spaced pools. Very
Dist. from Canony Canony	Riparian Vegetation Communities (Vierec	k et al. 1992)			
	Dist. from	Canopy			Canopy

Dist. from		Canopy		Canopy
Bank (m)	Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Alder Shrub	3	Closed Tall Alder Shrub	3
10 - 20	Open Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	10
20 - 30	Open Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	10

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Arctic grayling	Life Sta	ige: juvenile	Life H	listory: Resid	dent	
Total Fish Count: 2 Sampling Method (No. o		Fork Lengths (mm)	Min: 61	Max: 84	Mean: 72	Median: 72
Comments:						
Species: Chinook salmon	Life Sta	ige: juvenile	Life H	listory: Anac	lromous	
Total Fish Count: 1 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 73	Max: 73	Mean: 73	Median: 73
Species: slimy sculpin	Life Sta	ige: adult	Life H	istory: Resid	dent	
Total Fish Count: 1 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 71	Max: 71	Mean: 71	Median: 71
Species: slimy sculpin	Life Sta	ige: juvenile	Life H	listory: Resid	dent	
Total Fish Count: 3 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 20	Max: 27	Mean: 22	Median: 23

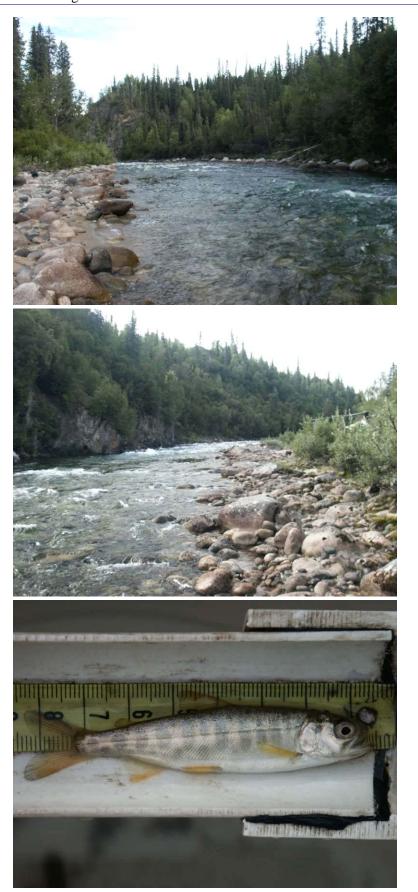
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Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths: Visual estimate Channel Widths: Visual estimate Electrofisher: Smith-Root LR-24 Transparency:

FSS0306A001.jpg



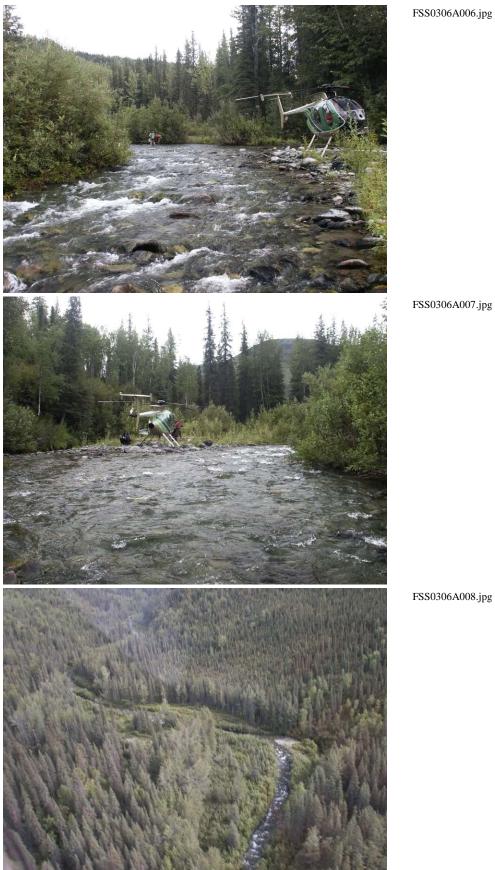
FSS0306A002.jpg

FSS0306A004.jpg



FSS0306A005.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/14/2003 11:30 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.78032 -147.87877 Coordinates 62.78032 -147.87877 Elevation NED (m)(ft): 548 1798 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-2 Legal Description (MTRS): S031N008E13 Waterbody Name: Jay Creek Anadromous Waters Catalog Number: **Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.40 DO (mg/L): 12.10 DO (%): Conductivity (µS/cm): 133 **pH:** 7.59 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 0.91 2.98 **Stream Channel** Stream Gradient (%): 2.5 **Entrenchment:** Catchment Area(sq. km): 169 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble 10.3 9.6 Width Subdominant Substrate 1: Boulder 0.40 **Thalweg Depth** Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 3 3 0 - 5 Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Balsam Poplar-White Spruce Forest 25 Closed Tall Willow Shrub 3 5 - 10 10 - 20 Closed Balsam Poplar-White Spruce Forest 25 Open White Spruce Forest 4 25 20 - 30 Closed Balsam Poplar-White Spruce Forest Open White Spruce Forest 4 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 3 Fish Measured: 1 Fork Lengths (mm) Min: 83 Max: 83 Mean: 83 Median: 83 Sampling Method (No. of fish): PEF (1) VOG (2) Comments: Average F.L. of additional fish was about 70 mm. Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



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Station Info

Station Info		
Observers: Joe Buckwalter, John Wells, Jim I	Lazar Date/Time: 08/14/2003 2:1	2 PM
StationLatitudeLongitudeCoordinates62.75510-147.72154Elevation NED (m)(ft):5391768Coordinate Determination Method:Non-DifUSGS Quadrangle:Talkeetna Mts D-2Waterbody Name:Susitna River	Sample CoordinatesLatitude 62.75510Longitude -147.72154fferential GPS Field Measurement Legal Description (MTRS):Datum: NAD83 S031N009E23	
Anadromous Waters Catalog Number:		
Geographic Comments: Susitna River and right	ht bank side channel.	
measured in side channel. M	stimated - main channel only. Water quality parameters entered above v fain channel: temperature (C) 8.5, pH 7.66, conductivity 155, turbidity 0.0. 11.69, color - high glacial turbidity. Stage - medium. Substrate: col	999
Wildlife Comments: Major caribou migration	trails.	
Water Quality \ Stream Flow		
Water Temp (C): 11.70DO (mg/L): 11.10Water Color: ClearTurbidi	DO (%):Conductivity (μS/cm): 220pH: 7.56ity (NTU):Thalweg Velocity (m/s)(ft/s):	
Stream Channel		
	nchment: Idedness:	
Channel Dimensions (m): Bankfull OH	W Wetted Dominant Substrate: Sand/Silt/Clay (legacy)	
Width	100.0 Subdominant Substrate 1: Cobble	
Thalweg Depth Bosten Class: C5 Low gradient meandering p	Subdominant Substrate 2: Gravel point-bar, riffle/pool, alluvial channels with broad, well-defined floodpl	aine
Riparian Vegetation Communities (Vi		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>		anopy eight(m)
0 - 5 Closed Low Willow Shrub	2 Closed Low Willow Shrub	2
5 - 10 Closed Low Willow Shrub	2 Closed Low Willow Shrub	2
10 - 20 Closed Tall Alder Shrub	4 Closed Tall Alder Shrub	3
20 - 30 Closed Spruce-Paper Birch Forest	15 Closed Spruce-Paper Birch Forest	20
Key To Fish Sampling Methods		
(PEF) Backpack Electrofisher	(VOG) Visual Observation, Ground	
Total Fish Count:20Fish Measured:10Sampling Method (No. of fish):PEF (10) VCComments:Average F.L. of additional fish wa	OG (10) as about 70 mm. tage: juvenile Life History: Resident	an: 97
Species: Arctic graylingLife StTotal Fish Count: 20Fish Measured: 10Sampling Method (No. of fish): PEF (10) VCComments: Average F.L. of additional fish watSpecies: longnose suckerLife St	 Fork Lengths (mm) Min: 62 Max: 133 Mean: 74 Medi OG (10) as about 70 mm. tage: juvenile Life History: Resident Fork Lengths (mm) Min: 32 Max: 115 Mean: 64 Medi OG (20) 	
Species: Arctic graylingLife StTotal Fish Count: 20Fish Measured: 10Sampling Method (No. of fish): PEF (10) VCComments: Average F.L. of additional fish wasSpecies: longnose suckerLife StTotal Fish Count: 23Fish Measured: 3Sampling Method (No. of fish): PEF (3) VOComments: F.L. of additional fish ranged from) Fork Lengths (mm) Min: 62 Max: 133 Mean: 74 Medi OG (10) as about 70 mm. tage: juvenile Life History: Resident Fork Lengths (mm) Min: 32 Max: 115 Mean: 64 Medi OG (20) n about 50 to 120 mm. tage: adult Life History: Resident 	

Appendix K39.–Page 2 of 4. Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 3 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOG (3) Comments: Average F.L. was about 50 mm. Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 35 Max: 35 **Mean:** 35 Median: 35 Sampling Method (No. of fish): PEF (1) **Comments:** Species: whitefish-unspecified Life Stage: juvenile Life History: Resident **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 51 Max: 54 **Mean: 52** Median: 52 Sampling Method (No. of fish): PEF (4) **Comments:** Instruments Stream Gradient: handheld optical clinometer **Channel Depths:**

Stream Gradient:handheld optical clinometerChannel Depths:Stream Velocity:Price pygmy meterChannel Widths:Visual estimateTurbidity:Electrofisher:Smith-Root LR-24Water Quality:Horiba U-10Transparency:

FSS0306A010.jpg



FSS0306A011.jpg

FSS0306A012.jpg



FSS0306A014.jpg

Station Info		
Observers: Joe Buckwalter, John Wells, Jim La	zar Date/Time: 08/14/2	003 3:30 PM
Station Latitude Longitude Coordinates 62.62784 -147.45495	SampleLatitudeLongitudeCoordinates62.62784-147.45495	
Elevation NED (m)(ft): 690 2264		
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna Mts C-1 Waterbody Name: Goose Creek Anadromous Waters Catalog Number: Geographic Comments:	erential GPS Field Measurement Datum: NAD83 Legal Description (MTRS): S029N011E06	
Visit Comments: Algae covers substrate.		
Wildlife Comments:		
Water Quality \ Stream Flow		
Water Temp (C): 11.10DO (mg/L): 10.99Water Color: ClearTurbidity	DO (%): Conductivity (μS/cm): 75 pH: 7. γ (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): Phi (M/s)(ft/s):	55
Stream Channel		
Stream Gradient (%): 2EntrenclCatchment Area(sq. km): 262Embedded		
Channel Dimensions (m): Bankfull OHW		
Width15.0Thalweg Depth	14.7Subdominant Substrate 1: Cobble0.60Subdominant Substrate 2: Gravel	
Rosgen Class: B2 Moderately entrenched, moder stable plan and profile. Stable bar	ate gradient, riffle dominated channel, with infrequently space	ed pools. Very
Riparian Vegetation Communities (Vie	reck et al. 1992)	
Dist. from	Canopy	Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m) <u>Right Bank Vegetation Type</u>	Height(m)
0 - 5 Closed Tall Willow Shrub5 - 10 Closed Tall Willow Shrub	 Closed Tall Willow Shrub Closed White Spruce Forest 	2 20
10 - 20 Closed Tall Willow Shrub	2 Closed White Spruce Forest	20
20 - 30 Open White Spruce Forest	15 Closed White Spruce Forest	20
Key To Fish Sampling Methods	-	
(PEF) Backpack Electrofisher	(VOG) Visual Observation, Ground	
Fish ObservationsSpecies: Arctic graylingLife Stap	ge: juvenile Life History: Resident	
Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments:	Fork Lengths (mm) Min: 72 Max: 72 Mean: 72	Median: 72
Species: slimy sculpinLife StagTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):PEF (1)Comments:	ge: adult Life History: Resident Fork Lengths (mm) Min: 74 Max: 74 Mean: 74	Median: 74
Species: slimy sculpinLife StagTotal Fish Count:15Fish Measured:Sampling Method (No. of fish):VOG (15)Comments:Average F.L. was about 50 mm.	ge: juvenile/adult Life History: Resident Fork Lengths (mm) Min: Max: Mean:	Median:
Species: slimy sculpinLife StateTotal Fish Count:4Fish Measured:4Sampling Method (No. of fish):PEF (4)	ge: juvenileLife History: ResidentFork Lengths (mm)Min: 21Max: 33Mean: 24	Median: 27

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths:graduated wading rodChannel Widths:measuring tapeElectrofisher:Smith-Root LR-24Transparency:

FSS0306A016.jpg



FSS0306A017.jpg

Station Info				
Observers: Joe Buckwalter, John Wells, Jim La	Izar		Date/Time:	08/14/2003 4:54 PM
StationLatitudeLongitudeCoordinates62.61765-147.38179	Sample Coordinates	Latitude 62.61765	Longitude -147.38179	
Elevation NED (m)(ft): 681 2234			-	
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna Mts C-1			Datum: NAD83 : S029N011E10	
Waterbody Name: Oshetna River	Legal Descrip		. 50291011210	
Anadromous Waters Catalog Number:				
Geographic Comments: Station located at left b				
Visit Comments: All fish (except 1 grayling) col channel. Main channel: Condu substrate boulder, gravel, cobb velocity - fast.	uctivity 146; turbidity	35; D.O. 10.	97; temperature © 1	0.4; pH 7.57;
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 6.80 DO (mg/L): 11.28		-	γ (μS/cm): 744	pH: 6.97
Water Color: Clear Turbidity	v (NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%):1Entrencl				
Catchment Area(sq. km): 1440 Embedd			((D 1)	
Channel Dimensions (m): Bankfull OHW Width			strate: Boulder rate 1: Cobble	
Thalweg Depth			rate 2: Gravel	
Rosgen Class: C2 Low gradient, meandering, por	int-bar, riffle/pool, all	uvial channel	s with broad, well-c	lefined floodplains.
Riparian Vegetation Communities (Vie	reck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>I</u>	Right Bank V	egetation Type	Canopy Height(m)
	Height(m)	Right Bank V Closed Tall W		1.
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m) <u>I</u> 2 (Closed Tall W		Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub	Height(m) <u>1</u> 2 (20 (Closed Tall W Closed White	illow Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest	Height(m) [2 (20 (20 (Closed Tall W Closed White Closed White	fillow Shrub Spruce Forest	Height(m) 2 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce Forest	Height(m) [2 (20 (20 (Closed Tall W Closed White Closed White	'illow Shrub Spruce Forest Spruce Forest	Height(m) 2 10 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce Forest	Height(m) [2 (20 (20 (20 (Closed Tall W Closed White Closed White Closed White	'illow Shrub Spruce Forest Spruce Forest	Height(m) 2 10 10
Bank (m)Left Bank Vegetation Type0-5Open Tall Alder-Willow Shrub5-10Closed White Spruce Forest10-20Closed White Spruce Forest20-30Closed White Spruce ForestKey To Fish Sampling Methods(PEF)Backpack Electrofisher	Height(m) [2 (20 (20 (20 (Closed Tall W Closed White Closed White Closed White	fillow Shrub Spruce Forest Spruce Forest Spruce Forest	Height(m) 2 10 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife State	Height(m) [2 (20 (20 (20 (20 (VOG) ge: juvenile	Closed Tall W Closed White Closed White Closed White Visual Obse Life His	Tillow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground tory: Resident	Height(m) 2 10 10 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count: 7Fish Measured: 7	Height(m) [2 (20 (20 (20 (20 (VOG)	Closed Tall W Closed White Closed White Closed White Visual Obse Life His	fillow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground	Height(m) 2 10 10 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife State	Height(m) [2 (20 (20 (20 (20 (VOG) ge: juvenile	Closed Tall W Closed White Closed White Closed White Visual Obse Life His	Tillow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground tory: Resident	Height(m) 2 10 10 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count:7Fish Measured:7Sampling Method (No. of fish):PEF (7)Comments:	Height(m) [2 (20 (20 (20 (20 (VOG) ge: juvenile	Closed Tall W Closed White Closed White Visual Obse Life His Min: 48	Tillow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground tory: Resident	Height(m) 2 10 10 10
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count: 7Fish Measured: 7Sampling Method (No. of fish): PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count: 7Fish Measured: 7Sampling Method (No. of fish): PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count: 2Fish Measured:	Height(m) I 2 (20 (20 (20 (20 (VOG) ge: juvenile Fork Lengths (mm)	Closed Tall W Closed White Closed White Visual Obse Life His Min: 48	fillow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground tory: Resident Max: 72 Mean	Height(m) 2 10 10 10 10 10 n: 59 Median: 60
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count: 7Fish Measured: 7Sampling Method (No. of fish): PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count: 7Fish Measured: 7Sampling Method (No. of fish): PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count: 2Fish Measured:Sampling Method (No. of fish): VOG (2)	Height(m) I 2 (20 (20 (20 (20 (20 ((VOG) (ge: juvenile Fork Lengths (mm) ge: juvenile (Closed Tall W Closed White Closed White Visual Obse Life His Min: 48	 'illow Shrub Spruce Forest Spruce Forest spruce Forest rvation, Ground tory: Resident Max: 72 Mean tory: Unknown 	Height(m) 2 10 10 10 10 10 n: 59 Median: 60
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count:7Fish Measured:7Sampling Method (No. of fish):PEF (7)Comments:2Species: salmonid-unspecifiedLife StagTotal Fish Count:2Sampling Method (No. of fish):VOG (2)Comments:Average F.L. was about 70 mm.	Height(m) I 2 (20 (20 (20 (20 (20 (VOG) ge: juvenile Fork Lengths (mm) ge: juvenile Fork Lengths (mm)	Closed Tall W Closed White Closed White Closed White Visual Obse Life His Min: 48 Life His Min:	fillow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground tory: Resident Max: 72 Mean tory: Unknown Max: Mean	Height(m) 2 10 10 10 10 10 10 n: 59 Median: 60 n: Median:
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count:7Fish Measured:7Sampling Method (No. of fish):PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count:2Fish Measured:Sampling Method (No. of fish):VOG (2)Comments:Average F.L. was about 70 mm.	Height(m) I 2 (20 (20 (20 (20 (20 ((VOG) (ge: juvenile Fork Lengths (mm) ge: juvenile (Closed Tall W Closed White Closed White Closed White Visual Obse Life His Min: 48 Life His Min:	 'illow Shrub Spruce Forest Spruce Forest spruce Forest rvation, Ground tory: Resident Max: 72 Mean tory: Unknown 	Height(m) 2 10 10 10 10 10 10 10 n: 59 Median: 60 n: Median:
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Closed White Spruce Forest10 - 20Closed White Spruce Forest20 - 30Closed White Spruce Forest20 - 30Closed White Spruce ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StagTotal Fish Count: 7Fish Measured: 7Sampling Method (No. of fish): PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count: 2Fish Measured: 7Sampling Method (No. of fish): PEF (7)Comments:Species: salmonid-unspecifiedLife StagTotal Fish Count: 2Fish Measured:Sampling Method (No. of fish): VOG (2)Comments: Average F.L. was about 70 mm.Species: Chinook salmonLife Stag	Height(m) <u>I</u> 2 (20 (20 (20 (20 (20 (VOG) ge: juvenile Fork Lengths (mm) ge: juvenile Fork Lengths (mm)	Closed Tall W Closed White Closed White Closed White Visual Obse Life His Min: 48 Life His Min:	 illow Shrub Spruce Forest Spruce Forest Spruce Forest rvation, Ground tory: Resident Max: 72 Mean tory: Unknown Max: Mean tory: Anadromous 	Height(m) 2 10 10 10 10 10 10 10 n: 59 Median: 60 n: Median:

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 52 Max: 52 **Mean: 52** Median: 52 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life History: Resident Life Stage: juvenile Total Fish Count: 16 Fish Measured: 4 Fork Lengths (mm) Min: 21 Max: 25 **Mean:** 23 Median: 23 Sampling Method (No. of fish): PEF (4) VOG (12) Comments: Average F.L. of additional fish was about 40 mm. Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



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FSS0306A021.jpg



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FSS0306A023.jpg

FSS0306A024.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/15/2003 10:39 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62,54810 -147,13653 Coordinates 62.54810 -147.13653 Elevation NED (m)(ft): 767 2516 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-1 Legal Description (MTRS): S028N012E01 Waterbody Name: Sanona Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 9.50 DO (mg/L): 10.62 DO (%): Conductivity (µS/cm): 253 **pH:** 7.16 Water Color: Clear Turbidity (NTU): 1.00 Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): 417 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel 14.6 Width 10.4 Subdominant Substrate 1: Sand/Silt/Clay (legacy) 0.50 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Open White Spruce Forest 25 Unvegetated 5 - 10 Open White Spruce Forest 25 Closed Tall Willow Shrub 2 2 10 - 20 Open White Spruce Forest 25 Closed Tall Willow Shrub 20 - 30 Open White Spruce Forest 25 Closed Tall Willow Shrub 2 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Life Stage: juvenile Species: Arctic grayling Life History: Resident Total Fish Count: 20 Fish Measured: 1 Fork Lengths (mm) Min: 62 Max: 62 Median: 62 **Mean:** 62 Sampling Method (No. of fish): PEF (1) VOG (19) Comments: F.L. of additional fish ranged from about 75 to 140 mm. **Species:** slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: **Total Fish Count: 2 Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (2) Comments: Average F.L. was about 50 mm. **Instruments** Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape Turbidity: Horiba U-10 Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



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FSS0307A004.jpg



Station Info								
Observers: Joe	Buckwalter, John We	ells, Jim Lazar			Date/	Fime: 08/	15/2003 12:	20 PM
Coordinates 62	atitude Longitude 2.67477 -147.05419 -1000 -716 2240		Sample Coordinate	Latitude s 62.67477	Longitude -147.05419			
USGS Quadrang Waterbody Namo Anadromous Wa Geographic Com Visit Comments:	rmination Method: de: Talkeetna Mts C- e: ters Catalog Numbe ments:	1 r:	Legal Desc	Measurement ription (MTRS	Datum: N 0: C010N01			
Water Quality	\ Stream Flow							
Water Temp (C): Water Color: Cle	: 12.60 DO (mg/L)	: 10.40 D Turbidity (N	О (%): ГU):	Conductivity Thalweg Vel	-	-	H: 7.27	
Stream Channe	el							
Stream Gradient Catchment Area		Entrenchme Embeddedne						
Channel Dimens	sions (m): Bankfu	ull OHW V	Vetted	Dominant Sub				
т	Width halweg Depth	6.0		dominant Subst dominant Subst		ble		
	Entrenched meander					denth ratio		
	tation Communi			-			<u> </u>	
				-)			~	
Dist. from Bank (m) Left]	Bank Vegetation Ty	pe	Canopy Height(m)	Right Bank V	egetation T	vpe		anopy eight(m)
	Tall Willow Shrub		2	Open Tall Wi				2
5 - 10 Open	White Spruce Forest		15	Open White S	pruce Fores	t		20
10 - 20 Open	White Spruce Forest		15	Open White S	pruce Fores	t		20
20 - 30 Open	White Spruce Forest		15	Open White S	pruce Fores	t		20
Key To Fish Sa	mpling Methods	5						
(PEF) Backpack	Electrofisher		(V0	G) Visual Obse	rvation, Gro	ound		
Fish Observati								
Species: Arctic gr		Life Stage: j sured: For		Life His m) Min:	story: Resid	lent Mean:	Media	an:
Total Fish Coun Sampling Metho	<pre>it: 1 Fish Meas od (No. of fish): VC . was about 250 mm.</pre>		K Lengths (in					
Total Fish Coun Sampling Metho Comments: F.L. Species: Arctic gr	od (No. of fish): VC . was about 250 mm. rayling	OG (1) Life Stage: j	uvenile		story: Resid			
Total Fish Coun Sampling Metho Comments: F.L Species: Arctic gr Total Fish Coun Sampling Metho	od (No. of fish): VC . was about 250 mm. rayling	OG (1) Life Stage: j sured: For OG (5)			story: Resid Max:	lent Mean:	Media	an:
Total Fish Coun Sampling Metho Comments: F.L Species: Arctic gr Total Fish Coun Sampling Metho	od (No. of fish): VC . was about 250 mm. ayling t: 5 Fish Meas od (No. of fish): VC erage F.L. was about 4	OG (1) Life Stage: j sured: For OG (5)	uvenile 'k Lengths (m	m) Min:	-	Mean:	Media	an:

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

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FSS0307A008.jpg

Appendix R++. Station 1 5565677165.			
Station Info			
Observers: Joe Buckwalter, John Wells, Jim L	azar	Date/Time: 08/15	/2003 1:02 PM
StationLatitudeLongitudeCoordinates62.67445-147.05508	Sample Coordinates	Latitude Longitude 62.67445 -147.05508	
Elevation NED (m)(ft): 716 2349 Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna Mts C-1 Waterbody Name: Tyone River Anadromous Waters Catalog Number: Geographic Comments: At confluence with 07 Visit Comments:	Legal Descrij	easurement Datum: NAD83 btion (MTRS): C010N010W02	
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 13.00 DO (mg/L): 10.70	DO (%): y (NTU):	Conductivity (µS/cm): 206 pH: Thalweg Velocity (m/s)(ft/s):	7.43
Stream Channel			
Stream Gradient (%): 0.5EntrendCatchment Area(sq. km): 2348Embedde			
Channel Dimensions (m): Bankfull OHV	W Wetted I	Dominant Substrate: Gravel	
Width Thalweg Depth		minant Substrate 1: Cobble minant Substrate 2: Sand/Silt/Clay (le	(maar)
Rosgen Class: C4 Low gradient, meandering, po			
Riparian Vegetation Communities (Vie	-	·····	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5 Closed Tall Willow Shrub	_	Closed Tall Willow Shrub	2
5 - 10 Open White Spruce Forest		Open White Spruce Forest	20
10 - 20 Open White Spruce Forest		Open White Spruce Forest	20
20 - 30 Open White Spruce Forest		Open White Spruce Forest	20
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher	(VOG)	Visual Observation, Ground	
Fish Observations			
Species: burbotLife StaTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):PEF (1)Comments:	age: juvenile Fork Lengths (mm	Life History: Resident) Min: 73 Max: 73 Mean: 73	Median: 73
Species: Arctic graylingLife StateTotal Fish Count:1Fish Measured:Sampling Method (No. of fish):VOG (1)Comments:F.L. was about 90 mm.	age: juvenile Fork Lengths (mm	Life History: Resident) Min: Max: Mean:	Median:
Species: slimy sculpinLife StateTotal Fish Count:1Fish Measured:Sampling Method (No. of fish):VOG (1)	age: juvenile/adult Fork Lengths (mm	Life History: Resident) Min: Max: Mean:	Median:

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0307A010.jpg

FSS0307A011.jpg



281

Station Info	
Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/15/20	003 2:30 PM
StationLatitudeLongitudeSampleLatitudeLongitudeCoordinates62.50392-147.47704Coordinates62.50392-147.47704	
Elevation NED (m)(ft): 823 2700 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-1 Legal Description (MTRS): S028N011E19 Waterbody Name: Oshetna River Anadromous Waters Catalog Number: Geographic Comments: Reach located immediately upstream of confluence with Black River (glacial origin).	
Visit Comments: Unwadeable - width, depth estimated.	
Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C): 9.80 DO (mg/L): 11.31 DO (%): Conductivity (μS/cm): 152 pH: 7.4 Water Color: Clear Turbidity (NTU): 1.00 Thalweg Velocity (m/s)(ft/s): PH: 7.4	42
Stream Channel	
Stream Gradient (%):0.5Entrenchment:Catchment Area(sq. km):894Embeddedness:	
Channel Dimensions (m):BankfullOHWWettedDominant Substrate: GravelWidth20.0Subdominant Substrate 1: CobbleThalweg Depth0.70Subdominant Substrate 2:	
Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined f	loodplains.
Riparian Vegetation Communities (Viereck et al. 1992)	1
Dist. fromCanopyBank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type	Canopy Height(m)
0-5 Closed Tall Willow Shrub 2 Closed Tall Willow Shrub	2
5 - 10 Closed Tall Willow Shrub 2 Closed Tall Willow Shrub	2
10 - 20Closed Tall Willow Shrub2Closed Tall Willow Shrub	2
20 - 30Open White Spruce Forest15Closed Tall Willow Shrub	2
Key To Fish Sampling Methods	
(PEF) Backpack Electrofisher (VOG) Visual Observation, Ground	
Fish Observations Species: Arctic grayling Life Stage: juvenile Life History: Resident Total Fish Count: 11 Fish Measured: 6 Fork Lengths (mm) Min: 54 Max: 72 Mean: 59 Sampling Method (No. of fish): PEF (6) VOG (5) Comments: Average F.L. of additional fish was about 80 mm.	Median: 63
Species: slimy sculpinLife Stage: adultLife History: ResidentTotal Fish Count:1Fish Measured:1Fork Lengths (mm)Min:72Mean:72Sampling Method (No. of fish):PEF (1)Comments:	Median: 72
Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count:17Fish Measured: 2Fork Lengths (mm)Min: 53Max: 65Mean: 59Sampling Method (No. of fish):PEF (2) VOG (15)Comments:Average F.L. of additional fish was about 50 mm.	Median: 59
Species: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:4Fish Measured:4Fork Lengths (mm)Min:34Max:43Mean:38Sampling Method (No. of fish):PEF (4)Comments:Comments:Comments:Comments:Comments:	Median: 38

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths: Visual estimate Channel Widths: Visual estimate Electrofisher: Smith-Root LR-24 Transparency:



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FSS0307A013.jpg

FSS0307A014.jpg

Station Info				
Observers: Joe Buckwalter, John Wells, Jim Lazar			Date/Time:	08/15/2003 4:30 PM
StationLatitudeLongitudeCoordinates62.69465-147.99674	Sample Coordinates	Latitude 62.69465	Longitude -147.99674	
Elevation NED (m)(ft): 778 2552				
Coordinate Determination Method: Non-Differer			Datum: NAD83	3
USGS Quadrangle: Talkeetna Mts C-2	Legal Descrip	tion (MTRS): S030N008E17	
Waterbody Name: Tsisi Creek				
Anadromous Waters Catalog Number:		1 . 1 . 1		
Geographic Comments: Left bank tributary of Kos	ina Creek. Station	located at do	wnstream end of re	each.
Visit Comments: Not wadeable - width, depth estim	nated.			
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 12.10 DO (mg/L): 10.72 D	OO (%):	Conductivit	y (µS/cm): 93	pH: 7.44
Water Color: Clear Turbidity (N	TU):	Thalweg Vel	ocity (m/s)(ft/s):	-
Stream Channel				
Stream Gradient (%): 4 Entrenchmo	ent:			
Catchment Area(sq. km): 224 Embeddedr	iess:			
Channel Dimensions (m): Bankfull OHW	Wetted D	ominant Sul	strate: Boulder	
Width			trate 1: Cobble	
Thalweg Depth			trate 2: Gravel	
0				
Rosgen Class: A2 Steep, entrenched, cascading, step	p/pool streams. Vo	ery stable.		
Riparian Vegetation Communities (Viered	rk et al. 1992)			

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Low Willow Shrub	1	Closed Low Willow Shrub	1
5 - 10	Closed Low Shrub Birch	1	Closed Low Shrub Birch	1
10 - 20	Closed Low Shrub Birch	1	Closed Low Shrub Birch	1
20 - 30	Closed Low Shrub Birch	1	Closed Low Shrub Birch	1

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: Visual estimate
Stream Velocity: Price pygmy meter	Channel Widths: Visual estimate
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:

FSS0307A018.jpg



Sampling Method (No. of fish): PEF (1)

Comments:

Station Info				
Observers: Joe Buckwalter, John Wells, Jim Lazar		D	ate/Time: 08/15/2	2003 5:01 PM
Station Latitude Longitude Coordinates 62.69379 -147.99668	Sample Coordinates	Latitude Longi 62.69379 -147.99		
 Elevation NED (m)(ft): 781 2562 Coordinate Determination Method: Non-Differen USGS Quadrangle: Talkeetna Mts C-2 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: Geographic Comments: Mainstem reach immediate 	Legal Descrip	ption (MTRS): S0301	n: NAD83 N008E17	
Visit Comments: Unwadeable - width, depth estimation	ited			
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 12.70DO (mg/L): 9.89DWater Color: ClearTurbidity (N	O (%): TU):	Conductivity (µS/cn Thalweg Velocity (m	-	7.30
Stream Channel				
Stream Gradient (%): 2EntrenchmeCatchment Area(sq. km): 752Embeddedn				
		Dominant Substrate:		
Width Thalweg Depth		minant Substrate 1: (minant Substrate 2: (
Rosgen Class: B2 Moderately entrenched, moderate stable plan and profile. Stable banks.	-	ominated channel, with	infrequently space	eed pools. Very
Riparian Vegetation Communities (Viered	ck et al. 1992)			
I O				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Right Bank Vegetation	on Type	Canopy Height(m)
Dist. from	Canopy Height(m)	Right Bank Vegetati Closed Low Willow S		
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Low Willow Shrub5 - 10Closed Low Shrub Birch	Canopy Height(m) 1		hrub	Height(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Low Willow Shrub5 - 10Closed Low Shrub Birch10 - 20Closed Low Shrub Birch	Canopy Height(m) 1 1	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi	hrub rch rch	Height(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Low Willow Shrub5 - 10Closed Low Shrub Birch10 - 20Closed Low Shrub Birch20 - 30Closed Low Shrub Birch	Canopy Height(m) 1 1	Closed Low Willow S Closed Low Shrub Bi	hrub rch rch	Height(m) 1 1
Dist. from Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Shrub Birch10-20Closed Low Shrub Birch20-30Closed Low Shrub BirchKey To Fish Sampling Methods	Canopy Height(m) 1 1	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi	hrub rch rch	Height(m) 1 1 1
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Low Willow Shrub5 - 10Closed Low Shrub Birch10 - 20Closed Low Shrub Birch20 - 30Closed Low Shrub Birch	Canopy Height(m) 1 1 1 1	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi	hrub rch rch	Height(m) 1 1 1
Dist. from Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Shrub Birch10-20Closed Low Shrub Birch20-30Closed Low Shrub BirchKey To Fish Sampling Methods	Canopy Height(m) 1 1 1 1	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi Closed Low Shrub Bi	hrub rch rch	Height(m) 1 1 1
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Low Willow Shrub 5-10 Closed Low Shrub Birch 10-20 Closed Low Shrub Birch 20-30 Closed Low Shrub Birch Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Life Stage:	Canopy Height(m)	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi Closed Low Shrub Bi) Visual Observation, Life History: F	hrub rch rch Ground	Height(m) 1 1 1
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Low Willow Shrub 5 - 10 Closed Low Shrub Birch 10 - 20 Closed Low Shrub Birch 20 - 30 Closed Low Shrub Birch Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Stage: Total Fish Count: 1 Fish Method (No. of fish): PEF (1) Comments: Species: salmonid-unspecified	Canopy Height(m)	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi (losed Low Shrub Bi) Visual Observation, Life History: R) Min: 56 Max: 5 Life History: U	hrub rch rch Ground esident 6 Mean: 56	Height(m) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Low Willow Shrub 5-10 Closed Low Shrub Birch 10-20 Closed Low Shrub Birch 20-30 Closed Low Shrub Birch 20-30 Closed Low Shrub Birch 20-30 Closed Low Shrub Birch Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Stage: Total Fish Count: 1 Fish Measured: 1 For Sampling Method (No. of fish): PEF (1) Comments: Species: salmonid-unspecified Life Stage: Total Fish Count: 3 Fish Measured: For Sampling Method (No. of fish): VOG (3) Comments: Average F.L. was about 70 mm. Species: Chinook salmon Life Stage:	Canopy Height(m)	Closed Low Willow S Closed Low Shrub Bi Closed Low Shrub Bi Closed Low Shrub Bi) Visual Observation, Life History: R) Min: 56 Max: 5 Life History: L) Min: Max:	hrub rch rch Ground esident 6 Mean: 56	Height(m) 1 1 1 1 1 1 1

Stream Gradient:	handheld optical clinometer	Channel Depths: Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths: Visual estimate
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: Ho	oriba U-10	Transparency:



FSS0307A016.jpg

FSS0307A017.jpg

FSS0307A018.jpg



Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/16/2003 10:01 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.76313 -148.51478 Coordinates 62.76313 -148.51478 Elevation NED (m)(ft): 636 2087 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-4 Legal Description (MTRS): S031N005E22 Waterbody Name: Fog Creek Anadromous Waters Catalog Number: 247-41-10200-2696 **Geographic Comments:** Visit Comments: Thalweg velocity measured at 60% of depth with Pygmy meter; 136 revolutions in 40.0 seconds. Wildlife Comments: Water Quality \ Stream Flow DO (%): Water Temp (C): 7.20 DO (mg/L): 12.30 Conductivity (µS/cm): 92 **pH:** 7.30 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 1.00 3.28 **Stream Channel** Stream Gradient (%): 1.5 **Entrenchment: Catchment Area(sq. km):** 161 **Embeddedness: Bankfull OHW** Wetted **Channel Dimensions (m):** Dominant Substrate: Cobble Width 8.9 7.6 Subdominant Substrate 1: Gravel **Thalweg Depth** 0.40 Subdominant Substrate 2: Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) Right Bank Vegetation Type Closed Tall Willow Shrub 2 0 - 5 2 Closed Tall Willow Shrub 2 20 5 - 10 Closed White Spruce Forest Closed Tall Willow Shrub 10 - 20 Closed White Spruce Forest Closed Tall Willow Shrub 2 20 20 - 30 Closed White Spruce Forest 20 Closed White Spruce Forest 8 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Resident **Total Fish Count:** 2 Fork Lengths (mm) Min: Max: **Fish Measured:** Mean: Median: Compliant Mathed (No. of figh). VOC(2)Commented Commenter Ver

Sampling Method (No. 6	of nsn): $VOG(2)$				Suspected S	pawning: res	
Comments: 1 was in spawning colors. Average F.L. was about 300 mm.							
Species: Dolly Varden	Life Sta	ge: juvenile	Life H	istory: Unkn	iown		
Total Fish Count: 15	Fish Measured: 10	Fork Lengths (mm)	Min: 41	Max: 57	Mean: 48	Median: 49	
Sampling Method (No. o	of fish): PEF (10) VO	G (5)			Suspected S	pawning: Yes	
Comments: Average F.L	. of additional fish was	about 50 mm.					

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:



FSS0308A001.jpg

FSS0308A002.jpg

FSS0308A003.jpg

Station In	nfo					
Observers	: Joe Buckwal	lter, John Wells, Jir	n Lazar		Date/Time: 03	8/16/2003 12:10 PM
Station Coordina	tes 63.06009	Longitude -147.71604	Sample Coordinat	Latitude es 63.06009	Longitude -147.71604	
Coordinat USGS Qu Waterbod Anadromo Geograph	adrangle: Heal y Name: Butte ous Waters Cat ic Comments:	n Method: Non- y A-2 Creek			Datum: NAD83 5): F021S001W27	
Wildlife C						
Water Qu	uality \ Strea	m Flow				
-	mp (C): 9.20	DO (mg/L): 12.3	4 DO (%): idity (NTU):		y (μ S/cm): 137 locity (m/s)(ft/s):	р Н: 7.50
Stream C	hannel					
	radient (%): 1 t Area(sq. km):		enchment: eddedness:			
	Dimensions (m)			Dominant Sul	bstrate: Cobble	
Chamier	. ,	Width		odominant Subs		
	Thalweg	Depth	0.60 Sul	odominant Subs	trate 2: Boulder	
Rosgen Cl	ass: F3 Entrend	ched meandering rit	ffle/pool channel on lo	w gradients with	n high width/depth rat	io.
Riparian	Vegetation (Communities (Viereck et al. 199	2)		
Dist. from	1		Canopy			Canopy
Bank (m)	Left Bank Ve	egetation Type	Height(m	n) <u>Right Bank </u>	Vegetation Type	Height(m)
0 - 5	Closed Tall W	Villow Shrub	2	Closed Tall V		2
5 - 10	Open Low Sh	rub Birch-Ericaceo	us Shrub Bog 0	Closed Tall V	Willow Shrub	2
10 - 20	Open Low Sh	rub Birch-Ericaceo	us Shrub Bog 0	Closed Tall V	Willow Shrub	2
20 - 30	Open Low Sh	rub Birch-Ericaceo	us Shrub Bog 0	Open Low Sl	nrub Birch-Ericaceous	Shrub Bog 0
Key To F	ish Sampling	g Methods				
(PEF) Bac	ckpack Electrofi	isher	(V0	OG) Visual Obs	ervation, Ground	
Total Fisl Sampling Comment	limy sculpin h Count: 1 ; Method (No. o ts:	Fish Measured: of fish): PEF (1)		nm) Min: 77	story: Resident Max: 77 Mean :	: 77 Median: 77
Total Fisl Sampling Comment	ts: Average F.L	Life Fish Measured: of fish): PEF (2) V of additional fish	/OG (2)		i story: Resident Max: 67 Mean:	: 65 Median: 65
a • 1	imy sculpin	I ifa	Stage: juvenile	Life Hi	story: Resident	

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: Visual estimate Channel Widths: Visual estimate Electrofisher: Smith-Root LR-24 Transparency:



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FSS0308A010.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/16/2003 1:54 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62,58810 -148,04649 Coordinates 62.58810 -148.04649 Elevation NED (m)(ft): 874 2867 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts C-3 Legal Description (MTRS): S029N007E24 Waterbody Name: Kosina Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.40 DO (mg/L): 10.82 DO (%): Conductivity (µS/cm): 47 **pH:** 7.32 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): 430 **Embeddedness:** Bankfull OHW Wetted Dominant Substrate: Boulder **Channel Dimensions (m):** Width 160.0 160.0 Subdominant Substrate 1: Gravel **Thalweg Depth** 0.70 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: F2 Entrenched, relatively low to moderate sinuosity, riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 1 Open Low Mixed Shrub-Sedge Tussock Open Low Mixed Shrub-Sedge Tussock Tundra 1 Tundra 5 - 10 1 Open Low Mixed Shrub-Sedge Tussock Open Low Mixed Shrub-Sedge Tussock Tundra 1 Tundra 10 - 20 Open Low Mixed Shrub-Sedge Tussock 1 Open Low Mixed Shrub-Sedge Tussock Tundra 1 Tundra 20 - 30 Open Low Mixed Shrub-Sedge Tussock 1 Open Low Mixed Shrub-Sedge Tussock Tundra 1 Tundra **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) Comments: F.L. was about 200 mm. Species: Arctic grayling Life Stage: juvenile Life History: Resident Total Fish Count: 18 Fish Measured: 6 Fork Lengths (mm) Min: 51 Max: 57 Mean: 53 Median: 54 Sampling Method (No. of fish): PEF (6) VOG (12) Comments: Average F.L. of additional fish was about 55 mm. Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 10 Fish Measured: 4 Fork Lengths (mm) Min: 53 Max: 62 Median: 57 Mean: 58 Sampling Method (No. of fish): PEF (4) VOG (6) Comments: Average F.L. of additional fish was about 50 mm.

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths: Visual estimate Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

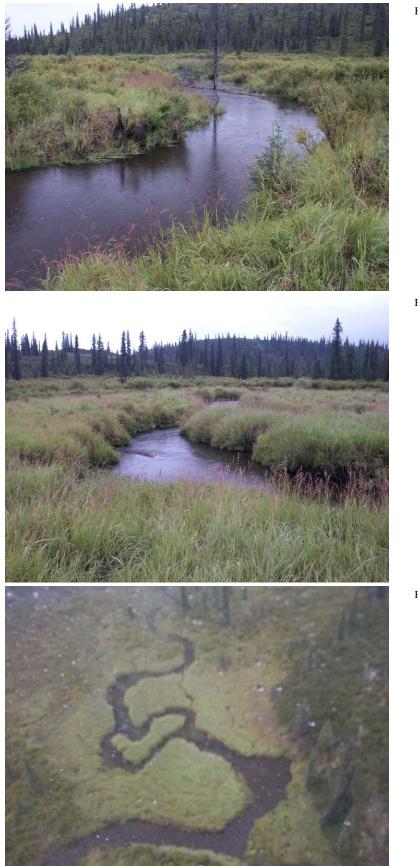


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FSS0308A013.jpg

**				
Station Info				
Observers: Joe Buckwalter, John Wells,	im Lazar		Date/Time:	08/16/2003 3:35 PM
StationLatitudeLongitudeCoordinates62.90009-148.23165	Sample Coordinates	Latitude 62.90009	Longitude -148.23165	
Elevation NED (m)(ft): 730 2395	Coordinates	02.90009	-148.23105	
Coordinate Determination Method: Non	n-Differential GPS Field M	easurement	Datum: NAD83	
USGS Quadrangle: Talkeetna Mts D-3	Legal Descrip	otion (MTRS):	S033N006E36	
Waterbody Name: Delusion Creek Anadromous Waters Catalog Number:				
Geographic Comments:				
Visit Comments: Sample reach located up	stream of a beaver pond.			
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 11.30 DO (mg/L): 10		Conductivity	-	pH: 7.30
Water Color: Muddy Tur	bidity (NTU):	Thalweg Velo	city (m/s)(ft/s):	
Stream Channel				
	trenchment: nbeddedness:			
		Oominant Subs		
Width		minant Substr		1
Thalweg Depth			ate 2: Sand/Silt/C	
Rosgen Class: E3 Low gradient, meanderin efficient and stable. High n		w width/depth	ratio and little de	position. very
Riparian Vegetation Communities	(Viereck et al. 1992)			
Riparian Vegetation Communities Dist. from				Canopy
- 0	Canopy	Right Bank V	egetation Type	Canopy Height(m)
Dist. from	Canopy Height(m)	Right Bank V Bluejoint-Herb		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) 1			Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Bluejoint-Herb	Canopy Height(m) 1 1	Bluejoint-Herb		Height(m)
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb	Canopy Height(m) 1 1 1	Bluejoint-Herb Bluejoint-Herb		Height(m) 1 1
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Bluejoint-Herb5 - 10Bluejoint-Herb10 - 20Bluejoint-Herb	Canopy Height(m) 1 1 1	Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb		Height(m) 1 1 1
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Bluejoint-Herb5 - 10Bluejoint-Herb10 - 20Bluejoint-Herb20 - 30Closed Tall Willow Shrub	Canopy Height(m) 1 1 1 2	Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb Closed Tall W		Height(m) 1 1 1
Dist. from Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub	Canopy Height(m) 1 1 1 2	Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb Closed Tall W	llow Shrub	Height(m) 1 1 1
Dist. from Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li	Canopy Height(m) 1 1 1 2 (VOG) fe Stage: juvenile/adult	Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist	illow Shrub vation, Ground ory: Resident	Height(m) 1 1 1 2
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Bluejoint-Herb 5-10 Bluejoint-Herb 10-20 Bluejoint-Herb 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measured	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm	Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist	illow Shrub vation, Ground	Height(m) 1 1 1
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measuree Sampling Method (No. of fish): PEF (4)	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm VOG (3)	Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist	illow Shrub vation, Ground ory: Resident	Height(m) 1 1 1 2
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measured Sampling Method (No. of fish): PEF (4) Comments: Average F.L. of additional fish	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm VOG (3)	Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist	illow Shrub vation, Ground ory: Resident	Height(m) 1 1 1 2
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measured Sampling Method (No. of fish): PEF (4)	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm VOG (3)	Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist	illow Shrub vation, Ground ory: Resident	Height(m) 1 1 1 2
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measured Sampling Method (No. of fish): PEF (4) Comments: Average F.L. of additional fish	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm VOG (3) h was about 55 mm.	Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist Min: 51	illow Shrub vation, Ground ory: Resident	Height(m) 1 1 2 n: 55 Median: 55
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Bluejoint-Herb 5 - 10 Bluejoint-Herb 10 - 20 Bluejoint-Herb 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measuree Sampling Method (No. of fish): PEF (4) Comments: Average F.L. of additional fis Instruments Stream Gradient: handheld optical clinor Stream Velocity: Price pygmy meter	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm VOG (3) h was about 55 mm.	Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist Min: 51	ullow Shrub vation, Ground ory: Resident Max: 59 Mea duated wading roo	Height(m) 1 1 2 n: 55 Median: 55
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Bluejoint-Herb 5-10 Bluejoint-Herb 10-20 Bluejoint-Herb 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Li Total Fish Count: 7 Fish Measurer Sampling Method (No. of fish): PEF (4) Comments: Average F.L. of additional fish Instruments Stream Gradient: handheld optical clinor	Canopy Height(m) 1 1 2 (VOG) fe Stage: juvenile/adult 1: 4 Fork Lengths (mm VOG (3) h was about 55 mm.	Bluejoint-Herb Bluejoint-Herb Bluejoint-Herb Closed Tall W Visual Obser Life Hist Min: 51	ullow Shrub vation, Ground ory: Resident Max: 59 Mea duated wading roo	Height(m) 1 1 2 n: 55 Median: 55



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FSS0308A016.jpg

Station In	fo						
Observers:	Joe Buckwalter, John W	ells, Jim Lazar			Date/T	ime: 08/18/2	003 11:12 AM
Station Coordinat	Latitude Longitud es 61.94236 -149.063		Sample Coordinates	Latitude 61.94236	Longitude -149.06318		
Coordinate USGS Qua Waterbody Anadromo Geographi	NED (m)(ft): 495 1624 • Determination Method: drangle: Anchorage D-6 • Name: Kashwitna River us Waters Catalog Numb c Comments: ments: Stream not wadeab	er:	Legal Descrij	ption (MTRS)		E03	to thalweg.
Wildlife Co	omments:						
Water Qu	ality \ Stream Flow						
	np (C): 4.70 DO (mg/I or: Glacial, High Turbidit		(%): (U): 130.00	-	y (µS/cm): 44 ocity (m/s)(ft/	pH: 7.3 /s): 1.61 5.28	30
Stream Cl	nannel						
	adient (%): 3 Area(sq. km): 121	Entrenchmen Embeddednes					
Channel I	()			Dominant Sub			
	Width Thalweg Depth			minant Subst minant Subst		le Silt/Clay (lega	ncv)
Rosgen Cla	stable plan and profile	ched, moderate g					
Riparian V	Vegetation Commun		c et al. 1992)				
Dist. from Bank (m)	Left Bank Vegetation T	vpe	Canopy Height(m)	Right Bank V	egetation Ty	<u>vpe</u>	Canopy Height(m)
0 - 5	Closed Tall Alder Shrub		3	Closed Tall A	lder Shrub		3
5 - 10	Closed Tall Alder Shrub		3	Closed Tall A	lder Shrub		3
	Closed Tall Alder Shrub			Closed Tall A			3
20 - 30	Closed Tall Alder Shrub			Closed White Poplar (Black	• •	r Birch-Balsar Forest)	n 20
Key To Fi	sh Sampling Method	ls					
(PEF) Bac	kpack Electrofisher		(VOG) Visual Obse	ervation, Grou	nd	
Sampling	olly Varden	EF (6) VOG (5)	k Lengths (mm		story: Reside Max: 250	Mean: 185	Median: 202 pawning: Yes
	Count: 2 Fish Mea Method (No. of fish): Pl		ivenile/adult k Lengths (mm		story: Unkno Max: 106	own Mean: 100	Median: 100
	Count: 3 Fish Mea Method (No. of fish): Pl		ivenile k Lengths (mm		story: Unkno Max: 51	Mean: 46	Median: 47 pawning: Yes

Appendix K52.-Page 2 of 5.

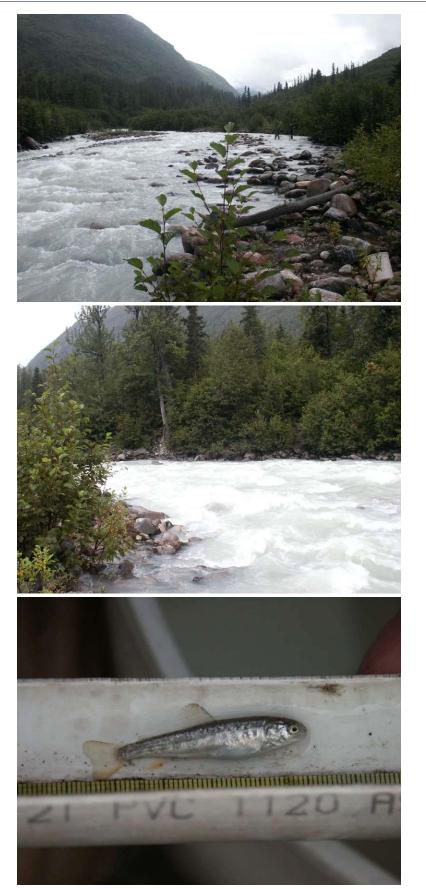
 Species: slimy sculpin
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 Fork Lengths (mm)
 Min:
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOG (1)
 VOG (1)
 VOG (1)
 VOG (1)
 VOG (1)

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths	: Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths	s: Visual estimate
Turbidity: Horiba	U-10	Electrofisher:	Smith-Root LR-24
Water Quality: He	oriba U-10	Transparency:	



FSS0309A001.jpg

FSS0309A002.jpg

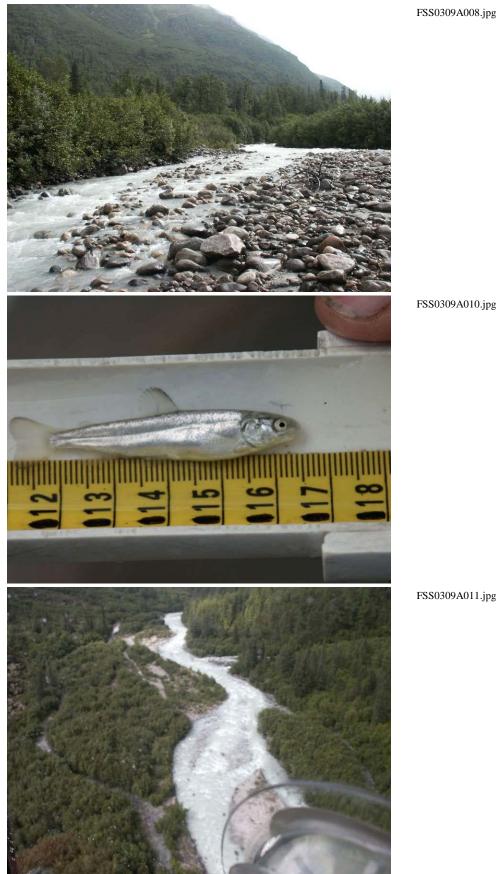
FSS0309A003.jpg



FSS0309A005.jpg

FSS0309A006.jpg

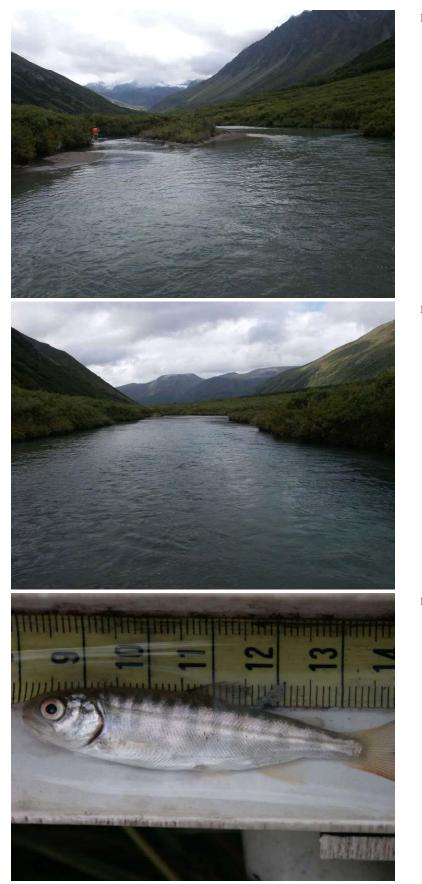
FSS0309A007.jpg



Station Info				
Observers: Joe Buckwalter, John Wells, Jim Laz	zar		Date/Time: 08	3/18/2003 1:51 PM
Station Latitude Longitude Coordinates 62.10400 -149.33403 Elevation NED (m)(ft): 774 2539	Sample Coordinates	Latitude 62.10400	Longitude -149.33403	
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna Mts A-5 Waterbody Name: Sheep Creek			Datum: NAD83 : S023N001E07	
Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 5.80DO (mg/L): 11.65Water Color: Glacial, Low TurbiditTurbidity	DO (%): (NTU):	Conductivity Thalweg Velo	(µS/cm): 15 city (m/s)(ft/s):	bH: 6.80
Stream Channel				
Stream Gradient (%): 1EntrenchCatchment Area(sq. km): 51Embedde				
Channel Dimensions (m):BankfullOHWWidth13.8Thalweg Depth0.80	13.8 Subdo	ominant Subs minant Substr minant Substr	rate 1: Sand/Silt/Cla	y (legacy)
Rosgen Class: F4 Entrenched meandering riffle/p	ool channel on low g	gradients with l	high width/depth rati	0.
Riparian Vegetation Communities (Vier	reck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
0 - 5 Closed Tall Willow Shrub	2 0	Closed Tall W	illow Shrub	2
5 - 10 Closed Tall Willow Shrub	2 0	Closed Tall W	illow Shrub	2
10 - 20 Closed Tall Willow Shrub	2 0	Closed Tall W	illow Shrub	2
20 - 30 Closed Tall Willow Shrub	2 (Closed Tall W	illow Shrub	2
Key To Fish Sampling Methods				
(PEF) Backpack Electrofisher	(VOG)	Visual Obser	vation, Ground	
Fish Observations				
Species: Dolly VardenLife StagTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):PEF (1)Comments:	ge: adult Fork Lengths (mm)		tory: Resident Max: 188 Mean:	188 Median: 188
	ge: juvenile/adult Fork Lengths (mm)		tory: Unknown Max: 92 Mean:	92 Median: 92
	ge: juvenile Fork Lengths (mm)		tory: Unknown Max: Mean:	Median:
	ge: juvenile Fork Lengths (mm) (1)		tory: Anadromous Max: 57 Mean:	50 Median: 52

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0309A012.jpg

FSS0309A013.jpg

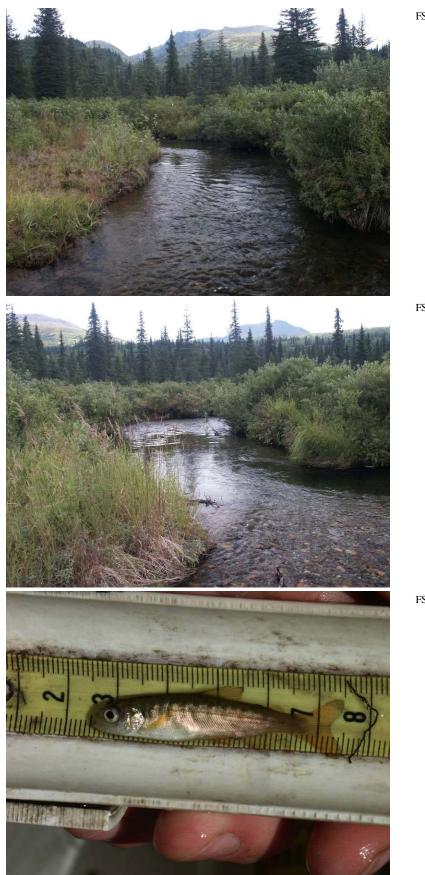
FSS0309A014.jpg



FSS0309A016.jpg

FSS0309A017.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/18/2003 3:00 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.13516 -149.66550 Coordinates 62.13516 -149.66550 Elevation NED (m)(ft): 454 1490 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Ouadrangle:** Talkeetna Mts A-6 Legal Description (MTRS): S024N002W28 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 8.90 DO (mg/L): 10.73 DO (%): Conductivity (µS/cm): 26 **pH:** 6.35 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 0.93 3.05 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 13 OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Gravel 3.5 Width 3.5 Subdominant Substrate 1: Sand/Silt/Clay (legacy) 0.40 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Tall Willow Shrub 2 Closed Tall Willow Shrub 2 5 - 10 Closed Tall Willow Shrub 2 Closed Tall Willow Shrub 2 2 2 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 20 - 30 Open White Spruce Forest 15 Closed Tall Willow Shrub 2 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous **Mean:** 43 **Total Fish Count:** 72 Fish Measured: 22 Fork Lengths (mm) Min: 34 Max: 52 Median: 43 Sampling Method (No. of fish): PEF (22) VOG (50) Suspected Spawning: Yes Comments: Average F.L. of additional fish was about 42 mm. Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 34 **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 20 Max: 49 **Mean: 38** Sampling Method (No. of fish): PEF (3) **Comments: Instruments** Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



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FSS0309A019.jpg

FSS0309A020.jpg



FSS0309A021.jpg

FSS0309A022.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/18/2003 4:16 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.14903 -149.79241 Coordinates 62.14903 -149.79241 Elevation NED (m)(ft): 411 1348 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts A-6 Legal Description (MTRS): S024N003W22 Waterbody Name: Goose Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.10 DO (mg/L): 10.68 DO (%): Conductivity (µS/cm): 12 **pH:** 6.40 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 0.5 **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 6 OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Sand/Silt/Clay (legacy) 3.3 3.3 Width Subdominant Substrate 1: Gravel 0.10 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: F5 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 4 0 - 5 Closed Tall Alder Shrub 4 Closed Tall Alder Shrub 5 - 10 Closed Tall Alder Shrub 4 **Open Black Spruce Forest** 10 10 - 20 Closed Tall Alder Shrub 4 **Open Black Spruce Forest** 10 20 - 30 Open Black Spruce Forest 10 Open Black Spruce Forest 10 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations**

Species: coho salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count: 2** Fish Measured: 2 Fork Lengths (mm) Min: 45 Max: 46 **Mean:** 45 Median: 45 Sampling Method (No. of fish): PEF (2) **Comments:** Species: rainbow trout Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 33 Max: 33 Median: 33 Total Fish Count: 1 Fish Measured: 1 Mean: 33 Sampling Method (No. of fish): PEF (1) Suspected Spawning: Yes **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 76 Max: 76 **Mean:** 76 Median: 76 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 32 Total Fish Count: 3 Fish Measured: 3 Fork Lengths (mm) Min: 24 Max: 41 **Mean: 33** Sampling Method (No. of fish): PEF (3) **Comments:**

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0309A023.jpg

FSS0309A024.jpg

FSS0309A025.jpg



FSS0309A026.jpg

FSS0309A028.jpg

FSS0309A029.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/18/2003 5:17 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.24980 -149.91327 Coordinates 62.24980 -149.91327 Elevation NED (m)(ft): 241 791 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna Mts B-6 Legal Description (MTRS): S025N003W18 Waterbody Name: Answer Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.10 DO (mg/L): 10.00 DO (%): Conductivity (µS/cm): 9 **pH:** 5.90 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 0.5 **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 17 OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Sand/Silt/Clay (legacy) 2.2 Width 2.5 Subdominant Substrate 1: 0.80 0.70 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: E5 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** Bluejoint-Shrub 1 1 0 - 5 Bluejoint-Shrub 0 1 5 - 10 Open Low Sweetgale-Graminoid Bog Bluejoint-Shrub 10 - 20 Open Low Sweetgale-Graminoid Bog 0 Bluejoint-Shrub 1 20 - 30 Open Low Sweetgale-Graminoid Bog 0 Bluejoint-Shrub 1 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 95 Max: 95 Mean: 95 Median: 95 Sampling Method (No. of fish): PEF (1) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 16 Fish Measured: 6 Fork Lengths (mm) Min: 41 Max: 59 **Mean:** 48 Median: 50 Sampling Method (No. of fish): PEF (6) VOG (10) Comments: Average F.L. of additional fish was about 50 mm. **Instruments** Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Channel Widths: measuring tape Price pygmy meter **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**





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Station In	ıfo					
Observers	: Joe Buckwalter,	John Wells, Jim Lazar	c	Da	te/Time: 08/19/20	003 9:56 AM
Station Coordina		Longitude 149.60428	Sample Coordinates	LatitudeLongitu62.94816-149.60		
Coordinat USGS Qua Waterbody Anadromo	adrangle: Talkeetn y Name: Pass Cree ous Waters Cataloş ic Comments: ments:	fethod: Non-Differen na Mts D-6 ek		easurement Datum ption (MTRS): S033N	: NAD83 1002W14	
Water Qu	ality \ Stream	Flow				
Water Ter Water Col	1 • 7	O (mg/L): 12.32 I Turbidity (N	DO (%): NTU):	Conductivity (µS/cm) Thalweg Velocity (m/	-	23
Stream C	hannel					
	radient (%): 2 t Area(sq. km):	7 Entrenchm				
Channel I	Dimensions (m): Wid Thalweg Dep		3.9 Subdo	Dominant Substrate: C minant Substrate 1: S minant Substrate 2: C	and/Silt/Clay (lega	cy)
Rosgen Cl			ol channel on low §	gradients with high wid	th/depth ratio.	
Riparian	Vegetation Cor	mmunities (Viere	ck et al. 1992)			
Dist. from Bank (m)	Left Bank Veget	ation Type	Canopy Height(m)	Right Bank Vegetatio	n Type	Canopy Height(m)
0 - 5	Closed Tall Willo	ow Shrub	2	Bluejoint-Herb		0
5 - 10	Closed Tall Willo	ow Shrub	2	Bluejoint-Herb		0
10 - 20	Closed Tall Willo	ow Shrub	2	Closed Tall Willow Sh	rub	2
20 - 30	Closed White Spr	ruce Forest	20	Closed White Spruce F	Forest	20
				1	orest	20
Key To Fi	ish Sampling N	Iethods		I		20
-	ish Sampling N ckpack Electrofishe) Visual Observation, (
(PEF) Bac Fish Obse Species: D Total Fish Sampling	ervations olly Varden h Count: 4 F Method (No. of fis	r Life Stage:	(VOG) : juvenile/adult ork Lengths (mm)		Ground	20 Median: 116
(PEF) Bac Fish Obse Species: D Total Fish Sampling Comment Species: D Total Fish	ckpack Electrofishe ervations olly Varden h Count: 4 F Method (No. of fists: Average F.L. of olly Varden h Count: 2 F Method (No. of fist	r Life Stage: Sish Measured: 2 F Sh): PEF (2) VOG (2 additional fish was ab Life Stage: Sish Measured: 2 F	(VOG) : juvenile/adult ork Lengths (mm) .) iout 100 mm.) Visual Observation, (Life History: Un) Min: 109 Max: 12 Life History: Un	Ground nknown 24 Mean: 116 nknown 7 Mean: 61	

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0310A001.jpg

FSS0310A002.jpg

FSS0310A003.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/19/2003 10:43 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.91352 -149.61217 Coordinates 62.91352 -149.61217 Elevation NED (m)(ft): 424 1391 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-6 Legal Description (MTRS): S033N002W35 Waterbody Name: Pass Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.60 DO (mg/L): 12.23 DO (%): Conductivity (µS/cm): 18 **pH:** 6.40 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1.5 **Entrenchment:** Catchment Area(sq. km): 32 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Gravel Width 6.9 6.3 Subdominant Substrate 1: Sand/Silt/Clay (legacy) 0.50 **Thalweg Depth** Subdominant Substrate 2: Cobble Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Tall Willow Shrub 2 Closed Tall Willow Shrub 2 5 - 10 Closed Tall Willow Shrub 2 20 Open White Spruce Forest 2 10 - 20 Closed Tall Willow Shrub Open White Spruce Forest 20 20 - 30 Closed Tall Willow Shrub 2 Open White Spruce Forest 20 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 121 Max: 121 Median: 121 **Mean:** 121 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Median: 41 **Total Fish Count: 2** Fish Measured: 1 Fork Lengths (mm) Min: 41 Max: 41 Mean: 41 Sampling Method (No. of fish): PEF (1) VOG (1) Suspected Spawning: Yes Comments: F.L. of additional fish was about 80 mm. Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 62 Max: 62 **Mean:** 62 Median: 62 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 47 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 47 Max: 47 **Mean:** 47 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0310A004.jpg



FSS0310A006.jpg

FSS0310A005.jpg

FF =							
Station Inf	ò						
Observers:	Joe Buckwalter, J	ohn Wells, Jim La	zar		Date/Time	: 08/19/2003 1	2:39 PM
Station Coordinate		ngitude 9.77762	Sample Coordinates	Latitude	Longitude		
	es 62.46866 -14 (ED (m)(ft): 448 1		Coordinates	62.46866	-149.77762		
			erential GPS Field N	leasurement	Datum: NAD8	33	
	drangle: Talkeetna	Mts B-6	Legal Descr	iption (MTRS): S028N003W3	5	
Waterbody Anadromou	Name: Is Waters Catalog 1	Number					
	Comments:	· · · · · · · · · · · · · · · · · · ·					
Visit Comm							
Wildlife Co	mments:						
Water Qua	ality \ Stream F	low					
Water Tem	-	(mg/L): 11.82	DO (%):		y (µS/cm): 20	pH: 6.60	
Water Colo	r: Clear	Turbidity	7 (NTU):	Thalweg Vel	ocity (m/s)(ft/s):		
Stream Ch	annel						
	dient (%): 1	Entrencl					
	Area(sq. km): 6				4 4 6 1/01		
Channel Di	imensions (m): Widtl	Bankfull OHW h 7.8			ostrate: Sand/Silt trate 1: Gravel	/Clay (legacy)	
	Thalweg Dept				trate 2: Cobble		
Rosgen Clas	ss: F5 Entrenched r	meandering riffle/I	pool channel on low	gradients with	high width/depth	n ratio.	
Riparian V	vegetation Com	munities (Vie	reck et al. 1992)			
Dist. from	0	× ×	Canopy				Canopy
	Left Bank Vegetat	tion Type	Height(m)	Right Bank V	Vegetation Type		Height(m)
0 - 5	Subarctic Lowland	Sedge-Bog Mead	ow 0	Subarctic Lov	vland Sedge-Shru	b Wet Meadow	, 0
5 - 10	Closed Tall Willow	v Shrub	2	Subarctic Lov	wland Sedge-Shru	b Wet Meadow	0
10 - 20	Closed Tall Willow	v Shrub	2	Subarctic Lov	wland Sedge-Shru	b Wet Meadow	0
20 - 30	Open White Spruce	e Forest	15	Subarctic Lov	vland Sedge-Shru	b Wet Meadow	0
Key To Fis	h Sampling Mo	ethods					
•	pack Electrofisher		(VOC	3) Visual Obse	ervation, Ground		
Fish Obser	vations						
Species: Dol	-	Life Sta	ge: adult	Life Hi	story: Resident		
Total Fish		h Measured:	Fork Lengths (mr	n) Min:	Max: Mo	ean: Me	dian:
	<pre>Method (No. of fish F.L. was about 18</pre>						
Species: slin			ge: juvenile/adult	Life Hi	story: Resident		
Total Fish		h Measured: 1	Fork Lengths (mr	n) Min: 70	Max: 70 Me	ean: 70 Me	dian: 70
	Method (No. of fish						
Species: slin	: Average F.L. of a		about 60 mm. ge: juvenile	L ife Hi	story: Resident		
Total Fish		h Measured: 4	Fork Lengths (mr		-	ean: 40 Me	dian: 41
	Method (No. of fish	n): PEF (4)	2 .				
Comments	•						
	•						

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0310A017.jpg

FSS0310A018.jpg

FSS0310A019.jpg

Station Info					
Observers: Joe Buckwalter, John Wells, Jim Laza	ar		Date/Time:	08/19/2003 1	:46 PM
StationLatitudeLongitudeCoordinates62.43716-150.04579Elevation NED (m)(ft):207679	Sample Coordinates	Latitude 62.43716	Longitude -150.04579		
Coordinate Determination Method: Non-Differ USGS Quadrangle: Talkeetna B-1 Waterbody Name: Wiggle Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Wildlife Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.70 DO (mg/L): 11.55 Water Color: Clear Turbidity (Stream Channel Stream Gradient (%): 0.5 Entrench	Legal Descrip DO (%): (NTU):	otion (MTRS)	Datum: NAD83 : S027N004W08 (μS/cm): 26 ocity (m/s)(ft/s):	pH: 6.70	
Catchment Area(sq. km): 6 Embedded					
Channel Dimensions (m):BankfullOHWWidth3.9Thalweg DepthRosgen Class:F3 Entrenched meandering riffle/pot	3.9 Subdom 0.30 Subdom	minant Substi minant Substi	rate 2:	ratio.	
Riparian Vegetation Communities (Viero	-	-	<u> </u>		
Dist. from					Canana
Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type		Canopy Height(m)
0 - 5 Open Low Sweetgale-Graminoid Bog	-		land Sedge-Shrub	Wet Meadow	1
5 - 10 Open Low Sweetgale-Graminoid Bog	1 (Open Low Sw	eetgale-Graminoid	l Bog	1
10 - 20 Open Low Sweetgale-Graminoid Bog	1 (Open Low Sw	eetgale-Graminoid	l Bog	1
20 - 30 Open Low Sweetgale-Graminoid Bog	1 0	Open Low Sw	eetgale-Graminoid	l Bog	1
Key To Fish Sampling Methods					
(PEF) Backpack Electrofisher	(VOG)	Visual Obser	vation, Ground		
Fish Observations					
	e: juvenile/adult Fork Lengths (mm)		tory: Unknown Max: Mea	ın: Mee	dian:
	e: juvenile/adult Fork Lengths (mm)		tory: Resident Max: 52 Mea	m: 52 Me	dian: 52
	e: juvenile/adult Fork Lengths (mm)		tory: Resident Max: 172 Mea	an: 172 Mee	dian: 172
Species: slimy sculpinLife StageTotal Fish Count:34Fish Measured:14Sampling Method (No. of fish):PEF (14) VOGComments:Average F.L. of additional fish was a	(20)		tory: Resident Max: 69 Mea	an: 57 Mee	dian: 60

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 13
 Fish Measured:
 13
 Fork Lengths (mm)
 Min:
 36
 Max:
 49
 Mean:
 41
 Median:
 42

 Sampling Method (No. of fish):
 PEF (13)
 Comments:
 Fish
 Fi

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:



FSS0310A021.jpg

FSS0310A023.jpg

Appendix K61.–Sta	uion F550510A05				
Station Info					
Observers: Joe Buckw	alter, John Wells, Jim	Lazar		Date/Time:	08/19/2003 11:41 AM
StationLatitudeCoordinates62.90517Elevation NED (m)(ft):	7 -149.73691	Sample Coordinates	Latitude 62.90517	Longitude -149.73691	
Coordinate Determinati		ifferential GPS Field M	easurement	Datum: NAD83	
USGS Quadrangle: Tal				: S033N002W31	
Waterbody Name: Pass Anadromous Waters Ca	atalog Number:				
Geographic Comments:	Station waypoint ma	rked while flying.			
Visit Comments: Wildlife Comments:					
Water Quality \ Stre	eam Flow				
Water Temp (C): Water Color:	DO (mg/L): Turbid	DO (%): ity (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km		nchment: ddedness:			
_			Dominant Sub	strate:	
Channel Dimensions (L	п); данкіші Оп				
Channel Dimensions (n	Width		ominant Subst		
Channel Dimensions (n Thalweg	Width	Subdo	ominant Subst ominant Subst	rate 1:	
	Width	Subdo		rate 1:	
Thalweg	Width g Depth	Subdo Subdo	ominant Subst	rate 1:	
Thalweş Rosgen Class:	Width g Depth Communities (V	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1:	Canopy Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from	Width g Depth Communities (V	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1: rate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10	Width g Depth Communities (V	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1: rate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Width g Depth Communities (V	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1: rate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width g Depth Communities (V Vegetation Type	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1: rate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width g Depth Communities (V Vegetation Type	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1: rate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None	Width g Depth Communities (V Vegetation Type	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst	rate 1: rate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0	Width g Depth Communities (V Zegetation Type ng Methods fort Life S Fish Measured:	Subdo Subdo iereck et al. 1992) Canopy	ominant Subst <u>Right Bank V</u> Life His	rate 1: rate 2:	Height(m)
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effection	Width g Depth Communities (V Zegetation Type ng Methods fort Life S Fish Measured:	Subdo Subdo iereck et al. 1992) Canopy Height(m)	ominant Subst <u>Right Bank V</u> Life His	story: Not Applica	Height(m)
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No.	Width g Depth Communities (V Zegetation Type ng Methods fort Life S Fish Measured:	Subdo Subdo iereck et al. 1992) Canopy Height(m)	ominant Subst <u>Right Bank V</u> Life His	story: Not Applica	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments:	Width g Depth Communities (V Zegetation Type ng Methods fort Life S Fish Measured:	Subdo Subdo iereck et al. 1992) Canopy Height(m) tage: not applicable Fork Lengths (mm	ominant Subst <u>Right Bank V</u> Life His	story: Not Applica	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments	Width g Depth Communities (V Zegetation Type ng Methods fort Life S Fish Measured:	Subdo Subdo iereck et al. 1992) Canopy Height(m) tage: not applicable Fork Lengths (mm Channe	Minant Subst	story: Not Applica	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments Stream Gradient:	Width g Depth Communities (V Zegetation Type ng Methods fort Life S Fish Measured:	Subdo Subdo iereck et al. 1992) Canopy Height(m) tage: not applicable Fork Lengths (mm Channe	Minant Subst	story: Not Applica	Height(m)

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Station Info					
Observers: Joe Buckwa	lter, John Wells, Jim La	azar		Date/Time:	: 08/19/2003 11:48 AM
StationLatitudeCoordinates62.81198Elevation NED (m)(ft):3	-149.66928	Sample Coordinates	Latitude 62.81198	Longitude -149.66928	
Coordinate Determination USGS Quadrangle: Talk Waterbody Name: Anadromous Waters Car Geographic Comments:	on Method: Non-Diff ceetna Mts D-6 talog Number:	Legal Descrij	ption (MTRS)	Datum: NAD8 : S031N002W04 vaypoint marked w	L .
Visit Comments: Wildlife Comments:					
Water Quality \ Strea	am Flow				
Water Temp (C): Water Color:	DO (mg/L): Turbidit	DO (%): y (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km)	Entrenc : Embedd				
Channel Dimensions (m): Bankfull OHW	W Wetted I	Dominant Sub	strate:	
	,	a	• • • • •		
Thalweg	Width		minant Subst minant Subst		
Thalweg Rosgen Class:	Width		minant Subst minant Subst		
-	Width Depth	Subdo			
Rosgen Class:	Width Depth	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	Сапору
Rosgen Class: Riparian Vegetation	Width Depth Communities (Vie	Subdo ereck et al. 1992) Canopy	minant Subst		Canopy Height(m)
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Ve</u> 0 - 5	Width Depth Communities (Vie	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Ve</u> 0 - 5 5 - 10	Width Depth Communities (Vie	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5 5 - 10 10 - 20	Width Depth Communities (Vie	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width Depth Communities (Vie egetation Type	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5 5 - 10 10 - 20	Width Depth Communities (Vie egetation Type	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Width Depth Communities (Vie egetation Type	Subdo ereck et al. 1992) Canopy	minant Subst	rate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None	Width Depth Communities (Vie egetation Type g Methods ort Life Sta Fish Measured:	Subdo ereck et al. 1992) Canopy	minant Subst <u>Right Bank V</u> Life His	rate 2: <u> ⁷egetation Type</u> story: Not Applic	Height(m)
Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Ver 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effect Total Fish Count: 0 Sampling Method (No. 6)	Width Depth Communities (Vie egetation Type g Methods ort Life Sta Fish Measured:	Subdo ereck et al. 1992) Canopy Height(m)	minant Subst <u>Right Bank V</u> Life His	rate 2: <u> ⁷egetation Type</u> story: Not Applic	Height(m)
Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Verestrian 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effect Total Fish Count: 0 Sampling Method (No. or Comments:	Width Depth Communities (Vie egetation Type g Methods ort Life Sta Fish Measured:	Subdo ereck et al. 1992) Canopy Height(m)	minant Subst <u>Right Bank V</u> Life His	rate 2: <u> ⁷egetation Type</u> story: Not Applic	Height(m)
Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Verestation 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effect Total Fish Count: 0 Sampling Method (No. or Comments: Instruments	Width Depth Communities (Vie egetation Type g Methods ort Life Sta Fish Measured:	Subdo creck et al. 1992) Canopy Height(m) ege: not applicable Fork Lengths (mm	minant Subst	rate 2: <u> ⁷egetation Type</u> story: Not Applic	Height(m)
Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Verestation 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effor Total Fish Count: 0 Sampling Method (No. 4) Comments: Instruments Stream Gradient:	Width Depth Communities (Vie egetation Type g Methods ort Life Sta Fish Measured:	Subdo creck et al. 1992) Canopy Height(m) ege: not applicable Fork Lengths (mm	minant Subst	rate 2: <u> ⁷egetation Type</u> story: Not Applic	Height(m)

FSS0310A011.jpg



Appendix K63.–Station FSS	505101107.				
Station Info					
Observers: Joe Buckwalter, John	ı Wells, Jim Lazaı	r		Date/Time:	08/19/2003 3:01 PM
StationLatitudeLongiCoordinates62.22645-149.8Elevation NED (m)(ft):306100-	37572	Sample Coordinates	Latitude 62.22645	Longitude -149.87572	
Coordinate Determination Metho USGS Quadrangle: Talkeetna Mt Waterbody Name: North Fork M Anadromous Waters Catalog Nu Geographic Comments: Station	ts A-6 fontana Creek mber:	Legal Descrip		Datum: NAD83 : S025N003W29	
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flor	W				
Water Temp (C): DO (m Water Color:	g/L): I Turbidity (N		Conductivity Fhalweg Velo	(μS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km):	Entrenchm Embeddedi				
Width	nkfull OHW	Subdor	ominant Sub ninant Subst	rate 1:	
Thalweg Depth		Subdor	ninant Subst	rate 2:	
Rosgen Class:					
Riparian Vegetation Comm	unities (Viere	ck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation</u>	<u>1 Type</u>	Canopy Height(m) <u>I</u>	Right Bank V	egetation Type	Canopy Height(m)
0 - 5					
5 - 10 10 - 20					
20 - 30					
	ods				
	iods				
Key To Fish Sampling Meth (NON) None	nods				
Key To Fish Sampling Meth (NON) None Fish Observations Species: no collection effort	Life Stage: Aeasured: Fo	not applicable ork Lengths (mm)		tory: Not Applica Max: Mea	
Key To Fish Sampling Meth (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish M Sampling Method (No. of fish): Comments:	Life Stage: Aeasured: Fo				
Key To Fish Sampling Meth (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish M Sampling Method (No. of fish): Comments:	Life Stage: Aeasured: Fo		Min:		
Key To Fish Sampling Meth (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish N Sampling Method (No. of fish): Comments: Instruments	Life Stage: Aeasured: Fo	ork Lengths (mm)	Min: Depths:		
Key To Fish Sampling Meth (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish N Sampling Method (No. of fish): Comments: Instruments Stream Gradient:	Life Stage: Aeasured: Fo	ork Lengths (mm) Channel	Min: Depths: Widths:		

FSS0310A024.jpg



Appendix K04.–Stanon 1550510A08.				
Station Info				
Observers: Joe Buckwalter, John Wells, Jim Laz	zar		Date/Time: 08	/19/2003 3:05 PM
Station Latitude Longitude	Sample	Latitude	Longitude	
Coordinates 62.19963 -149.86628	Coordinates	62.19963	-149.86628	
Elevation NED (m)(ft): 319 1047 Coordinate Determination Method: Non-Differ	nantial CDS Field Ma	agunamant	Determ NAD92	
USGS Quadrangle: Talkeetna Mts A-6			Datum: NAD83): S024N003W05	
Waterbody Name: Middle Fork Montana Creek	Legai Descrip		. 502 11 (005 11 05	
Anadromous Waters Catalog Number:				
Geographic Comments: Station waypoint marke	d while flying.			
Visit Comments:				
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): DO (mg/L):		Conductivit		H:
Water Color: Turbidity	(NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%): Entrench				
Catchment Area(sq. km): Embedde	dness:			
Channel Dimensions (m): Bankfull OHW		ominant Sub		
Width Thelweg Depth		ninant Subst ninant Subst		
Thalweg Depth	Subuoi	iiiiaiit Subsi	rate 2:	
Rosgen Class:				
Riparian Vegetation Communities (Vier	reck et al. 1992)			
Dist. from	Canopy			Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Right Bank V	egetation Type	Height(m)
0-5				
5 - 10 10 - 20				
20 - 30				
Key To Fish Sampling Methods				
(NON) None				
Fish Observations		T ·0 TT·	·	
	e: not applicable Fork Lengths (mm)		story: Not Applicable Max: Mean:	Median:
Sampling Method (No. of fish): NON (0)	FORK Lengths (mm)	141111.		wiculaii.
Comments:				
Instruments	Channel	Donths		
Instruments Stream Gradient:	Channel	-		
Instruments Stream Gradient: Stream Velocity:	Channel	Widths:		
Instruments Stream Gradient:		Widths: sher:		

FSS0310A025.jpg



Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/19/2003 3:32 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.18009 -149.85644 Coordinates -149.85644 62.18009 Elevation NED (m)(ft): 325 1066 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts A-6 Legal Description (MTRS): S024N003W08 Waterbody Name: South Fork Montana Creek **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked on ground at 2.4-meter high falls. Visit Comments: Wetted width is ~ 7 meters. Status of falls as a barrier to migrating adult salmon was not assessed. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 96 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground

Fish Observations

 Species: salmonid-unspecified
 Life Stage: adult
 Life History: Unknown

 Total Fish Count:
 2
 Fish Measured:
 Fork Lengths (mm)
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOG (2)
 VOG (2)
 VOG barrier.
 VOG barrier.

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

FSS0310A026.jpg



FSS0310A027.jpg



FSS0310A028.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/20/2003 11:03 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.41061 -150.31003 Coordinates -150.31003 62.41061 Elevation NED (m)(ft): 183 600 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna B-1 Legal Description (MTRS): S027N006W24 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 13.30 DO (mg/L): 8.40 DO (%): Conductivity (µS/cm): 10 **pH:** 5.90 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 3 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Organic Width 2.5 2.5 Subdominant Substrate 1: Sand/Silt/Clay (legacy) 1.40 1.40 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: E6 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Black Spruce Forest	7	Open Low Sweetgale-Graminoid Bog	0
5 - 10	Open Black Spruce Forest	7	Open Low Sweetgale-Graminoid Bog	0
10 - 20	Open Low Sweetgale-Graminoid Bog	0	Open Low Sweetgale-Graminoid Bog	0
20 - 30	Open Low Sweetgale-Graminoid Bog	0	Open Low Mixed Shrub-Sedge Tussock Bog	1

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

```
      Species: threespine stickleback
      Life Stage: adult
      Life History: Resident

      Total Fish Count:
      1
      Fish Measured:
      1
      Fork Lengths (mm)
      Min:
      68
      Mean:
      68
      Median:
      68

      Sampling Method (No. of fish):
      MTQ (1)
      Kenter
      Ke
```

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: H	oriba U-10	Transparency:	



FSS0311A005.jpg

FSS0311A006.jpg

FSS0311A007.jpg

FSS0311A008.jpg



Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/20/2003 10:04 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.40872 -150.19981 Coordinates -150.19981 62.40872 Elevation NED (m)(ft): 152 499 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna B-1 Legal Description (MTRS): S027N005W21 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 12.10 DO (mg/L): 9.61 DO (%): Conductivity (µS/cm): 7 **pH:** 4.98 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 4 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Organic Width 1.6 1.6 Subdominant Substrate 1: Gravel 0.98 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: E6 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
0 - 5	Bluejoint-Shrub	1	Bluejoint-Shrub	1
5 - 10	Open Tall Alder Shrub	3	Open Tall Alder Shrub	3
10 - 20	Open Tall Alder Shrub	3	Open Tall Alder Shrub	3
20 - 30	Open Tall Alder Shrub	3	Open Tall Alder Shrub	3

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

No Fish Found

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: Horiba U-10		Transparency:	



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FSS0311A010.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/20/2003 12:13 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.43356 -150.09041 Coordinates -150.09041 62.43356 Elevation NED (m)(ft): 182 597 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna B-1 Legal Description (MTRS): S027N004W18 Waterbody Name: Wiggle Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 16.10 DO (mg/L): 7.92 DO (%): Conductivity (µS/cm): 20 **pH:** 6.66 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 1 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Organic Width 0.6 0.6 Subdominant Substrate 1: 0.30 0.30 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: E6 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Bluejoint Meadow	1	Bluejoint Meadow	1
5 - 10	Bluejoint Meadow	1	Bluejoint Meadow	1
10 - 20	Closed Paper Birch Forest	20	Bluejoint Meadow	1
20 - 30	Closed Paper Birch Forest	20	Bluejoint Meadow	1

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

No Fish Found

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: He	oriba U-10	Transparency:	



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FSS0311A012.jpg

Station Info								
Observers: J	oe Buckwal	ter, John Wells	, Jim Laza	ır			Date/Time:	08/20/2003 2:58 PM
Station Coordinates	Latitude 62.37108	Longitude -150.28362		Sampl Coord		Latitude 62.37108	Longitude -150.28362	
Elevation NE	D (m)(ft): 1	55 509						
Coordinate D	eterminatio	n Method: N	on-Differe	ential GPS	Field Meas	urement	Datum: NAD83	}
USGS Quadra	angle: Talke	eetna B-1		Legal	Descriptio	on (MTRS): S026N005W06	
Waterbody Na	ame:							
Anadromous '		alog Number:						
Geographic C								
Visit Commer								
Wildlife Com	ments:							
Water Quali	ty \ Strea	m Flow						
Water Temp ((C): 15.10	DO (mg/L): 7	.15	DO (%):	C	onductivit	y (μS/cm): 14	pH: 6.36
Water Color:	Humic	T	urbidity (NTU):	Th	alweg Vel	ocity (m/s)(ft/s):	
Stream Cha	nnel							
Stream Gradi	ent (%): 0	F	Intrenchn	nent:				
Catchment A			mbedded	lness:				
Channel Dim	ensions (m)	: Bankfull	OHW	Wetted	Don	ninant Sul	ostrate: Organic	
	,	Width	4.5	4.5	Subdomi	nant Subs	trate 1:	
	Thalweg l	Depth	1.35	1.35	Subdomi	nant Subs	trate 2:	
Rosgen Class:	Ų	adient, meande id stable. High	U U	•		width/dept	h ratio and little de	position. Very
	cificient an	ia stable. Then						

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Sweetgale-Graminoid Bog	2	Open Low Sweetgale-Graminoid Bog	2
5 - 10	Subarctic Lowland Sedge-Bog Meadow	0	Subarctic Lowland Sedge-Bog Meadow	0
10 - 20	Subarctic Lowland Sedge-Bog Meadow	0	Subarctic Lowland Sedge-Bog Meadow	0
20 - 30	Subarctic Lowland Sedge-Bog Meadow	0	Subarctic Lowland Sedge-Bog Meadow	0

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

 Species: coho salmon
 Life Stage: juvenile
 Life History: Anadromous

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 124
 Mean:
 124
 Median:
 124

 Sampling Method (No. of fish):
 MTQ (1)
 Kenter
 Kente

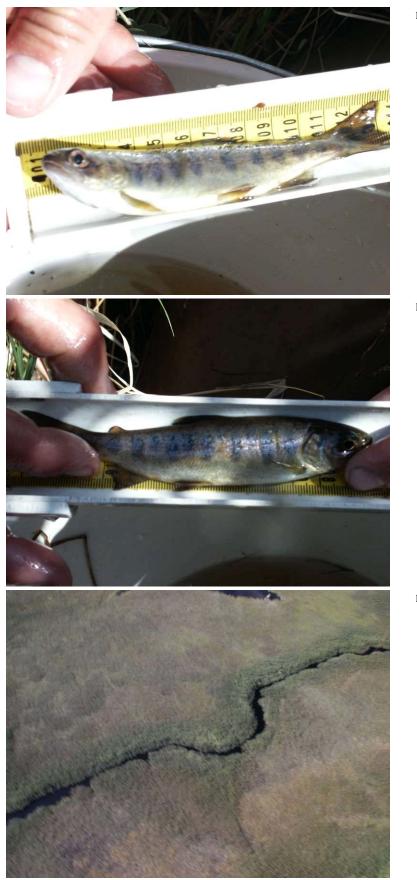
Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: Horiba U-10		Transparency:	



FSS0311A015.jpg

FSS0311A016.jpg

FSS0311A017.jpg



FSS0311A018.jpg

FSS0311A019.jpg

FSS0311A020.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/20/2003 1:31 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.36800 -150.11881 Coordinates -150.11881 62.36800 Elevation NED (m)(ft): 114 374 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna B-1 Legal Description (MTRS): S026N005W01 Waterbody Name: Wiggle Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 13.80 DO (mg/L): 7.28 DO (%): Conductivity (µS/cm): 37 **pH:** 6.67 Water Color: Humic Thalweg Velocity (m/s)(ft/s): **Turbidity (NTU): Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 32 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Organic Width 4.8 4.8 Subdominant Substrate 1: 1.40 1.40 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: E6 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
5 - 10	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
10 - 20	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
20 - 30	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

Species: threespine stickleback Life Stage: juvenile/adult Life History: Unknown Median: 49 **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 39 Max: 60 **Mean: 50** Sampling Method (No. of fish): MTQ (6) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 23 Fish Measured: 23 Fork Lengths (mm) Min: 71 **Max:** 126 **Mean:** 100 Median: 98 Sampling Method (No. of fish): MTQ (23) **Comments:**

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: Horiba U-10		Transparency:	



FSS0311A021.jpg

FSS0311A022.jpg

FSS0311A023.jpg



FSS0311A024.jpg

FSS0311A025.jpg

Station Info Observers: Joe Buckwalter, John Wells, Jim Lazar Date/Time: 08/20/2003 1:41 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.37583 -150.18445 Coordinates -150.18445 62.37583 Elevation NED (m)(ft): 121 397 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna B-1 Legal Description (MTRS): S026N005W03 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.80 DO (mg/L): 8.16 DO (%): Conductivity (µS/cm): 15 **pH:** 6.61 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 9 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Organic Width 2.3 2.3 Subdominant Substrate 1: Cobble 0.70 0.70 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: E6 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
5 - 10	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
10 - 20	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
20 - 30	Open Low Sweetgale-Graminoid Bog	1	Closed Black Spruce Forest	7

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

 Species: coho salmon
 Life Stage: juvenile
 Life History: Anadromous

 Total Fish Count: 53
 Fish Measured: 53
 Fork Lengths (mm)
 Min: 53
 Max: 107
 Mean: 73
 Median: 80

 Sampling Method (No. of fish):
 MTQ (53)

 Comments:

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: H	oriba U-10	Transparency:	

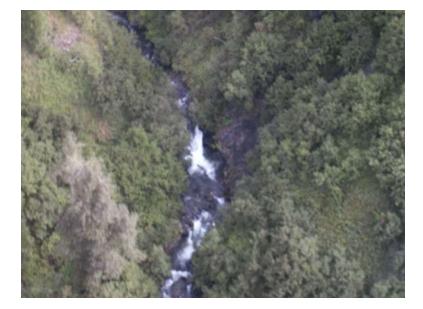


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FSS0311A028.jpg

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Station Info			
Observers: Joe Buckwalter, John Wells	s, Jim Lazar	Da	te/Time: 08/20/2003 10:45 AM
Station Latitude Longitude	Sample	Latitude Longit	
Coordinates 62.52034 -149.97524	Coordinates	62.52034 -149.97	524
Elevation NED (m)(ft): 514 1686 Coordinate Determination Method: N	Ion-Differential CDS Field Ma	asuramant Dat	: NAD83
USGS Quadrangle: Talkeetna Mts C-6		tion (MTRS): S028N	
Waterbody Name:	Legar Descrip		
Anadromous Waters Catalog Number:			
Geographic Comments: Station waypo	int marked while flying.		
Visit Comments:			
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): DO (mg/L):		Conductivity (µS/cm	_
Water Color: T	'urbidity (NTU):	Thalweg Velocity (m/	s)(ft/s):
Stream Channel			
Stream Gradient (%):	Entrenchment:		
Catchment Area(sq. km):	Embeddedness:		
Channel Dimensions (m): Bankfull	OHW Wetted D	ominant Substrate:	
Width		ninant Substrate 1:	
Thalweg Depth	Subdor	ninant Substrate 2:	
Rosgen Class:			
Riparian Vegetation Communitie	es (Viereck et al. 1992)		
Dist. from	Canopy		Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m) <u>H</u>	Right Bank Vegetatio	n Type Height(m)
0 - 5			
5 - 10			
10 - 20			
<u>20 - 30</u>			
Key To Fish Sampling Methods			
(NON) None			
Fish Observations			
Species: no collection effort	Life Stage: not applicable	Life History: N	ot Applicable
Total Fish Count: 0 Fish Measur	8 . /	Min: Max:	Mean: Median:
Sampling Method (No. of fish): NON	(0)		
Comments:			
Instruments			
Instruments Stream Gradient:	Channel	Depths:	
	Channel Channel	-	
Stream Gradient:		Widths:	

FSS0311A003.jpg

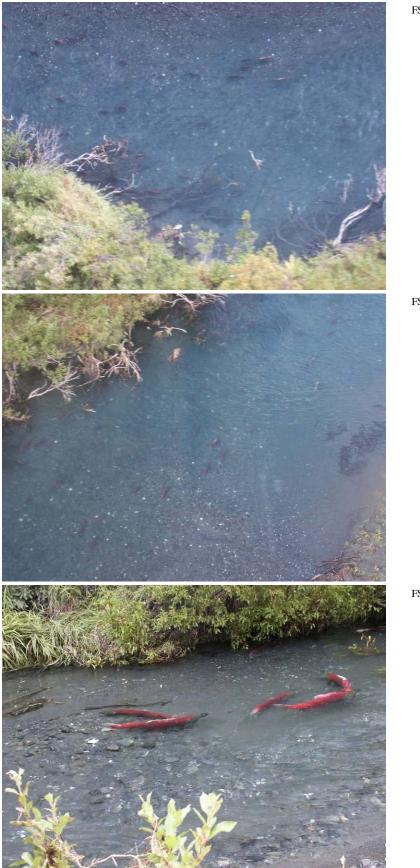


11:23 AM Longitude 151.60350 hates for reach. ions were many
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Height(m)
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Instruments

Stream Gradient:Stream Velocity:Price pygmy meterTurbidity:Water Quality:

Channel Depths: Channel Widths: Electrofisher: Transparency:



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FSS0312A008.jpg



FSS0312A009.jpg

FSS0312A010.jpg

FSS0312A011.jpg

Station Info

Observers: Joe Buckwalter	r, J Johnson, Jim Lazar			Date/Time: 08/	/21/2003 10:14 AM
	Longitude -151.66127	Sample Coordinates		gitude .66127	
Elevation NED (m)(ft): 686	6 2251				
Coordinate Determination	Method: Non-Differen	ntial GPS Field Me	asurement Dat	um: NAD83	
USGS Quadrangle: Talkeet	tna C-4	Legal Descrip	tion (MTRS): S02	28N013W03	
Waterbody Name: Sunflow	ver Creek				
Anadromous Waters Catal	og Number:				
Geographic Comments:					
Visit Comments:					
Wildlife Comments: 1 fem of sta		oove station; 1 king	fisher. 1 male moo	se observed ~ 3 i	miles downstream
Water Quality \ Stream	n Flow				
Water Temp (C): 6.10 I Water Color: Clear	DO (mg/L): 11.70 I Turbidity (N	. ,	Conductivity (µS/ Fhalweg Velocity (, 1	H: 6.53
Stream Channel					
Stream Gradient (%): 2	Entrenchm	ent:			
Catchment Area(sq. km):	25 Embeddedi	ness:			
Channel Dimensions (m):	Bankfull OHW	Wetted D	ominant Substrate	e: Cobble	
Wi	idth 11.2	10.6 Subdor	ninant Substrate 1	: Gravel	
Thalweg De	epth	0.50 Subdor	ninant Substrate 2	2:	
Rosgen Class: B3 Moderate stable plan ar	ely entrenched, moderate nd profile. Stable banks		minated channel, w	ith infrequently	spaced pools. Very

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden Total Fish Count: 3 Sampling Method (No. o Comments:	Fish Measured: 3	age: juvenile/adult Fork Lengths (mm)	istory: Unkn Max: 111	own Mean: 104	Median: 101
Species: Dolly Varden Total Fish Count: 4 Sampling Method (No. o Comments:	Fish Measured: 4	age: juvenile Fork Lengths (mm)	istory: Unkn Max: 56	Mean: 47	Median: 44 pawning: Yes
Species: Chinook salmon Total Fish Count: 7 Sampling Method (No. o Comments:	Fish Measured: 7	age: juvenile Fork Lengths (mm)	istory: Anad Max: 56	romous Mean: 50	Median: 51

Appendix K74.–Page 2 of 4.

Species: coho salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 41 Max: 48 **Mean:** 44 Median: 44 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life History: Resident Life Stage: adult Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 91 Max: 91 Mean: 91 Median: 91 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 52 Fork Lengths (mm) Min: 52 Max: 52 Total Fish Count: 1 Fish Measured: 1 **Mean:** 52 Sampling Method (No. of fish): PEF (1) **Comments:** Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:

FSS0312A003.jpg





FSS0312A004.jpg

FSS0312A005.jpg



FSS0312A006.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/21/2003 11:47 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.54052 -151.59685 Coordinates -151.59685 62.54052 Elevation NED (m)(ft): 868 2848 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Ouadrangle:** Talkeetna C-4 Legal Description (MTRS): S028N013W01 Waterbody Name: Colorado Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.00 DO (mg/L): 12.11 DO (%): Conductivity (µS/cm): 18 pH: 6.25 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2 **Entrenchment:** Catchment Area(sq. km): 6 **Embeddedness:** OHW Wetted **Channel Dimensions (m):** Bankfull Dominant Substrate: Cobble Width 3.8 3.8 Subdominant Substrate 1: Boulder 0.40 0.40 **Thalweg Depth** Subdominant Substrate 2: Gravel Rosgen Class: A3 Steep, entrenched, cascading, step/pool streams. High energy/debris transport associated with depositional soils.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
5 - 10	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
10 - 20	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
20 - 30	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher: S	mith-Root LR-24
Water Quality: He	oriba U-10	Transparency:	



FSS0312A012.jpg

FSS0312A013.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/21/2003 1:06 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.47868 -151.70244 Coordinates 62.47868 -151.70244 Elevation NED (m)(ft): 703 2306 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna B-4 Legal Description (MTRS): S028N013W33 Waterbody Name: California Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.90 DO (mg/L): 12.40 DO (%): Conductivity (µS/cm): 31 **pH:** 6.94 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2.5 **Entrenchment:** Catchment Area(sq. km): 10 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble 5.5 Width 5.2 Subdominant Substrate 1: Boulder 0.30 **Thalweg Depth** Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** Closed Tall Willow Shrub 3 3 0 - 5 Closed Tall Willow Shrub 0 5 - 10 Mixed Herbs 1 Open Low Scrub 10 - 20 Mixed Herbs 1 Open Low Scrub 0 20 - 30 Mixed Herbs 1 Open Low Scrub 0 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life History: Resident Life Stage: adult **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) Comments: F.L. was about 150 mm. Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 98 Max: 116 Mean: 107 **Median:** 107 Sampling Method (No. of fish): PEF (2) **Comments:** Life History: Unknown Species: Dolly Varden Life Stage: juvenile Total Fish Count: 2 Fish Measured: 2 Fork Lengths (mm) Min: 53 Max: 62 Mean: 57 Median: 57

Instruments

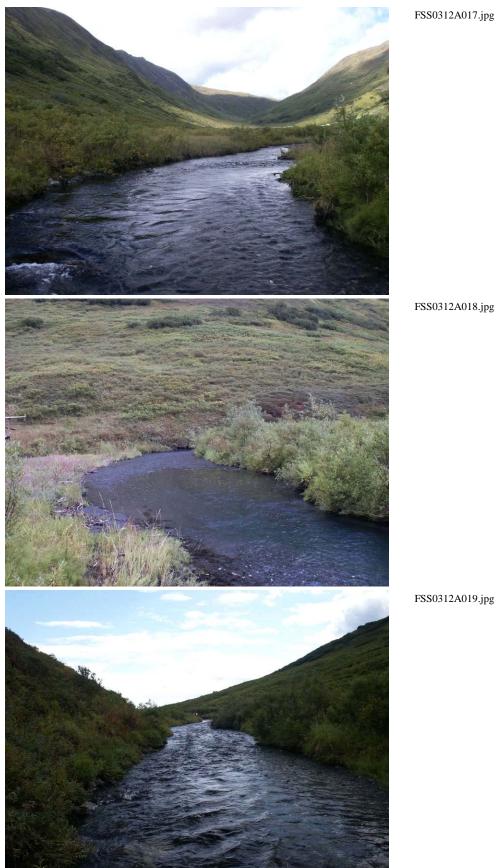
Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



11				
Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Lazar	r		Date/Time	: 08/21/2003 2:51 PM
Station Latitude Longitude	Sample	Latitude	Longitude	
Coordinates 62.47775 -151.53167	Coordinates	62.47775	-151.53167	
Elevation NED (m)(ft): 758 2487 Coordinate Determination Method: Non-Differ	ential GPS Field M	easurement	Datum: NAD8	3
USGS Quadrangle: Talkeetna B-4			: S028N012W32	
Waterbody Name: Bonanza Creek	8			
Anadromous Waters Catalog Number:				
Geographic Comments: Visit Comments:				
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 7.30 DO (mg/L): 11.75	DO (%):	-	γ (μS/cm): 32	pH: 6.63
Water Color: Clear Turbidity ((NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%): 1.5 Entrench	ment:			
Catchment Area(sq. km): 8 Embedded	dness:			
Channel Dimensions (m): Bankfull OHW			strate: Cobble	
Width 5.6 Thalweg Depth			rate 1: Gravel rate 2: Boulder	
				l-defined floodnlains
Rosgen Class: C3 Low gradient, meandering, poin	n-bai, mile/pool, a	iu viui chuminei		aennea nooapiamb.
Rosgen Class: C3 Low gradient, meandering, poin Riparian Vegetation Communities (Viere	-		,,	
	-			Сапору
Riparian Vegetation Communities (Viero	eck et al. 1992) Canopy		egetation Type	
Riparian Vegetation Communities (Viero Dist. from	eck et al. 1992) Canopy Height(m)		egetation Type	Canopy
Riparian Vegetation Communities (Viero Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	canopy Height(m) 2	Right Bank V	egetation Type	Canopy Height(m)
Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Willow Shrub	eck et al. 1992) Canopy Height(m) 2 0	Right Bank V Closed Tall W	Tegetation Type Tillow Shrub Tillow Shrub	Canopy Height(m) 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs	Canopy Height(m) 2 0 0	<u>Right Bank V</u> Closed Tall W Closed Tall W	'egetation Type 'illow Shrub 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2
Biparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs	Canopy Height(m) 2 0 0	<mark>Right Bank V</mark> Closed Tall W Closed Tall W Closed Tall W	'egetation Type 'illow Shrub 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs	eck et al. 1992) Canopy Height(m) 2 0 0 0 0	<u>Right Bank V</u> Closed Tall W Closed Tall W Closed Tall W Closed Tall W	'egetation Type 'illow Shrub 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods	eck et al. 1992) Canopy Height(m) 2 0 0 0 0	<u>Right Bank V</u> Closed Tall W Closed Tall W Closed Tall W Closed Tall W	'egetation Type 'illow Shrub 'illow Shrub 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage	eck et al. 1992) Canopy Height(m) 2 0 0 0 0 0 (VOG	<u>Right Bank V</u> Closed Tall W Closed Tall W Closed Tall W Closed Tall W	'egetation Type 'illow Shrub 'illow Shrub 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3	eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His	Tegetation Type "illow Shrub "illow Shrub "illow Shrub "illow Shrub "illow Shrub "ullow Shrub	Canopy Height(m) 2 2 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3 Fish Measured: 2 Sampling Method (No. of fish): PEF (2) VOG (eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm 1)	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His	Tegetation Type "illow Shrub "illow Shrub "illow Shrub "illow Shrub "illow Shrub "ullow Shrub	Canopy Height(m) 2 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3	eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm 1)	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His	Tegetation Type "illow Shrub "illow Shrub "illow Shrub "illow Shrub "illow Shrub "ullow Shrub	Canopy Height(m) 2 2 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3 Fish Measured: 2 Sampling Method (No. of fish): PEF (2) VOG (eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm 1)	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His	Tegetation Type "illow Shrub "illow Shrub "illow Shrub "illow Shrub "illow Shrub "ullow Shrub	Canopy Height(m) 2 2 2 2 2 2
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3 Fish Measured: 2 1 Sampling Method (No. of fish): PEF (2) VOG (Comments: F.L. of additional fish was about 60 r	eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm 1) nm. Channe	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His) Min: 45	'egetation Type 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2 2 2 2 2 2 3
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3 Sampling Method (No. of fish): PEF (2) VOG (Comments: F.L. of additional fish was about 60 r	eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm 1) nm. Channe	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His) Min: 45	'egetation Type 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2 2 2 2 2 2 3
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Mixed Herbs 10 - 20 Mixed Herbs 20 - 30 Mixed Herbs 20 - 30 Mixed Herbs Key To Fish Sampling Methods (PEF) (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 3 Fish Measured: 2 D Sampling Method (No. of fish): PEF (2) VOG (Comments: F.L. of additional fish was about 60 r Instruments Stream Gradient: handheld optical clinometer Stream Gradient:	eck et al. 1992) Canopy Height(m) 2 0 0 0 0 (VOG e: juvenile Fork Lengths (mm 1) nm. Channe	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W) Visual Obse Life His) Min: 45	'egetation Type 'illow Shrub 'illow Shrub	Canopy Height(m) 2 2 2 2 2 2 2 2 2 3

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Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/21/2003 3:50 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.30271 -151.27770 Coordinates -151.27770 62.30271 Elevation NED (m)(ft): 366 1201 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Ouadrangle:** Talkeetna B-3 Legal Description (MTRS): S026N011W34 Waterbody Name: Anadromous Waters Catalog Number: **Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 12.50 DO (mg/L): 10.50 DO (%): Conductivity (µS/cm): 8 **pH:** 6.00 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): 4 **Embeddedness:** Bankfull OHW **Channel Dimensions (m):** Wetted Dominant Substrate: Cobble Width 2.7 2.8 Subdominant Substrate 1: Boulder 0.20 **Thalweg Depth** Subdominant Substrate 2: Gravel Rosgen Class: F3 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
5 - 10	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
10 - 20	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
20 - 30	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations Species: coho salmon

Species: coho salmon	Life Stage: juvenile		Life H				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 53	Max: 57	Mean: 54	Median: 55	
Sampling Method (No. o	of fish): PEF (4)						
Comments:							
Species: slimy sculpin	Life Sta	Life H					
Total Fish Count: 7	Fish Measured: 7	Fork Lengths (mm)	Min: 54	Max: 67	Mean: 59	Median: 60	
Sampling Method (No. o	of fish): PEF (7)						
Comments:							
Species: slimy sculpin	Life Stage: juvenile		Life History: Resident				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 19	Max: 49	Mean: 33	Median: 34	
Sampling Method (No. of fish): PEF (4)							
Comments:							

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T 'C. TT'-4

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T .C. C.

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0312A024.jpg



Sampling Method (No. of fish): PEF (8)

Comments:

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/21/2003 4:51 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.29713 -151.29747 Coordinates 62.29713 -151.29747 Elevation NED (m)(ft): 379 1243 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna B-3 Legal Description (MTRS): S026N011W34 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 12.90 DO (mg/L): 10.02 DO (%): Conductivity (µS/cm): 8 **pH:** 5.90 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 0.5 **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 3 OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble 3.5 Width 3.5 Subdominant Substrate 1: Gravel 0.30 **Thalweg Depth** Subdominant Substrate 2: Boulder Rosgen Class: E3 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** Bluejoint-Shrub 1 Bluejoint-Shrub 1 0 - 5 1 1 5 - 10 Bluejoint-Shrub Bluejoint-Shrub 10 - 20 Bluejoint-Shrub 1 Closed Tall Willow Shrub 2 20-30 Bluejoint-Shrub 1 Closed White Spruce Forest 10 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 20 Fish Measured: 18 Fork Lengths (mm) Min: 42 Max: 89 Mean: 63 Median: 65 Sampling Method (No. of fish): PEF (18) VOG (2) Comments: Average F.L. of additional fish was about 70 mm. Species: slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 92 Max: 92 **Mean: 92** Median: 92 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 7 Fish Measured: 2 Fork Lengths (mm) Min: 50 Max: 58 **Mean: 54** Median: 54 Sampling Method (No. of fish): PEF (2) VOG (5) Comments: Average F.L. of additional fish was about 60 mm. Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 8 Fish Measured: 8 Fork Lengths (mm) Min: 29 Max: 47 **Mean: 38** Median: 38

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0312A026.jpg

FSS0312A027.jpg

FSS0312A028.jpg



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/22/2003 9:27 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.30917 -151.47532 Coordinates 62.30917 -151.47532 Elevation NED (m)(ft): 486 1594 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna B-3 Legal Description (MTRS): S026N012W27 Waterbody Name: Home Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Several big active beaver dams/ponds downstream of station. Water Quality \ Stream Flow DO (%): **Water Temp (C): 6.50** DO (mg/L): 11.70 Conductivity (µS/cm): 5 pH: 5.91 **Turbidity (NTU):** Water Color: Clear Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment: Catchment Area(sq. km):** 3 **Embeddedness: Bankfull OHW** Wetted **Channel Dimensions (m):** Dominant Substrate: Gravel 3.2 2.2 Width Subdominant Substrate 1: Cobble **Thalweg Depth** 0.25 Subdominant Substrate 2: Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 1 1 0 - 5Closed Low Willow Shrub Closed Low Willow Shrub 5 - 10 Closed Low Willow Shrub 1 Closed Low Willow Shrub 1 10 - 20 Closed Low Willow Shrub Closed Low Willow Shrub 1 1 20 - 30 Closed Low Willow Shrub 1 Closed Low Willow Shrub 1 **Kev To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Resident Max: Median: **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOG (2) Comments: Average F.L. was about 150 mm. Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 73 **Total Fish Count:** 2 Fish Measured: 2 Max: 80 Mean: 76 Median: 76 Sampling Method (No. of fish): PEF (2) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Median: 52 **Total Fish Count: 32** Fish Measured: 26 Fork Lengths (mm) Min: 42 Max: 63 **Mean:** 49 Sampling Method (No. of fish): PEF (26) VOG (6) Suspected Spawning: Yes

Comments: Average F.L. of additional fish was about 50 mm.

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

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FSS0313A003.jpg



FSS0313A004.jpg

FSS0313A005.jpg



rppendix	Kor. Stati	101110000101	102.							
Station Info	1									
Observers:	Joe Buckwal	ter, J Johnson, J	im Lazar				Date/T	`ime: 08/22/	2003 1	0:03 AM
Station Coordinates	Latitude 62.26141	Longitude -151.35533		Samp Coord	le linates	Latitude 62.26141	Longitude -151.35533			
Elevation NE	2 D (m)(f t): 4	20 1378								
		n Method: No	on-Differe				Datum: N			
USGS Quadr Waterbody N	-	eetna B-3		Legal	Descrip	otion (MTRS): S025N011	W1/		
		alog Number:								
Geographic (
		ocated immedia	tely upstr	eam of aba	ndoned,	blown-out be	eaver dam.			
Wildlife Com	iments:									
Water Qual	ity \ Strea	m Flow								
Water Temp		DO (mg/L): 1		DO (%):		Conductivit		pH: 5	5.75	
Water Color:	Humic	Tu	rbidity (NTU):		Thalweg Vel	ocity (m/s)(ft	/s):		
Stream Cha	nnel									
Stream Grad			ntrenchn							
Catchment A			mbedded	ness:						
Channel Din			OHW 2.1	Wetted 2.2		ominant Sub		/Silt/Clay (leg	gacy)	
	Thalweg 1	Width Depth	2.1 0.40	0.30		minant Subst minant Subst				
Rosgen Class	_	adient, meander						tle depositio	n. Verv	/
		nd stable. High								,
Riparian Ve	getation (Communitie	s (Viere	ck et al.	1992)					
Dist. from Bank (m) J	oft Bonk Vo	getation Type			10py sht(m)	Right Bank V	Vegetation T	VDA		Canopy Ieight(m)
		vland Sedge-Mo	ss Bog M			Subarctic Lov				0
		vland Sedge-Mo	-			Subarctic Lov	-	-		0
		vland Sedge-Mo	-			Open White S	-	-	cuuon	6
		vland Sedge-Mo	0			Closed White	-			18
			33 D 05 IN	cadow	0		Sprace I ore.			10
Key To Fish		-								
(PEF) Backpa	ack Electrofi	sher			(VOG)	Visual Obse	ervation, Grou	ınd		
Fish Observ	ations									
Species: salme	onid-unspeci	ified L	ife Stage	: juvenile		Life His	story: Unkno	own		
Total Fish C		Fish Measure		ork Lengt	hs (mm) Min:	Max:	Mean:	Mee	lian:
		of fish): VOG (olly Varden. Av		was about	t 70 mm					
Species: Chin	-	-	-	: juvenile	t 70 mm		story: Anadr	omous		
Total Fish C		Fish Measure	-	•	hs (mm	Min: 60	Max: 67	Mean: 64	Mee	lian: 63
Sampling M	ethod (No. o	of fish): PEF (3	5)	_						
Comments:										
Species: coho			-	: juvenile	h a ć		story: Anadr			P 51
Total Fish C Sampling M		Fish Measure of fish): PEF (6		ork Lengt	ths (mm) Min: 43	Max: 59	Mean: 47	Mee	lian: 51
Comments:	CHIOU (110, U	- 11511) , - 1151 (C	')							
Species: slimy	y sculpin	L	ife Stage	: adult		Life Hi	story: Reside	ent		
Total Fish C			-							
	ount: 1	Fish Measure	ed:1 H	ork Lengt	hs (mm) Min: 80	Max: 80	Mean: 80	Mee	lian: 80

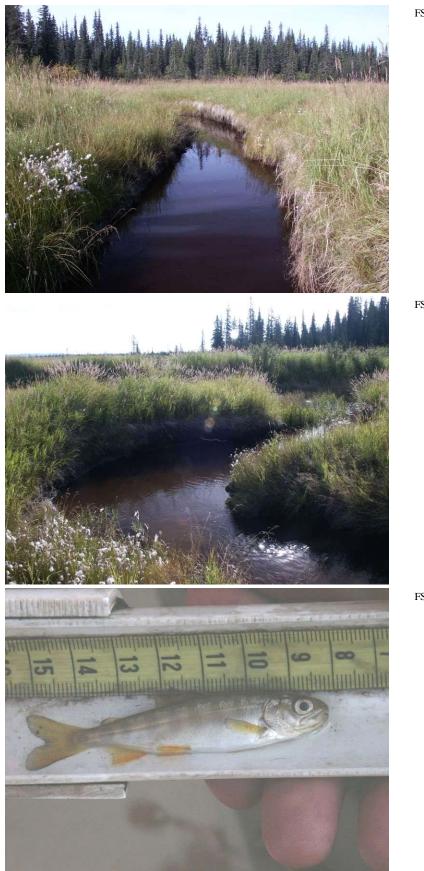
Comments:

Appendix K81.–Page 2 of 4.

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 6 Fork Lengths (mm) Min: 52 Max: 68 Median: 60 Fish Measured: 3 **Mean:** 62 Sampling Method (No. of fish): PEF (3) VOG (3) Comments: Average F.L. of additional fish was about 50 mm. Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 27 Max: 42 **Mean:** 33 Median: 34 Sampling Method (No. of fish): PEF (6) **Comments:**

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod			
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape			
Turbidity:		Electrofisher: Smith-Root LR-24			
Water Quality: He	priba U-10	Transparency:			



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Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/22/2003 11:28 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.19889 -151.36230 Coordinates -151.36230 62.19889 Elevation NED (m)(ft): 416 1365 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna A-3 Legal Description (MTRS): S024N011W06 Waterbody Name: Mill Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.10 DO (mg/L): 9.81 DO (%): Conductivity (µS/cm): 17 **pH:** 6.02 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1.5 **Entrenchment:** Catchment Area(sq. km): 4 **Embeddedness:** Bankfull OHW Dominant Substrate: Boulder **Channel Dimensions (m):** Wetted Width 2.0 2.2 Subdominant Substrate 1: Cobble 0.20 **Thalweg Depth** Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: E2 XXX

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Subarctic Lowland Sedge Wet Meadow	0	Closed Tall Alder Shrub	3
5 - 10	Open Low Sweetgale-Graminoid Bog	0	Closed Tall Alder Shrub	3
10 - 20	Open Low Sweetgale-Graminoid Bog	0	Closed Tall Alder Shrub	3
20 - 30	Open Low Sweetgale-Graminoid Bog	0	Closed White Spruce Forest	15

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher: S	mith-Root LR-24
Water Quality: He	oriba U-10	Transparency:	

FSS0313A011.jpg

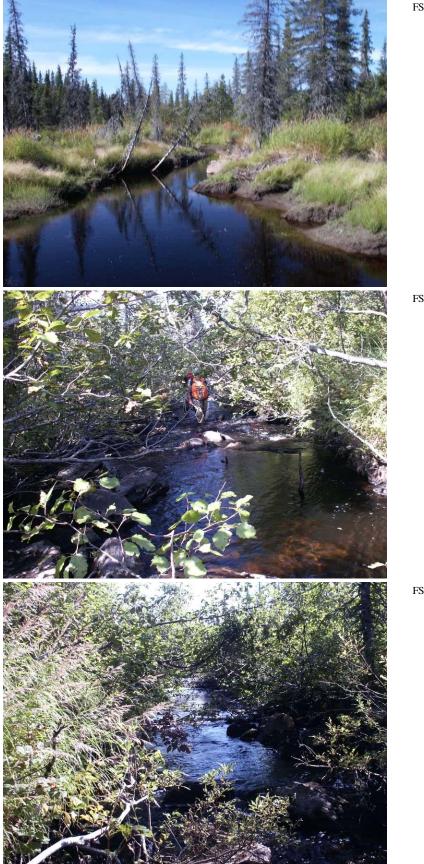


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FSS0313A013.jpg

rippenam mest station i sposisition			
Station Info			
Observers: Joe Buckwalter, J Johnson, Jim Lazar		Date/Time:	08/22/2003 1:30 PM
StationLatitudeLongitudeCoordinates62.22814-151.40929Elevation NED (m)(ft):3681207	Sample Coordinates	LatitudeLongitude62.22814-151.40929	
Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna A-3 Waterbody Name: Mill Creek Anadromous Waters Catalog Number: Geographic Comments: Suspect lower forested reac	Legal Descr	iption (MTRS): S025N012W25	
landing zones available dow			,
Visit Comments: Reach located immediately downst	ream of an abar	doned, blown-out beaver dam.	
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 12.20DO (mg/L): 10.21DOWater Color: HumicTurbidity (NT	О (%): ГU):	Conductivity (µS/cm): 12 Thalweg Velocity (m/s)(ft/s):	pH: 6.09
Stream Channel			
Stream Gradient (%):1EntrenchmenCatchment Area(sq. km):18Embeddedne			
		Dominant Substrate: Boulder	
Width 4.0 Thalweg Depth		ominant Substrate 1: Cobble ominant Substrate 2: Sand/Silt/C	Clay (legacy)
Rosgen Class: B2 Moderately entrenched, moderate g stable plan and profile. Stable banks.			
Riparian Vegetation Communities (Vierecl	k et al. 1992)	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5 Closed Tall Alder Shrub	3	Closed Tall Alder Shrub	3
5 - 10 Open White Spruce Forest	12	Open White Spruce Forest	12
10 - 20 Open White Spruce Forest	12	Open White Spruce Forest	12
20 - 30 Open White Spruce Forest	12	Open White Spruce Forest	12
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher	(VOC	b) Visual Observation, Ground	
Fish Observations Species: rainbow trout Life Stage: j Total Fish Count: 2 Fish Measured: 2 For Sampling Method (No. of fish): PEF (2) Comments: No fish captured upstream at 13A03. Species: rainbow trout Life Stage: j Total Fish Count: 6 Fish Measured: 3 For Sampling Method (No. of fish): PEF (3) VOG (3) Comments: Average F.L. of additional fish was above	∙k Lengths (mr uvenile ∙k Lengths (mr	Life History: Resident n) Min: 86 Max: 92 Mea	nn: 114 Median: 114 nn: 88 Median: 89
Instruments Stream Gradient: handheld optical clinometer		al Darréhan anodroceta derro d'	1
Stream Gradient: nanufield obtical chilometer	Unann	el Depths: graduated wading roo	1

Stream Gradient:	handheld optical clinometer	Channel Depths	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths	: measuring tape
Turbidity:		Electrofisher:	Smith-Root LR-24
Water Quality: Ho	oriba U-10	Transparency:	



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FSS0313A016.jpg



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Sampling Method (No. of fish): VOG (1) **Comments:** F.L. was about 150 mm.

Sampling Method (No. of fish): PEF (10)

Sampling Method (No. of fish): PEF (1)

Species: coho salmon

Species: slimy sculpin

Total Fish Count: 1

Comments:

Comments:

Total Fish Count: 10

Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/Time: 08/22/200	3 2:17 PM
StationLatitudeLongitudeCoordinates62.22828-151.51992	Sample Coordinates	Latitude 62.22828	Longitude -151.51992	
Elevation NED (m)(ft): 146–479 Coordinate Determination Method: Non-Differentia USGS Quadrangle: Talkeetna A-4 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Suspect forested reach upstree	Legal Descr	iption (MTRS)	Datum: NAD83 : S025N012W28	nding
zones available upstream of t				
Visit Comments: Upper end of reach is low gradient (~0.5%) glide.	Lower end of re	each is riffle/pool with gradie	nt = 1.5%.
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 9.30DO (mg/L): 11.29DOWater Color: ClearTurbidity (NT	(%): U):	Conductivity Thalweg Velo	y (μS/cm): 24 pH: 6.24 pcity (m/s)(ft/s):	ŀ
Stream Channel				
Width 4.2	4.3 Subd 0.40 Subd ol stream with 1	ominant Subst	rate 1: Sand/Silt/Clay (legac rate 2: Gravel	
Riparian Vegetation Communities (Viereck	et al. 1992)		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m
0 - 5 Bluejoint Meadow	1	Bluejoint Mea	dow	1
5 - 10 Open Black Spruce-White Spruce Forest	10	Open Black Sp	pruce-White Spruce Forest	10
10 - 20 Open Black Spruce-White Spruce Forest	10	Open Black Sp	pruce-White Spruce Forest	10
20 - 30 Open Black Spruce-White Spruce Forest	10	Open Black Sp	pruce-White Spruce Forest	10
Key To Fish Sampling Methods				
(PEF) Backpack Electrofisher	(VOC	G) Visual Obser	rvation, Ground	
Fish Observations Species: salmonid-unspecified Life Stage: jur Total Fish Count: 1 Fish Measured: Fork	venile/adult x Lengths (mr		tory: Unknown Max: Mean:	Median:

Life History: Anadromous

Mean: 45

Mean: 36

Median: 52

Median: 36

Suspected Spawning: Yes

Max: 67

Life History: Resident

Max: 36

Life Stage: juvenile

Life Stage: juvenile

Fish Measured: 10 Fork Lengths (mm) Min: 37

Fish Measured: 1 Fork Lengths (mm) Min: 36

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0313A020.jpg

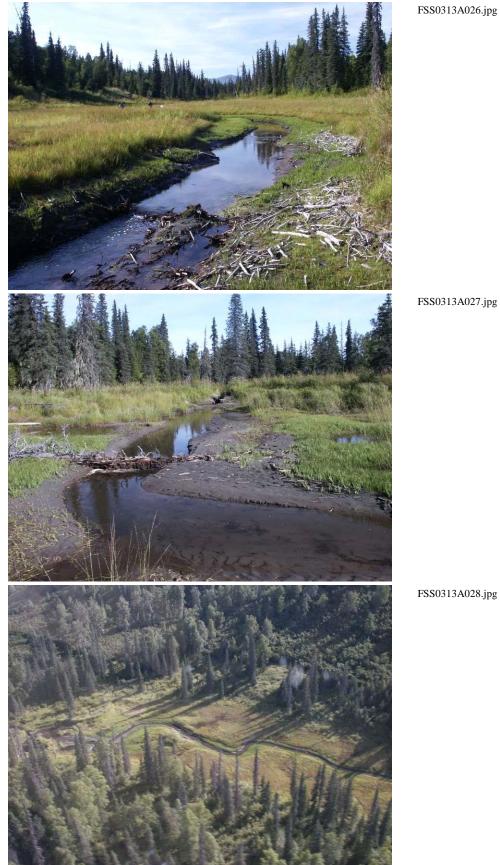
FSS0313A021.jpg



FSS0313A022.jpg

FSS0313A023.jpg

Station Info					
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/Time:	08/22/2003	5:06 PM
0	1		Longitude 151.92910		
Elevation NED (m)(ft): 240 787				_	
Coordinate Determination Method: Non-Differential GF USGS Quadrangle: Talkeetna B-4 Leg			Datum: NAD83 S025N014W07		
Waterbody Name:	gai Descriptio	л (м 1 К З).	5025110141107		
Anadromous Waters Catalog Number:					
Geographic Comments:	ash Daash la				
Visit Comments: Old beaver dam at downstream end of re	each. Reach Io	cated in old	pona.		
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 12.60DO (mg/L): 10.31DO (%)Water Color: ClearTurbidity (NTU):	, ,	onductivity alweg Veloo	(µS/cm): 8 ity (m/s)(ft/s):	рН: 5.80	
Stream Channel					
Stream Gradient (%): 1Entrenchment:Catchment Area(sq. km): 7Embeddedness:					
Channel Dimensions (m): Bankfull OHW Wetter	d Don	ninant Subs	trate: Sand/Silt/	Clay (legacy)	
Width 2.2 2.0		nant Substr			
Thalweg Depth0.20DCIC5		nant Substr		1 0 10	1 1 .
Rosgen Class: C5 Low gradient, meandering, point-bar, rif	ffie/pool, alluv	fal channels	with broad, well	-defined floo	aplains.
Riparian Vegetation Communities (Viereck et a	al. 1992)				
Dist. from	n				~
	Canopy leight(m) Dia	abt Bonk Va	gotation Type		Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u> H	leight(m) <u>Rig</u>		getation Type	Meadow	Height(m)
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow	leight(m) <u>Rig</u> 0 Sul	barctic Lowl	and Sedge Wet N		Height(m)
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow5 - 10Subarctic Lowland Sedge Wet Meadow	feight(m) <u>Ris</u> 0 Sul 0 Sul	barctic Lowl barctic Lowl	and Sedge Wet N and Sedge Wet N	Aeadow	Height(m) 0 0
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow5 - 10Subarctic Lowland Sedge Wet Meadow10 - 20Subarctic Lowland Sedge Wet Meadow	leight(m) <u>Ris</u> 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl	and Sedge Wet M and Sedge Wet M and Sedge Wet M	Meadow Meadow	Height(m) 0 0 0
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow5 - 10Subarctic Lowland Sedge Wet Meadow10 - 20Subarctic Lowland Sedge Wet Meadow20 - 30Subarctic Lowland Sedge Wet Meadow	leight(m) <u>Ris</u> 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl	and Sedge Wet N and Sedge Wet N	Meadow Meadow	Height(m) 0 0
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow5 - 10Subarctic Lowland Sedge Wet Meadow10 - 20Subarctic Lowland Sedge Wet Meadow20 - 30Subarctic Lowland Sedge Wet MeadowKey To Fish Sampling Methods	leight(m) <u>Ris</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M	Meadow Meadow	Height(m) 0 0 0
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow5 - 10Subarctic Lowland Sedge Wet Meadow10 - 20Subarctic Lowland Sedge Wet Meadow20 - 30Subarctic Lowland Sedge Wet Meadow	leight(m) <u>Ris</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl	and Sedge Wet M and Sedge Wet M and Sedge Wet M	Meadow Meadow	Height(m) 0 0 0
Bank (m)Left Bank Vegetation TypeH0 - 5Subarctic Lowland Sedge Wet Meadow5 - 10Subarctic Lowland Sedge Wet Meadow10 - 20Subarctic Lowland Sedge Wet Meadow20 - 30Subarctic Lowland Sedge Wet MeadowKey To Fish Sampling Methods	leight(m) <u>Ris</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M	Meadow Meadow	Height(m) 0 0 0
Bank (m) Left Bank Vegetation Type H 0 - 5 Subarctic Lowland Sedge Wet Meadow 5 5 - 10 Subarctic Lowland Sedge Wet Meadow 4 10 - 20 Subarctic Lowland Sedge Wet Meadow 4 20 - 30 Subarctic Lowland Sedge Wet Meadow 4 Key To Fish Sampling Methods 5 5 (PEF) Backpack Electrofisher 5 Fish Observations Species: Dolly Varden Life Stage: adult	leight(m) <u>Rig</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl 'isual Observ Life Hist	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground	Meadow Meadow Meadow	Height(m) 0 0 0 0
Bank (m) Left Bank Vegetation Type H 0 - 5 Subarctic Lowland Sedge Wet Meadow 5 - 10 5 - 10 Subarctic Lowland Sedge Wet Meadow 10 - 20 10 - 20 Subarctic Lowland Sedge Wet Meadow 20 - 30 20 - 30 Subarctic Lowland Sedge Wet Meadow 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Letter	leight(m) <u>Ris</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl 'isual Observ Life Hist	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground	Meadow Meadow Meadow	Height(m) 0 0 0
Bank (m) Left Bank Vegetation Type H 0 - 5 Subarctic Lowland Sedge Wet Meadow 5 5 - 10 Subarctic Lowland Sedge Wet Meadow 4 10 - 20 Subarctic Lowland Sedge Wet Meadow 4 20 - 30 Subarctic Lowland Sedge Wet Meadow 4 Key To Fish Sampling Methods 5 5 (PEF) Backpack Electrofisher 5 Fish Observations Species: Dolly Varden Life Stage: adult	leight(m) <u>Rig</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl 'isual Observ Life Hist	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground	Meadow Meadow Meadow	Height(m) 0 0 0 0
Bank (m) Left Bank Vegetation Type H 0 - 5 Subarctic Lowland Sedge Wet Meadow 5 - 10 Subarctic Lowland Sedge Wet Meadow 10 - 20 Subarctic Lowland Sedge Wet Meadow 20 - 30 Subarctic Lowland Sedge Wet Meadow 20 - 30 Subarctic Lowland Sedge Wet Meadow 4 Fish Sampling Methods 6 6 (PEF) Backpack Electrofisher 6 Fish Observations 5 5 Species: Dolly Varden Life Stage: adult Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOG (1) Comments: F.L.was about 150 mm. Species: slimy sculpin Life Stage: adult	leight(m) <u>Rig</u> 0 Sul 0 Sul 0 Sul (VOG) V	barctic Lowl barctic Lowl barctic Lowl barctic Lowl 'isual Observ Life Hist Min: N Life Hist	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground	Meadow Meadow Meadow	Height(m) 0 0 0 0
Bank (m) Left Bank Vegetation Type H 0 - 5 Subarctic Lowland Sedge Wet Meadow 5 - 10 Subarctic Lowland Sedge Wet Meadow 10 - 20 Subarctic Lowland Sedge Wet Meadow 20 - 30 Subarctic Lowland Sedge Wet Meadow 20 - 30 Subarctic Lowland Sedge Wet Meadow 20 - 30 Subarctic Lowland Sedge Wet Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher 7 Fish Observations Species: Dolly Varden Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Let Sampling Method (No. of fish): VOG (1) Comments: F.L.was about 150 mm. Species: slimy sculpin Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Let Sampling Method (No. of fish):	leight(m) <u>Rig</u> 0 Sul 0 Sul 0 Sul 0 Sul	barctic Lowl barctic Lowl barctic Lowl barctic Lowl 'isual Observ Life Hist Min: N Life Hist	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground ory: Resident Max: Mes	Meadow Meadow Meadow	Height(m) 0 0 0 0
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Bank (m) Left Bank Vegetation Type H 0-5 Subarctic Lowland Sedge Wet Meadow 5-10 Subarctic Lowland Sedge Wet Meadow 10-20 Subarctic Lowland Sedge Wet Meadow 20-30 Subarctic Lowland Sedge Wet Meadow 20-30 Subarctic Lowland Sedge Wet Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Let Sampling Method (No. of fish): VOG (1) Comments: F.L.was about 150 mm. Species: slimy sculpin Life Stage: adult Total Fish Count: 1 Fish Measured: Subarctic Information Species: adult Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): PEF (1) Comments: Instruments Stream Gradient: handheld optical clinometer	Ieight(m) Rig 0 Sul (VOG) V ngths (mm) I ngths (mm) I Channel D	barctic Lowl barctic Lowl barctic Lowl barctic Lowl Visual Observ Life Hist Min: M Life Hist Min: 94 M	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground ory: Resident fax: Me ory: Resident fax: 94 Me luated wading ro	Meadow Meadow Aeadow an: M an: 94 M	Height(m) 0 0 0 0
Bank (m) Left Bank Vegetation Type H 0-5 Subarctic Lowland Sedge Wet Meadow 5-10 Subarctic Lowland Sedge Wet Meadow 10-20 Subarctic Lowland Sedge Wet Meadow 20-30 Subarctic Lowland Sedge Wet Meadow 20-30 Subarctic Lowland Sedge Wet Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Fork Least adult Species: Dolly Varden Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Least Sampling Method (No. of fish): VOG (1) Comments: Species: slimy sculpin Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Least Sampling Method (No. of fish): VOG (1) Comments: Instruments Instruments Stream Gradient: handheld optical clinometer Stream Velocity: Price pygmy meter	Ieight(m) Rig 0 Sul (VOG) V ngths (mm) I ngths (mm) I Channel D Channel W	barctic Lowl barctic Lowl barctic Lowl barctic Lowl 'isual Observ Life Hist Min: M Life Hist Min: 94 M epths: grad	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground ory: Resident Max: Mes ory: Resident Max: 94 Mes luated wading ro suring tape	Meadow Meadow Aeadow an: M an: 94 M	Height(m) 0 0 0 0
Bank (m) Left Bank Vegetation Type H 0-5 Subarctic Lowland Sedge Wet Meadow 5-10 Subarctic Lowland Sedge Wet Meadow 10-20 Subarctic Lowland Sedge Wet Meadow 20-30 Subarctic Lowland Sedge Wet Meadow 20-30 Subarctic Lowland Sedge Wet Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Let Sampling Method (No. of fish): VOG (1) Comments: F.L.was about 150 mm. Species: slimy sculpin Life Stage: adult Total Fish Count: 1 Fish Measured: Subarctic Information Species: adult Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): PEF (1) Comments: Instruments Stream Gradient: handheld optical clinometer	Ieight(m) Rig 0 Sul (VOG) V ngths (mm) I ngths (mm) I Channel D Channel W	barctic Lowl barctic Lowl barctic Lowl barctic Lowl Visual Observ Life Hist Min: M Life Hist Min: 94 M epths: grad Vidths: mea	and Sedge Wet M and Sedge Wet M and Sedge Wet M and Sedge Wet M vation, Ground ory: Resident fax: Me ory: Resident fax: 94 Me luated wading ro	Meadow Meadow Aeadow an: M an: 94 M	Height(m) 0 0 0 0



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/23/2003 9:30 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.36120 -151.64638 Coordinates -151.64638 62.36120 Elevation NED (m)(ft): 574 1883 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna B-4 Legal Description (MTRS): S026N013W11 Waterbody Name: Clearwater Creek **Anadromous Waters Catalog Number:** Geographic Comments: Stream descends steep hillside downstream of station. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.10 DO (mg/L): 11.01 DO (%): Conductivity (µS/cm): 12 **pH:** 6.14 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment: Catchment Area(sq. km):** 20 **Embeddedness: Channel Dimensions (m): Bankfull OHW** Wetted Dominant Substrate: Gravel Width 4.8 4.7 Subdominant Substrate 1: Thalweg Depth 0.30 Subdominant Substrate 2: Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 2 0 - 5 2 Closed Tall Scrub Closed Tall Scrub 2 2 5-10 Closed Tall Scrub Closed Tall Scrub 10 - 20 Closed Tall Scrub 2 Closed Tall Scrub 2 20 - 30 Closed Tall Scrub 2 Closed Tall Scrub 2 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations**

Species: slimy sculpin	Life Sta	ge: juvenile/adult	Life H	istory: Resid	dent	
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 53	Max: 67	Mean: 58	Median: 60
Sampling Method (No. of	fish): PEF (5)					
Comments:						
Species: slimy sculpin	Life Sta	ige: juvenile	Life H	istory: Resid	dent	
Species: slimy sculpin Total Fish Count: 9	Life Sta Fish Measured: 9	ge: juvenile Fork Lengths (mm)		•	lent Mean: 39	Median: 40
1 , 1	Fish Measured: 9	8 5		•		Median: 40

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



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FSS0314A003.jpg

Station In									
	fo								
Observers:	Joe Buckwa	alter, J Johnson,	Jim Laza	r			Date/T	ime: 08/23/20	03 10:23 AM
Station Coordinat	Latitude 62.27112	8		Sam Coor	ple rdinates	Latitude 62.27112	Longitude -151.86451		
	NED (m)(ft):		D.00						
	e Determination drangle: Talk	on Method: N keetna B-4	lon-Diffei			easurement p tion (MTRS)	Datum: NA S025N014		
Waterbody	0			Lug			. 502011011		
		talog Number:							
	c Comments: nents: At leas	st 6 active beave	er ponds i	n lower rea	ch of stre	eam.			
Wildlife Co			1						
Water Qu	ality \ Strea	am Flow							
Water Ten	np (C): 7.50	DO (mg/L):	11.89	DO (%):		Conductivity	γ (μS/cm): 25	pH: 6.4	4
Water Col	or: Clear	Т	urbidity	(NTU):		Thalweg Velo	ocity (m/s)(ft/	/s):	
Stream Cl	hannel								
	adient (%): 2		Entrench						
	Area(sq. km)		Embedde		_				
Channel L	Dimensions (m	ı): Bankfull Width	OHW 10.5	Wetted 8.6		Dominant Sub minant Subst			
	Thalweg			0.30		minant Subst			
Rosgen Cla		rately entrenche n and profile. S		-	t, riffle do	ominated chan	nel, with infre	equently spaced	l pools. Very
Riparian V	Vegetation	Communitie	es (Vier	eck et al	. 1992)				
Dist. from					anopy		, , , , , , , , , , , , , , , , , , , 		Canopy
Bank (m)	<u>Left Bank V</u>	egetation Type		He	ight(m)	<u>Right Bank V</u>	egetation Ty	pe	Height(m)
Bank (m) 0 - 5		egetation Type Alder-Willow Sh		He	3	Right Bank V Closed Tall A			Height(m)
	Closed Tall A Closed White		nrub Birch-Bal		3 20	Closed Tall A	lder-Willow S Spruce-Paper	Shrub Birch-Balsam	3
0 - 5 5 - 10	Closed Tall A Closed White Poplar (Black Closed White	Alder-Willow Sh e Spruce-Paper l	nrub Birch-Bal orest) Birch-Bal	sam	3 20 20	Closed Tall A Closed White Poplar (Black	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper	Shrub : Birch-Balsam Forest) : Birch-Balsam	3 20
0 - 5 5 - 10 10 - 20	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White	Alder-Willow Sh e Spruce-Paper I k Cottonwood F e Spruce-Paper I	nrub Birch-Bal orest) Birch-Bal orest) Birch-Bal	sam sam	3 20 20 20	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper	Shrub • Birch-Balsam Forest) • Birch-Balsam Forest) • Birch-Balsam	3 20 20
0 - 5 5 - 10 10 - 20 20 - 30	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black	Alder-Willow Sh e Spruce-Paper I k Cottonwood F e Spruce-Paper I k Cottonwood F e Spruce-Paper I	nrub Birch-Bal orest) Birch-Bal orest) Birch-Bal	sam sam	3 20 20 20	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper	Shrub • Birch-Balsam Forest) • Birch-Balsam Forest) • Birch-Balsam	3 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black	Alder-Willow She e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F ag Methods	nrub Birch-Bal orest) Birch-Bal orest) Birch-Bal	sam sam	3 20 20 20	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood	Shrub : Birch-Balsam Forest) : Birch-Balsam Forest) : Birch-Balsam Forest)	3 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black Sh Samplin kpack Electrof	Alder-Willow She e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F ag Methods	nrub Birch-Bal orest) Birch-Bal orest) Birch-Bal	sam sam	3 20 20 20	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood	Shrub : Birch-Balsam Forest) : Birch-Balsam Forest) : Birch-Balsam Forest)	3 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black Sh Samplin kpack Electroof rvations obly Varden	Alder-Willow She e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F ng Methods fisher	hrub Birch-Bal Jorest) Birch-Bal Jorest) Birch-Bal Jorest)	sam sam sam e: juvenile	3 20 20 20 (VOG	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black) Visual Obse Life His	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood rvation, Grou	Shrub : Birch-Balsam Forest) : Birch-Balsam Forest) : Birch-Balsam Forest) nd	3 20 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black sh Samplin kpack Electron rvations olly Varden	Alder-Willow Sh e Spruce-Paper I k Cottonwood F e Spruce-Paper I k Cottonwood F e Spruce-Paper I k Cottonwood F ng Methods fisher	hrub Birch-Bal forest) Birch-Bal forest) Birch-Bal forest)	sam sam sam e: juvenile	3 20 20 20 (VOG	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black) Visual Obse	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood	Shrub • Birch-Balsam Forest) • Birch-Balsam Forest) • Birch-Balsam Forest) nd	3 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black sh Samplin kpack Electron rvations olly Varden Count: 1 Method (No.	Alder-Willow She e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F e Spruce-Paper I & Cottonwood F ng Methods fisher	hrub Birch-Bal forest) Birch-Bal forest) Birch-Bal forest)	sam sam sam e: juvenile	3 20 20 20 (VOG	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black) Visual Obse Life His	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood rvation, Grou	Shrub : Birch-Balsam Forest) : Birch-Balsam Forest) : Birch-Balsam Forest) nd	3 20 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Da Total Fish Sampling Comments Species: Ch Total Fish	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black sh Samplin kpack Electron rvations olly Varden Count: 1 Method (No. s: ninook salmon Count: 1 Method (No.	Alder-Willow She e Spruce-Paper 1 k Cottonwood F e Spruce-Paper 1 k Cottonwood F e Spruce-Paper 1 k Cottonwood F ng Methods fisher	hrub Birch-Bal forest) Birch-Bal forest) Birch-Bal forest) Life Stag red: 1 (1)	sam sam e: juvenile Fork Lenş e: juvenile	3 20 20 20 (VOG	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black) Visual Obse Life His) Min: 55	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood rvation, Grou	Shrub • Birch-Balsam Forest) • Birch-Balsam Forest) • Birch-Balsam Forest) nd wn Mean: 55	3 20 20 20
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: Ch Total Fish Sampling Comments Species: co	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black Sh Samplin kpack Electron rvations olly Varden Count: 1 Method (No. s: hinook salmon Count: 1 Method (No. s: ho salmon	Alder-Willow She e Spruce-Paper 1 k Cottonwood F e Spruce-Paper 1 k Cottonwood F e Spruce-Paper 1 k Cottonwood F g Methods fisher Fish Measur of fish): PEF (Fish Measur of fish): PEF (hrub Birch-Bal Jorest) Birch-Bal Jorest) Birch-Bal Jorest) Life Stag red: 1 (1) Life Stag (1) Life Stag	sam sam sam e: juvenile Fork Lenş e: juvenile Fork Lenş e: juvenile	3 20 20 20 (VOG gths (mm	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black) Visual Obse Life His) Min: 55 Life His) Min: 70	Ider-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood rvation, Grou tory: Unkno Max: 55 tory: Anadro Max: 70	Shrub Shrub Shrub Sirch-Balsam Forest) Sirch-Balsam Forest) nd wn Mean: 55 omous Mean: 70	3 20 20 20 Median: 55 Median: 70
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: Ch Total Fish Sampling Comments	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black Sh Samplin kpack Electron rvations olly Varden Count: 1 Method (No. s: ho salmon Count: 15 Method (No.	Alder-Willow She e Spruce-Paper I k Cottonwood F e Spruce-Paper I k Cottonwood F e Spruce-Paper I k Cottonwood F fisher Fish Measur of fish): PEF (Fish Measur of fish): PEF (Life Stag red: 1 (1) Life Stag red: 1 (1) Life Stag	sam sam sam e: juvenile Fork Lenş e: juvenile Fork Lenş e: juvenile	3 20 20 20 (VOG gths (mm	Closed Tall A Closed White Poplar (Black Closed White Poplar (Black Closed White Poplar (Black) Visual Obse Life His) Min: 55 Life His) Min: 70	lder-Willow S Spruce-Paper Cottonwood Spruce-Paper Cottonwood Spruce-Paper Cottonwood rvation, Grou tory: Unkno Max: 55 tory: Anadro Max: 70	Shrub Shrub Birch-Balsam Forest) Birch-Balsam Forest) Birch-Balsam Forest) nd wn Mean: 55 omous Mean: 70 omous Mean: 47	3 20 20 20 Median: 55

Appendix K87.-Page 2 of 5.

 Species: pink salmon
 Life Stage: adult
 Life History: Anadromous

 Total Fish Count:
 1
 Fish Measured:
 Fork Lengths (mm)
 Max:
 Mean:
 Median:

 Sampling Method (No. of Fish):
 VOG (1)
 VOG (1)
 VOG (1)
 VOG (1)
 VOG (1)

 Comments:
 Make.
 Make
 Make
 Make
 Median:

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:





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FSS0314A008.jpg

FSS0314A009.jpg

FSS0314A010.jpg



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/23/2003 11:42 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.24254 -151.85152 Coordinates 62.24254 -151.85152 Elevation NED (m)(ft): 183 600 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-4 Legal Description (MTRS): S025N014W22 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 8.00 DO (mg/L): 11.00 DO (%): Conductivity (µS/cm): 34 **pH:** 6.67 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel Entrenchment:** Stream Gradient (%): 2 Catchment Area(sq. km): 12 **Embeddedness:** OHW Bankfull Wetted Dominant Substrate: Cobble **Channel Dimensions (m):** 7.3 Width 6.0 Subdominant Substrate 1: Gravel 0.40 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 3 0 - 5 Closed Tall Alder-Willow Shrub 4 Closed Tall Alder-Willow Shrub 5 - 10 Closed Tall Alder-Willow Shrub 4 15 Closed Paper Birch Forest 10 - 20 Open Balsam Poplar (Black Cottonwood) 25 15 Closed Paper Birch Forest Forest 25 15 20 - 30 Open Balsam Poplar (Black Cottonwood) Closed Paper Birch Forest Forest **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous Fork Lengths (mm) Min: 47 **Total Fish Count: 5** Fish Measured: 1 Max: 47 Mean: 47 Median: 47 Sampling Method (No. of fish): PEF (1) VOG (4) Comments: Average F.L. of additional fish was about 50 mm. Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 38 Fork Lengths (mm) Min: 38 Total Fish Count: 1 Fish Measured: 1 **Max: 38 Mean: 38** Sampling Method (No. of fish): PEF (1) **Comments:** Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 **Turbidity:** Water Quality: Horiba U-10 **Transparency:**

409





FSS0314A014.jpg

Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/Time: 08/23/2	2003 1:29 PM
Station Latitude Longitude	Sample		gitude	
Coordinates 62.20736 -151.83164	Coordinates	62.20736 -151	.83164	
Elevation NED (m)(ft): 213 699 Coordinate Determination Method: Non-Differenti	al GPS Field M	easurement Dat	um: NAD83	
USGS Quadrangle: Talkeetna A-4		ption (MTRS): S02		
Waterbody Name:				
Anadromous Waters Catalog Number: Geographic Comments:				
Visit Comments: Station located at blown-out beaver	dam. Sampled	reach downstream o	f dam. OHW mark co	ould not be
determined due to recent blow-out of				
Wildlife Comments:				
Water Quality \ Stream Flow				
) (%):	Conductivity (µS/	_	.22
Water Color: Clear Turbidity (NT	'U):	Thalweg Velocity	m/s)(ft/s):	
Stream Channel				
Stream Gradient (%):1.5Entrenchmen				
Catchment Area(sq. km):4Embeddednes				
		Dominant Substrate ominant Substrate 1	: Sand/Silt/Clay (leg	acy)
		ominant Substrate 1 ominant Substrate 2		
Rosgen Class: E5 Low gradient, meandering riffle/poo				Verv
efficient and stable. High meander wid			und intie deposition	·······································
Riparian Vegetation Communities (Viereck	x et al. 1992)			
Dist. from	Canopy			Canopy
Bank (m) Left Bank Vegetation Type	Height(m)	Right Bank Vegeta	<u>tion Type</u>	Height(m)
0 - 5 Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-V	Villow Shrub	2
5-10 Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-V	Villow Shrub	2
10 - 20 Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-V	Villow Shrub	2
20 - 30 Closed White Spruce Forest	25	Closed White Spruc	e Forest	
Key To Fish Sampling Methods				25
Key 10 Fish Sampling Methods				25
(PEF) Backpack Electrofisher	(VOG) Visual Observatio	n, Ground	25
(PEF) Backpack Electrofisher	(VOG) Visual Observatio	n, Ground	25
(PEF) Backpack Electrofisher) Visual Observatio		25
(PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: ac Total Fish Count: 2 Fish Measured: For		Life History:	Resident	25 Median:
(PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: ac Total Fish Count: 2 Fish Measured: For Sampling Method (No. of fish): VOG (2)	dult	Life History:	Resident	
 (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: ad Total Fish Count: 2 Fish Measured: For Sampling Method (No. of fish): VOG (2) Comments: Average F.L. was about 150 mm. 	dult k Lengths (mn	Life History: 1) Min: Max	Resident Mean:	
(PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: ac Total Fish Count: 2 Fish Measured: For Sampling Method (No. of fish): VOG (2) Comments: Average F.L. was about 150 mm. Species: Dolly Varden Life Stage: ju	dult k Lengths (mn ıvenile/adult	Life History: 1) Min: Max Life History:	Resident Mean: Unknown	Median:
(PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: ac Total Fish Count: 2 Fish Measured: For Sampling Method (No. of fish): VOG (2) Comments: Average F.L. was about 150 mm. Species: Dolly Varden Life Stage: ju	dult k Lengths (mn ıvenile/adult	Life History: 1) Min: Max	Resident Mean: Unknown	
(PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: ac Total Fish Count: 2 Fish Measured: For Sampling Method (No. of fish): VOG (2) Comments: Average F.L. was about 150 mm. Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1 For	dult k Lengths (mn ıvenile/adult	Life History: 1) Min: Max Life History:	Resident Mean: Unknown	Median:

Total Fish Count:29Fish Measured:23Fork Lengths (mm)Min:38Max:79Mean:49Median:58Sampling Method (No. of fish):PEF (23) VOG (6)Suspected Spawning:YesComments:Average F.L. of additional fish was about 45 mm.

Appendix K89.–Page 2 of 4.

Species: rainbow trout Life Stage: juvenile Life History: Resident Max: 79 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 79 **Mean:** 79 Median: 79 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 58 Max: 61 **Mean: 59** Median: 59 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 42 Fork Lengths (mm) Min: 41 Max: 44 **Total Fish Count:** 3 Fish Measured: 3 **Mean:** 42 Sampling Method (No. of fish): PEF (3) **Comments:** Instruments

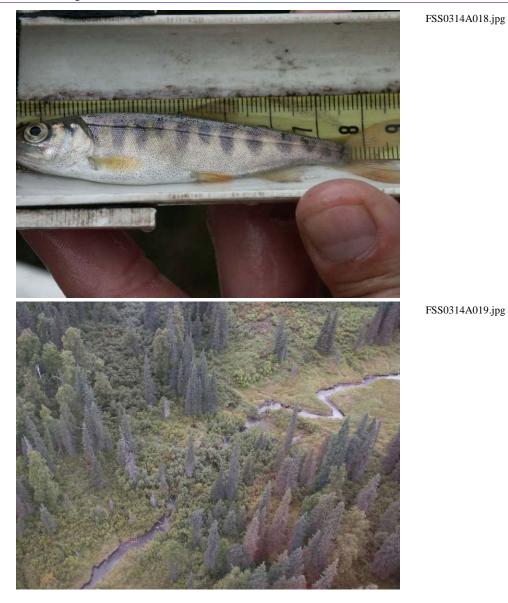
Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



FSS0314A015.jpg

FSS0314A016.jpg

FSS0314A017.jpg



FSS0314A018.jpg

Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/Time: 08	2/23/2003 2:56 PM
Station Latitude Longitude Coordinates 62.17686 -151.84080	Sample Coordinates	Latitude 62.17686	Longitude -151.84080	
Elevation NED (m)(ft): 250 820	Coordinates	02.17080	-131.84080	
Coordinate Determination Method: Non-Differen	tial GPS Field N	leasurement	Datum: NAD83	
USGS Quadrangle: Talkeetna A-4	Legal Descr	iption (MTRS)	: S024N014W16	
Waterbody Name:				
Anadromous Waters Catalog Number: Geographic Comments:				
Visit Comments: Large beaver dam downstream of s	sample reach. C	ould not access	stream below beaver	dam - vegetation
(alders/willow) too dense.	r			
Wildlife Comments: Bear, moose tracks.				
Water Quality \ Stream Flow				
Water Temp (C): 8.90DO (mg/L): 10.89DWater Color: ClearTurbidity (N	O (%): TU):	-	ν (μ S/cm): 18 p ocity (m/s)(ft/s):	H: 6.37
Stream Channel				
Stream Gradient (%): 0.5 Entrenchme	ent:			
Catchment Area(sq. km): 6 Embeddedn				
Channel Dimensions (m): Bankfull OHW	Wetted	Dominant Sub	strate: Gravel	
Width	Subd		rate 1: Cobble	
With	Subu	ominant Subsi	Tate 1. Couble	
Thalweg Depth			rate 2: Sand/Silt/Clay	y (legacy)
	Subd	ominant Subst	rate 2: Sand/Silt/Clay	
Thalweg Depth	Subd bar, riffle/pool, a	ominant Subst Illuvial channel	rate 2: Sand/Silt/Clay	
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-b	Subd bar, riffle/pool, a	ominant Subst Illuvial channel	rate 2: Sand/Silt/Clay	
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-t Riparian Vegetation Communities (Vierec Dist. from	Subd bar, riffle/pool, a k et al. 1992 Canopy	ominant Subst Illuvial channel) <u>Right Bank V</u>	rate 2: Sand/Silt/Clays with broad, well-det	fined floodplains.
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-le Riparian Vegetation Communities (Vierec Dist. from Bank (m) Left Bank Vegetation Type	Subd bar, riffle/pool, a ck et al. 1992 Canopy Height(m)	ominant Subst illuvial channel) <u>Right Bank V</u> Closed Tall A	rate 2: Sand/Silt/Clay s with broad, well-def <u>egetation Type</u>	fined floodplains. Canopy Height(m)
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-te Riparian Vegetation Communities (Vierec Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Alder-Willow Shrub	Subd bar, riffle/pool, a ck et al. 1992 Canopy Height(m) 3	ominant Subst Illuvial channel Might Bank V Closed Tall A Closed Tall A	rate 2: Sand/Silt/Clay s with broad, well-det <u>regetation Type</u> lder-Willow Shrub	fined floodplains. Canopy Height(m) 3
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-4 Riparian Vegetation Communities (Vierect Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Alder-Willow Shrub 5 - 10 Closed Tall Alder-Willow Shrub	Subd bar, riffle/pool, a k et al. 1992 Canopy Height(m) 3 3	Might Bank V Closed Tall A Closed Tall A Closed Tall A	rate 2: Sand/Silt/Clay s with broad, well-def <u>regetation Type</u> lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3
Thalweg DepthRosgen Class: C4 Low gradient, meandering, point-8Riparian Vegetation Communities (Vierect Dist. fromBank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub	Subd bar, riffle/pool, a ck et al. 1992 Canopy Height(m) 3 3 3 3	Might Bank V Closed Tall A Closed Tall A Closed Tall A	rate 2: Sand/Silt/Clay s with broad, well-det <u>regetation Type</u> lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3
Thalweg DepthRosgen Class: C4 Low gradient, meandering, point-teRiparian Vegetation Communities (VierectDist. fromBank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow Shrub	Subd bar, riffle/pool, a k et al. 1992, Canopy Height(m) 3 3 3 3 3	Might Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A	rate 2: Sand/Silt/Clay s with broad, well-det <u>regetation Type</u> lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3
Thalweg DepthRosgen Class: C4 Low gradient, meandering, point-teRiparian Vegetation Communities (VierectDist. fromBank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow ShrubKey To Fish Sampling Methods	Subd bar, riffle/pool, a k et al. 1992, Canopy Height(m) 3 3 3 3 3	Might Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A	rate 2: Sand/Silt/Clay s with broad, well-det der-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3
Thalweg DepthRosgen Class: C4 Low gradient, meandering, point-8Riparian Vegetation Communities (VierectDist. fromBank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow ShrubClosed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow ShrubElectrofisherFish Observations	Subd bar, riffle/pool, a k et al. 1992, Canopy Height(m) 3 3 3 3 3	Might Bank V Right Bank V Closed Tall A S) Visual Obse	rate 2: Sand/Silt/Clay s with broad, well-det der-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3
Thalweg DepthRosgen Class: C4 Low gradient, meandering, point-4Riparian Vegetation Communities (VierectDist. fromBank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow ShrubKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: salmonid-unspecifiedLife Stage: j	Subd bar, riffle/pool, a canopy Height(m) 3 3 3 3 (VOC	Might Bank V Right Bank V Closed Tall A S) Visual Obse Life Hist	rate 2: Sand/Silt/Clay s with broad, well-det /egetation Type lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-4 Riparian Vegetation Communities (Vierect Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Alder-Willow Shrub 5 - 10 Closed Tall Alder-Willow Shrub 10 - 20 Closed Tall Alder-Willow Shrub 20 - 30 Closed Tall Alder-Willow Shrub 20 - 30 Closed Tall Alder-Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: salmonid-unspecified Life Stage: j Total Fish Count: 2 Fish Measured: Fo Sampling Method (No. of fish): VOG (2)	Subd bar, riffle/pool, a ck et al. 1992 Canopy Height(m) 3 3 3 3 (VOC juvenile/adult rk Lengths (mm	Might Bank V Right Bank V Closed Tall A S) Visual Obse Life His n) Min:	rate 2: Sand/Silt/Clay s with broad, well-det der-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3 3 3
Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-4 Riparian Vegetation Communities (Vierect Dist. from Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Alder-Willow Shrub 5 - 10 Closed Tall Alder-Willow Shrub 10 - 20 Closed Tall Alder-Willow Shrub 20 - 30 Closed Tall Alder-Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: salmonid-unspecified Life Stage: j Total Fish Count: 2	Subd bar, riffle/pool, a ck et al. 1992 Canopy Height(m) 3 3 3 3 (VOC juvenile/adult rk Lengths (mm	Might Bank V Right Bank V Closed Tall A S) Visual Obse Life His n) Min:	rate 2: Sand/Silt/Clay s with broad, well-det der-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub lder-Willow Shrub	fined floodplains. Canopy Height(m) 3 3 3 3 3

Stream Gradient:	handheld optical clinometer	Channel Depth	s:
Stream Velocity:	Price pygmy meter	Channel Width	s:
Turbidity:		Electrofisher:	Smith-Root LR-24
Water Quality: He	oriba U-10	Transparency:	



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FSS0314A021.jpg

FSS0314A022.jpg



FSS0314A023.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/23/2003 3:31 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.20879 -152.02458 Coordinates 62.20879 -152.02458 62.20938 -152.02198 Elevation NED (m)(ft): 414 1358 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-5 Legal Description (MTRS): S025N015W34 Waterbody Name: Nakochna River **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): Water Temp (C): DO (mg/L): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km):** 66 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult Life History: Anadromous **Total Fish Count: 300** Max: Median: Fish Measured: Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOH (300) Suspected Spawning: Yes **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity:** Price pygmy meter **Turbidity: Electrofisher:** Water Quality: **Transparency:**

FSS0314A027.jpg



Water Quality: Horiba U-10

Station Info			
Observers: Joe Buckwalter, J Johnson, Jim Laza	ar	Date	e/Time: 08/23/2003 4:04 PM
StationLatitudeLongitudeCoordinates62.26222-152.19804	Sample Coordinates	Latitude Longitue 62.26222 -152.198	
Elevation NED (m)(ft): 767 2516 Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna B-5 Waterbody Name: Nakochna River Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: Wildlife Comments:		easurement Datum: Datum : Datum : Datum : Datum : Datum :	
Water Quality \ Stream Flow			
Water Temp (C): 6.80DO (mg/L): 10.99Water Color: ClearTurbidity	DO (%): • (NTU):	Conductivity (µS/cm): Thalweg Velocity (m/s)	=
Stream Channel			
Stream Gradient (%): 5EntrenchCatchment Area(sq. km): 11Embedde			
Channel Dimensions (m): Bankfull OHW		Dominant Substrate: Co	
Width 8.7 Thalweg Depth		minant Substrate 1: Bo minant Substrate 2: Gr	
Rosgen Class: A3 Steep, entrenched, cascading, s soils.			
Riparian Vegetation Communities (View	reck et al. 1992)		
Dist. from	Canopy		Canopy
Bank (m) Left Bank Vegetation Type	Height(m)	Right Bank Vegetation	Type Height(m)
0-5 Fireweed	0	Mixed Herbs	0
5-10 Fireweed	0	Mixed Herbs	0
10 - 20 Fireweed	0	Mixed Herbs	0
20 - 30 Open Tall Alder-Willow Shrub	2	Mixed Herbs	0
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher	(VOG	Visual Observation, G	round
Total Fish Count:6Fish Measured:2Sampling Method (No. of fish):PEF (2) VOGComments:Average F.L. of additional fish was	(4) about 120 mm.	Life History: Unl) Min: 120 Max: 122	
Species: Dolly VardenLife StagTotal Fish Count:4Fish Measured:4Sampling Method (No. of fish):PEF (4)Comments:	ge: juvenile Fork Lengths (mm	Life History: Unl) Min: 35 Max: 66	known Mean: 54 Median: 50 Suspected Spawning: Yes
Instruments			
Stream Gradient: handheld optical clinometer	Channe	l Depths: graduated wa	ading rod

Transparency:

FSS0314A024.jpg





FSS0314A025.jpg

FSS0314A026.jpg



Station Info				
Observers: Joe Buckwalter, J Johnson	n, Jim Lazar	Date	e/Time: 08/24/2003	11:45 AM
Station Latitude Longitude Coordinates 62.08165 -151.99744		Latitude Longitude 62.08165 -151.997		
Elevation NED (m)(ft): 371 1217 Coordinate Determination Method: USGS Quadrangle: Talkeetna A-4 Waterbody Name: Anadromous Waters Catalog Number Geographic Comments: Visit Comments: Wildlife Comments:	Legal Descri	easurement Datum: ption (MTRS): S023N(
Water Quality \ Stream Flow				
Water Temp (C): 8.00 DO (mg/L):		Conductivity (µS/cm): Thalweg Velocity (m/s)		
Stream Channel				
Stream Gradient (%): 2 Catchment Area(sq. km): 6	Entrenchment: Embeddedness:			
Channel Dimensions (m): Bankfu Width Thalweg Depth	3.8 3.1 Subdo	Dominant Substrate: Gr minant Substrate 1: Sa minant Substrate 2:		
Rosgen Class: C4 Low gradient, mean			ad, well-defined flood	lplains.
Riparian Vegetation Communit	ties (Viereck et al. 1992)			
Dist. from	Canopy			G
Bank (m) <u>Left Bank Vegetation Typ</u>		Right Bank Vegetation	Туре	Canopy Height(m)
	be Height(m)	Right Bank Vegetation Closed Tall Alder-Willd		1.
Bank (m) Left Bank Vegetation Typ	DeHeight(m)Shrub2		w Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S	DeHeight(m)Shrub2ite Spruce Forest25	Closed Tall Alder-Willo	w Shrub Vhite Spruce Forest	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S5 - 10Closed Balsam Poplar-White	beHeight(m)Shrub2ite Spruce Forest25ite Spruce Forest25	Closed Tall Alder-Willd Closed Balsam Poplar-V	w Shrub Vhite Spruce Forest Vhite Spruce Forest	Height(m) 2 25
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S5 - 10Closed Balsam Poplar-White10 - 20Closed Balsam Poplar-White	DeHeight(m)Shrub2ite Spruce Forest25ite Spruce Forest25ite Spruce Forest25	Closed Tall Alder-Willo Closed Balsam Poplar-V Closed Balsam Poplar-V	w Shrub Vhite Spruce Forest Vhite Spruce Forest	Height(m) 2 25 25
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S5 - 10Closed Balsam Poplar-Whit10 - 20Closed Balsam Poplar-Whit20 - 30Closed Balsam Poplar-Whit	DeHeight(m)Shrub2ite Spruce Forest25ite Spruce Forest25ite Spruce Forest25	Closed Tall Alder-Willo Closed Balsam Poplar-V Closed Balsam Poplar-V	w Shrub Vhite Spruce Forest Vhite Spruce Forest Vhite Spruce Forest	Height(m) 2 25 25
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S5 - 10Closed Balsam Poplar-Whit10 - 20Closed Balsam Poplar-Whit20 - 30Closed Balsam Poplar-WhitKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish Observations	De Height(m) Shrub 2 ite Spruce Forest 25 ite Spruce Forest 25 ite Spruce Forest 25 ite Spruce Forest 25	Closed Tall Alder-Willo Closed Balsam Poplar-V Closed Balsam Poplar-V Closed Balsam Poplar-V) Visual Observation, G	ow Shrub White Spruce Forest White Spruce Forest White Spruce Forest round	Height(m) 2 25 25
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S5 - 10Closed Balsam Poplar-Whit10 - 20Closed Balsam Poplar-Whit20 - 30Closed Balsam Poplar-WhitKey To Fish Sampling Methods(PEF)Backpack Electrofisher	De Height(m) Shrub 2 ite Spruce Forest 25 ite Stage: juvenile (VOG)	Closed Tall Alder-Willd Closed Balsam Poplar-V Closed Balsam Poplar-V Closed Balsam Poplar-V) Visual Observation, G Life History: Unl	w Shrub Vhite Spruce Forest Vhite Spruce Forest Vhite Spruce Forest round	Height(m) 2 25 25
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow S5 - 10Closed Balsam Poplar-Whit10 - 20Closed Balsam Poplar-Whit20 - 30Closed Balsam Poplar-Whit20 - 30Closed Balsam Poplar-WhitKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenTotal Fish Count:1Fish Method (No. of fish):PEFComments:Species: coho salmon	De Height(m) Shrub 2 Shrub 2 ite Spruce Forest 25 ite Stage: juvenile (VOG) Life Stage: juvenile Image: juvenile ured: 1 Fork Lengths (mm) F (12) VOG (5)	Closed Tall Alder-Willo Closed Balsam Poplar-V Closed Balsam Poplar-V Closed Balsam Poplar-V) Visual Observation, G Life History: Uni) Min: 46 Max: 46 Life History: Ana	w Shrub Vhite Spruce Forest Vhite Spruce Forest Vhite Spruce Forest round known Mean: 46 Me	Height(m) 2 25 25 25 edian: 46

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:





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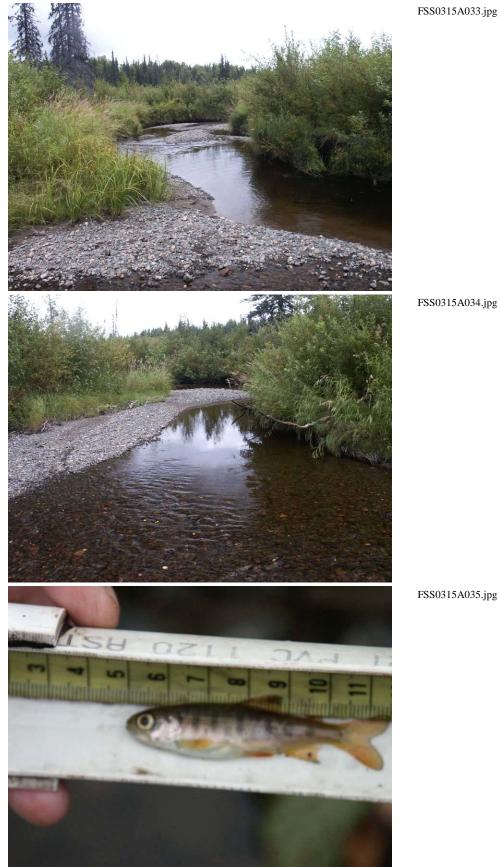
FSS0315A032.jpg

Station Info					
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/T	`ime: 08/24/2	2003 1:25 PM
Station Latitude Longitude Coordinates 62.11538 -151.84991	Sample Coordinates	Latitude 62.11538	Longitude -151.84991		
Elevation NED (m)(ft): 213 699					
Coordinate Determination Method: Non-Differe USGS Quadrangle: Talkeetna A-4		leasurement ption (MTRS):	Datum: N		
Waterbody Name:	Legal Descri		. 502511014	W 04	
Anadromous Waters Catalog Number:					
Geographic Comments: Reach located downstream					
Visit Comments: Reach entrenched in wider chann		her beaver dam	downstream		
Wildlife Comments: Tracks: brown bear & cub,me	oose,otter?				
Water Quality \ Stream Flow					
Water Temp (C): 10.20 DO (mg/L): 10.63 I Water Color: Clear Turbidity (Note: Clear)	DO (%): NTU): 1.00	Conductivity Thalweg Velo		-	.18
Stream Channel					
Stream Gradient (%): 1.5EntrenchmCatchment Area(sq. km): 12Embedded					
Channel Dimensions (m): Bankfull OHW	Wetted	Dominant Subs	strate: Grave	el	
Width 3.6 Thalweg Depth		ominant Substr ominant Substr			acy)
Rosgen Class: C4 Low gradient, meandering, point	-bar, riffle/pool, a	lluvial channels	s with broad,	well-defined	floodplains.
Riparian Vegetation Communities (Viere	ck et al. 1992)	1			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank V</u>	egetation T	vpe	Canopy Height(m)
0 - 5 Closed Tall Alder-Willow Shrub	2	Closed Tall Al	der-Willow	Shrub	2
5 - 10 Closed Tall Alder-Willow Shrub	2	Closed Tall Al	der-Willow	Shrub	2
10 - 20 Closed Tall Alder-Willow Shrub	2	Closed Tall Al	der-Willow	Shrub	2
20 - 30 Closed Tall Alder-Willow Shrub	2	Open Black Sp	pruce Forest		8
Key To Fish Sampling Methods					
(PEF) Backpack Electrofisher	(VOG	b) Visual Obser	rvation, Grou	ınd	
Fish Observations					
Species: coho salmon Life Stage:	•		tory: Anadr		
Total Fish Count: 29 Fish Measured: 23 F Sampling Method (No. of fish): PEF (23) VOG (-	n) Min: 35	Max: 60	Mean: 41	Median: 47 pawning: Yes
Comments: Average F.L. of additional fish was ab				Suspected 8	pawning. 103
Species: slimy sculpin Life Stage:	: juvenile/adult	Life Hist	tory: Reside	ent	
Total Fish Count: 1 Fish Measured: 1 F Sampling Method (No. of fish): PEF (1) Comments:	ork Lengths (mn) Min: 51	Max: 51	Mean: 51	Median: 51
Species: slimy sculpin Life Stage:	: juvenile	Life Hist	tory: Reside	ent	
Total Fish Count: 1 Fish Measured: 1 F Sampling Method (No. of fish): PEF (1) Comments:	ork Lengths (mn	n) Min: 48	Max: 48	Mean: 48	Median: 48

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0315A034.jpg

FSS0315A035.jpg



FSS0315A036.jpg

FSS0315A038.jpg

FSS0315A039.jpg

Station Info	
Observers: Joe Buckwalter, J Johnson, Jim Lazar	Date/Time: 08/24/2003 2:35 PM
Coordinates 62.10551 -151.87487	Sample Latitude Longitude Coordinates 62.10551 -151.87487
Elevation NED (m)(ft): 265 869	
Coordinate Determination Method: Non-Differential C USGS Quadrangle: Talkeetna A-4	GPS Field MeasurementDatum: NAD83Legal Description (MTRS):\$023N014W05
Waterbody Name:	
Anadromous Waters Catalog Number:	
Geographic Comments: Old blown-out beaver dam at u	pstream end of reach.
Visit Comments: Wildlife Comments: Old beaver ponds, tadpole.	
Water Quality \ Stream Flow	
Water Temp (C): 10.20DO (mg/L): 10.63DO (%Water Color: ClearTurbidity (NTU)	
Stream Channel	
Stream Gradient (%): 1 Entrenchment:	
Catchment Area(sq. km): 2 Embeddedness:	
Channel Dimensions (m): Bankfull OHW Wett	j()
Width 2.9 2.6 Thalweg Depth 0.10	
Ŭ .	
efficient and stable. High meander width	stream with low width/depth ratio and little deposition. Very ratio.
Riparian Vegetation Communities (Viereck et	t al. 1992)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	CanopyCanopyHeight(m)Right Bank Vegetation TypeHeight(m)
0-5 Closed Tall Alder Shrub	2 Closed Tall Alder Shrub 2
5 - 10 Open White Spruce Forest	12 Open White Spruce Forest 12
10 - 20 Open White Spruce Forest	12 Open White Spruce Forest 12
20 - 30 Open White Spruce Forest	12Open White Spruce Forest12

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: slimy sculpin	Life Sta	age: juvenile/adult	Life H	istory: Resid	lent	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 52	Max: 52	Mean: 52	Median: 52
Sampling Method (No. o	f fish): PEF (1)					
Comments:						

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity: Horiba U-10	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



FSS0315A040.jpg

FSS0315A043.jpg



Station Info			
Observers: Joe Buckwalter, J Johnson, Jim La	zar	Date/Time: 08/2	24/2003 3:28 PM
StationLatitudeLongitudeCoordinates62.01563-151.62251	Sample Coordinates	Latitude Longitude 62.01563 -151.62251	
Elevation NED (m)(ft): 183 600 Coordinate Determination Method: Non-Dif USGS Quadrangle: Talkeetna A-4		Ieasurement Datum: NAD83 ption (MTRS): S022N013W10	
Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Visit Comments:	2 .9 2	Proz (11110), 1011010 1110	
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 13.70 DO (mg/L): 9.02	DO (%):		I: 6.03
Water Color: Humic Turbidit	ty (NTU):	Thalweg Velocity (m/s)(ft/s):	
Stream Channel			
	chment: dedness:		
Channel Dimensions (m): Bankfull OHV		Dominant Substrate: Gravel	
Width 4.9 Thalweg Depth		ominant Substrate 1: Sand/Silt/Clay ominant Substrate 2: Cobble	(legacy)
Rosgen Class: F4 Entrenched meandering riffle			
	-		
Riparian Vegetation Communities (Vie			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5 Bluejoint-Shrub	1	Bluejoint-Shrub	1
5 - 10 Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2
			2
10 - 20 Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	4
10 - 20 Closed Tall Alder-Willow Shrub20 - 30 Closed Black Spruce Forest	2 6	Closed Tall Alder-Willow Shrub Closed Black Spruce Forest	6
20 - 30 Closed Black Spruce Forest			
	6		
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods	6	Closed Black Spruce Forest	
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations	6	Closed Black Spruce Forest	
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life State Total Fish Count: 1 Fish Measured: 1	6 (VOC	Closed Black Spruce Forest i) Visual Observation, Ground Life History: Resident	6
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments:	6 (VOC age: adult Fork Lengths (mm	Closed Black Spruce Forest (i) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6	6
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: coho salmon	6 (VOC age: adult Fork Lengths (mn age: juvenile Fork Lengths (mn	Closed Black Spruce Forest b) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6 Life History: Anadromous n) Min: 38 Max: 53 Mean: 4	6 3 Median: 63
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: coho salmon Life Sta Total Fish Count: 26 Fish Measured: 20	6 (VOC age: adult Fork Lengths (mn age: juvenile Fork Lengths (mn DG (6)	Closed Black Spruce Forest b) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6 Life History: Anadromous n) Min: 38 Max: 53 Mean: 4	 6 3 Median: 63 3 Median: 45
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: coho salmon Life Sta Total Fish Count: 26 Fish Measured: 20 Sampling Method (No. of fish): PEF (20) VC	6 (VOC age: adult Fork Lengths (mn age: juvenile Fork Lengths (mn DG (6)	Closed Black Spruce Forest b) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6 Life History: Anadromous n) Min: 38 Max: 53 Mean: 4	6 3 Median: 63 3 Median: 45
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: coho salmon Life Sta Total Fish Count: 26 Fish Measured: 20 Sampling Method (No. of fish): PEF (20) VC Comments: Average F.L. of additional fish wa	(VOC age: adult Fork Lengths (mm age: juvenile Fork Lengths (mm OG (6) is about 45 mm.	Closed Black Spruce Forest b) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6 Life History: Anadromous n) Min: 38 Max: 53 Mean: 4	 6 3 Median: 63 3 Median: 45
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: coho salmon Life Sta Total Fish Count: 26 Fish Measured: 20 Sampling Method (No. of fish): PEF (20) VC Comments: Average F.L. of additional fish wa	(VOC age: adult Fork Lengths (mm age: juvenile Fork Lengths (mm DG (6) as about 45 mm.	Closed Black Spruce Forest i) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6 Life History: Anadromous n) Min: 38 Max: 53 Mean: 4 Suspector	 6 3 Median: 63 3 Median: 45
20 - 30 Closed Black Spruce Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: ninespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: coho salmon Life Sta Total Fish Count: 26 Fish Measured: 20 Sampling Method (No. of fish): PEF (20) VC Comments: Average F.L. of additional fish wa Instruments Stream Gradient: handheld optical clinometer	(VOC age: adult Fork Lengths (mm age: juvenile Fork Lengths (mm DG (6) as about 45 mm.	Closed Black Spruce Forest i) Visual Observation, Ground Life History: Resident n) Min: 63 Max: 63 Mean: 6 Life History: Anadromous n) Min: 38 Max: 53 Mean: 4 Suspected el Depths: graduated wading rod el Widths: measuring tape	 6 3 Median: 63 3 Median: 45



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1 PRODUCED AND A CONTRACT



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FSS0315A048.jpg

FSS0315A049.jpg

Turbidity:

Water Quality:

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/24/2003 4:24 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.08863 -152.27210 Coordinates -152.27210 62.08863 62.08923 -152.26951 Elevation NED (m)(ft): 424 1391 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna A-5 Legal Description (MTRS): S023N016W18 Waterbody Name: Johnson Creek **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): Water Temp (C): DO (mg/L): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 103 **Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) <u>Right Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 100 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): VOH (100) Comments: No sockeye observed upstream at 15A06. Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity:** Price pygmy meter

Electrofisher:

Transparency:

FSS0315A056.jpg



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/24/2003 5:04 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.08686 -152.39984 Coordinates -152.39984 62.08686 Elevation NED (m)(ft): 530 1739 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-5 Legal Description (MTRS): S023N017W16 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Johnson Creek tributary. Visit Comments: Wildlife Comments: Bear droppings. Saw 2 grizzlies upstream (observed from helicopter). Water Quality \ Stream Flow Water Temp (C): 4.40 DO (mg/L): 11.77 DO (%): Conductivity (µS/cm): 28 pH: 6.68 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2 **Entrenchment:** Catchment Area(sq. km): 4 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Gravel 8.1 Width 7.7 Subdominant Substrate 1: Cobble 0.30 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

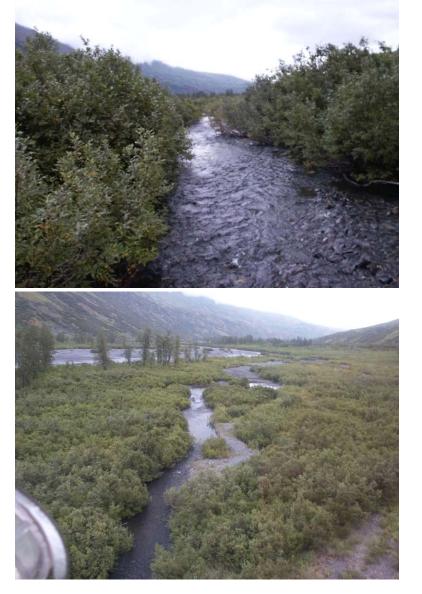
Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld optical clinometerStream Velocity: Price pygmy meterTurbidity: Horiba U-10Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0315A051.jpg

FSS0315A052.jpg

tation Info	
Observers: Joe Buckwalter, J Johnson, Jim Lazar	Date/Time: 08/24/2003 5:43 PM
StationLatitudeLongitudeCoordinates62.09367-152.37300	SampleLatitudeLongitudeCoordinates62.09367-152.37300
Elevation NED (m)(ft): 446 1463	
Coordinate Determination Method: Non-Differentia	al GPS Field Measurement Datum: NAD83
USGS Quadrangle: Talkeetna A-5	Legal Description (MTRS): S023N017W10
Waterbody Name: Johnson Creek	
Anadromous Waters Catalog Number:	
Geographic Comments: Mainstem braid and slough.	
Visit Comments: Width measured across 1 braid only.	. Entire braided stream channel approximately 300 meters across.
Wildlife Comments:	
Vater Quality \ Stream Flow	$(0/)$ $C_{au} = \frac{1}{2} \frac{1}$
Water Temp (C): 6.70 DO (mg/L): 10.74 DO Water Color: Glacial, Low Turbidit Turbidity (NTW)	O (%): Conductivity (μS/cm): 37 pH: 6.56 U): Thalweg Velocity (m/s)(ft/s):
tream Channel	
Stream Gradient (%): 1 Entrenchment	t:
Catchment Area(sq. km): 78 Embeddednes	58:
Channel Dimensions (m): Bankfull OHW We	Tetted Dominant Substrate: Cobble
Width 13.4 1	13.1 Subdominant Substrate 1: Gravel
	0.50 Subdominant Substrate 2:
Thalweg Depth0.700	
	and transverse bars. Very wide channel with eroding banks.

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2
5 - 10	Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2
10 - 20	Closed Tall Alder-Willow Shrub	2	Open Balsam Poplar (Black Cottonwood) Forest	20
20 - 30	Closed Tall Alder-Willow Shrub	2	Open Balsam Poplar (Black Cottonwood) Forest	20

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden	Life Sta	age: juvenile/adult	Life H	istory: Unkr	nown	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 95	Max: 110	Mean: 102	Median: 102
Sampling Method (No. o	of fish): PEF (2)					
Comments:						
Species: Dolly Varden	Life Sta	age: juvenile	Life H	istory: Unkr	nown	
Species: Dolly Varden Total Fish Count: 3	Life Sta Fish Measured: 3	age: juvenile Fork Lengths (mm)		•	nown Mean: 34	Median: 35
1 5	Fish Measured: 3	8 5		•	Mean: 34	Median: 35 pawning: Yes

Instruments

Stream Gradient: handheld optical cli	nometer Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



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FSS0315A054.jpg

FSS0315A055.jpg

Station Info					
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/T	ime: 08/25/20	03 9:18 AM
Station Latitude Longitude Coordinates 61.86857 -151.16537	Sample Coordinates	Latitude 61.86857	Longitude -151.16537	Latitude / 61.86915	Longitude -151.16282
Elevation NED (m)(ft): 51 167 Coordinate Determination Method: Non-Different USGS Quadrangle: Tyonek D-4 Waterbody Name: Eightmile Creek Anadromous Waters Catalog Number: Geographic Comments: Station waypoint marked w	Legal Descrip		Datum: NA): S021N010		
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT		Conductivity Fhalweg Velo	y (µS/cm): ocity (m/s)(ft	pH: /s):	
Stream Channel					
Stream Gradient (%):EntrenchmenCatchment Area(sq. km):122Embeddedne					
Channel Dimensions (m): Bankfull OHW V		ominant Sub			
Width Thalweg Depth		ninant Subst ninant Subst			
Rosgen Class:	Subuoi				
Riparian Vegetation Communities (Vierecl	k et al. 1992)				
Dist. from	Canopy	icht Donk V	logototion T		Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5	Intergent(in) <u>F</u>	Aight Dank V	egetation Ty	<u>, pe</u>	ineight(iii)
5 - 10					
10 - 20					
20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations					
Species: Chinook salmon Life Stage: c	arcass	Life His	story: Anadr	omous	
Total Fish Count:6Fish Measured:ForSampling Method (No. of fish):VOH (6)Comments:No adult chinook observed upstream at	*k Lengths (mm)	Min:	Max:	Mean: Suspected Sp	Median: awning: Yes
-	dult spawning	I ifo Hic	story: Anadr	omous	
Total Fish Count:20Fish Measured:ForSampling Method (No. of fish):VOH (20)	k Lengths (mm)		Max:	Mean:	Median:
Comments: No adult sockeye observed upstream at	10AU2.				
T / /					
Instruments					
Instruments Stream Gradient:	Channel	Depths:			

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths
Turbidity:		Electrofisher:
Water Quality:		Transparency:

Station Info			
Observers: Joe Buckwalter, J Johnson, Jim Lazar		Date/Time: 08/2	25/2003 9:53 AM
StationLatitudeLongitudeCoordinates61.81345-151.24661	Sample Coordinates	Latitude Longitude 61.81345 -151.24661	
Elevation NED (m)(ft): 103 338 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Tyonek D-4 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Headwater stream of Eightm	Legal Descri	ption (MTRS): S020N011W22	
Visit Comments: Several active beaver dams downstr	eam of station.		
Wildlife Comments: Frog. Otter tracks.			
Water Quality \ Stream Flow			
Water Temp (C): 10.60DO (mg/L): 8.59DOWater Color: ClearTurbidity (NT) (%): `U):	Conductivity (μS/cm): 68pHThalweg Velocity (m/s)(ft/s):	: 6.50
Stream Channel			
Stream Gradient (%):0EntrenchmenCatchment Area(sq. km):18Embeddedne			
		Dominant Substrate: Gravel	
Width 4.4 Thalweg Depth		ominant Substrate 1: Sand/Silt/Clay (ominant Substrate 2: Cobble	(legacy)
Rosgen Class: E4 Low gradient, meandering riffle/po efficient and stable. High meander wic	ol stream with l		ion. Very
Riparian Vegetation Communities (Viereck	x et al. 1992))	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5 Bluejoint Meadow	1	Bluejoint Meadow	1
5 - 10 Bluejoint Meadow	1	Bluejoint Meadow	1
10 - 20 Bluejoint Meadow	1	Bluejoint Meadow	1
20 - 30 Bluejoint Meadow	1	Bluejoint Meadow	1
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher	(VOC	i) Visual Observation, Ground	
Sampling Method (No. of fish):PEF (2)Comments:Life Stage: ju	k Lengths (mn ivenile	Life History: Unknown	
Total Fish Count:2Fish Measured:2ForSampling Method (No. of fish):PEF (2)Comments:	k Lengths (mn		4 Median: 24 d Spawning: Yes
Species: lamprey-unspecified Life Stage: ju		Life History: Unknown Min: 120 Max: 120 Mean: 12	

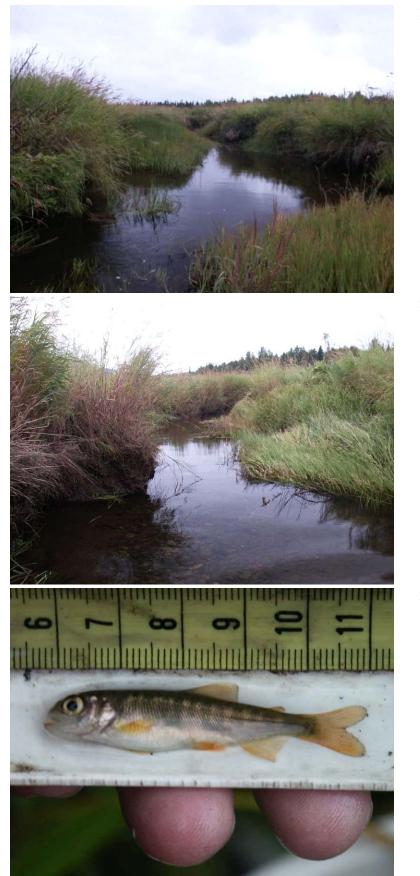
Total Fish Count:1Fish Measured:1Fork Lengths (mm)Min:120Mean:120Median:120Sampling Method (No. of fish):PEF (1)PEF (1)PEF (1)PEF (1)PEF (1)PEF (1)

Comments:

Species: coho salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 82 Fish Measured: 32 Fork Lengths (mm) Min: 39 Max: 75 Mean: 54 Median: 57 Sampling Method (No. of fish): PEF (32) VOG (50) Suspected Spawning: Yes Comments: Average F.L. of additional fish was about 50 mm. Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 60 Max: 62 Mean: 61 Median: 61 Sampling Method (No. of fish): PEF (3) **Comments:**

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod	
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape	
Turbidity:		Electrofisher: Smith-Root LR-24	
Water Quality: He	oriba U-10	Transparency:	



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FSS0316A002.jpg

FSS0316A003.jpg



FSS0316A004.jpg

FSS0316A005.jpg

Station Info		
Observers: Joe Buckwalter, J Johnson	, Jim Lazar	Date/Time: 08/25/2003 3:27 PM
StationLatitudeLongitudeCoordinates61.89160-151.63676	Sample Coordinates	Latitude Longitude 61.89160 -151.63676
Elevation NED (m)(ft): 205 673		
Coordinate Determination Method:	Non-Differential GPS Field M	easurement Datum: NAD83
USGS Quadrangle: Tyonek D-5	Legal Descrip	ption (MTRS): S021N013W22
Waterbody Name:		
Anadromous Waters Catalog Number	:	
Geographic Comments:		
this electrofisher put		24, yellow) for first time at this station. Noticed that n 500 V) than green electofisher used to this point
Wildlife Comments:		
Water Quality \ Stream Flow		
Water Temp (C): 11.10 DO (mg/L): Water Color: Clear	9.96 DO (%): Furbidity (NTU): 0.00	Conductivity (μS/cm): 30pH: 6.46Thalweg Velocity (m/s)(ft/s):
Stream Channel		
	Entrenchment:	
Catchment Area(sq. km): 4	Embeddedness:	
Channel Dimensions (m): Bankful	l OHW Wetted I	Dominant Substrate: Gravel
Width	3.0 3.4 Subdo	minant Substrate 1: Sand/Silt/Clay (legacy)
Thalweg Depth	0.40 0.30 Subdo	minant Substrate 2:
Rosgen Class: E4 Low gradient, meand efficient and stable. Hig	e .	ow width/depth ratio and little deposition. Very

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Bluejoint-Shrub	1	Bluejoint-Shrub	1
5 - 10	Open Tall Alder-Willow Shrub	3	Open Tall Alder-Willow Shrub	3
10 - 20	Open Tall Alder-Willow Shrub	3	Closed Spruce-Paper Birch Forest	15
20 - 30	Open White Spruce Forest	20	Closed Spruce-Paper Birch Forest	15

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: rainbow trout	Life Sta	ge: juvenile/adult	Life H	istory: Resid	ent	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 104	Max: 115	Mean: 109	Median: 109
Sampling Method (No. o Comments:	f fish): PEF (2)				Suspected S	pawning: Yes
Species: rainbow trout	Life Sta	ge: juvenile	Life H	istory: Resid	ent	
Total Fish Count: 14	Fish Measured: 14	Fork Lengths (mm)	Min: 35	Max: 57	Mean: 44	Median: 46
Sampling Method (No. o Comments:	f fish): PEF (14)					
Species: slimy sculpin	Life Sta	ge: adult	Life H	istory: Resid	ent	
Total Fish Count: 2 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 72	Max: 84	Mean: 78	Median: 78

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 8 Fish Measured: 8 Fork Lengths (mm) Min: 50 Max: 68 **Mean: 56** Median: 59 Sampling Method (No. of fish): PEF (8) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count: 5** Fish Measured: 5 Fork Lengths (mm) Min: 34 Max: 42 **Mean:** 38 Median: 38 Sampling Method (No. of fish): PEF (5) **Comments:** Instruments

Stream Gradient: handheld optical clinometer Stream Velocity: Price pygmy meter Turbidity: Horiba U-10 Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 **Transparency:**



FSS0316A008.jpg

FSS0316A009.jpg

FSS0316A010.jpg



FSS0316A011.jpg

FSS0316A012.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/25/2003 4:27 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61,92660 -151,59683 Coordinates -151.59683 61.92719 61.92660 -151.59427 Elevation NED (m)(ft): 105 344 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-5 Legal Description (MTRS): S021N013W11 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): DO (%): Water Temp (C): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km):** 34 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: chum salmon Life Stage: adult Life History: Anadromous **Total Fish Count: 2** Fork Lengths (mm) Min: Median: **Fish Measured:** Max: Mean: Sampling Method (No. of fish): VOH (2) Suspected Spawning: Yes **Comments:** Species: chum salmon Life Stage: carcass Life History: Anadromous Total Fish Count: 50 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOH (50) Suspected Spawning: Yes

Instruments

Comments: Photos 13, 14.

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:
Water Quality:		Transparency:



FSS0316A013.jpg

FSS0316A014.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/25/2003 4:34 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.92920 -151.74618 Coordinates -151.74618 61.92920 Elevation NED (m)(ft): 120 394 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-5 Legal Description (MTRS): S021N014W12 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Fish observations made on the ground. Station waypoint marked while flying. Visit Comments: Wildlife Comments: Bear droppings, tracks, trail Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 50 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground

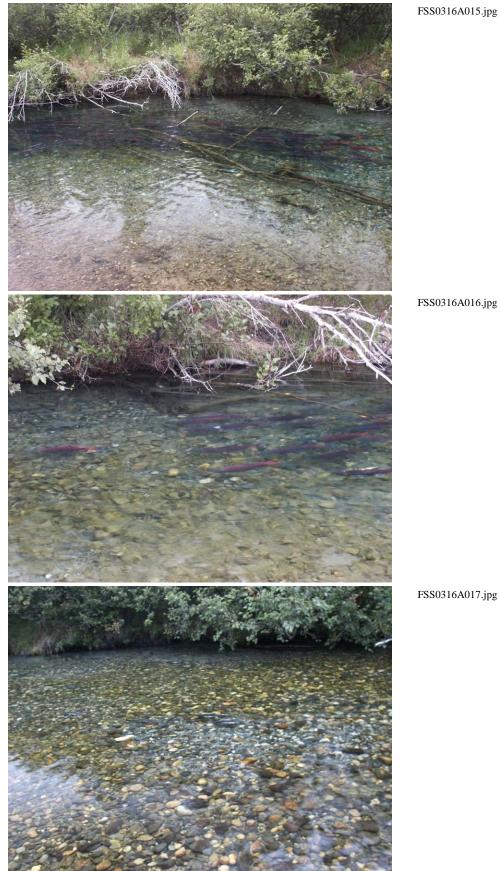
Fish Observations

Species: chum salmon	Life Sta	age: adult	Life	History: Ana	adromous	
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. o	of fish): VOG (2)				Suspected	Spawning: Yes
Comments: Photo 16. N	lo salmon observed up	ostream at 16A06				
Species: pink salmon	Life Sta	age: adult spawning	Life 1	History: Ana	adromous	
Total Fish Count: 25	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. o	of fish): VOG (25)					
Comments: Photo 17 (re	dd). No salmon obser	rved upstream at 16A06				
Species: sockeye salmon	Life Sta	age: adult	Life	History: Ana	adromous	
Total Fish Count: 200	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. o	of fish): VOG (200)					
Commenter Distant 15.1	6. No salmon observed	d upstream at 16A06				

Stream Gradient:Channel Depths:Stream Velocity:Price pygmy meterChannel Widths:Turbidity:Electrofisher:

Water Quality:

Transparency:



FSS0316A016.jpg

FSS0316A017.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/25/2003 5:30 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.88455 -151.73551 Coordinates 61.88455 -151.73551 Elevation NED (m)(ft): 400 1312 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-5 Legal Description (MTRS): S021N013W30 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Reach located immediately upstream of blown-out beaver dam (see photo 19). Wildlife Comments: moose, bear tracks. Water Quality \ Stream Flow DO (mg/L): 11.07 Water Temp (C): 8.30 DO (%): Conductivity (µS/cm): 11 pH: 6.49 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 1 Channel Dimensions (m): **Bankfull OHW** Wetted Dominant Substrate: Gravel 2.4 Width 2.1Subdominant Substrate 1: Sand/Silt/Clay (legacy) 0.05 Thalweg Depth Subdominant Substrate 2: Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Mixed Herbs 0 Closed Tall Alder Shrub 3 5 - 10 3 **Open Paper Birch Forest** 10 Closed Tall Alder Shrub 10 - 20 Open Paper Birch Forest 10 Closed Tall Alder Shrub 3 3 20 - 30 Open Paper Birch Forest 10 Closed Tall Alder Shrub **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 4 Fish Measured: 2 Fork Lengths (mm) Min: 40 **Max:** 42 **Mean:** 41 Median: 41 Sampling Method (No. of fish): PEF (2) VOG (2) Suspected Spawning: Yes Comments: Average F.L. of additional fish was about 80 mm. **Instruments** Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: Horiba U-10 **Transparency:**



FSS0316A018.jpg

FSS0316A019.jpg

FSS0316A020.jpg

Appendix K100.–Station 1550510A	
Station Info	
Observers: Joe Buckwalter, J Johnson, Jim	Lazar Date/Time: 08/25/2003 1:43 PM
StationLatitudeLongitudeCoordinates61.84398-151.51984Elevation NED (m)(ft):155509	SampleLatitudeLongitudeCoordinates61.84398-151.51984
Coordinate Determination Method: Non- USGS Quadrangle: Tyonek D-5 Waterbody Name: Quartz Creek Anadromous Waters Catalog Number: Geographic Comments: Station waypoint r	Legal Description (MTRS): S020N012W07
Visit Comments: Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C):DO (mg/L):Water Color:Turb	DO (%):Conductivity (µS/cm):pH:idity (NTU):Thalweg Velocity (m/s)(ft/s):
Stream Channel	
Catchment Area(sq. km): Emb	renchment: beddedness: DHW Wetted Dominant Substrate:
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:
Rosgen Class:	
Riparian Vegetation Communities (Viereck et al. 1992)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	CanopyCanopyHeight(m)Right Bank Vegetation TypeHeight(m)
0 - 5	
5 - 10	
10 - 20 20 - 30	
Key To Fish Sampling Methods	
(NON) None	
Fish Observations	
Species: no collection effortLifeTotal Fish Count:0Fish Measured:Sampling Method (No. of fish):NON (0)	Stage: not applicableLife History: Not ApplicableFork Lengths (mm)Min:Max:Mean:Median:
Comments:	
Comments: Instruments	
	Channel Depths:
Instruments	Channel Depths: Channel Widths:
Instruments Stream Gradient:	-

FSS0316A007.jpg



Station Info	
Observers: Joe Buckwalter, J Johnson, Jim Lazar	Date/Time: 08/26/2003 11:12 AM
0	npleLatitudeLongitudeordinates62.07565-151.16923
Elevation NED (m)(ft): 367 1204	
Coordinate Determination Method: Non-Differential GP	
USGS Quadrangle: Talkeetna A-3 Leg Waterbody Name:	al Description (MTRS): S023N010W19
Anadromous Waters Catalog Number:	
Geographic Comments:	D.
Visit Comments: Reach located in beaver meadow (old por Wildlife Comments:	10).
Water Quality \ Stream Flow	
Water Temp (C): 7.70DO (mg/L): 10.86DO (%)Water Color: ClearTurbidity (NTU):	: Conductivity (μS/cm): 34 pH: 6.46 Thalweg Velocity (m/s)(ft/s):
Stream Channel	
Stream Gradient (%): 1.5 Entrenchment:	
Catchment Area(sq. km): 12 Embeddedness:	
Channel Dimensions (m): Bankfull OHW Wetted Width 5.6 5.5	Dominant Substrate: Gravel Subdominant Substrate 1: Cobble
With5.05.3Thalweg Depth0.30	Subdominant Substrate 1: Cobble
Rosgen Class: F4 Entrenched meandering riffle/pool chann	el on low gradients with high width/depth ratio.
Riparian Vegetation Communities (Viereck et a	J. 1992)
	anopy Canopy
	eight(m) <u>Right Bank Vegetation Type</u> Height(m)
0 - 5 Bluejoint Meadow	1 Bluejoint-Shrub 1
5 - 10 Bluejoint Meadow	1 Bluejoint-Shrub 1
10 - 20 Bluejoint Meadow	1 Bluejoint-Shrub 1
20 - 30 Open White Spruce Forest	15 Bluejoint-Shrub 1
Key To Fish Sampling Methods	
(PEF) Backpack Electrofisher(VOG) Visual Observation, Ground	(MTQ) Minnow Trap, 1/4 in. Mesh
Fish ObservationsSpecies: Dolly VardenLife Stage: adult	I : fa History Desident
• • •	Life History: Resident gths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)	
Comments: F.L. was about 150 mm.	
Species: slimy sculpin Life Stage: juvenil Total Fish Count: 2 Fish Measured: 2 Fork Ler	e Life History: Resident gths (mm) Min: 35 Max: 45 Mean: 40 Median: 40
Sampling Method (No. of fish): PEF (2)	
Comments:	
Instruments	
Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:

FSS0317A001.jpg



FSS0317A002.jpg





FSS0317A003.jpg

Station Inf						
Station Int	0					
Observers:	Joe Buckwalter, J Johnson	n, Jim Lazar			Date/Time: 0	8/26/2003 12:59 PM
Station Coordinate	021000000 10110/10		Sample Coordinates	Latitude 62.05353	Longitude -151.07159	
Coordinate 1	ED (m)(ft): 251 823 Determination Method: Irangle: Talkeetna A-3 Name:	Non-Differenti			Datum: NAD83): S023N010W26	
Geographic	ents: Water high - poor e		nditions.			
Water Qua Water Temp Water Color		: 9.76 DC Turbidity (NT) (%): ' U): 1.00	Conductivity Thalweg Vel	y (μS/cm): 6 ocity (m/s)(ft/s):	pH: 4.98
Stream Cha	annel					
	dient (%): 1.5 Area(sq. km): 9	Entrenchmen Embeddedne				
Channel Di	Width	3.6	3.6 Subd		rate 1: Boulder	
Rosgen Clas	Thalweg Depth ss: E4 Low gradient, mean efficient and stable. Hi	dering riffle/po	ol stream with l	ominant Subst		osition. Very
Riparian V	egetation Communi	ties (Viereck	x et al. 1992))		
Dist. from			Canopy			Canopy
Bank (m)	Left Bank Vegetation Ty	<u>pe</u>	Height(m)	<u>Right Bank V</u>	egetation Type	Height(m)
0 - 5	Bluejoint-Shrub		1	Open Tall Ald	ler Shrub	4
5 - 10	Bluejoint-Shrub		1	Open Tall Ald	ler Shrub	4
10 - 20	Bluejoint-Shrub		1	Open Tall Ald	ler Shrub	4
20 - 30	Bluejoint-Shrub		1	Closed Spruce	e-Paper Birch Forest	20
Key To Fis	h Sampling Methods	5				
(PEF) Back	pack Electrofisher		(VOC	3) Visual Obse	rvation, Ground	
	lly Varden		dult k Lengths (mn		story: Resident Max: Mean	: Median:
Species: Dol Total Fish Sampling M	Ily Varden Count: 1 Fish Meas Method (No. of fish): VC : F.L. was about 150 mm.	sured: For			-	: Median:
Species: Dol Total Fish (Sampling N Comments: Instrument	Ily Varden Count: 1 Fish Meas Method (No. of fish): VC : F.L. was about 150 mm.	sured: For OG (1)	k Lengths (mn	n) Min:	Max: Mean	: Median:
Species: Dol Total Fish (Sampling N Comments: Instrument	lly Varden Count: 1 Fish Meas Method (No. of fish): VC F.L. was about 150 mm. ts dient: handheld optical c	sured: For OG (1)	k Lengths (mn	n) Min:	Max: Mean	: Median:
Species: Dol Total Fish Sampling M Comments: Instrument Stream Grad	Ily Varden Count: 1 Fish Meas Method (No. of fish): VC : F.L. was about 150 mm. ts dient: handheld optical c ocity: Price pygmy mete	sured: For OG (1)	k Lengths (mn	n) Min: el Depths: gr el Widths: m	Max: Mean	: Median:



FSS0317A004.jpg

FSS0317A005.jpg

FSS0317A006.jpg

Station Info						
Observers: Joe Buckwa	lter, J Johnson, 3	Jim Lazar			Date/Time:	08/26/2003 1:37 PM
StationLatitudeCoordinates61.99763	8		Sampl Coord		Longitude -151.03109	
Elevation NED (m)(ft):	46 151					
Coordinate Determination	on Method: No	on-Differe	ential GPS I	Field Measurement	Datum: NAD83	3
USGS Quadrangle: Tyo	nek D-3		Legal	Description (MTRS)	: S022N010W13	
Waterbody Name:						
Anadromous Waters Cat	talog Number:					
Geographic Comments:						
Visit Comments: Bog.						
Wildlife Comments:						
Water Quality \ Strea	am Flow					
Water Temp (C): 12.00			DO (%):	•	y (μS/cm): 94	pH: 6.33
Water Color: Humic	Tt	irbidity (NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel						
Stream Gradient (%): 0) E	ntrenchn	nent:			
Catchment Area(sq. km)	: 9 E	mbedded	lness:			
Channel Dimensions (m): Bankfull	OHW	Wetted	Dominant Sub	strate: Organic	
· · · · · · · · · · · · · · · · · · ·	Width	2.5	2.5	Subdominant Subst	rate 1:	
			0.45	Subdominant Subst	rate 2:	
Thalweg	Depth		0.45	Subuominant Subst		

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
5 - 10	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
10 - 20	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
20 - 30	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

No Fish Found

Instruments

Stream Gradient:	handheld optical clinometer
Stream Velocity:	Price pygmy meter
Turbidity:	
Water Quality: He	oriba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Transparency:



FSS0317A007.jpg

FSS0317A008.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/26/2003 1:57 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.90519 -151.01931 Coordinates -151.01931 61.90519 Elevation NED (m)(ft): 71 233 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-3 Legal Description (MTRS): S021N010W13 Waterbody Name: Anadromous Waters Catalog Number: **Geographic Comments:** Visit Comments: Width, depth estimated - not wadeable. Wildlife Comments: Northern harrier hawk Water Quality \ Stream Flow Water Temp (C): 12.40 DO (mg/L): 4.80 Conductivity (µS/cm): 44 pH: 5.97 DO (%): Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 6 **Embeddedness: Channel Dimensions (m): Bankfull OHW** Wetted Dominant Substrate: Organic 3.5 Width 3.5 Subdominant Substrate 1: **Thalweg Depth** 2.00 Subdominant Substrate 2: Rosgen Class: WET Wetland

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Fresh Grass Marsh	2	Fresh Grass Marsh	2
5 - 10	Fresh Grass Marsh	2	Fresh Grass Marsh	2
10 - 20	Fresh Grass Marsh	2	Fresh Grass Marsh	2
20 - 30	Closed Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	20

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

No Fish Found

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: He	oriba U-10	Transparency:	



FSS0317A009.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/26/2003 2:06 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.92352 -151.24876 Coordinates -151.24876 61.92352 Elevation NED (m)(ft): 50 164 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Ouadrangle:** Tyonek D-4 Legal Description (MTRS): S021N011W11 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Not wadeable - width, depth estimated. Skwentna River at high stage - Glacially turbid mainstem water backing up into stream channel at this station. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.50 DO (mg/L): 7.06 DO (%): Conductivity (µS/cm): 89 **pH:** 6.30 Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment: Embeddedness:** Catchment Area(sq. km): 8 **Channel Dimensions (m):** OHW Wetted Bankfull Dominant Substrate: Organic Width 4.5 4.5 Subdominant Substrate 1: Thalweg Depth 2.00 2.00 Subdominant Substrate 2: Rosgen Class: WET Wetland

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Fresh Sedge Marsh	0	Fresh Sedge Marsh	0
5 - 10	Fresh Sedge Marsh	0	Fresh Sedge Marsh	0
10 - 20	Fresh Sedge Marsh	0	Fresh Sedge Marsh	0
20 - 30	Fresh Sedge Marsh	0	Fresh Sedge Marsh	0

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

Species: coho salmon	Life Sta	ge: juvenile	Life H	istory: Anad	lromous	
Total Fish Count: 14	Fish Measured: 14	Fork Lengths (mm)	Min: 68	Max: 114	Mean: 99	Median: 91
Sampling Method (No. o	f fish): MTQ (14)					
Comments: These fish w	ere originally ID'd as O	Chinook; however, they	y are now th	nought to be c	oho presmolts	which are begi
Species: sockeye salmon	Life Sta	ge: juvenile	Life H	istory: Anad	lromous	
1 2	Life Sta Fish Measured: 1	ge: juvenile Fork Lengths (mm)		e e	romous Mean: 58	Median: 58
1 2	Fish Measured: 1	0 5		e e		Median: 58
Total Fish Count: 1	Fish Measured: 1	0 5		e e		Median: 58

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	Visual estimate
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: H	oriba U-10	Transparency:	



FSS0317A012.jpg

FSS0317A013.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/27/2003 11:10 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.42794 -152.77187 Coordinates 61.42794 -152.77187 Elevation NED (m)(ft): 886 2907 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek B-8 Legal Description (MTRS): S016N020W36 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.20 DO (mg/L): 11.25 DO (%): Conductivity (µS/cm): 33 **pH:** 7.37 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): Stream Channel Stream Gradient (%): 2 **Entrenchment:** Catchment Area(sq. km): 44 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble 14.3 Width 13.2 Subdominant Substrate 1: Gravel 0.30 Thalweg Depth Subdominant Substrate 2: Boulder Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 2 3 Open Tall Willow Shrub Closed Tall Willow Shrub 0 - 5 Open Tall Willow Shrub 2 Closed Tall Willow Shrub 3 5 - 10 2 10 - 20 Open Tall Willow Shrub Closed Tall Willow Shrub 3 2 Closed Tall Willow Shrub 20 - 30 Open Tall Willow Shrub 3 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life History: Resident Life Stage: adult Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) Suspected Spawning: Yes Comments: Spawning colors. F.L. was about 160 mm. Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 90 Max: 90 Mean: 90 Median: 90 Sampling Method (No. of fish): PEF (1) **Comments:** Life History: Unknown Species: Dolly Varden Life Stage: juvenile Total Fish Count: 2 Fish Measured: 2 Fork Lengths (mm) Min: 44 Max: 66 **Mean: 55** Median: 55 Sampling Method (No. of fish): PEF (2) Suspected Spawning: Yes **Comments:**

 Species: slimy sculpin
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 54
 Mean:
 54
 Median:
 54

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Comments:

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS0318A003.jpg

FSS0318A004.jpg

FSS0318A005.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/27/2003 12:07 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61,56628 -152,89488 Coordinates 61.56628 -152.89488 Elevation NED (m)(ft): 704 2310 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek C-8 Legal Description (MTRS): S017N020W15 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Left bank tributary of Skwentna River. Visit Comments: Wildlife Comments: Black bear with 2 cubs watching, eating berries on hillside. Water Quality \ Stream Flow Water Temp (C): 7.90 DO (mg/L): 10.17 DO (%): Conductivity (µS/cm): 99 pH: 7.36 Water Color: Clear Turbidity (NTU): 1.00 Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment: Embeddedness:** Catchment Area(sq. km): 6 Wetted Channel Dimensions (m): **Bankfull OHW** Dominant Substrate: Gravel 6.1 4.0Subdominant Substrate 1: Sand/Silt/Clay (legacy) Width Thalweg Depth 0.05 Subdominant Substrate 2: Cobble Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Open Low Willow Shrub 1 Closed Tall Willow Shrub 2 2 5 - 10 Open Low Willow Shrub 1 Closed Tall Willow Shrub 2 10 - 20 Open Low Willow Shrub 1 Closed Tall Willow Shrub 2 20 - 30 Open Low Willow Shrub 1 Closed Tall Willow Shrub **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Resident Total Fish Count: 206 Fish Measured: 6 Fork Lengths (mm) Min: 156 Max: 186 Mean: 170 **Median:** 171 Sampling Method (No. of fish): PEF (6) VOG (200) Comments: Schooling at sockeye redds. Average F.L. of additional fish was about 150 mm. Life History: Unknown Species: Dolly Varden Life Stage: juvenile/adult Total Fish Count: 14 Fish Measured: 14 Fork Lengths (mm) Min: 94 Max: 143 Mean: 127 Median: 118 Sampling Method (No. of fish): PEF (14) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 Median: 75 Total Fish Count: 1 **Mean:** 75 Sampling Method (No. of fish): PEF (1) **Comments:** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 60 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (60)

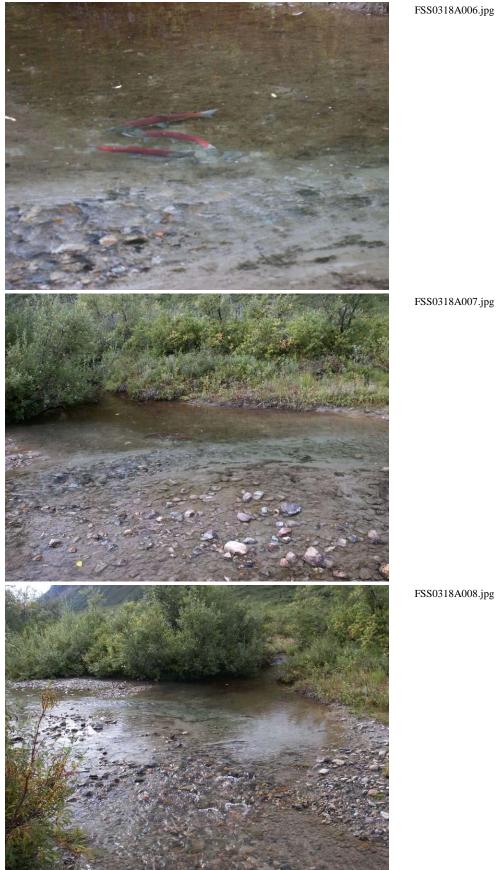
Comments: Photos 6, 7, 12. Redds present.

Appendix K113.-Page 2 of 4.

Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 80 Max: 80 Total Fish Count: 1 Fish Measured: 1 **Mean:** 80 Median: 80 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 65 Max: 65 **Mean:** 65 Median: 65 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 33 Fork Lengths (mm) Min: 33 Max: 33 Total Fish Count: 1 Fish Measured: 1 **Mean:** 33 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity: Horiba U-10	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:





FSS0318A012.jpg

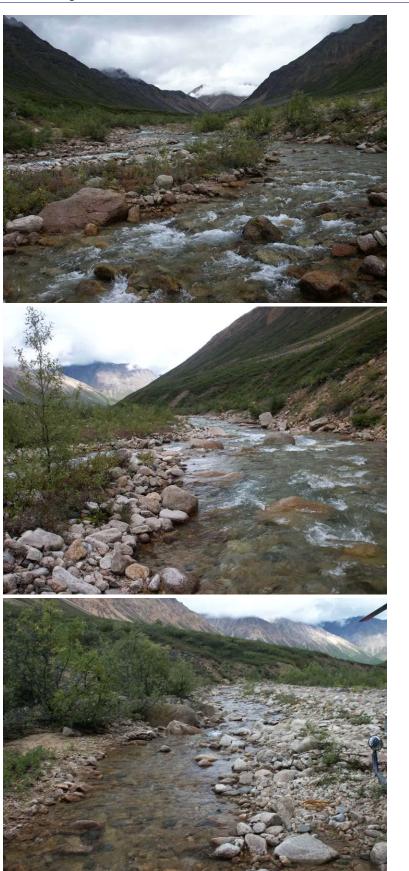
Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/27/2003 2:05 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.58861 Coordinates -152.97709 -152.97709 61.58861 Elevation NED (m)(ft): 892 2927 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek C-8 Legal Description (MTRS): S017N020W06 Waterbody Name: Crystal Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.90 DO (mg/L): 10.17 DO (%): Conductivity (µS/cm): 99 **pH:** 7.36 Water Color: Clear Turbidity (NTU): 1.00 Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 3 **Entrenchment:** Catchment Area(sq. km): 48 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble 14.3 Width 11.0 Subdominant Substrate 1: Gravel Thalweg Depth 0.40 Subdominant Substrate 2: Boulder Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 2 2 Open Tall Willow Shrub Open Tall Willow Shrub 0 - 5 Vaccinium Dwarf Shrub Tundra 0 Vaccinium Dwarf Shrub Tundra 0 5 - 10 10 - 20 Open Low Shrub Birch-Willow Shrub 0 Open Low Shrub Birch-Willow Shrub 0 20 - 30 Open Low Shrub Birch-Willow Shrub 0 Open Low Shrub Birch-Willow Shrub 0 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Resident **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 148 Max: 148 Mean: 148 Median: 148 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 30 Fish Measured: 15 Fork Lengths (mm) Min: 90 Max: 137 Mean: 113 Median: 113 Sampling Method (No. of fish): PEF (15) VOG (15) Comments: Average F.L. of additional fish was about 120 mm. Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 73 Max: 83 Mean: 76 Median: 78 Sampling Method (No. of fish): PEF (6) **Comments:**

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Horiba U-10Water Quality:Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

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FSS0318A020.jpg

FSS0318A021.jpg



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/27/2003 3:04 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.79414 -152.84927 Coordinates -152.84927 61.79414 Elevation NED (m)(ft): 767 2516 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-8 Legal Description (MTRS): S020N020W26 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.10 DO (mg/L): 11.86 DO (%): Conductivity (µS/cm): 143 **pH:** 7.63 Water Color: Glacial, Low Turbidit Thalweg Velocity (m/s)(ft/s): **Turbidity (NTU): Stream Channel** Stream Gradient (%): 3 **Entrenchment:** Catchment Area(sq. km): 61 **Embeddedness:** OHW Wetted **Channel Dimensions (m):** Bankfull Dominant Substrate: Cobble Width 8.7 7.2 Subdominant Substrate 1: Gravel 0.60 **Thalweg Depth** Subdominant Substrate 2: Boulder Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	4	Closed Tall Alder-Willow Shrub	3
5 - 10	Closed Tall Willow Shrub	4	Closed Tall Alder-Willow Shrub	3
10 - 20	Closed Tall Willow Shrub	4	Closed Tall Alder-Willow Shrub	3
20 - 30	Closed Tall Alder Shrub	3	Closed Tall Alder-Willow Shrub	3

Key To Fish Sampling Methods

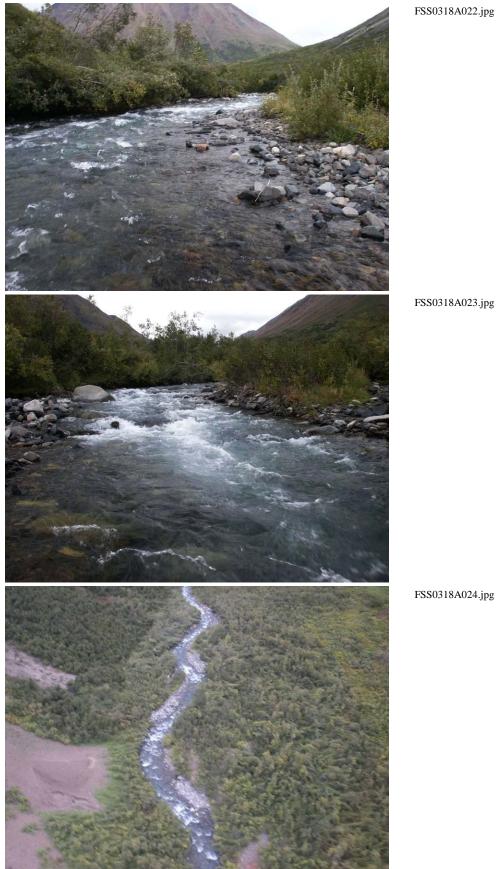
(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Median: 92 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 92 Max: 92 **Mean: 92** Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count: 2** Fish Measured: 2 Fork Lengths (mm) Min: 34 Max: 68 **Mean:** 51 Median: 51 Sampling Method (No. of fish): PEF (2) Suspected Spawning: Yes **Comments:**

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



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Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Laz	ar		Date/Time:	08/27/2003 4:35 PM
Station Latitude Longitude Coordinates 61.97649 -152.82902	Sample Coordinates	Latitude 61.97649	Longitude -152.82902	
Elevation NED (m)(ft): 611 2005				
Coordinate Determination Method: Non-Diff	erential GPS Field N	leasurement	Datum: NAD83	3
USGS Quadrangle: Tyonek D-8	Legal Descri	iption (MTRS)	: S022N019W19	
Waterbody Name:				
Anadromous Waters Catalog Number:				
Geographic Comments: Left bank tributary of l	Portage Creek.			
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 5.80 DO (mg/L): 11.74	DO (%):	Conductivity	ν (μS/cm): 23	pH: 7.15
Water Color: Clear Turbidity	y (NTU):	Thalweg Velo	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%): 1 Entrenc	hment:			
Catchment Area(sq. km): 2 Embedd	edness:			
Channel Dimensions (m): Bankfull OHW	Wetted	Dominant Sub	strate: Cobble	
Width 4.1	3.7 Subd	ominant Subst	rate 1: Gravel	
Thalweg Depth	0.30 Subd	ominant Subst	rate 2: Boulder	
Rosgen Class: C3 Low gradient, meandering, po	int-bar, riffle/pool, a	lluvial channel	s with broad, well	-defined floodplains.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 1 Fork Lengths (mm) Min: 121 Max: 121 Total Fish Count: 1 **Mean:** 121 **Median:** 121 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient: handheld optical clinon	teter Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:

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II				
Station Info				
Observers: Joe Buckwalter, J Johns	on, Jim Lazar		Date/Time: 0	8/27/2003 4:18 PM
Station Latitude Longitud Coordinates 61.95786 -152.8524 Elevation NED (m)(ft): 673 -2208	=		Longitude -152.85282	
Elevation NED (m)(ft): 673 2208 Coordinate Determination Method: USGS Quadrangle: Tyonek D-8 Waterbody Name: Portage Creek Anadromous Waters Catalog Numb Geographic Comments: Waterfall.	Legal Descrip	otion (MTRS):	Datum: NAD83 s S022N020W36	
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): DO (mg/I Water Color:		Conductivity Thalweg Velo	(µS/cm): city (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%): Catchment Area(sq. km):	Entrenchment: Embeddedness:			
()		ominant Subs		
Width Thalweg Depth		minant Substı minant Substı		
Rosgen Class:				
Riparian Vegetation Commun	ities (Viereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation T</u>	Canopy	Right Bank V	egetation Type	Canopy Height(m)
0 - 5	<u> </u>			
5 - 10				
10 - 20 20 - 30				
Key To Fish Sampling Method	s			
(NON) None				
Fish Observations				
Species: no collection effort Total Fish Count: 0 Fish Mea Sampling Method (No. of fish): No Comments:	8 ()		t ory: Not Applicab Max: Mean	
Instruments				
		Denths:		
Stream Gradient:	Channel	Depuis.		
Stream Gradient: Stream Velocity:		Widths:		
		Widths:		

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 9:23 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.16694 -152.93635 Coordinates -152.93635 62.16694 Elevation NED (m)(ft): 724 2375 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-6 Legal Description (MTRS): S024N020W15 Waterbody Name: Happy River **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Tracks: wolf, bear. Water Quality \ Stream Flow DO (mg/L): DO (%): Water Temp (C): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km):** 232 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count: 5** Median: **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (5) **Comments:** Species: sockeye salmon Life Stage: carcass Life History: Anadromous **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (2) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: Price pygmy meter **Channel Widths: Turbidity: Electrofisher:** Water Quality: **Transparency:**

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Station Info	
Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08	8/28/2003 9:42 AM
StationLatitudeLongitudeSampleLatitudeLongitudeLaCoordinates62.11588-153.07000Coordinates62.11588-153.0700062.	titudeLongitude.11649-153.06739
Elevation NED (m)(ft): 802 2631	
Coordinate Determination Method:Non-Differential GPS Field MeasurementDatum:NAD83USGS Quadrangle:Mc Grath A-1Legal Description (MTRS):\$023N021W02	
Waterbody Name: Happy River	
Anadromous Waters Catalog Number:	
Geographic Comments: Elevation measured at downstream terminus of reach.	
Visit Comments: Photos taken at downstream end of reach.	
Wildlife Comments:	
Water Quality \ Stream Flow	
	pH:
Water Color: Turbidity (NTU): Thalweg Velocity (m/s)(ft/s):	
Stream Channel	
Stream Gradient (%): Entrenchment:	
Catchment Area(sq. km): 86 Embeddedness:	
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Width Subdominant Substrate 1:	
Thalweg Depth Subdominant Substrate 2:	
Rosgen Class:	
Riparian Vegetation Communities (Viereck et al. 1992)	
	~
Dist. fromCanopyBank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type	Canopy Height(m)
0 - 5	
5 - 10 10 - 20	
20 - 30	
Key To Fish Sampling Methods	
(VOG) Visual Observation, Ground	
Fish Observations	
Species: sockeye salmonLife Stage: adult spawningLife History: Anadromous	
Total Fish Count: 19 Fish Measured: Fork Lengths (mm) Min: Max: Mean:	: Median:
Sampling Method (No. of fish): VOG (19)	
Comments:	
Species: sockeye salmonLife Stage: carcassLife History: AnadromousTotal Fish Count:13Fish Measured:Fork Lengths (mm)Min:Max:Mean:	: Median:
Sampling Method (No. of fish): VOG (13)	Witchiam.
Comments:	
Instruments	
Stream Gradient: Channel Depths:	
Stream Gradient:Channel Depths:Stream Velocity:Price pygmy meterChannel Widths:	
Stream Gradient:Channel Depths:Stream Velocity:Price pygmy meterChannel Widths:	



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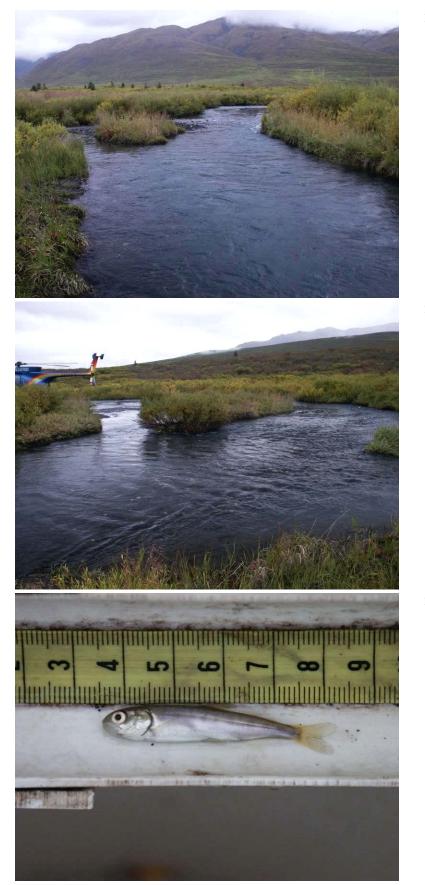


Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 10:22 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.05693 -153.09985 Coordinates -153.09985 62.05693 Elevation NED (m)(ft): 832 2730 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Mc Grath A-1 Legal Description (MTRS): S023N021W27 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Bear tracks, trails. Water Quality \ Stream Flow Water Temp (C): 4.00 DO (%): DO (mg/L): 11.43 Conductivity (µS/cm): 100 **pH:** 7.45 **Turbidity (NTU):** Water Color: Clear Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment: Catchment Area(sq. km):** 18 **Embeddedness: Bankfull OHW** Wetted **Channel Dimensions (m):** Dominant Substrate: Gravel Width 5.1 5.1 Subdominant Substrate 1: Sand/Silt/Clay (legacy) Thalweg Depth 0.60 Subdominant Substrate 2: Cobble Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 1 1 Closed Tall Willow Shrub Closed Tall Willow Shrub 5 - 10 Closed Tall Willow Shrub 1 Closed Tall Willow Shrub 1 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 1 1 20 - 30 Closed Tall Willow Shrub 1 Closed Tall Willow Shrub 1 **Kev To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fish Measured: 2 Fork Lengths (mm) Min: 27 Max: 35 Median: 31 **Total Fish Count:** 2 Mean: 31 Suspected Spawning: Yes Sampling Method (No. of fish): PEF (2) **Comments:** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (2) **Comments:** Species: sockeye salmon Life Stage: carcass Life History: Anadromous **Total Fish Count:** 3 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (3) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous Median: 37 Total Fish Count: 4 Fish Measured: 4 Fork Lengths (mm) Min: 30 Max: 44 **Mean: 36** Sampling Method (No. of fish): PEF (4) **Comments:**

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

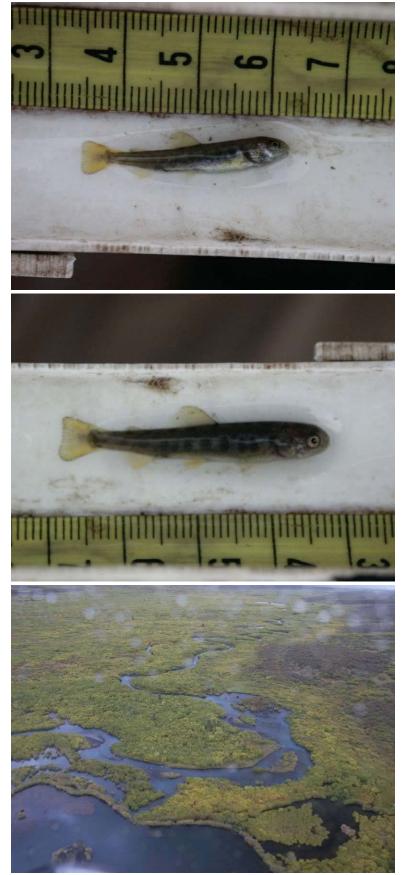


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Station Info							
Observers: Joe Buckwalte	er, J Johnson, J	im Laza	r			Date/Time:	08/28/2003 11:28 AM
	Longitude -153.02408		Samp Coord	le linates	Latitude 62.11602	Longitude -153.02408	
Elevation NED (m)(ft): 82		D.00	(1 CDC)	C' 11M			2
Coordinate Determination USGS Quadrangle: Mc Gr		on-Diffei				Datum: NAD83 : S023N020W06	-
Waterbody Name: Anadromous Waters Catal Geographic Comments: L	0	lla Creel	k tributary.				
Visit Comments: Main cha		adeable,	but difficult	to electr	ofish (deep, f	ast). All electrofi	shing occurred in side
Wildlife Comments:							
Water Quality \ Stream	n Flow						
Water Temp (C): 4.80 Water Color: Clear	DO (mg/L): 1 Tu	1.66 I rbidity	DO (%): (NTU):		•	y (μS/cm): 88 ocity (m/s)(ft/s):	рН: 7.33
Stream Channel							
Stream Gradient (%): 1	E	ntrench	ment:				
Catchment Area(sq. km):	39 E	mbedde	dness:				
Channel Dimensions (m):	Bankfull	OHW	Wetted	D	ominant Sub	strate: Gravel	
W	'idth	6.5	6.5	Subdor	ninant Subst	rate 1: Cobble	
Thalweg D	epth		0.60	Subdor	ninant Subst	rate 2: Sand/Silt/	Clay (legacy)
Rosgen Class: C4 Low grad	dient, meander	ing, poir	nt-bar, riffle	pool, all	uvial channel	s with broad, well	-defined floodplains.
- -		<u> </u>		-			•

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Chinook salmon	Life Sta	age: juvenile	Life H	listory: Anac	lromous	
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 41	Max: 50	Mean: 46	Median: 45
Sampling Method (No. o	f fish): PEF (3)					
Comments:						
Species: sockeye salmon	Life Sta	age: juvenile	Life H	listory: Anac	lromous	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 47	Max: 47	Mean: 47	Median: 47
Sampling Method (No. o	f fish): PEF (1)					
I O I I I I						

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher: S	Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:	



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FSS0319A020.jpg



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 1:09 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.17361 -152.81188 Coordinates -152.81188 62.17361 Elevation NED (m)(ft): 674 2211 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-6 Legal Description (MTRS): S024N019W17 Waterbody Name: Threemile Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Sampled right bank side channel. Mainstem not wadeable (~15 meters wide) Wildlife Comments: bear tracks Water Quality \ Stream Flow Water Temp (C): 5.00 DO (mg/L): 11.93 DO (%): Conductivity (µS/cm): 171 pH: 7.85 Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2 **Entrenchment:** 122 Catchment Area(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Cobble 4.2 Width 3.6 Subdominant Substrate 1: Boulder 0.15 **Thalweg Depth** Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** ъ.

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden	Life Sta	age: adult	Life H	istory: Resid	lent	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 164	Max: 164	Mean: 164	Median: 164
Sampling Method (No. of	f fish): PEF (1)					
Comments: No fish captu	ured or observed upstro	eam at station 19A08.				
Species: sockeye salmon	Life Sta	age: juvenile	Life H	istory: Anad	romous	
1 5	Life Sta Fish Measured: 9	nge: juvenile Fork Lengths (mm)		•	romous Mean: 51	Median: 49
1 5	Fish Measured: 9	8 5		•	Mean: 51	Median: 49 pawning: Yes

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher: S	Smith-Root LR-24
Water Quality: He	oriba U-10	Transparency:	

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FSS0319A022.jpg

FSS0319A023.jpg



FSS0319A024.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 2:09 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.16708 -153.05657 Coordinates -153.05657 62.16708 Elevation NED (m)(ft): 855 2805 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Mc Grath A-1 Legal Description (MTRS): S024N021W13 Waterbody Name: Pass Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 3.60 DO (mg/L): 12.13 DO (%): Conductivity (µS/cm): 127 **pH:** 7.61 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2 **Entrenchment:** Catchment Area(sq. km): 26 **Embeddedness:** Dominant Substrate: Gravel OHW **Channel Dimensions (m):** Bankfull Wetted Width 6.9 5.4 Subdominant Substrate 1: Cobble 0.50 **Thalweg Depth** Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B4 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5	Bluejoint-Shrub	1	Bluejoint-Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 152 Max: 152 **Mean:** 152 Median: 152 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 133 Max: 133 Mean: 133 Median: 133 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



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FSS0319A028.jpg

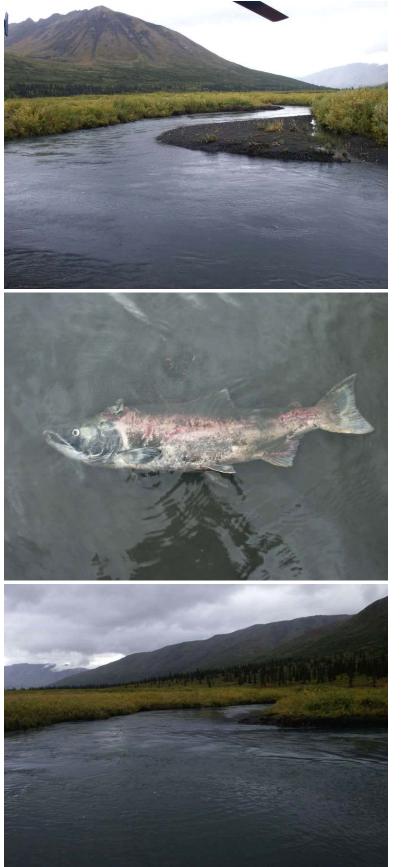
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Station In								
	fo							
Observers:	Joe Buckwal	lter, J Johnson, Ji	m Lazar			Date/T	ime: 08/28/20	003 3:23 PM
Station Coordinat Elevation N	Latitude es 62.21646 NED (m)(ft): 6	Longitude -152.69509 566 2185		ample oordinates	Latitude 62.21646	Longitude -152.69509		
USGS Qua Waterbody Anadromo Geographi Visit Comr	drangle: Talke 7 Name: Moos us Waters Cat c Comments: nents:	e Creek	L	egal Descri	ption (MTRS	Datum: N4): S025N018		
	ality \ Strea		6.,					
Water Ten	np (C): 6.30 or: Glacial, Lov	DO (mg/L): 10.	.79 DO (% bidity (NTU):	, ,		y (µS/cm): 71 ocity (m/s)(ft/	_	52
Stream Cl	hannel							
	adient (%): 1 Area(sq. km):		trenchment: nbeddedness:					
Channel I	Dimensions (m)				Dominant Sul			``
	Thalweg 1	Width Depth	9.0 8.3 0.50		ominant Subs ominant Subs		Silt/Clay (lega	icy)
Rosgen Cla	-	adient, meanderin	ng, point-bar, ri	iffle/pool, a	lluvial channe	ls with broad,	well-defined f	loodplains.
Dimension	Vacatation	~	(T 7) T					
кірагіап	vegetation (Communities	(Viereck et	al. 1992)				
- Dist. from	Left Bank Ve			al. 1992) Canopy Height(m)	<u>Right Bank V</u>	Vegetation Ty	/ <u>pe</u>	Canopy Height(m)
- Dist. from	0	getation Type		Canopy			/ <u>pe</u>	
Dist. from Bank (m)	<u>Left Bank Ve</u>	egetation Type /illow Shrub		Canopy Height(m)	<u>Right Bank V</u>	Villow Shrub	7 <u>pe</u>	Height(m)
Dist. from Bank (m) 0 - 5 5 - 10	Left Bank Ve Closed Tall W	egetation Type /illow Shrub /illow Shrub		Canopy Height(m) 2	<u>Right Bank V</u> Closed Tall V	Villow Shrub Villow Shrub	/ <u>pe</u>	Height(m) 2
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20	Left Bank Ve Closed Tall W Closed Tall W	getation Type /illow Shrub /illow Shrub /illow Shrub		Canopy Height(m) 2 2	<u>Right Bank V</u> Closed Tall V Closed Tall V	Villow Shrub Villow Shrub Villow Shrub	/ <u>pe</u>	Height(m) 2 2
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W	egetation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub		Canopy Height(m) 2 2 2 2	Right Bank V Closed Tall V Closed Tall V Closed Tall V	Villow Shrub Villow Shrub Villow Shrub	/ <u>pe</u>	Height(m) 2 2 2
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W Closed Tall W	egetation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub g Methods		Canopy Height(m) 2 2 2 2 2	Right Bank V Closed Tall V Closed Tall V Closed Tall V	Villow Shrub Villow Shrub Villow Shrub Villow Shrub		Height(m) 2 2 2
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W Closed Tall W Sh Sampling kpack Electrofi	getation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub g Methods	I	Canopy Height(m) 2 2 2 2 2 (VOG	Right Bank V Closed Tall V Closed Tall V Closed Tall V Closed Tall V) Visual Obse	Villow Shrub Villow Shrub Villow Shrub Villow Shrub ervation, Grou	nd	Height(m) 2 2 2
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W Closed Tall W Sh Sampling kpack Electrofi rvations olly Varden Count: 4 Method (No. 0	getation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub g Methods	fe Stage: juven 1: 4 Fork Lo	Canopy Height(m) 2 2 2 2 2 (VOC	Right Bank V Closed Tall V Closed Tall V Closed Tall V Closed Tall V) Visual Obse	Villow Shrub Villow Shrub Villow Shrub Villow Shrub	nd wn Mean: 46	Height(m) 2 2 2
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W Closed Tall W Sh Sampling kpack Electrofi rvations olly Varden Count: 4 Method (No. 0	egetation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub g Methods isher Li Fish Measured of fish): PEF (4)	fe Stage: juven 1: 4 Fork Lo	Canopy Height(m) 2 2 2 2 (VOG ile engths (mm	Right Bank V Closed Tall V Closed Tall V Closed Tall V Closed Tall V) Visual Obse Life Hin) Min: 32	Villow Shrub Villow Shrub Villow Shrub Villow Shrub ervation, Grou story: Unkno	nd wn Mean: 46 Suspected Sj	Height(m) 2 2 2 2 Median: 51
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: so Total Fish Sampling	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W Closed Tall W Sh Sampling kpack Electrofi rvations olly Varden Count: 4 Method (No. o s: ckeye salmon Count: 2 Method (No. o	egetation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub g Methods isher Li Fish Measured of fish): PEF (4)	fe Stage: juven d: 4 Fork Lo fe Stage: carcas d: Fork Lo	Canopy Height(m) 2 2 2 2 (VOC ille engths (mm	Right Bank V Closed Tall V Closed Tall V Closed Tall V Closed Tall V) Visual Obse Life Hin) Min: 32	Villow Shrub Villow Shrub Villow Shrub Villow Shrub ervation, Grou story: Unkno Max: 71	nd wn Mean: 46 Suspected Sj	Height(m) 2 2 2 2 Median: 51
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: so Total Fish Sampling Comments	Left Bank Ve Closed Tall W Closed Tall W Closed Tall W Closed Tall W Sh Sampling kpack Electrofi rvations olly Varden Count: 4 Method (No. o s: ckeye salmon Count: 2 Method (No. o	egetation Type /illow Shrub /illow Shrub /illow Shrub /illow Shrub g Methods asher Li Fish Measured of fish): PEF (4) Li Fish Measured of fish): VOG (2 pockeye observed to	fe Stage: juven d: 4 Fork Lo fe Stage: carcas d: Fork Lo	Canopy Height(m) 2 2 2 2 (VOC ille engths (mn ss engths (mn reek Lk.	Right Bank V Closed Tall V Closed Tall V Closed Tall V Closed Tall V) Visual Obse Life Hia) Min: 32 Life Hia	Villow Shrub Villow Shrub Villow Shrub Villow Shrub ervation, Grou story: Unkno Max: 71	nd Mean: 46 Suspected Sp omous Mean:	Height(m) 2 2 2 2 Median: 51 pawning: Yes

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0319A031.jpg

FSS0319A033.jpg



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FSS0319A035.jpg

FSS0319A036.jpg



FSS0319A037.jpg

FSS0319A038.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 5:03 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.22500 -152.90769 Coordinates -152.90769 62.22500 Elevation NED (m)(ft): 739 2425 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-6 Legal Description (MTRS): S025N020W25 Waterbody Name: Threemile Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Bear tracks, scat. Water Quality \ Stream Flow Water Temp (C): 4.50 DO (mg/L): 10.95 DO (%): Conductivity (µS/cm): 193 **pH:** 7.20 Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment: Embeddedness: Catchment Area(sq. km):** 65 **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Sand/Silt/Clay (legacy) Width 5.4 5.4 Subdominant Substrate 1: Gravel Thalweg Depth 0.50 Subdominant Substrate 2: Rosgen Class: F5 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:	handheld optical clinometer	Cha
Stream Velocity:	Price pygmy meter	Cha
Turbidity:		Elec
Water Quality: He	oriba U-10	Tra

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

FSS0319A039.jpg



FSS0319A040.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 3:06 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.16064 -152.73400 Coordinates -152.73400 62.16064 62.16124 -152.73139 Elevation NED (m)(ft): 627 2057 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-6 Legal Description (MTRS): S024N019W22 Waterbody Name: Moose Creek **Anadromous Waters Catalog Number:** Geographic Comments: Overlaps station 19A07. Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): DO (%): Water Temp (C): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 86 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 150 Fork Lengths (mm) Min: Median: Fish Measured: Max: Mean: Sampling Method (No. of fish): VOH (150) **Comments:** Species: sockeye salmon Life Stage: carcass Life History: Anadromous Fish Measured: Total Fish Count: 30 Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOH (30) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: Price pygmy meter **Channel Widths: Turbidity: Electrofisher:** Water Quality: **Transparency:**

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/28/2003 4:30 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.18225 -152.87793 Coordinates -152.87793 62.18225 62.18286 -152.87532 Elevation NED (m)(ft): 703 2306 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-6 Legal Description (MTRS): S024N020W11 Waterbody Name: Threemile Creek **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): DO (%): Water Temp (C): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 93 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 15 Fork Lengths (mm) Min: Median: Fish Measured: Max: Mean: Sampling Method (No. of fish): VOH (15) Comments: No fish observed upstream at 19A08. Species: sockeye salmon Life Stage: carcass Life History: Anadromous **Total Fish Count:** 8 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOH (8) Comments: No fish observed upstream at 19A08. Instruments **Stream Gradient: Channel Depths:** Stream Velocity: Price pygmy meter **Channel Widths:**

Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Laz	zar		Date/Time:	08/29/2003 9:12 AM
StationLatitudeLongitudeCoordinates61.92063-151.89391	Sample Coordinates	Latitude 61.92063	Longitude -151.89391	
Elevation NED (m)(ft): 153 502 Coordinate Determination Method: Non-Diff USGS Quadrangle: Tyonek D-6 Waterbody Name:			Datum: NAD83): S021N014W08	
Anadromous Waters Catalog Number: Geographic Comments: Right bank tributary to marked while flying.	Hayes River. Barrier	falls upstream	n at station 20A13.	Station waypoint
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):Water Color:Turbidity	DO (%): y (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%):EntrencCatchment Area(sq. km):91Embedd				
Channel Dimensions (m): Bankfull OHW	W Wetted 1	Dominant Sub	strate:	
Width		minant Subst		
Thalweg Depth	Subdo	ominant Subst	rate 2:	
Rosgen Class:				
Riparian Vegetation Communities (Vie	ereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
0 - 5				
5 - 10 10 - 20				
20 - 30				
Key To Fish Sampling Methods				
(VOH) Visual Observation, Helicopter				
Fish Observations Species: sockeye salmon Life Sta Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOH (6) Comments: No sockeye observed upstream at 2	nge: adult spawning Fork Lengths (mm 20A02.		story: Anadromou Max: Mea	
Species: sockeye salmonLife StateTotal Fish Count:6Fish Measured:Sampling Method (No. of fish):VOH (6)	Fork Lengths (mm		-	
Species: sockeye salmonLife StaTotal Fish Count:6Fish Measured:Sampling Method (No. of fish):VOH (6)Comments:No sockeye observed upstream at 2	Fork Lengths (mm		-	
Species: sockeye salmon Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOH (6) Comments: No sockeye observed upstream at 2	Fork Lengths (mm 20A02. Channe) Min:	-	
Species: sockeye salmon Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOH (6) Comments: No sockeye observed upstream at 2 Instruments Stream Gradient:	Fork Lengths (mm 20A02. Channe) Min: d Depths: d Widths:	-	

Station Info	
Observers: Joe Buckwalter, J Johnson, Jim Lazar	Date/Time: 08/29/2003 9:48 AM
Station Latitude Longitude Coordinates 61.89920 -151.92488	ampleLatitudeLongitudeCoordinates61.89920-151.92488
Elevation NED (m)(ft): 209 686 Coordinate Determination Method: Non-Differenti	GPS Field Measurement Datum: NAD83
USGS Quadrangle: Tyonek D-6 Waterbody Name: Anadromous Waters Catalog Number:	Argal Description (MTRS): S021N014W19 River. Barrier falls about 2.5 miles upstream at station 20A13.
Visit Comments: Wildlife Comments: bear tracks Water Quality \ Stream Flow	
Water Temp (C): 6.10 DO (mg/L): 12.02 DO Water Color: Clear Turbidity (NT	
Stream Channel	
Stream Gradient (%): 2EntrenchmenCatchment Area(sq. km):86Embeddednes	
Width 7.1	edDominant Substrate: Cobble2Subdominant Substrate 1: Gravel3Subdominant Substrate 2: Sand/Silt/Clay (legacy)
Rosgen Class: B3 Moderately entrenched, moderate g stable plan and profile. Stable banks.	ient, riffle dominated channel, with infrequently spaced pools. Very
Riparian Vegetation Communities (Viereck	t al. 1992)
Dist. from	Canopy Canopy Usight(m) Did to Did to T Usight(m)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	4	Open Balsam Poplar (Black Cottonwood) Forest	15
5 - 10	Closed Balsam Poplar Forest	25	Open Balsam Poplar (Black Cottonwood) Forest	15
10 - 20	Closed Balsam Poplar Forest	25	Open Balsam Poplar (Black Cottonwood) Forest	15
20 - 30	Closed Balsam Poplar Forest	25	Open Balsam Poplar (Black Cottonwood) Forest	15

Key To Fish Sampling Methods

(PEF) Backpack Elec	etrofisher	(VOG)	Visual Ob	servation, Gro	ound	
Fish Observations						
Species: Dolly Varder	n Life S	Stage: juvenile/adult	Life H	listory: Unk	nown	
Total Fish Count:	1 Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (N Comments: F.L. was	No. of fish): VOG (1) s about 100 mm.					
Species: Dolly Varder	n Life S	Stage: juvenile	Life H	listory: Unk	nown	
	5 Fish Measured: 5 No. of fish): PEF (5)	5 Fork Lengths (mm)	Min: 44	Max: 57	Mean: 51 Suspected S	Median: 50 Spawning: Yes
Species: Chinook salr	non Life S	Stage: juvenile	Life H	listory: Anad	dromous	
Total Fish Count: 4 Sampling Method (N Comments:	4 Fish Measured: 4 No. of fish): PEF (4)	Fork Lengths (mm)	Min: 57	Max: 67	Mean: 61	Median: 62

 Species: slimy sculpin
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 119
 Mean:
 119
 Median:
 119

 Sampling Method (No. of Fish):
 PEF (1)
 Comments:
 Vertical Period
 Vert

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:

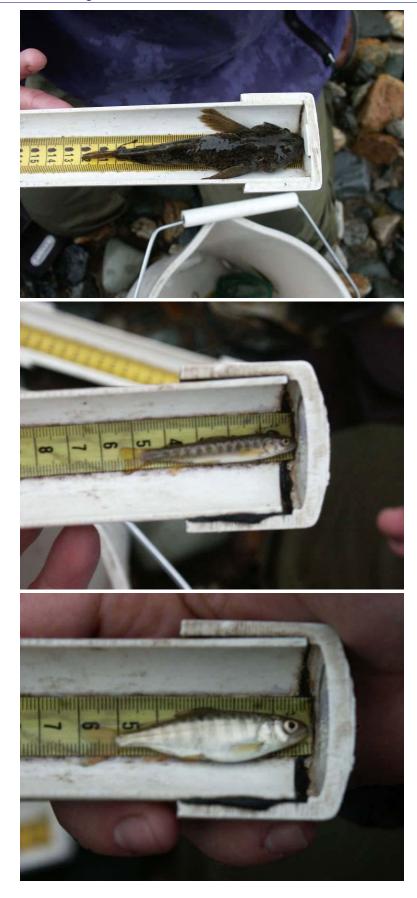


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FSS0320A006.jpg



FSS0320A007.jpg

FSS0320A008.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/29/2003 10:30 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.91086 -151.99293 Coordinates -151.99293 61.91086 Elevation NED (m)(ft): 184 604 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-6 Legal Description (MTRS): S021N015W15 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear right bank tributary to Hayes River. Visit Comments: Wildlife Comments: Bear sign: tracks, droppings, salmon carcass remnants. Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 2 **Embeddedness:** Catchment Area(sq. km): Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground **Fish Observations** Species: Pacific salmon-unspecified Life Stage: juvenile Life History: Anadromous Max: Median: **Total Fish Count:** 6 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOG (6) **Comments:** Species: sockeye salmon Life Stage: adult Life History: Anadromous Total Fish Count: 50 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOG (50) Suspected Spawning: Yes **Comments:** Species: sockeye salmon Life Stage: carcass Life History: Anadromous **Total Fish Count: 2** Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (2) Comments: Photo 9. **Instruments**

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:

Water Quality:

Transparency:



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Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/Time: (08/29/2003 10:48 AM
StationLatitudeLongitudeCoordinates61.82424-152.08335	Sample Coordinates	Latitude 61.82424	8	atitudeLongitude.82484-152.08078
Elevation NED (m)(ft): 197 646			-	
Coordinate Determination Method: Non-Different USGS Quadrangle: Tyonek D-6			Datum: NAD83): S020N016W13	
Waterbody Name: Trimble River	Legai Descriț	00011 (101 1 KS): 30201010W13	
Anadromous Waters Catalog Number:				
Geographic Comments: Fish observed in clear sid miles upstream at station				er falls about 2.5
Visit Comments:				
Wildlife Comments:				
Water Quality \ Stream Flow				
	DO (%):	Conductivit	у (µS/cm):	pH:
Water Color: Turbidity ((NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%):EntrenchrCatchment Area(sq. km):528Embedded				
Channel Dimensions (m): Bankfull OHW		ominant Sul	strate	
Width		minant Subs		
Thalweg Depth	Subdo	minant Subs	trate 2:	
Rosgen Class:				
Riparian Vegetation Communities (Viero	eck et al. 1992)			
Dist. from	Canopy			Canopy
Bank (m) <u>Left Bank Vegetation Type</u>		Right Bank V	Vegetation Type	Height(m)
0 - 5				
5 - 10				
10 - 20				
20 - 30 Kay Ta Fish Sampling Mathada				
Key To Fish Sampling Methods				
(VOH) Visual Observation, Helicopter				
Fish Observations				
Species: sockeye salmon Life Stage	e: adult spawning	Life Hi	story: Anadromous	
	Fork Lengths (mm)	Min:	Max: Mean	: Median:
Sampling Method (No. of fish): VOH (230) Comments:				
Species: sockeye salmon Life Stage	e: carcass	Life Hi	story: Anadromous	
	Fork Lengths (mm)	Min:	Max: Mean	: Median:
Sampling Method (No. of fish): VOH (2) Comments:				
Instruments Streem Condicate		Dontha		
Stream Gradient:		Depths:		
Stream Velocity: Price pygmy meter		Widths:		
Turbidity:	Electrof			
Water Quality:	Transpa	rency:		

Station Info					
Observers: Joe Buckwalter, J Johnson, Jim Lazar			Date/Ti	me: 08/29/20	03 11:23 AM
Station Latitude Longitude Coordinates 61.89166 -152.07682	Sample Coordinates	Latitude 61.89166	Longitude -152.07682	/ Latitude 61.89226	Longitude -152.07425
Elevation NED (m)(ft): 200 656			_		
Coordinate Determination Method: Non-Differen USGS Quadrangle: Tyonek D-6	tial GPS Field Me Legal Descrip		Datum: NA • \$021N015		
Waterbody Name:	Legai Deserip		. 50211(015)		
Anadromous Waters Catalog Number:		~			
Geographic Comments: Unnamed clear left bank tr 20A15. Station waypoint n			r falls about 7	miles upstrean	1 at station
Visit Comments: Wildlife Comments:		-			
Water Quality \ Stream Flow					
Water Temp (C): DO (mg/L): D	O (%):	Conductivity	y (μS/cm):	pH:	
Water Color: Turbidity (N	TU):	Thalweg Vel	ocity (m/s)(ft/	s):	
Stream Channel					
Stream Gradient (%): Entrenchme	ent:				
Catchment Area(sq. km): 140 Embeddedn					
Channel Dimensions (m): Bankfull OHW W Width		ominant Sub ninant Subst			
Thalweg Depth		ninant Subst			
Rosgen Class:					
Riparian Vegetation Communities (Vierec	k et al. 1992)				
Dist. from	Canopy				Canopy
Bank (m) <u>Left Bank Vegetation Type</u>		Right Bank V	egetation Ty	<u>pe</u>	Height(m)
0 - 5					
0-5					
5 - 10					
5 - 10 10 - 20 20 - 30					
5 - 10 10 - 20					
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations					
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 3	adult spawning		story: Anadro		
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Life Stage: 7 Total Fish Count: 8 Fish Measured: Fo	adult spawning rk Lengths (mm)		story: Anadro Max:	omous Mean:	Median:
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 3			-		Median:
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: a Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: a	ork Lengths (mm)	Min:	-	Mean:	Median:
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo	ork Lengths (mm)	Min: Life His	Max:	Mean:	Median: Median:
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1)	rk Lengths (mm)	Min: Life His	Max: story: Anadro	Mean:	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1) Comments: Source: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1) Comments:	rk Lengths (mm)	Min: Life His	Max: story: Anadro	Mean:	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1) Comments: Instruments	ork Lengths (mm) carcass ork Lengths (mm)	Min: Life His Min:	Max: story: Anadro	Mean:	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1) Comments: Instruments Stream Gradient:	ork Lengths (mm) carcass ork Lengths (mm) Channel	Min: Life His Min: Depths:	Max: story: Anadro	Mean:	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1) Comments: Instruments Stream Gradient: Stream Velocity: Price pygmy meter	rk Lengths (mm) carcass ork Lengths (mm) Channel Channel	Min: Life His Min: Depths: Widths:	Max: story: Anadro	Mean:	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage: 4 Total Fish Count: 8 Fish Measured: Fo Sampling Method (No. of fish): VOH (8) Comments: Species: sockeye salmon Life Stage: 4 Total Fish Count: 1 Fish Measured: Fo Sampling Method (No. of fish): VOH (1) Comments: Instruments Stream Gradient:	ork Lengths (mm) carcass ork Lengths (mm) Channel	Min: Life His Min: Depths: Widths: sher:	Max: story: Anadro	Mean:	

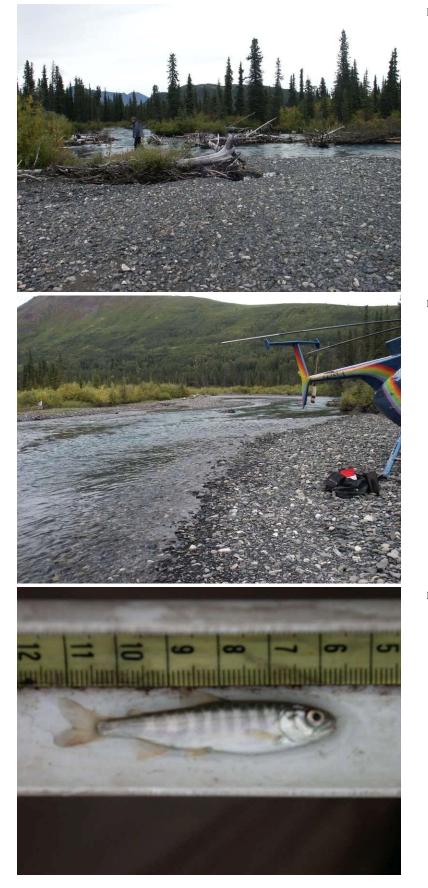
Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/29/2003 12:56 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61,99325 -152,64512 Coordinates 61.99325 -152.64512 Elevation NED (m)(ft): 527 1729 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-8 Legal Description (MTRS): S022N018W18 Waterbody Name: Portage Creek **Anadromous Waters Catalog Number:** Geographic Comments: Canyon begins immediately downstream of station. Barrier falls about 8.5 miles upstream at station 18A06 on mainstem Portage Creek. Visit Comments: Sampled predominantly in left bank side channel: velocity slow, width ~3 meters, substrate gravel, cobble with silt layer. Wildlife Comments: Fresh beaver chew. Flock of mergansers upstream. Water Quality \ Stream Flow Water Temp (C): 5.90 DO (mg/L): 12.00 DO (%): Conductivity (µS/cm): 48 **pH:** 7.46 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Catchment Area(sq. km): 161 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel Width 25.0 20.3 Subdominant Substrate 1: Cobble 0.40 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Thalweg Depth Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 Closed Tall Willow Shrub 2 Closed Tall Willow Shrub 2 5 - 10 Open White Spruce Forest 20 Open White Spruce Forest 20 10 - 20 Open White Spruce Forest 20 Open White Spruce Forest 20 20 - 30 Open White Spruce Forest 20 Open White Spruce Forest 20 Key To Fish Sampling Methods (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 61 Fish Measured: 31 Fork Lengths (mm) Min: 42 Max: 60 **Mean:** 48 Median: 51 Sampling Method (No. of fish): PEF (31) VOG (30) Suspected Spawning: Yes Comments: Average F.L. of additional fish was about 50 mm. No chinook observed upstream at 18A05. Instruments Stream Gradient: handheld optical clinometer Channel Depths: graduated wading rod Stream Velocity: Price pygmy meter Channel Widths: measuring tape **Turbidity:** Electrofisher: Smith-Root LR-24

Water Quality: Horiba U-10

-continued-525

Transparency:

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FSS0320A015.jpg

FSS0320A016.jpg



FSS0320A017.jpg

Station Info						
Observers: Joe Buckwa	lter, J Johnson, J	Jim Lazar			Date/Time:	08/29/2003 2:17 PM
StationLatitudeCoordinates61.96390	Longitude -152.42719		1	Latitude 61.96390	Longitude -152.42719	
Elevation NED (m)(ft):	325 1066					
Coordinate Determination	on Method: No				Datum: NAD83	}
USGS Quadrangle: Tyo	nek D-7	Le	gal Descripti	on (MTRS)	: S022N017W29	
Waterbody Name:						
Anadromous Waters Cat Geographic Comments:	0	k Chickak River	ributary.			
Visit Comments: Reach 12.6, to	sampled was in emperature 6.2, j	U	ibutary. Main	channel: co	onductivity 286, tu	rbidity 210, D.O.
Wildlife Comments:						
Water Quality \ Strea	m Flow					
Water Temp (C): 5.20 Water Color: Clear	DO (mg/L): 1 Tu	2.56 DO (%) arbidity (NTU):		•	ν (μS/cm): 167 ocity (m/s)(ft/s):	pH: 8.16
Stream Channel						
Stream Gradient (%): 1		ntrenchment:				
Catchment Area(sq. km)		mbeddedness:				
Channel Dimensions (m					strate: Cobble	
Thalweg	Width Depth	7.3 6.1 0.05			rate 1: Gravel rate 2: Boulder	
Rosgen Class: C3 Low g	adient, meander	ring, point-bar, rif	fle/pool, alluv	vial channel	s with broad, well-	defined floodplains.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	3	Closed Tall Alder Shrub	4
5 - 10	Unvegetated		Closed Tall Alder Shrub	4
10 - 20	Unvegetated		Closed Tall Alder Shrub	4
20 - 30	Unvegetated		Closed Tall Alder Shrub	4

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden	Life Sta	age: adult	Life H	istory: Resid	lent	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 150	Max: 202	Mean: 167	Median: 176
Sampling Method (No.	of fish): PEF (4)					
Comments: No adult Do	olly Varden observed u	pstream at 20A02.				
Species: Dolly Varden	Life Sta	age: juvenile/adult	Life H	istory: Unkn	own	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 95	Max: 138	Mean: 118	Median: 116
Sampling Method (No.	of fish): PEF (4)					
Comments:						
Species: Dolly Varden	Life Sta	age: juvenile	Life H	istory: Unkn	own	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 72	Max: 88	Mean: 79	Median: 80
Sampling Method (No.	of fish): PEF (4)					
Comments:						

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0320A020.jpg

FSS0320A021.jpg

FSS0320A022.jpg

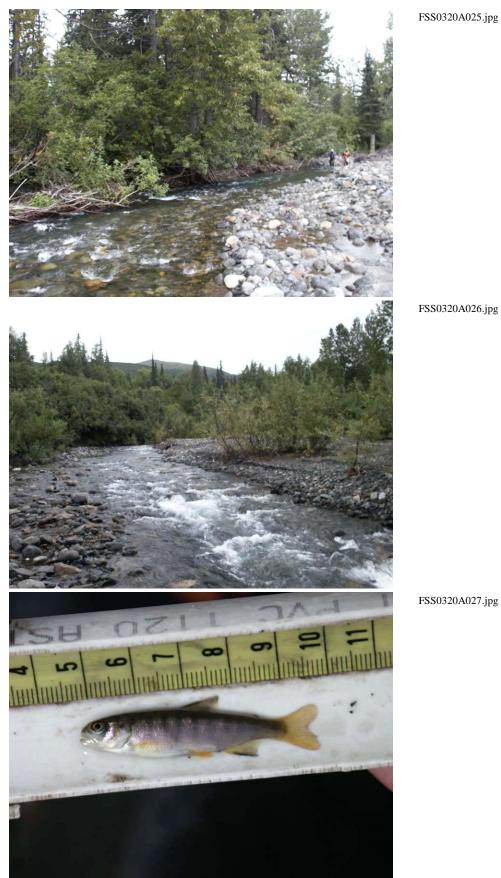


Station Info			
Observers: Joe Buckwalter, J Johnson, Jim Laz	zar	Date/Tim	e: 08/29/2003 3:42 PM
Station Latitude Longitude	Sample	Latitude Longitude	
Coordinates 61.92897 -152.13780	Coordinates	61.92897 -152.13780	
Elevation NED (m)(ft): 306 1004 Coordinate Determination Method: Non-Diff	erential GPS Field N	Measurement Datum: NAD	083
USGS Quadrangle: Tyonek D-6		iption (MTRS): S021N016W	
Waterbody Name:			
Anadromous Waters Catalog Number: Geographic Comments: Tributary stream to Re	ed Salmon Lake.		
Visit Comments:			
Wildlife Comments: Moose, bear droppings.			
Water Quality \ Stream Flow			
Water Temp (C): 7.80 DO (mg/L): 12.06	DO (%):	Conductivity (µS/cm): 94	pH: 8.04
Water Color: Clear Turbidit	y (NTU):	Thalweg Velocity (m/s)(ft/s)	:
Stream Channel			
Stream Gradient (%): 2 Entrenc			
Catchment Area(sq. km): 37 Embedd Channel Dimensions (m): Bankfull OHW		Dominant Substrate: Cobble	
Width 12.0		ominant Substrate 1: Gravel	
Thalweg Depth	0.30 Subd	ominant Substrate 2:	
Rosgen Class: B3 Moderately entrenched, mode stable plan and profile. Stable ba		lominated channel, with infrequ	uently spaced pools. Very
Riparian Vegetation Communities (Vie	ereck et al. 1992)	
Dist. from	Canopy		Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	<u>Right Bank Vegetation Type</u>	Height(m)
0 - 5 Closed Balsam Poplar Forest	24	Unvegetated	
5 - 10 Closed Balsam Poplar Forest	24	Unvegetated	
10 - 20 Closed Balsam Poplar Forest	24	Unvegetated	
20 - 30 Closed Balsam Poplar Forest	24	Unvegetated	
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher	(VOC	G) Visual Observation, Ground	l
Fish Observations			
	age: juvenile/adult	Life History: Unknow	
Total Fish Count: 11 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) VOC	-	n) Min: 106 Max: 106 N	Iean: 106 Median: 106
Comments: Average F.L. of additional fish was			
-	ige: juvenile	Life History: Unknow	n
Total Fish Count: 20 Fish Measured: 20 Sampling Method (No. of fish): PEF (20) Comments:	Fork Lengths (m		Iean: 62Median: 60uspected Spawning:Yes
Species: coho salmon Life Sta	age: juvenile	Life History: Anadrom	nous
Total Fish Count:13Fish Measured:8	Fork Lengths (m		Iean: 44 Median: 44
Sampling Method (No. of fish): PEF (8) VOC			
Comments: Average F.L. of additional fish was	s about 45 mm.		

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:





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FSS0320A029.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/29/2003 4:46 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.19517 -152.28158 Coordinates -152.28158 62.19517 62.19576 -152.27898 Elevation NED (m)(ft): 250 820 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-5 Legal Description (MTRS): S024N016W06 Waterbody Name: Kichatna River **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): DO (%): Water Temp (C): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 479 **Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 10 10 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 100 Fish Measured: Median: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOH (100) Comments: Adult sockeye observed upstream at 20A10. Species: sockeye salmon Life Stage: carcass Life History: Anadromous **Total Fish Count:** 3 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOH (3) Comments: Adult sockeye observed upstream at 20A10. Instruments Gi C I' nnal Danti

	Channel Depths:
Price pygmy meter	Channel Widths:
	Electrofisher:
	Transparency:
	Price pygmy meter

Station Info			
Observers: Joe Buckwalter, J Johnson, Jim Laz	zar	Date	e/Time: 08/29/2003 5:04 PM
StationLatitudeLongitudeCoordinates62.27030-152.56767	Sample Coordinates	Latitude Longitue 62.27030 -152.567	
Elevation NED (m)(ft): 367 1204 Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna B-6 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Clear left bank tributar Visit Comments: Wildlife Comments: tracks: moose, wolf, bear.		tion (MTRS): S025N()18W11
Water Quality \ Stream Flow			
Water Temp (C): 9.10DO (mg/L): 8.33Water Color: ClearTurbidity		Conductivity (µS/cm): Thalweg Velocity (m/s)	_
Stream Channel			
Stream Gradient (%):1EntrencCatchment Area(sq. km):96EmbeddChannel Dimensions (m):BankfullOHWWidth4.6Thalweg DepthChannel Dimension	ledness: V Wetted D 2.2 Subdor	ominant Substrate: Co ninant Substrate 1: Gr ninant Substrate 2: Sa	avel
Rosgen Class: C3 Low gradient, meandering, po			
Riparian Vegetation Communities (Vie	-		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation	Canopy Type Height(m)
0 - 5 Closed Tall Alder-Willow Shrub	2 0	Closed Tall Alder-Willo	w Shrub 2
5 - 10 Closed Tall Alder-Willow Shrub	2 0	Closed Tall Alder-Willo	w Shrub 2
10 - 20 Closed Tall Alder-Willow Shrub	2 0	Closed Tall Alder-Willo	w Shrub 2
20 - 30 Closed Balsam Poplar-White Spruce	Forest 25 C	Closed Tall Alder-Willo	w Shrub 2
Key To Fish Sampling Methods			
(PEF) Backpack Electrofisher	(VOG)	Visual Observation, G	round
Fish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):PEF (1)Comments:	ge: adult Fork Lengths (mm)	Life History: Res Min: 161 Max: 161	
Species: Dolly VardenLife StaTotal Fish Count:3Sampling Method (No. of fish):PEF (3)Comments:	ge: juvenile Fork Lengths (mm)	Life History: Uni Min: 41 Max: 55	known Mean: 48 Median: 48 Suspected Spawning: Yes
		Life History: Ana Min: 37 Max: 77	adromous Mean: 52 Median: 57 Suspected Spawning: Yes
Species: sockeye salmonLife StaTotal Fish Count:75Fish Measured:Sampling Method (No. of fish):VOG (75)Comments:	ge: adult spawning Fork Lengths (mm)	Life History: Ana Min: Max:	adromous Mean: Median:

-continued-537

Appendix K137.–Page 2 of 4.

Species: sockeye salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 46 Max: 47 **Mean:** 46 Median: 46 Sampling Method (No. of fish): PEF (2) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 52 Max: 52 **Mean: 52** Median: 52 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 42 Max: 49 Total Fish Count: 3 Fish Measured: 3 Fork Lengths (mm) Min: 36 **Mean:** 41 Sampling Method (No. of fish): PEF (3) **Comments:** Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



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FSS0320A038.jpg



FSS0320A039.jpg

FSS0320A040.jpg

FSS0320A042.jpg

Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Laza	r		Date/Time: 08/29/	2003 11:09 AM
StationLatitudeLongitudeCoordinates61.80257-152.09309Elevation NED (m)(ft):229751	Sample Coordinates	Latitude 61.80257	Longitude / Latitud -152.09309 / 61.803	0
Coordinate Determination Method: Non-Differ USGS Quadrangle: Tyonek D-6 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Clear left bank tributary	Legal Descrip	tion (MTRS	Datum: NAD83): S020N016W24 nt marked while flying.	
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):Water Color:Turbidity		Conductivity Thalweg Vel	y (μS/cm): pH: ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%):EntrenchCatchment Area(sq. km):15Embeddee				
Channel Dimensions (m): Bankfull OHW Width		ominant Sub ninant Subst		
Thalweg Depth	Subdo	minant Subst	trate 2:	
Rosgen Class:				
Riparian Vegetation Communities (Vier	eck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
0 - 5				
5 - 10 10 - 20				
20 - 30				
20 - 30				
20 - 30 Key To Fish Sampling Methods				
20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage	e: adult spawning Fork Lengths (mm)		story: Anadromous Max: Mean:	Median:
20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 1000 Fish Measured: Sampling Method (No. of fish): VOH (1000)			-	Median:
20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 1000 Sampling Method (No. of fish): VOH (1000) Comments:		Min:	-	Median:
20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage Total Fish Count: 1000 Fish Measured: Sampling Method (No. of fish): VOH (1000) Comments: Instruments	Fork Lengths (mm) Channel	Min:	-	Median:
20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: sockeye salmon Life Stage Total Fish Count: 1000 Fish Measured: Sampling Method (No. of fish): VOH (1000) Comments: Instruments Stream Gradient:	Fork Lengths (mm) Channel	Min: Depths: Widths:	-	Median:

Station Info					
Observers: Joe Buckwalter, J Johnson, Jim Laza	r		Date/Ti	ime: 08/29/20	03 3:15 PM
StationLatitudeLongitudeCoordinates61.93991-152.01482Elevation NED (m)(ft):171561	Sample Coordinates	Latitude 61.93991	Longitude -152.01482	/ Latitude 61.94051	Longitude -152.01225
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Tyonek D-6 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Unnamed tributary to R	Legal Descrip	tion (MTRS		W03	
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):Water Color:Turbidity	DO (%): (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/	pH: (s):	
Stream Channel					
Stream Gradient (%):EntrenchCatchment Area(sq. km):62Channel Dimensions (m):Bankfull	edness:	ominant Sub	octuator		
Width		minant Subst			
Thalweg Depth	Subdo	minant Subst	trate 2:		
Rosgen Class:					
Riparian Vegetation Communities (Vier	reck et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Ty	<u>pe</u>	Canopy Height(m)
0 - 5 5 - 10 10 - 20 20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOH (1) Comments: No sockeye observed upstream at 200	Fork Lengths (mm)		story: Anadro Max:	omous Mean: Suspected Sp	Median: awning: Yes
· · · · · · · · · · · · · · · · · · ·		I ifo Hi	story: Anadro	omous	
Species: sockeye salmonLife StagTotal Fish Count:5Fish Measured:Sampling Method (No. of fish):VOH (5)Comments:No sockeye observed upstream at 20	Fork Lengths (mm)		Max:	Mean:	Median:

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:
Water Quality:		Transparency:

Station Info				
Observers: Joe Buckwalter, J Johnson, Jim Laza	ar		Date/Time:	08/29/2003 9:17 AM
Station Latitude Longitude	Sample	Latitude	Longitude	
Coordinates 61.87296 -151.95736	Coordinates	61.87296	-151.95736	
Elevation NED (m)(ft): 426 1398				
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Tyonek D-6			Datum: NAD83): S021N015W36	
Waterbody Name:	Legal Descrip		. 50211015 ₩ 50	
Anadromous Waters Catalog Number:				
Geographic Comments: Waterfall. Station way	point marked while fl	ying.		
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): DO (mg/L):	DO (%):	Conductivity	y (μS/cm):	pH:
Water Color: Turbidity	(NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%): Entrench				
Catchment Area(sq. km): Embedde				
Channel Dimensions (m): Bankfull OHW		ominant Sub		
Width Thalweg Depth		minant Subst minant Subst		
Rosgen Class:	Subus		Aute 2.	
Riparian Vegetation Communities (View	mode at al. 1002)			
Riparian vegetation Communities (vie	reck et al. 1992)			
Dist. from Bank (m) Laft Bards Variated for Torre	Canopy Height(m)	Dialet Dearly S	7 4. T	Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5	incigitt(iii)	<u>Kigiit dalik v</u>	egetation Type	Treight(iii)
0-5 5-10				
10 - 20				
20 - 30				
Key To Fish Sampling Methods				
(NON) None				
Fish Observations				
	ge: not applicable		story: Not Applicat	
Total Fish Count: 0 Fish Measured:	Fork Lengths (mm)	Min:	Max: Mean	n: Median:
Sampling Method (No. of fish): NON (0) Comments:				
Instruments				
Instruments Stream Gradient:	Channel	Depths:		
		Depths: Widths:		
Stream Gradient:		Widths:		

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/29/2003 10:58 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.74568 -152.00078 Coordinates -152.00078 61.74568 Elevation NED (m)(ft): 512 1680 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek C-6 Legal Description (MTRS): S019N015W09 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Total Fish Count:** 0 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths:** Stream Velocity: **Turbidity: Electrofisher:** Water Quality: **Transparency:**

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Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/29/2003 11:28 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.85448 -152.27150 Coordinates 61.85448 -152.27150 Elevation NED (m)(ft): 464 1522 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-7 Legal Description (MTRS): S020N017W01 Waterbody Name: Spring Creek **Anadromous Waters Catalog Number:** Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Total Fish Count:** 0 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths:** Stream Velocity: **Turbidity: Electrofisher:** Water Quality: **Transparency:**

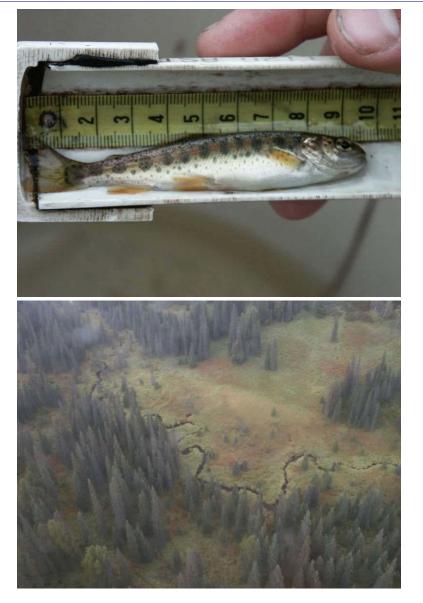
FSS0320A013.jpg



Station Info			
Observers: Joe Buckwalter, J Johnson, Jim Lazar		Date/Time:	08/30/2003 9:28 AM
0	Sample Coordinates	Latitude Longitude 62.11145 -150.99389	
Elevation NED (m)(ft): 282 925			
Coordinate Determination Method: Non-Differential			
USGS Quadrangle: Talkeetna A-2 Waterbody Name:	Legal Descri	ption (MTRS): S023N009W06	
Anadromous Waters Catalog Number:			
Geographic Comments:			
Visit Comments: JBU fell in - wet Horiba not working.			
Wildlife Comments: Reach located in beaver meadow.			
Water Quality \ Stream Flow			
Water Temp (C): 10.10 DO (mg/L): DO (Conductivity (µS/cm): 28	pH: 6.18
Water Color: Clear Turbidity (NTU)):	Thalweg Velocity (m/s)(ft/s):	
Stream Channel			
Stream Gradient (%): 0.5 Entrenchment:			
Catchment Area(sq. km): 4 Embeddedness:			
Channel Dimensions (m): Bankfull OHW Wet Width 2.5 2.		Dominant Substrate: Sand/Silt/C ominant Substrate 1: Gravel	lay (legacy)
Thalweg Depth 0.5		ominant Substrate 2: Cobble	
Rosgen Class: E5 Low gradient, meandering riffle/pool efficient and stable. High meander width		ow width/depth ratio and little dep	position. Very
Riparian Vegetation Communities (Viereck e	et al. 1992)		
Dist. from	Canopy		Canopy Usisht(m)
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5 Bluejoint Meadow5 - 10 Bluejoint Meadow	1	Bluejoint Meadow Bluejoint Meadow	1
5 - 10 Bluejoint Meadow		DILLEIOIIIL MEALOW	1
10 20 Blueigint Meadow		-	1
10 - 20 Bluejoint Meadow	1	Bluejoint Meadow	1
20 - 30 Bluejoint Meadow		-	1 20
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods	1	Bluejoint Meadow Open White Spruce Forest	
20 - 30 Bluejoint Meadow	1	Bluejoint Meadow	
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods	1	Bluejoint Meadow Open White Spruce Forest	
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve	1 1 (VOG	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident	
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve Total Fish Count: 23 Fish Measured: 18	1 1 (VOG	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident) Min: 35 Max: 98 Mea	20 n: 52 Median: 66
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Total Fish Count: 23 Fish Measured: 18 Fork B Sampling Method (No. of fish): PEF (18) VOG (5)	1 (VOG enile Lengths (mn	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident) Min: 35 Max: 98 Mea	20
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve Total Fish Count: 23 Fish Measured: 18 Sampling Method (No. of fish): PEF (18) VOG (5) Comments: Average F.L. of additional fish was about 5	1 (VOG enile Lengths (mn	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident) Min: 35 Max: 98 Mea	20 n: 52 Median: 66
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve Total Fish Count: 23 Fish Measured: 18 Sampling Method (No. of fish): PEF (18) VOG (5) Comments: Average F.L. of additional fish was about 5	1 (VOG enile Lengths (mn 50 mm.	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident a) Min: 35 Max: 98 Mea Susp	20 n: 52 Median: 66 nected Spawning: Yes
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve Total Fish Count: 23 Fish Measured: 18 Fork I Sampling Method (No. of fish): PEF (18) VOG (5) Comments: Average F.L. of additional fish was about 5 Instruments Stream Gradient: handheld optical clinometer	1 (VOG enile Lengths (mn 50 mm.	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident a) Min: 35 Max: 98 Mea Susp	20 n: 52 Median: 66 nected Spawning: Yes
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve Total Fish Count: 23 Fish Measured: 18 Fork I Sampling Method (No. of fish): PEF (18) VOG (5) Comments: Average F.L. of additional fish was about 5 Instruments Stream Gradient: handheld optical clinometer Stream Velocity: Price pygmy meter	1 (VOC enile Lengths (mn 50 mm. Channe Channe	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident) Min: 35 Max: 98 Mea Susp el Depths: graduated wading rod	n: 52 Median: 66 ected Spawning: Yes
20 - 30 Bluejoint Meadow Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: rainbow trout Life Stage: juve Total Fish Count: 23 Fish Measured: 18 Fork I Sampling Method (No. of fish): PEF (18) VOG (5) Comments: Average F.L. of additional fish was about 5 Instruments Stream Gradient: handheld optical clinometer	1 (VOG enile Lengths (mn 50 mm. Channe Electro	Bluejoint Meadow Open White Spruce Forest) Visual Observation, Ground Life History: Resident) Min: 35 Max: 98 Mea Susp el Depths: graduated wading rod	n: 52 Median: 66 hected Spawning: Yes



-continued-549



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FSS0321A005.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/30/2003 10:34 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.09154 -151.12529 Coordinates 62.09154 -151.12529 Elevation NED (m)(ft): 365 1198 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna A-3 Legal Description (MTRS): S023N010W09 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Right-bank Yenlo Creek tributary. Visit Comments: Wildlife Comments: Bear tracks. Water Quality \ Stream Flow Water Temp (C): 8.40 DO (mg/L): DO (%): Conductivity (µS/cm): 39 pH: 6.58 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 1.5 **Entrenchment:** 17 **Embeddedness: Catchment Area**(sq. km): Channel Dimensions (m): **Bankfull OHW** Wetted Dominant Substrate: Gravel Width 5.4 4.7 Subdominant Substrate 1: Cobble Thalweg Depth 0.50 Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Height(m) Left Bank Vegetation Type **Right Bank Vegetation Type** 0 - 5 Closed Tall Alder-Willow Shrub 3 Closed Tall Alder-Willow Shrub 3 5 - 10 Closed Tall Alder-Willow Shrub 3 Closed Tall Alder-Willow Shrub 3 10 - 20 Open White Spruce Forest 20 Closed Tall Alder-Willow Shrub 3 3 20 - 30 Open White Spruce Forest 20 Closed Tall Alder-Willow Shrub

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 61 Max: 61 Mean: 61 Median: 61 Sampling Method (No. of fish): PEF (1) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 23 Fish Measured: 18 Fork Lengths (mm) Min: 37 **Max: 52** Mean: 44 Median: 44 Suspected Spawning: Yes Sampling Method (No. of fish): PEF (18) VOG (5) Comments: Average F.L. of additional fish was about 50 mm. Species: rainbow trout Life Stage: juvenile Life History: Resident Mean: 41 **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 32 Max: 68 Median: 50 Sampling Method (No. of fish): PEF (6) Suspected Spawning: Yes **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 3 Fish Measured: 3 Fork Lengths (mm) Min: 60 Max: 70 **Mean:** 64 Median: 65 Sampling Method (No. of fish): PEF (3) **Comments:**

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min: 45
 Max: 45
 Mean: 45
 Median: 45

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Vertice
 Veri

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths: measuring tape
Turbidity:		Electrofisher: Smith-Root LR-24
Water Quality: H	oriba U-10	Transparency:





FSS0321A010.jpg

Station Info	
Observers: Joe Buckwalter, J Johnson, Jim Lazar	Date/Time: 08/30/2003 11:42 AM
StationLatitudeLongitudeCoordinates62.13623-151.17196	ampleLatitudeLongitudeoordinates62.13623-151.17196
Elevation NED (m)(ft): 458 1503	
Coordinate Determination Method: Non-Differentia	
USGS Quadrangle: Talkeetna A-3	egal Description (MTRS): S024N010W30
Waterbody Name:	
Anadromous Waters Catalog Number:	
Geographic Comments: Right-bank Yenlo Creek trib	ry.
Visit Comments:	
Wildlife Comments: Bull and cow moose.	
Water Quality \ Stream Flow	
Water Temp (C): 7.80DO (mg/L):DOWater Color: ClearTurbidity (NT	
Stream Channel	
Stream Gradient (%): 1.5 Entrenchmen	
Catchment Area(sq. km): 8 Embeddednes	
Channel Dimensions (m): Bankfull OHW W	ed Dominant Substrate: Cobble
Width 7.0	Subdominant Substrate 1: Gravel
Thalweg Depth (Subdominant Substrate 2: Sand/Silt/Clay (legacy)
Rosgen Class: C3 Low gradient, meandering, point-ba	iffle/pool, alluvial channels with broad, well-defined floodplains.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Bluejoint-Shrub	1	Bluejoint-Shrub	1
5 - 10	Bluejoint-Shrub	1	Bluejoint-Shrub	1
10 - 20	Bluejoint-Shrub	1	Bluejoint-Shrub	1
20 - 30	Closed Tall Alder Shrub	3	Bluejoint-Shrub	1

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden	Life Sta	ige: juvenile	Life H	istory: Unkn	own	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 37	Max: 66	Mean: 51	Median: 51
Sampling Method (No. o	f fish): PEF (2)				Suspected S	Spawning: Yes
Comments:						
Species: coho salmon	Life Sta	ige: juvenile	Life H	istory: Anad	romous	
Total Fish Count: 18	Fish Measured: 18	Fork Lengths (mm)	Min: 36	Max: 50	Mean: 41	Median: 43
Sampling Method (No. o	f fish): PEF (18)				Suspected S	Spawning: Yes
Comments:						
Species: rainbow trout	Life Sta	ige: juvenile	Life H	istory: Resid	lent	
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 29	Max: 57	Mean: 35	Median: 43
Sampling Method (No. o	f fish): PEF (5)				Suspected S	Spawning: Yes
Comments:						

Instruments

Stream Gradient:handheld optical clinometerStream Velocity:Price pygmy meterTurbidity:Water Quality: Horiba U-10

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS0321A014.jpg

FSS0321A016.jpg



FSS0321A017.jpg

FSS0321A019.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/30/2003 12:34 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.16114 -151.21356 Coordinates 62.16114 -151.21356 Elevation NED (m)(ft): 574 1883 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna A-3 Legal Description (MTRS): S024N011W24 Waterbody Name: Yenlo Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.10 DO (mg/L): DO (%): Conductivity (µS/cm): 53 **pH:** 6.83 Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 2 **Entrenchment:** Catchment Area(sq. km): 3 **Embeddedness:** OHW **Channel Dimensions (m):** Bankfull Wetted Dominant Substrate: Cobble Width 4.3 2.7 Subdominant Substrate 1: Gravel 0.15 **Thalweg Depth** Subdominant Substrate 2: Sand/Silt/Clay (legacy) Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2
5 - 10	Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2
10 - 20	Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2
20 - 30	Closed Tall Alder-Willow Shrub	2	Closed Tall Alder-Willow Shrub	2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 129 Max: 129 Mean: 129 Median: 129 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 11 Fish Measured: 11 Fork Lengths (mm) Min: 30 Max: 87 **Mean:** 47 Median: 58 Sampling Method (No. of fish): PEF (11) **Comments:**

Instruments

Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:

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FSS0321A022.jpg

FSS0321A023.jpg

FSS0321A024.jpg



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/30/2003 4:26 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.90297 -151.36027 Coordinates 61.90297 -151.36027 Elevation NED (m)(ft): 64 210 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Tyonek D-4 Legal Description (MTRS): S021N011W18 Waterbody Name: Skwentna River **Anadromous Waters Catalog Number:** Geographic Comments: Side channel of Skwentna River (at high stage) - likely a tributary (not side channel) when Skwentna River is lower. . Visit Comments: Skwentna River at high stage - channel inundated with glacially turbid water from the Skwentna River. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.90 DO (mg/L): DO (%): Conductivity (µS/cm): 98 pH: 6.69 Water Color: Glacial, Low Turbidit **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 5838 **Embeddedness: Channel Dimensions (m): Bankfull OHW** Wetted Dominant Substrate: Sand/Silt/Clay (legacy) 15.8 7.1 Subdominant Substrate 1: Gravel Width 0.30 **Thalweg Depth** Subdominant Substrate 2: Cobble Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Spruce-Paper Birch Forest	4	Closed Tall Alder Shrub	4
5 - 10	Closed Spruce-Paper Birch Forest	4	Closed Tall Alder Shrub	4
10 - 20	Closed Spruce-Paper Birch Forest	4	Closed Tall Alder Shrub	4
20 - 30	Closed Spruce-Paper Birch Forest	25	Closed Tall Alder Shrub	4

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

Species: ninespine sticklet	back Life Sta	age: juvenile/adult	Life H	istory: Resid	ent	
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 43	Max: 57	Mean: 51	Median: 50
Sampling Method (No. o	f fish): MTQ (5)					
Comments:						
Species: coho salmon	Life Sta	age: juvenile	Life H	istory: Anad	romous	
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 99	Max: 110	Mean: 106	Median: 104
Sampling Method (No. o	f fish): MTQ (3)					
Comments:						
Species: sockeye salmon	Life Sta	age: juvenile	Life H	istory: Anad	romous	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 55	Max: 59	Mean: 57	Median: 57
Sampling Method (No. o	f fish): MTQ (2)					
Comments:						
Species: rainbow trout	Life Sta	age: juvenile/adult	Life H	istory: Resid	ent	
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 122	Max: 138	Mean: 131	Median: 130
Sampling Method (No. o	f fish): MTQ (3)					
Comments:						
		continued				

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: He	oriba U-10	Transparency:	



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FSS0321A028.jpg

Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/30/2003 5:10 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.14821 -151.89305 Coordinates -151.89305 62.14821 Elevation NED (m)(ft): 215 705 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Ouadrangle: Talkeetna A-4 Legal Description (MTRS): S024N014W29 Waterbody Name: **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 14.00 DO (mg/L): DO (%): Conductivity (µS/cm): 12 **pH:** 6.05 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Catchment Area(sq. km): 1 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Organic Width 2.8 2.8 Subdominant Substrate 1: 1.70 **Thalweg Depth** Subdominant Substrate 2: Rosgen Class: WET Wetland **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
5 - 10	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
10 - 20	Open Low Sweetgale-Graminoid Bog	1	Open Low Sweetgale-Graminoid Bog	1
20 - 30	Open Black Spruce-White Spruce Forest	10	Open Black Spruce-White Spruce Forest	15

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

No Fish Found

Instruments

Stream Gradient:	handheld optical clinometer	С
Stream Velocity:	Price pygmy meter	С
Turbidity:		Ε
Water Quality: He	oriba U-10	T

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Transparency:



Station Info Observers: Joe Buckwalter, J Johnson, Jim Lazar Date/Time: 08/30/2003 5:59 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.33511 -151.24535 Coordinates -151.24535 62.33511 Elevation NED (m)(ft): 359 1178 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 **USGS Ouadrangle:** Talkeetna B-3 Legal Description (MTRS): S026N011W24 Waterbody Name: Anadromous Waters Catalog Number: **Geographic Comments:** Visit Comments: Wildlife Comments: Bear trail Water Quality \ Stream Flow Water Temp (C): 12.70 DO (mg/L): DO (%): Conductivity (µS/cm): 5 **pH:** 5.27 Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): 0 **Entrenchment: Embeddedness: Catchment Area(sq. km):** 6 **Channel Dimensions (m):** OHW Wetted Bankfull Dominant Substrate: Organic Width 3.4 3.4 Subdominant Substrate 1: 0.90 Thalweg Depth 0.90 Subdominant Substrate 2: Rosgen Class: WET Wetland **Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Bluejoint-Shrub	1	Bluejoint-Shrub	1
5 - 10	Open Low Sweetgale-Graminoid Bog	0	Open Low Sweetgale-Graminoid Bog	0
10 - 20	Subarctic Lowland Sedge-Bog Meadow	0	Open Low Sweetgale-Graminoid Bog	0
20 - 30	Subarctic Lowland Sedge-Bog Meadow	0	Open Low Sweetgale-Graminoid Bog	0

Key To Fish Sampling Methods

(MTQ) Minnow Trap, 1/4 in. Mesh

Fish Observations

 Species: coho salmon
 Life Stage: juvenile
 Life History: Anadromous

 Total Fish Count: 30
 Fish Measured: 30
 Fork Lengths (mm)
 Min: 55
 Max: 112
 Mean: 81
 Median: 83

 Sampling Method (No. of fish):
 MTQ (30)
 Comments:
 Value
 Value
 Value

Instruments

Stream Gradient:	handheld optical clinometer	Channel Depths:	graduated wading rod
Stream Velocity:	Price pygmy meter	Channel Widths:	measuring tape
Turbidity:		Electrofisher:	
Water Quality: H	oriba U-10	Transparency:	



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FSS0321A035.jpg



FSS0321A036.jpg

FSS0321A037.jpg

FSS0321A038.jpg

Station Info	
Observers: Joe Buckwalter, J Johnson	Date/Time: 08/01/2003 11:54 AM
0	SampleLatitudeLongitudeLatitudeLongitudeCoordinates62.26748-149.2546562.26802-149.25212GPS Field MeasurementDatum: NAD83
	Legal Description (MTRS): S025N001E10
Visit Comments: Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C):DO (mg/L):DO (Water Color:Turbidity (NTU)	
Stream Channel	
Stream Gradient (%):Entrenchment:Catchment Area(sq. km):750Embeddedness:	
Channel Dimensions (m): Bankfull OHW Wet	ted Dominant Substrate:
Width	Subdominant Substrate 1:
Thalweg Depth Rosgen Class:	Subdominant Substrate 2:
	4 al 1002)
Riparian Vegetation Communities (Viereck e	
Dist. from Bank (m) Left Bank Vegetation Type	Canopy Canopy Height(m) Right Bank Vegetation Type Height(m
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 10 - 20 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Life Stage: adu	Height(m) <u>Right Bank Vegetation Type</u> Height(m t Life History: Anadromous Lengths (mm) Min: Max: Mean: Median: Suspected Spawning: Yes
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: Chinook salmon Life Stage: adu Total Fish Count: 29 Fish Measured: Fork I Sampling Method (No. of fish): VOH (29) VOH (29)	Height(m) <u>Right Bank Vegetation Type</u> Height(m t Life History: Anadromous Lengths (mm) Min: Max: Mean: Median: Suspected Spawning: Yes
Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: Chinook salmon Life Stage: adu Total Fish Count: 29 Fish Measured: Fork I Sampling Method (No. of fish): VOH (29) Comments: No chinook observed upstream at 01A01, (19)	Height(m) <u>Right Bank Vegetation Type</u> Height(m t Life History: Anadromous Lengths (mm) Min: Max: Mean: Median: Suspected Spawning: Yes
Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: Chinook salmon Life Stage: adultation Total Fish Count: 29 Fish Measured: Fork I Sampling Method (No. of fish): VOH (29) Comments: No chinook observed upstream at 01A01, O Instruments Instruments Instruments	Height(m) <u>Right Bank Vegetation Type</u> Height(m t Life History: Anadromous Lengths (mm) Min: Max: Mean: Median: Suspected Spawning: Yes 1A03.

Water Quality:

Transparency:

Station Info Observers: Joe Buckwalter, J Johnson Date/Time: 08/01/2003 9:11 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.77405 -148.70653 Coordinates 62.77405 -148.70653 Elevation NED (m)(ft): 426 1398 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: NAD83 USGS Quadrangle: Talkeetna Mts D-4 Legal Description (MTRS): S031N004E16 Waterbody Name: Fog Creek Anadromous Waters Catalog Number: 247-41-10200-2696 Geographic Comments: Station waypoint marked while flying. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 390 **Catchment Area(sq. km): Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: Chinook salmon Life Stage: adult Life History: Anadromous **Total Fish Count: 2** Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOH (2) Suspected Spawning: Yes Comments: No chinook observed upstream at 08A01. Instruments

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:
Water Quality:		Transparency:

Station Info					
Observers: Joe Buckv	valter, J Johnson			Date/Time:	08/01/2003 9:31 AM
StationLatitudCoordinates62.8345	55 -148.59018	Sample Coordinat	Latitude 62.83455	Longitude -148.59018	
Elevation NED (m)(ft):				-	
Coordinate Determinat				Datum: NAD83	
USGS Quadrangle: Ta Waterbody Name: Tsu		Legal Des	cription (MTKS)): S032N005E30	
Anadromous Waters C					
Geographic Comments	_	ream at station 05A0	05. Station waypo	oint marked while	flying.
Visit Comments:			••		
Wildlife Comments:					
Water Quality \ Str	eam Flow				
Water Temp (C):	DO (mg/L):	DO (%):	Conductivity	v (uS/cm):	рН:
Water Color:	-	ty (NTU):	-	ocity (m/s)(ft/s):	Piri
Stream Channel				• • • •	
Stream Gradient (%):	Entron	chment:			
Catchment Area(sq. kn		ldedness:			
Channel Dimensions (Dominant Sub	strata.	
Channel Dimensions (Width		dominant Subst		
Thalwe	eg Depth		dominant Subst		
Rosgen Class:					
Riparian Vegetation	ı Communities (Vi	ereck et al. 199	2)		
Dist. from		Canopy			Canopy
Bank (m) Left Bank	Vegetation Type	Height(m) Right Bank V	egetation Type	Height(m)
0 - 5					
5 - 10					
10 - 20					
20 - 30					
Key To Fish Sampli	ng Methods				
(VOH) Visual Observati	on, Helicopter				
Fish Observations					
Species: Chinook salmo	n Life St	t age: adult	Life His	story: Anadromou	S
Total Fish Count: 1 Sampling Method (No		Fork Lengths (n		Max: Mea	
Comments: No chinoc	ok observed upstream at	05A02. Waterfall a	bout 2.5 miles up	ostream at 05A05 is	s a population barrier t
Instruments					
Stream Gradient:		Char	nel Depths:		
Stroom Volocity Dui		Char			

Stream Gradient:		Channel Depths:
Stream Velocity:	Price pygmy meter	Channel Widths:
Turbidity:		Electrofisher:
Water Quality:		Transparency:

APPENDIX L. 2011 STATION REPORTS AND PHOTOS

11			
Station Info			
Observers: Daniel Reed, Tim Sundlov		Date/Time: 08/03	3/2011 12:00 PM
StationLatitudeLongitudeCoordinates62.93620-147.28810	Sample Coordinates	Latitude Longitude Latitu 62.93620 -147.28810 / 62.926	0
Elevation NED (m)(ft): 763 2503			
Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna Mts D-1		IeasurementDatum: WGS84Iption (MTRS):\$033N011E24	
Waterbody Name: Coal Creek	Legal Desci	puoli (M1K3): 505510111224	
Anadromous Waters Catalog Number:			
Geographic Comments:			
Visit Comments: pH meter not working properly	у.		
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 8.17 DO (mg/L): 10.81	DO (%): 91.70 y (NTU): 1.24	Conductivity (μS/cm): 23 pH: Thalweg Velocity (m/s)(ft/s): 0.70 2.	
Stream Channel			
Stream Gradient (%): 0.5 Entrenc		ntrenched	
Catchment Area(sq. km): 235 Embedd			
Channel Dimensions (m): Bankfull OHW Width 21.5		Dominant Substrate: Cobble ominant Substrate 1: Gravel	
Thalweg Depth 0.46		ominant Substrate 1: Glaver	
Rosgen Class: C3 Low gradient, meandering, po		-	d floodplains.
Riparian Vegetation Communities (Vie	ereck et al. 1992)	
Dist. from	Canopy		Canopy
Bank (m) Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m
0 - 5 Closed Low Willow Shrub	1	Open Low Willow Shrub	0.5
5 - 10 Open White Spruce Forest	5	Closed Tall Alder-Willow Shrub	1
10 - 20 Closed Black Spruce Forest	4	Closed Tall Willow Shrub	1.5
20 - 30 Closed Black Spruce Forest	5	Open Black Spruce Forest	5
Key To Fish Sampling Methods	Estimated reach	length (m): 2900 Total Electrofishin	g Time (s): 2909
(BEF) Boat-Mounted Electrofisher		3) Visual Observation, Boat	0
(DEA) Dow Wounted Executionisher	(101		
Fish Observations			
	ge: adult	Life History: Resident	
Total Fish Count: 32 Fish Measured: 19 Sampling Method (No. of fish): BEF (19) VO	-	n) Min: 332 Max: 407 Mean: 35	6 Median: 369
Comments:	(1 <i>3)</i>		
	ge: juvenile	Life History: Resident	
		$\mathbf{Min} \cdot 29 \mathbf{Max} \cdot 50 \mathbf{Mean} \cdot 42$	Median · 39

Total Fish Count:29Fish Measured:27Fork Lengths (mm)Min:29Max:50Mean:42Median:39Sampling Method (No. of fish):BEF (27) VOB (2)Comments:Comments:Comments:Comments:Comments:

 Species: slimy sculpin
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 15
 Fish Measured: 8
 Fork Lengths (mm)
 Min: 52
 Max: 58
 Mean: 55
 Median: 55

 Sampling Method (No. of fish):
 BEF (8) VOB (7)
 Comments:
 Species: Arctic grayling
 Life Stage: juvenile/adult
 Life History: Resident

Total Fish Count: 7 Fish Measured: 6 Fork Lengths (mm) Min: 296 Max: 325 Mean: 310 Median: 310 Sampling Method (No. of fish): BEF (6) VOB (1) Comments:

Species: burbot Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 280 Max: 372 Mean: 322 Total Fish Count: 6 Fish Measured: 5 Median: 326 Sampling Method (No. of fish): BEF (5) VOB (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 51 Max: 51 Mean: 51 Median: 51

Sampling Method (No. of fish): BEF (1) Comments:

Instruments

Stream Gradient:handheld abney levelStream Velocity:Orange FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1101A010357.jpg

FSS1101A010359.jpg

FSS1101A010363.jpg

FSS1101A010365.jpg



Station In	fo				
Observers:	Jonathan Kirsch, Ashley Reed		Da	te/Time: 08/03/20	011 11:34 AM
Station Coordinat	Latitude Longitude tes 62.95278 -147.00649	Sample Coordinates	LatitudeLongit62.95278-147.00	ude / Latitude 649 / 62.93615	0
	NED (m)(ft): 777 2549				
	e Determination Method: Non-			: WGS84	
	ndrangle: Talkeetna Mts D-1 y Name: Clearwater Creek	Legal Descri	ption (MTRS): C0141	N009W31	
-	us Waters Catalog Number:				
Geographi	c Comments: IU6				
Visit Comr	nents: Stream velocity calculated	I from TVHR readings is	1.77 m/s.		
Wildlife Co	omments:				
Water Qu	ality \ Stream Flow				
Water Ten Water Cole	np (C): 7.45 DO (mg/L): 11.4 or: Clear Turb	DO (%): 95.70 DO (%): 1.24	Conductivity (µS/cm Thalweg Velocity (m/	· •	75
Stream Cl	hannel				
Stream Gr	adient (%): 1 Ent	renchment: Slightly Er	trenched		
		beddedness: Low			
Channel I		OHW Wetted I	Oominant Substrate: (Cobble	
	Width 38.0		minant Substrate 1: (
Deggen Cle	Thalweg Depth 1.50		minant Substrate 2: S	-	loodalaina
	ass: C3 Low gradient, meandering Vegetation Communities (oau, wen-uenneu i	
-	vegetation Communities (G
Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetatio	n Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	_	Closed Tall Willow Sh		3.3
5 - 10	Closed White Spruce Forest	9	Closed Tall Willow Sh	rub	3.3
10 - 20	Closed White Spruce Forest	9	Closed Tall Willow Sh	rub	3.3
	Closed White Spruce Forest		Closed Black Spruce-V		
	-				
	sh Sampling Methods		ength (m): 2500 Tot		ime (s): 889
(BEF) Boa	t-Mounted Electrofisher	(VOB)	Visual Observation, 1	Boat	
Fish Obse	rvations				
r Isli Obse	1 valions				
Species: Ar	rctic grayling Life	e Stage: adult	Life History: R		
Species: A Total Fish	rctic grayling Life Count: 20 Fish Measured:	2 Fork Lengths (mm	Life History: Ro Min: 360 Max: 38		Median: 370
Species: A Total Fish Sampling	trice Life a Count: 20 Fish Measured: Method (No. of fish): BEF (2)	2 Fork Lengths (mm			Median: 370
Species: An Total Fish Sampling Comments	rctic grayling Life a Count: 20 Fish Measured: Method (No. of fish): BEF (2) Y s:	2 Fork Lengths (mm VOB (18)) Min: 360 Max: 38	30 Mean: 370	Median: 370
Species: An Total Fish Sampling Comments Species: An	rctic grayling Life a Count: 20 Fish Measured: Method (No. of fish): BEF (2) Y s:	2 Fork Lengths (mm VOB (18) e Stage: juvenile) Min: 360 Max: 38	30 Mean: 370	Median: 370 Median:
Species: An Total Fish Sampling Comments Species: An Total Fish	rctic grayling Life a Count: 20 Fish Measured: Method (No. of fish): BEF (2) ' s: rctic grayling Life	2 Fork Lengths (mm VOB (18) e Stage: juvenile : Fork Lengths (mm) Min: 360 Max: 38	30 Mean: 370 esident	
Species: An Total Fish Sampling Comment: Species: An Total Fish Sampling	rctic graylingLifea Count:20Fish Measured:Method (No. of fish):BEF (2)s:rctic graylingLifea Count:1Fish Measured:	2 Fork Lengths (mm VOB (18) e Stage: juvenile : Fork Lengths (mm) Min: 360 Max: 38	30 Mean: 370 esident	
Species: An Total Fish Sampling Comments Species: An Total Fish Sampling Comments Species: An	rctic graylingLifea Count:20Fish Measured:Method (No. of fish):BEF (2)s:rctic graylingLifea Count:1Fish Measured:Method (No. of fish):VOB (1)s:Event O arctic grayling approx	2 Fork Lengths (mm VOB (18) e Stage: juvenile : Fork Lengths (mm imately 95mm. e Stage: juvenile/adult) Min: 360 Max: 38	30 Mean: 370 esident Mean: esident	

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1101B010299.jpg

FSS1101B010300.jpg

FSS1101B010301.jpg

FSS1101B010302.jpg



FSS1101B010303.jpg



Station Info

Observers: Raye Ann Neustel, Joe Buckwalter Date/Time: 08/03/2011 9:44 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.26993 -146.42260 Coordinates -146.41500 / 63.26862 63.26993 -146.42260 Elevation NED (m)(ft): 992 3255 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Mt Hayes B-5 Legal Description (MTRS): F019S007E16 Waterbody Name: East Fork Maclaren River **Anadromous Waters Catalog Number:** Geographic Comments: HU101. Habitat transect down stream of the mouth of unnamed tributary. Visit Comments: Right bank has a vegetated gravel bar below bankful level. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.40 DO (mg/L): 11.50 DO (%): 88.60 Conductivity (µS/cm): 68 pH: 6.10 Water Color: Glacial, High Turbidit **Turbidity (NTU):** 185.00 Thalweg Velocity (m/s)(ft/s): 1.40 4.59 **Stream Channel** Stream Gradient (%): 2 **Entrenchment:** Moderatley Entrenched Catchment Area(sq. km): 49 **Embeddedness:** Low **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 41.0 20.4 Subdominant Substrate 1: Boulder 0.36 Thalweg Depth 1.80 Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	2
10 - 20	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	2
20 - 30	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	2
Key To Fis	sh Sampling Methods	Estimated reach	length (m): 490	

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling Total Fish Count: 10 Sampling Method (No. o	Fish Measured: 4	8 . <i>,</i>		v		Median: 156
Comments:						
Species: slimy sculpin	Life Sta	age: juvenile/adult	Life H	istory: Resid	ent	
Total Fish Count: 59	Fish Measured: 2	Fork Lengths (mm)	Min: 56	Max: 66	Mean: 61	Median: 61
Sampling Method (No. o	f fish): PEF (14) VO	OG (45)				
Comments:						
Species: slimy sculpin	Life Sta	age: adult	Life H	istory: Resid	ent	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 71	Max: 110	Mean: 88	Median: 90
Sampling Method (No. o	f fish): PEF (4)					
Comments:						
Species: slimy sculpin	Life Sta	age: juvenile	Life H	istory: Resid	ent	
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 35	Max: 48	Mean: 42	Median: 41
Sampling Method (No. o	f fish): PEF (5)					
Comments:						

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1101c010004.jpg



FSS1101c010006.jpg

FSS1101c010005.jpg



FSS1101c010008.jpg

FSS1101c010009.jpg

Station In	ıfo						
Observers	Raye Ann N	leustel, Joe Buckwal	ter		Date/Tim	e: 08/03/20	11 3:15 PM
	tes 63.19090	-146.42755	Sample Coordinates	Latitude 63.19160	Longitude -146.42471	Latitude 63.18992	Longitude -146.42903
	NED (m)(ft):		Differential GPS Field N	leasurement	Datum: WGS	884	
	adrangle: Mt H): F020S007E0		
Waterbod	y Name: Boul	der Creek	0	•	, ,		
		talog Number:					
	ic Comments:		ctrofishedmuch of the	channal was to	o doon for wadi		t shocked
visit Com		he banks.	cuonshedmuch of the	channel was to		ig, so we spe	n-shocked
Wildlife C	Comments: 4 (Caribou.					
Water Qu	uality \ Strea	am Flow					
Water Ter	mp (C): 10.88	DO (mg/L): 9.56	DO (%): 86.60	Conductivit	y (μS/cm): 16	рН: 5.5	6
Water Co	lor: Clear	Turbi	dity (NTU): 1.00	Thalweg Vel	ocity (m/s)(ft/s)	: 1.42 4.66	
Stream C	hannel						
Stream G	radient (%): 0) Entre	enchment: Slightly E	Entrenched			
Catchmen	nt Area(sq. km)	e 83 Emb	eddedness: Very High	h			
Channel 1	Dimensions (m			Dominant Sul			
		Width 13.1 Depth 1.25			t rate 1: Gravel t rate 2: Boulder		
Rosgen Cl	-	-	riffle/pool stream with				Verv
Rosgen er		nd stable. High mea				deposition.	very
		<u>a</u> a	Viereck et al. 1007)			
Riparian	Vegetation	Communities (V	vieleck et al. 1992)			
- Dist. from	1	communities (v	Canopy Height(m)		Vegetation Type	2	Canopy Height(m)
- Dist. from	1	egetation Type	Canopy			2	
Dist. from Bank (m)	n) <u>Left Bank V</u> o	egetation Type /illow Shrub	Canopy Height(m)	<u>Right Bank V</u>	illow Shrub	2	Height(m)
Dist. from Bank (m) 0 - 5 5 - 10) <u>Left Bank Va</u> Open Low W Open Low W	egetation Type /illow Shrub	Canopy Height(m) 0.7 0.7	Right Bank V Open Low W	illow Shrub illow Shrub	2	Height(m) 0.7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20	 Deft Bank Vo Open Low W Open Low W Subarctic Low 	egetation Type Villow Shrub Villow Shrub	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3	<u>Right Bank V</u> Open Low W Open Low W	illow Shrub illow Shrub ceous	2	Height(m) 0.7 0.7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	 Deft Bank Vo Open Low W Open Low W Subarctic Low 	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad	illow Shrub illow Shrub ceous ceous	2	Height(m) 0.7 0.7 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F	D Den Low W Open Low W Subarctic Low Subarctic Low	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods	Canopy Height(m) 0.7 0.7 80g Meadow 0.3 80g Meadow 0.3 Estimated reach	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad length (m): 31	illow Shrub illow Shrub ceous ceous		Height(m) 0.7 0.7 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac	 Define the second second	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods	Canopy Height(m) 0.7 0.7 80g Meadow 0.3 80g Meadow 0.3 Estimated reach	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad length (m): 31	illow Shrub illow Shrub ceous ceous 0		Height(m) 0.7 0.7 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obso	 D Left Bank Vo Open Low W Open Low W Subarctic Low 	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3 Bog Meadow 0.3 Estimated reach (VOC	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse	illow Shrub illow Shrub ceous ceous 0 ervation, Ground		Height(m) 0.7 0.7 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obse Species: A Total Fish	 Definition Left Bank Volume Open Low W Open Low W Subarctic Low Subarctic Low<	egetation Type 'illow Shrub Villow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods Tisher Life Fish Measured:	Canopy Height(m) 0.7 0.7 30g Meadow 0.3 30g Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi	illow Shrub illow Shrub zeous 0 ervation, Ground		Height(m) 0.7 0.7 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obso Species: A Total Fish Sampling	Den Low W Open Low W Subarctic Low Subarctic Low Subarctic Low Subarctic Con	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life	Canopy Height(m) 0.7 0.7 30g Meadow 0.3 30g Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident		Height(m) 0.7 0.7 0.3 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obse Species: A Total Fish Sampling Comment	Den Low W Open Low W Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic graphin ckpack Electrof ervations Arctic grayling h Count: 10 g Method (No. of ts:	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life Fish Measured: 2 of fish): PEF (2) V	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3 Bog Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8)	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 N	lean: 35	Height(m) 0.7 0.7 0.3 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Baa Fish Obso Species: A Total Fish Sampling Comment Species: sh	 Left Bank V Open Low W Open Low W Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic Subarctic State Continuation State Continuation State Continuation State Method (No. of ts: limy sculpin 	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life Fish Measured: 2 of fish): PEF (2) V Life	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3 Bog Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8) Stage: juvenile/adult	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 M	Iean: 35	Height(m) 0.7 0.7 0.3 0.3 Median: 35
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Baa Fish Obso Species: A Total Fish Sampling Comment Species: sl Total Fish	 Left Bank V Open Low W Open Low W Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic Low	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life Fish Measured: 2 of fish): PEF (2) V	Canopy Height(m) 0.7 0.7 30g Meadow 0.3 30g Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8) Stage: juvenile/adult 6 Fork Lengths (mr	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 N story: Resident	Iean: 35	Height(m) 0.7 0.7 0.3 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Baa Fish Obso Species: A Total Fish Sampling Comment Species: sl Total Fish	Den Low W Open Low W Open Low W Subarctic Low Subarctic Low Subarctic Com	egetation Type (illow Shrub (illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life Fish Measured: (of fish): PEF (2) V Life Fish Measured: (Canopy Height(m) 0.7 0.7 30g Meadow 0.3 30g Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8) Stage: juvenile/adult 6 Fork Lengths (mr	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 M	Iean: 35	Height(m) 0.7 0.7 0.3 0.3 Median: 35
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obso Species: A Total Fish Sampling Comment Species: sl Total Fish Sampling Comment Species: sl	D Left Bank Vo Open Low W Open Low W Subarctic Low Subarctic Subarctic Subarctic Subarctic Subarctic Subarctic Subarctic Subarctic Suba	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life Fish Measured: 2 of fish): PEF (2) V Life Fish Measured: 0 of fish): PEF (6) V Life	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3 Bog Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8) Stage: juvenile/adult 6 Fork Lengths (mr OG (30) Stage: adult	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35 Life Hi n) Min: 51	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 M story: Resident Max: 65 M	Iean: 35 Iean: 54	Height(m) 0.7 0.7 0.3 0.3 Median: 35
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obso Species: A Total Fish Sampling Comment Species: sl Total Fish Sampling Comment	 Left Bank Vo Open Low W Open Low W Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic grayling Acount: 10 Method (No. of ts: limy sculpin h Count: 36 S Method (No. of ts: limy sculpin h Count: 3 	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ig Methods fisher Life Fish Measured: 1 of fish): PEF (2) V Life Fish Measured: 1 of fish): PEF (6) V Life Fish Measured: 1	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3 Bog Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8) Stage: juvenile/adult 6 Fork Lengths (mr OG (30) Stage: adult	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35 Life Hi n) Min: 51	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 M story: Resident Max: 65 M	Iean: 35 Iean: 54	Height(m) 0.7 0.7 0.3 0.3 Median: 35
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To F (PEF) Bac Fish Obso Species: A Total Fish Sampling Comment Species: sl Total Fish Sampling Comment	 Left Bank V Open Low W Open Low W Subarctic Low Subarctic Low Subarctic Low Subarctic Low Subarctic Samplin Count: 3 Subarctic Low Subarctic Low Subarctic Samplin Count: 3 Subarctic Low Subarc	egetation Type 'illow Shrub 'illow Shrub wland Sedge-Moss E wland Sedge-Moss E ag Methods fisher Life Fish Measured: 2 of fish): PEF (2) V Life Fish Measured: 0 of fish): PEF (6) V Life	Canopy Height(m) 0.7 0.7 Bog Meadow 0.3 Bog Meadow 0.3 Estimated reach (VOC Stage: juvenile 2 Fork Lengths (mr OG (8) Stage: juvenile/adult 6 Fork Lengths (mr OG (30) Stage: adult	Right Bank V Open Low W Open Low W Bryoid herbad Bryoid herbad Iength (m): 31 G) Visual Obse Life Hi n) Min: 35 Life Hi n) Min: 51	illow Shrub illow Shrub ceous 0 ervation, Ground story: Resident Max: 35 M story: Resident Max: 65 M	Iean: 35 Iean: 54	Height(m) 0.7 0.7 0.3 0.3 Median: 35

Appendix L4.–Page 2 of 4.

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 12
 Fish Measured:
 12
 Fork Lengths (mm)
 Min:
 30
 Max:
 40
 Mean:
 35

 Sampling Method (No. of fish):
 PEF (12)
 Comments:
 Vertical State
 Vertical State

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



FSS1101c020012.jpg

FSS1101c020013.jpg

FSS1101c020015.jpg

FSS1101c020017.jpg



.								
Station In	ıfo							
Observers	: Joe Buck	walter, Jonatha	ın Kirsch			Date/T	'ime: 06/30/20)11 11:30 AM
Station Coordinat		8		Sample Coordinates	Latitude 61.41173	Longitude -148.62240	Latitude / 61.47519	0
	NED (m)(ft							
		ation Method: Anchorage B-5	Non-Different	ial GPS Field M Legal Descri		Datum: W		
-	y Name: K	-		Legal Descri		<i>j:</i> 301511005	L07	
-	-	Catalog Numb	er:					
	ic Commen							
Visit Com	in 1	hr and 25 min	ft G3 with 90/6 utes. Used appro d from 3.8 to 6.4	ox. 6 gallons of f	uel or half a ta	ank. Cruising	ground speed 1	
Wildlife C	omments:							
Water Qu	ality \ St	ream Flow						
Water Ten	np (C): 1.65	5 DO (mg/I	L): 14.94 D	O (%): 106.00	Conductivit	y (μS/cm): 51	pH:	
Water Col	or: Glacial,	High Turbidit	Turbidity (N	FU): 103.00	Thalweg Vel	ocity (m/s)(ft	/s): 1.90 6.23	
Stream C	hannel							
	radient (%) t Area(sq. k		Entrenchme Embeddedne	0.	ntrenched			
Channel I	Dimensions	(m): Bank	full OHW V	Vetted 1	Dominant Sul	bstrate: Grave	el	
		Width 380			ominant Subs			
_		eg Depth 2.5			ominant Subs		-	
Rosgen Cla	ass: D4 Bra	ided channel w	ith longitudinal	and transverse t	bars. Very with	le channel wit	h eroding bank	ζS.
Riparian	Vegetatio	on Commun	ities (Vierec	k et al. 1992)				
Dist. from Bank (m)		Vegetation T	<u>vpe</u>	Canopy Height(m)	<u>Right Bank '</u>	Vegetation Ty	vpe	Canopy Height(m
0 - 5	Closed Ta	ll Alder-Willow	v Shrub	2.5	Closed Tall A	Ider-Willow	Shrub	2.5
5 - 10	Closed Ta	ll Alder-Willow	v Shrub	2.5	Closed Tall A	Ider-Willow	Shrub	2.5
10 - 20	Closed Ta	ll Alder-Willow	v Shrub	2.5	Closed Tall A	Ider-Willow	Shrub	2.5
20 - 30	Closed Ta	ll Alder-Willow	v Shrub	2.5	Closed Tall A	Ider-Willow	Shrub	2.5
Key To Fi	ish Samp	ling Method	ls E	stimated reach	length (m):##	+##		
(BEF) Boa	at-Mounted	Electrofisher		(VOB) Visual Obse	ervation, Boat		
Fish Obse	rvations							
	olly Varden		Life Stage: j	uvenile/adult	Life Hi	story: Unkno	own	
-	h Count: 4		sured: 20 For			Max: 245	Mean: 157	Median: 165
			EF (20) VOB (2					
			ents section, all					nd finclips we
Total Fish				uvenile/adult r k Lengths (mm		story: Reside Max: 63	ent Mean: 63	Median: 63
Comment								
. .								
	nts							
	nts	undheld abney l	evel		e l Depths: ha			

Stream Velocity: GPS Float

Turbidity: LaMotte 2020e turbidimeter

Water Quality: YSI 556

Channel Depths: handheld sonar depth finder Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:

```
592
```

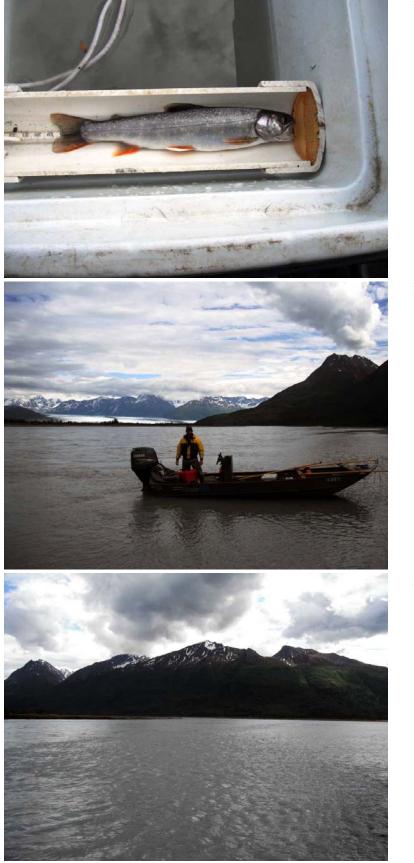


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FSS1101D010192.jpg

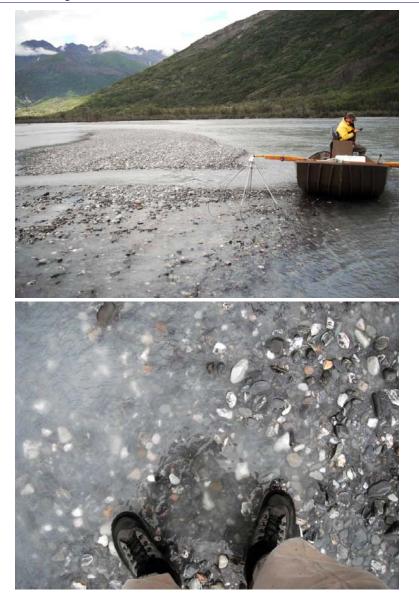
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FSS1101D010196.jpg

FSS1101D010202.jpg



FSS1101D010203.jpg

FSS1101D010204.jpg

Station Info

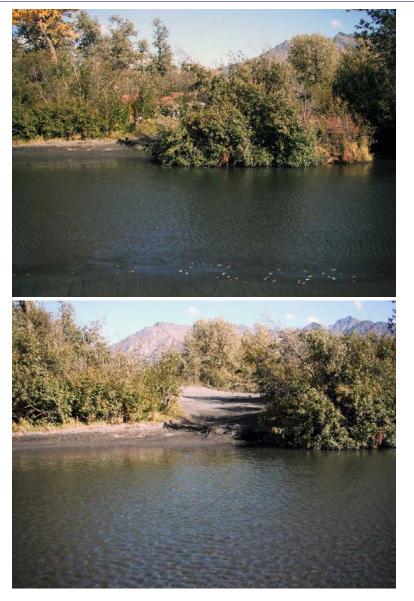
Observers: Joe Buckwalter, Joe Giefer	Date/Time: 09/14/2011 11:49 AM
	Sample Latitude Longitude
Elevation NED (m)(ft): 16 52 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Anchorage C-6 Waterbody Name: Jim Creek Anadromous Waters Catalog Number: 247-50-1020 Geographic Comments: Visit Comments: Major ATV crossing area. Minnow Wildlife Comments:	Legal Description (MTRS): S017N003E32
Water Quality \ Stream Flow	
Water Temp (C):DO (mg/L):DOWater Color: ClearTurbidity (NT	0 (%):Conductivity (μS/cm):pH:U):Thalweg Velocity (m/s)(ft/s):
Stream Channel	
Stream Gradient (%): Entrenchmen Catchment Area(sq. km): 123 Embeddednes Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth	ss:
Rosgen Class:	Subdommant Substrate 2:
Riparian Vegetation Communities (Viereck	et al. 1992)
I	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	CanopyCanopyHeight(m)Right Bank Vegetation TypeHeight(m)
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	Height(m) <u>Right Bank Vegetation Type</u> Height(m)
Bank (m) Left Bank Vegetation Type 0 - 5 - 5 - 10 - 10 - 20 - 20 - 30 - Key To Fish Sampling Methods - (MTR) Minnow Trap Fish Observations - Species: sockeye salmon Life Stage: ju	Height(m) Right Bank Vegetation Type Height(m) (VOG) Visual Observation, Ground venile Life History: Anadromous
Bank (m) Left Bank Vegetation Type 0 - 5 - 5 - 10 - 10 - 20 - 20 - 30 - Key To Fish Sampling Methods - (MTR) Minnow Trap Fish Observations - Species: sockeye salmon Life Stage: ju	Height(m) <u>Right Bank Vegetation Type</u> Height(m) (VOG) Visual Observation, Ground
Bank (m) Left Bank Vegetation Type 0 - 5 - 5 - 10 - 10 - 20 - 20 - 30 - Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: sockeye salmon Life Stage: ju Total Fish Count: 50 Fish Measured: Forther Sampling Method (No. of fish): VOG (50) Comments: Age 0+ fry. Species: Dolly Varden	Height(m) Right Bank Vegetation Type Height(m) (VOG) Visual Observation, Ground (VOG) venile Life History: Anadromous Min: x Lengths (mm) Min: Max: Mean:
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 10 - 20 20 20 - 30 Wey To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: sockeye salmon Life Stage: ju Total Fish Count: 50 Sampling Method (No. of fish): VOG (50) Comments: Age 0+ fry. Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1 Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1	Height(m) Right Bank Vegetation Type Height(m) (VOG) Visual Observation, Ground (VOG) venile Life History: Anadromous Min: x Lengths (mm) Min: Max: Median: venile/adult Life History: Unknown Max: Median:
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: sockeye salmon Life Stage: ju Total Fish Count: 50 Fish Measured: Forther Sampling Method (No. of fish): VOG (50) Comments: Age 0+ fry. Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): WTR (1) Comments: Comments: 1 Fish Measured: 1	Height(m) Right Bank Vegetation Type Height(m) (VOG) Visual Observation, Ground (VOG) venile Life History: Anadromous Min: x Lengths (mm) Min: Max: Median: venile/adult Life History: Unknown Max: Median:
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: sockeye salmon Life Stage: ju Total Fish Count: 50 Fish Measured: Forther Sampling Method (No. of fish): VOG (50) Comments: Age 0+ fry. Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1 Suppling Method (No. of fish): MTR (1) Comments: Instruments Instruments Instruments	Height(m) Right Bank Vegetation Type Height(m) (VOG) Visual Observation, Ground (VOG) Visual Observation, Ground venile Life History: Anadromous Max: Median: s Lengths (mm) Min: Max: Median: venile/adult Life History: Unknown Min: 152 Mean: 152 s Lengths (mm) Min: 152 Mean: 152 Median: 152
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: sockeye salmon Life Stage: ju Total Fish Count: 50 Fish Measured: Forther Sampling Method (No. of fish): VOG (50) Comments: Age 0+ fry. Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1 Species: Dolly Varden Life Stage: ju Total Fish Count: 1 Fish Measured: 1 Suppling Method (No. of fish): MTR (1) Comments: Instruments Stream Gradient: Stream Gradient:	Height(m) Right Bank Vegetation Type Height(m) (VOG) Nisual Observation, Ground (VOG) venile Life History: Anadromous Median: x Lengths (mm) Min: Max: Median: venile/adult Life History: Unknown Median: 152 x Lengths (mm) Min: 152 Mean: 152 Kalengths Mine 152 Mean: 152 Kalengths Mine 152 Mean: 152 Kalengths Mine 152 Mean: 152 Kalengths Max Max 152



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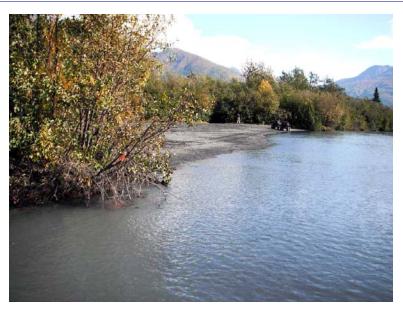
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FSS1101F010820.jpg

FSS1101F010821.jpg

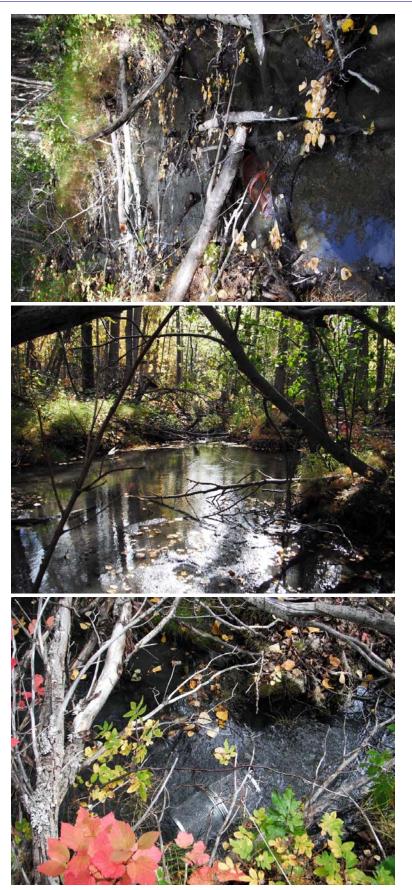
Appendix L7.–Station FSS110						
Station Info						
Observers: Joe Buckwalter, Joe Gie	efer			Date/Tim	ne: 09/14/20)11 12:18 PM
		nple ordinates	Latitude 61.50240	Longitude -148.85570	/ Latitude 61.50234	0
Elevation NED (m)(ft): 16 52 Coordinate Determination Method: USGS Quadrangle: Anchorage C-5 Waterbody Name: Knik River Anadromous Waters Catalog Numb Geographic Comments: Springbroot	Leş per:			Datum: WGS): S016N003E0		
Visit Comments: This site is at an A occurred. Set 1 tra	TV trail crossing. Min ap at downstream coor					
Wildlife Comments:						
Water Quality \ Stream Flow						
Water Temp (C):DO (mg/lWater Color: Glacial, Low Turbidit			Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s)	pH: :	
Stream Channel						
Stream Gradient (%): Catchment Area(sq. km): 1.5	Entrenchment: Embeddedness:					
Channel Dimensions (m): Bank Width	full OHW Wetted		ominant Sub			
				trate 1: Gravel		
Thalweg Depth			minant Subst minant Subst			
Thalweg Depth Rosgen Class:	ities (Viereck et a	Subdo				
Thalweg Depth	(Subdor al. 1992) Canopy	minant Subst		<u>e</u>	Canopy Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) <u>Left Bank Vegetation T</u> 0 - 5 5 - 10	(Subdor al. 1992) Canopy	minant Subst	trate 2:	<u>e</u>	
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) <u>Left Bank Vegetation T</u> 0 - 5	(Subdor al. 1992) Canopy	minant Subst	trate 2:	<u>e</u>	Canopy Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) <u>Left Bank Vegetation T</u> 0 - 5 5 - 10 10 - 20 20 - 30	v <u>pe</u> H	Subdor al. 1992) Canopy	minant Subst	trate 2:	<u>e</u>	
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) <u>Left Bank Vegetation T</u> 0 - 5 5 - 10 10 - 20 20 - 30	v <u>pe</u> H	Subdor al. 1992) Canopy	minant Subst	trate 2:	<u>e</u>	
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) <u>Left Bank Vegetation T</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Method	v <u>pe</u> H	Subdor al. 1992) Canopy	minant Subst	trate 2:	<u>e</u>	
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) Left Bank Vegetation T 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Method (MTR) Minnow Trap Fish Observations Species: Dolly Varden	(<u>vpe</u> H ds Life Stage: juvenil asured: 9 Fork Ler	Subdox al. 1992) Canopy eight(m)	minant Subst	vegetation Type		Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communation Dist. from Bank (m) Left Bank Vegetation T 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Method (MTR) Minnow Trap Fish Observations Species: Dolly Varden Total Fish Count: 9 Fish Mea Sampling Method (No. of fish): M Comments:	(<u>vpe</u> H ds Life Stage: juvenil asured: 9 Fork Ler	Subdox al. 1992) Canopy eight(m)	minant Subst	vegetation Type	n	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communation Dist. from Bank (m) Left Bank Vegetation T Dist. from Bank (m) Left Bank Vegetation T 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Method Key To Fish Sampling Method (MTR) Minnow Trap Fish Observations Species: Dolly Varden Total Fish Count: 9 Fish Mea Sampling Method (No. of fish): M Comments: M	(<u>vpe</u> H ds Life Stage: juvenil asured: 9 Fork Ler	Subdor al. 1992) Canopy eight(m)	minant Subst	vegetation Type	n	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) Left Bank Vegetation T 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Method (MTR) Minnow Trap Fish Observations Species: Dolly Varden Total Fish Count: 9 Fish Method Sampling Method (No. of fish): M Comments: Instruments	(<u>vpe</u> H ds Life Stage: juvenil asured: 9 Fork Ler	Subdor al. 1992) Canopy eight(m) <u>p</u> e/adult ngths (mm) Channel	ninant Subst	vegetation Type	n	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Commun Dist. from Bank (m) <u>Left Bank Vegetation T</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Method (MTR) Minnow Trap Fish Observations Species: Dolly Varden Total Fish Count: 9 Fish Mea Sampling Method (No. of fish): M Comments: Instruments Stream Gradient:	(<u>vpe</u> H ds Life Stage: juvenil asured: 9 Fork Ler	Subdor al. 1992) Canopy eight(m) <u>p</u> e/adult ngths (mm) Channel	Right Bank V Life His Min: 86 Depths: Widths:	vegetation Type	n	



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Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/14/2011 1:37 PM Sample Latitude Longitude Latitude Longitude Coordinates -148.72773 / 61.49078 61.49165 -148.72762 Elevation NED (m)(ft): 47 154 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E10 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Unnamed right-bank Knik River tributary at ATV trail crossing. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. ATVs have excavated large pools at the stream crossing. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 5 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations** No Fish Found Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



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FSS1101F030828.jpg

FSS1101F030832.jpg

FSS1101F030833.jpg



Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/14/2011 2:05 PM Sample Latitude Longitude Coordinates 61.48429 -148.71340 Elevation NED (m)(ft): 44 144 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E10 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Unnamed right-bank Knik River tributary at ATV trail crossing. Visit Comments: No sampling occurred--too shallow for minnow traps. Recent debris flow deposits. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 1 Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Fish Measured:** Fork Lengths (mm) Min: Max: Median: **Total Fish Count:** 0 Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths: Electrofisher: Turbidity:** Water Quality: **Transparency:**



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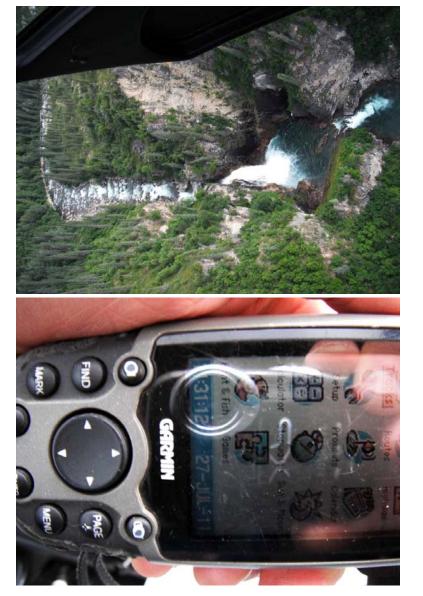
Observers: Joe Buckwalter, Raye Ann Neustel			Date/Ti	me: 07/27/20	11 10:45 AM
	Sample Coordinates	Latitude 62.76586	Longitude -148.53187	/ Latitude 62.77535	Longitude -148.71770
Elevation NED (m)(ft): 637 2090 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Talkeetna Mts D-4 Waterbody Name: Fog Creek Anadromous Waters Catalog Number: Geographic Comments: Aerial survey from mouth at	Legal Descrip	easurement tion (MTRS)	Datum: WC	3 S84	
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT) (%): 'U):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s	рН: s):	
Stream Channel					
Stream Gradient (%):EntrenchmenCatchment Area(sq. km):Embeddedner					
Channel Dimensions (m): Bankfull OHW W Width	Subdo	ominant Sub ninant Subst	trate 1:		
Thalweg Depth Rosgen Class:	Subdo	minant Subst	trate 2:		
Riparian Vegetation Communities (Viereck	x et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Right Bank V	egetation Ty	<u>pe</u>	Canopy Height(m)
0 - 5 5 - 10 10 - 20 20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations Species: salmonid-unspecified Life Stage: and Total Fish Count: 200 Fish Measured: For Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably Article)	k Lengths (mm)	Min:		Mean:	Median:
Instruments					

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Observers: Joe Buckwalter, Raye Ann Neustel			Date/Time	e: 07/27/20	11 11:29 AM
	Sample Coordinates	Latitude 62.85363	Longitude -148.55199 /	Latitude 62.82351	Longitude -148.61366
Elevation NED (m)(ft): 563 1847 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Talkeetna Mts D-4 Waterbody Name: Tsusena Creek Anadromous Waters Catalog Number: Geographic Comments: Aerial survey from mouth to	Legal Descri	ption (MTRS	Datum: WGS): S032N005E20 eam.		
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT) (%): TU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	pH:	
Stream Channel					
Stream Gradient (%): Entrenchmer Catchment Area(sq. km): Embeddedne Channel Dimensions (m): Bankfull OHW Width Thalweg Depth	ss: Vetted I Subda	Dominant Sub minant Subst minant Subst	trate 1:		
Rosgen Class:					
Riparian Vegetation Communities (Viereck	x et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m)	Right Bank V	Vegetation Type		Canopy Height(m)
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations Species: salmonid-unspecified Life Stage: au Total Fish Count: 200 Fish Measured: For Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably Ar	k Lengths (mm) Min:		ean: re observed.	Median:

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



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Observers: Joe Buckwalter, Raye Ann Neustel			Date/Ti	me: 07/27/20	011 11:37 AM
	Sample Coordinates	Latitude 62.96064	Longitude -148.07760	Latitude 62.82935	Longitude -148.25803
Elevation NED (m)(ft): 740 2428 Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna Mts D-3 Waterbody Name: Watana Creek Anadromous Waters Catalog Number: Geographic Comments: Aerial survey from mouth to	Legal Descri	ption (MTRS	Datum: W(): F022S003V		
Visit Comments: Water was turbid from mouth upstr W148.14896), then clear upstream Wildlife Comments:			de at GPS way	point 013 (Ne	52.88674
Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO Water Color: Turbidity (NT)	D (%): FU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s	рН: s):	
Stream Channel					
Stream Gradient (%):EntrenchmenCatchment Area(sq. km):Embeddedne					
Channel Dimensions (m): Bankfull OHW W		Dominant Sul			
Width Thalweg Depth		minant Subst minant Subst			
Rosgen Class:	Subu	minant Subs	1 atc 2.		
Riparian Vegetation Communities (Vierecl	k et al. 1992)				
	Canopy	Right Bank V	egetation Ty	pe	Canopy Height(m)
Riparian Vegetation Communities (Vierecl Dist. from	Canopy	Right Bank V	Vegetation Ty	<u>pe</u>	1.0
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10	Canopy	<u>Right Bank V</u>	Vegetation Ty	<u>pe</u>	1.0
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	Canopy	<u>Right Bank V</u>	Vegetation Ty	<u>pe</u>	1.0
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy	<u>Right Bank V</u>	Vegetation Ty	<u>pe</u>	1.0
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	Canopy	<u>Right Bank V</u>	⁷ egetation Ty	<u>pe</u>	1.0
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	Canopy	<u>Right Bank V</u>	Vegetation Ty	<u>pe</u>	1.0
Riparian Vegetation Communities (Vierect Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: salmonid-unspecified	Canopy Height(m) dult k Lengths (mm	Life His) Min:	story: Resider Max:	nt Mean:	Height(m)
Riparian Vegetation Communities (Vierect Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: salmonid-unspecified Life Stage: a Total Fish Count: 200 Fish Measured: For Sampling Method (No. of fish): VOH (200)	Canopy Height(m) dult k Lengths (mm	Life His) Min:	story: Resider Max:	nt Mean:	Height(m)
Riparian Vegetation Communities (Vierect Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: salmonid-unspecified Life Stage: a Total Fish Count: 200 Fish Measured: For Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably Advice)	Canopy Height(m) dult k Lengths (mm retic grayling) se	Life His) Min:	story: Resider Max:	nt Mean:	Height(m)
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: salmonid-unspecified Life Stage: a Total Fish Count: 200 Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably And Instruments)	Canopy Height(m) dult k Lengths (mm retic grayling) se Channe	Life His) Min: een throughou	story: Resider Max:	nt Mean:	Height(m)
Riparian Vegetation Communities (Vierecl Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOH) Visual Observation, Helicopter Fish Observations Species: salmonid-unspecified Life Stage: a Total Fish Count: 200 Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably Adult salmonids (p	Canopy Height(m) dult k Lengths (mm retic grayling) se Channe	Life His) Min: een throughour d Depths: d Widths:	story: Resider Max:	nt Mean:	Height(m)

Station Info Observers: Joe Buckwalter, Raye Ann Neustel Date/Time: 07/27/2011 1:39 PM Sample Latitude Longitude Coordinates -148.00421 62.67335 Elevation NED (m)(ft): 800 2625 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-3 Legal Description (MTRS): S030N008E20 Waterbody Name: Kosina Creek Anadromous Waters Catalog Number: 247-41-10200-2810 Geographic Comments: Aerial survey from mouth (62.78439, -147.94441) to about 15 miles upstream (62.60033, -148.03957). Visit Comments: An adult Chinook salmon was observed at N62.67335 W148.00421 (WGS84). Water was clear, but visibility was poor due to turbulence. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 516 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations** Species: Chinook salmon Life Stage: adult Life History: Anadromous Max: Median: **Total Fish Count:** 1 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOH (1) Suspected Spawning: Yes **Comments:** Species: salmonid-unspecified Life Stage: adult Life History: Resident Total Fish Count: 500 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOH (500) Comments: Schools of other large fish (probably grayling and round whitefish) were observed. Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths:**

Electrofisher:

Observers: Joe Buckwalter, Raye Ann Neustel			Date/Time	: 07/27/201	1 2:20 PM
	Sample Coordinates	Latitude 62.83731	Longitude -147.71899 /	Latitude 62.77693	Longitude -147.88850
Elevation NED (m)(ft): 823 2700 Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna Mts D-2 Waterbody Name: Jay Creek Anadromous Waters Catalog Number: Geographic Comments: Aerial survey from mouth t	tial GPS Field Me Legal Descrip	easurement otion (MTRS)	Datum: WGS8 : S032N009E26	34	-147.00050
Visit Comments: Wildlife Comments: Beaver pond about 8 miles up	Jay Creek at GPS	waypoint 016	5 (N62.83753 W	147.72259).	
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT)		Conductivity Thalweg Velo	(μS/cm): ocity (m/s)(ft/s):	pH:	
Stream Channel					
Stream Gradient (%):EntrenchmeCatchment Area(sq. km):Embeddedne					
Channel Dimensions (m): Bankfull OHW W Width		ominant Sub minant Subst			
Thalweg Depth		minant Subst			
Rosgen Class:					
Riparian Vegetation Communities (Vierec	k et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type		Canopy Height(m)
0 - 5 5 - 10					
10 - 20 20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations					
Species: salmonid-unspecified Life Stage: a	adult rk Lengths (mm)		tory: Resident Max: Me	ean:	Median:

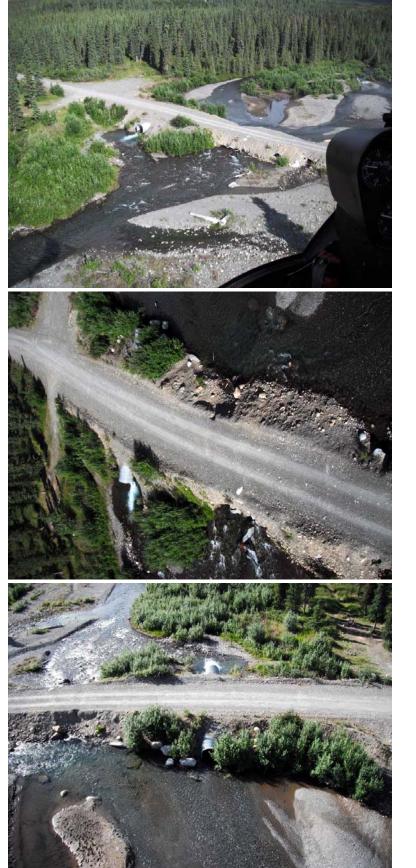
Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Comments: Schools of adult salmonids (probably Arctic grayling) seen throughout Jay Creek. No salmon were observed.

Observers: Joe Buckwalter, Raye Ann Neustel			Date/Time	e: 07/27/20	11 5:37 PM
	Sample Coordinates	Latitude 63.11209	Longitude -147.45890 /	Latitude 63.11303	Longitude -147.51917
Elevation NED (m)(ft): 814 2671 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Healy A-1 Waterbody Name: Windy Creek Anadromous Waters Catalog Number: Geographic Comments: Aerial survey from mouth to	Legal Descri	ption (MTRS	Datum: WGS): F021S001E12		
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT) (%): 'U):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:	
Stream Channel					
Stream Gradient (%): Entrenchmen Catchment Area(sq. km): Embeddedne Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth Thalweg Depth	ss: /etted Subde	Dominant Sub ominant Subst ominant Subst	trate 1:		
Rosgen Class:					
Riparian Vegetation Communities (Viereck	x et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	Vegetation Type		Canopy Height(m)
0 - 5 5 - 10 10 - 20 20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations					
Species: Arctic graylingLife Stage: acTotal Fish Count:200Fish Measured:ForSampling Method (No. of fish):VOH (200)Comments:Schools of grayling, especially near mouth	k Lengths (mn) Min:		ean:	Median:
Instruments					
	~				

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



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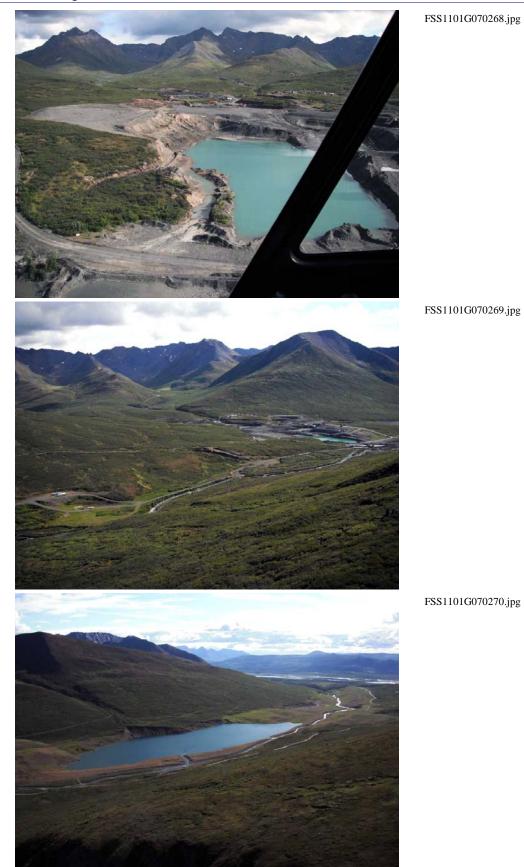
Station mil							
Observers: Joe Buckwa	alter, Raye Ar	nn Neustel			Date/Time	e: 07/27/20	11 5:50 PM
			Sample Coordinates	Latitude 63.19221	Longitude -147.42788 /	Latitude 63.16515	Longitude -147.50691
Elevation NED (m)(ft):	904 2966						
Coordinate Determinati	on Method:	Non-Different	ial GPS Field M		Datum: WGS		
USGS Quadrangle: Hea	-		Legal Descri	ption (MTRS): F020S002E07	1	
Waterbody Name: Vald							
Anadromous Waters Ca Geographic Comments:	-		o about 3.5 miles	unstream			
Visit Comments:	neriai sui ve	y nom mouth a	0 about 5.5 mile.	s upstream.			
Wildlife Comments:							
Water Quality \ Stre	am Flow						
Water Temp (C):	DO (mg/L)): D(O (%):	Conductivit	у (µS/ст):	pH:	
Water Color:		Turbidity (N7	ГU):	Thalweg Vel	ocity (m/s)(ft/s):		
Stream Channel							
Stream Gradient (%):		Entrenchme	nt:				
Catchment Area(sq. km):	Embeddedne	ess:				
Channel Dimensions (m	n): Bankf	ull OHW V	Vetted I	Dominant Sul	ostrate:		
	Width			minant Subs			
Thalweg	g Depth		Subdo	minant Subs	trate 2:		
Rosgen Class:							
Riparian Vegetation	Communi	ties (Vierecl	k et al. 1992)				
Dist. from Bank (m) <u>Left Bank V</u>	egetation Ty	<u>pe</u>	Canopy Height(m)	Right Bank V	Vegetation Type		Canopy Height(m)
0 - 5							
5 - 10							
10 - 20							
20 - 30							
Key To Fish Samplin	ng Method	S					
(VOH) Visual Observatio	on, Helicopter						
Fish Observations							
Species: Arctic grayling		Life Stage: a	ıdult	Life Hi	story: Resident		
Total Fish Count: 200			rk Lengths (mm) Min:	Max: M	ean:	Median:
Sampling Method (No.			.1 1				
Comments: Many gray	ling observed	, especially near	r mouth. No sali	non.			
Instruments							
Stream Gradient:			Channe	l Depths:			
Stream Velocity:				l Widths:			
Turbidity:			Electro	isher:			
Water Quality:			Transpa	arency:			
Canal Canal			Tump				



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Observers: Joe Buckwalter, Raye Ann Neustel			Date/Tir	ne: 07/27/20	11 6:18 PM
	Sample Coordinates	Latitude 63.32844	Longitude -147.24294	Latitude 63.32674	Longitude -147.26762
Elevation NED (m)(ft): 785 2575 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Healy B-1 Waterbody Name: Boulder Creek Anadromous Waters Catalog Number: Geographic Comments: Aerial survey from mouth to	Legal Descrij	otion (MTRS	Datum: WG): F018S003E3		
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT) (%): TU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s	рН:):	
Stream Channel					
Stream Gradient (%): Entrenchmer Catchment Area(sq. km): Embeddedne Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth Rosgen Class:	ss: Vetted I Subdo	Dominant Sub minant Subst minant Subst	trate 1:		
Riparian Vegetation Communities (Viereck	x et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m)	Right Bank V	Vegetation Typ	<u>e</u>	Canopy Height(m)
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations Species: salmonid-unspecified Life Stage: and Total Fish Count: 200 Fish Measured: For Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably Arrows)	k Lengths (mm) Min:		Mean:	Median:

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Observers: Joe Buckwalter, Raye Ann Neustel			Date/Tin	ne: 07/27/20	11 6:25 PM
	Sample Coordinates	Latitude 63.40475	Longitude -147.17250	/ Latitude 63.37350	Longitude -147.19403
Elevation NED (m)(ft): 797 2615 Coordinate Determination Method: Non-Different USGS Quadrangle: Healy B-1 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Unnamed right-bank East F	Legal Descrij	otion (MTRS)	Datum: WG): F017S003E3		
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT	О (%): ГU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s)	рН:):	
Stream Channel					
Stream Gradient (%):EntrenchmenCatchment Area(sq. km):Embeddedne					
Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth	Subdo	Oominant Sub minant Subst minant Subst	trate 1:		
Rosgen Class:					
Riparian Vegetation Communities (Vierecl	k et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Typ	<u>e</u>	Canopy Height(m)
0 - 5 5 - 10 10 - 20 20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations Species: salmonid-unspecified Life Stage: a Total Fish Count: 200 Fish Measured: For Sampling Method (No. of fish): VOH (200)	dult k Lengths (mm)		story: Resident Max: M	dean:	Median:

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Observers: Joe Buckwalter, Raye Ann Neus	
	Sample Latitude Longitude Coordinates 63,43257 -147,18558
Elevation NED (m)(ft): 846 2776 Coordinate Determination Method: Non-E USGS Quadrangle: Healy B-1 Waterbody Name: Susitna River	
Anadromous Waters Catalog Number: Geographic Comments: Fly-by onlyphotos	s of Susitna Glacier.
Visit Comments: Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C):DO (mg/L):Water Color:Turbi	DO (%):Conductivity (μS/cm):pH:dity (NTU):Thalweg Velocity (m/s)(ft/s):
Stream Channel	
	enchment: eddedness:
	HW Wetted Dominant Substrate:
Width Thalweg Depth	Subdominant Substrate 1: Subdominant Substrate 2:
Rosgen Class:	Subdommant Substrate 2.
Riparian Vegetation Communities (Viereck et al. 1992)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	CanopyCanopyHeight(m)Right Bank Vegetation TypeHeight(m)
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	
Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (NON) None Fish Observations	
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Life Total Fish Count: 0 Fish Measured: Sampling Method (No. of fish): NON (0) Comments: 10	Height(m) Right Bank Vegetation Type Height(m) Stage: not applicable Life History: Not Applicable
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Life Total Fish Count: 0 Fish Measured: Sampling Method (No. of fish): NON (0) Comments: 10	Height(m) Right Bank Vegetation Type Height(m) Stage: not applicable Life History: Not Applicable
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Life Total Fish Count: 0 Fish Measured: Sampling Method (No. of fish): NON (0) Comments: Instruments	Height(m) Right Bank Vegetation Type Height(m) Stage: not applicable Life History: Not Applicable Fork Lengths (mm) Min: Max: Median:
Bank (m) Left Bank Vegetation Type 0 - 5 5 5 - 10 10 - 20 20 - 30 20 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Life Total Fish Count: 0 Fish Measured: Sampling Method (No. of fish): NON (0) Comments: Instruments Stream Gradient: Stream Gradient:	Height(m) Right Bank Vegetation Type Height(m) Stage: not applicable Life History: Not Applicable Fork Lengths (mm) Min: Max: Median: Channel Depths:



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Observers: Joe Buckwa	lter, Raye Ann Neust	tel		Date/Ti	me: 07/27/20	11 6:40 PM
		Sample Coordinates	Latitude 63.34960	Longitude -147.40474	/ Latitude 63.30971	Longitude -147.39042
Elevation NED (m)(ft): 8 Coordinate Determination USGS Quadrangle: Heal Waterbody Name: Anadromous Waters Cat Geographic Comments:	on Method: Non-D ly B-1 talog Number:	Legal Descri k Susitna River tributary	ption (MTRS		817	from mouth
Visit Comments: Wildlife Comments:						
Water Quality \ Strea	am Flow					
Water Temp (C): Water Color:	DO (mg/L): Turbid	DO (%): lity (NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/	pH: s):	
Stream Channel						
Stream Gradient (%): Catchment Area(sq. km) Channel Dimensions (m Thalweg	: Embe): Bankfull OE Width	Subdo	Dominant Sul minant Subs minant Subs	trate 1:		
Rosgen Class:	~ ~ ~ ~ ~ ~					
Riparian Vegetation Dist. from Bank (m) <u>Left Bank Ve</u> 0 - 5		Canopy	Right Bank V	Vegetation Ty	<u>pe</u>	Canopy Height(m
5 - 10 10 - 20 20 - 30						
Key To Fish Samplin	g Methods					
(VOH) Visual Observation	n, Helicopter					
Fish Observations Species: salmonid-unspec Total Fish Count: 200 Sampling Method (No. o Comments: Schools of a	Fish Measured: of fish): VOH (200)) Min:	story: Reside Max: seen. No salr	Mean:	Median:
Instruments						
Stream Gradient:		Channe	l Depths:			
Stream Velocity:			l Widths:			
Turbidity:		Electrof	fisher:			

Water Quality:

Transparency:

Observation Los Puskuster Paus Ann Neustal			Data/T	ime: 07/27/20	11 7.04 DM
Observers: Joe Buckwalter, Raye Ann Neustel	Sampla	Latitude	Longitude	me: 07/27/20	
	Sample Coordinates	63.30764	-147.65388	/ 63.30496	Longitude -147.53951
Elevation NED (m)(ft): 789 2589					
Coordinate Determination Method: Non-Differen			Datum: Wo		
USGS Quadrangle: Healy B-2	Legal Descrip	tion (MTRS): F018S001V	W36	
Waterbody Name: Anadromous Waters Catalog Number:					
Geographic Comments: Unnamed right-bank West (about 4 miles).	Fork Susitna Rive	er tributary. A	erial survey fr	om lake down	to mouth
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DWater Color:Turbidity (N	O (%): TU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/	pH: (s):	
Stream Channel					
Stream Gradient (%): Entrenchme	ent:				
Catchment Area(sq. km): Embeddedn	less:				
		ominant Sub			
Width Thelmer Donth		minant Subst minant Subst			
Thalweg Depth	Subdo	minant Subs	rate 2:		
Rosgen Class:					
Riparian Vegetation Communities (Vierec	ek et al. 1992)				
Dist. from	Canopy				Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	<u>Right Bank V</u>	egetation Ty	pe	Height(m
0 - 5					
5 - 10					
10 - 20 20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations					
Fish Observations Species: salmonid-unspecified Life Stage:	adult	Life His	story: Reside	nt	
Species: salmonid-unspecified Life Stage:	adult o rk Lengths (mm)		story: Reside Max:	nt Mean:	Median:
Species: salmonid-unspecified Life Stage:			-		Median:
Species: salmonid-unspecifiedLife Stage: aTotal Fish Count:200Fish Measured:Fo	ork Lengths (mm)	Min:	Max:	Mean:	
Species: salmonid-unspecifiedLife Stage: Total Fish Count: 200Total Fish Count: 200Fish Measured: FoSampling Method (No. of fish):VOH (200)Comments:Schools of adult salmonids (probably A	ork Lengths (mm)	Min:	Max:	Mean:	
Species: salmonid-unspecifiedLife Stage: Total Fish Count: 200Total Fish Count: 200Fish Measured: FoSampling Method (No. of fish):VOH (200)Comments:Schools of adult salmonids (probably A	ork Lengths (mm)	Min:	Max:	Mean:	
Species: salmonid-unspecifiedLife Stage: FormTotal Fish Count:200Fish Measured:FormSampling Method (No. of fish):VOH (200)VOH (200)Comments:Schools of adult salmonids (probably AInstruments	ork Lengths (mm) Arctic grayling or v Channel	Min: whitefish sp.)	Max:	Mean:	
Species: salmonid-unspecified Life Stage: a Total Fish Count: 200 Fish Measured: Fo Sampling Method (No. of fish): VOH (200) Comments: Schools of adult salmonids (probably A Instruments Stream Gradient: Stream Gradient: Stream Gradient:	ork Lengths (mm) Arctic grayling or v Channel	Min: whitefish sp.) Depths: Widths:	Max:	Mean:	

Sampling Method (No. of fish): BEF (10)

fo						
Daniel Reed, Da	wid Pluth			Date/Ti	ne: 08/04/20	011 9:53 AM
	0	Sample	Latitude	Longitude	/ Latitude	0
00100111		Coordinates	63.06142	-147.60439	63.06053	-147.55556
		erential GPS Field Me	easurement	Datum: WC	iS84	
	5					
-	was manufictioning	2.				
•						
	· U /		-	-	pH:	
		y (NIU): 0.32	I naiweg vei	ocity (m/s)(it/s	5): 1.10 5.01	
nannel						
adient (%): 1	Entrenc	0.	trenched			
Area(sq. km):	434 Embedd	ledness: Negligible				
Dimensions (m):						
					-	loodplains
Vegetation Cor	mmunities (Vie	ereck et al. 1992)				
		Canopy				Canopy
<u>Left Bank Vegeta</u>	ation Type	Height(m)	Right Bank V	egetation Typ	<u>be</u>	Height(m)
Open Low Willow	v Shrub	1 1	Unvegetated			
Open Low Willow	v Shrub	15	Unvegetated			
		1.5				
Open Low Willow	v Shrub		Open Low Wi	llow Shrub		1.5
Open Low Willow Open Black Spruc		3 (Open Low Wi Open Low Wi			1.5 1.5
1	ce Forest	3 (Open Low Wi	llow Shrub	ctrofishing 7	1.5
Open Black Spruc	ce Forest 1ethods	3 (5 (Estimated reach lo	Open Low Wi	llow Shrub 00 Total Ele	ctrofishing]	1.5
Open Black Spruc	ce Forest Iethods fisher	3 (5 (Estimated reach lo	Open Low Wi	llow Shrub 00 Total Ele	ctrofishing 7	1.5
Open Black Spruce sh Sampling M t-Mounted Electron	ce Forest Iethods fisher	3 (5 (Estimated reach lo	Open Low Wi	llow Shrub 00 Total Ele	ctrofishing 7	1.5
Open Black Spruce sh Sampling M t-Mounted Electron ual Observation, Gu	ce Forest Iethods fisher round	3 (5 (Estimated reach lo	Open Low Wi ength (m): 31 Visual Obse	llow Shrub 00 Total Ele		1.5
Open Black Spruce sh Sampling M. tt-Mounted Electrol ual Observation, Gr rvations retic grayling Count: 46 Fi	ce Forest Iethods fisher round Life Sta ish Measured: 33	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm)	Open Low Wi ength (m): 31 Visual Obse	llow Shrub 00 Total Ele rvation, Boat tory: Resider		1.5
Open Black Spruce sh Sampling Market t-Mounted Electron ual Observation, Gr rvations retic grayling to Count: 46 Fi Method (No. of fission)	ce Forest Iethods fisher round Life Sta	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm)	Open Low Wi ength (m): 31 Visual Obse	llow Shrub 00 Total Ele rvation, Boat tory: Resider	ıt	1.5 Fime (s): 2098
Open Black Spruce sh Sampling M at-Mounted Electrodic ual Observation, Gri rvations rctic grayling a Count: 46 Fi Method (No. of fisses)	ce Forest Iethods fisher round Life Sta ish Measured: 33 sh): BEF (33) VO	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) 0B (9) VOG (4)	Open Low Wi ength (m): 31 Visual Obse Life His) Min: 123	llow Shrub 00 Total Ele rvation, Boat tory: Residen Max: 411	it Mean: 285	1.5 Fime (s): 2098
Open Black Spruce sh Sampling M at-Mounted Electrod ual Observation, Gr rvations retic grayling a Count: 46 Fi Method (No. of fisses) s: ngnose sucker	ce Forest Iethods fisher round Life Sta ish Measured: 33 sh): BEF (33) VO Life Sta	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) DB (9) VOG (4) age: adult	Open Low Wi ength (m): 31 Visual Obse Life His Min: 123 Life His	llow Shrub 00 Total Ele rvation, Boat tory: Residen Max: 411	ıt Mean: 285 ıt	1.5 Fime (s): 2098 Median: 267
Open Black Spruce sh Sampling M. tt-Mounted Electroford ual Observation, Gr rvations retic grayling a Count: 46 Find Method (No. of find s: ngnose sucker a Count: 10 Find b Count: 10 Find Count:	ce Forest Iethods fisher round Life Sta ish Measured: 33 sh): BEF (33) VO Life Sta ish Measured: 7	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) DB (9) VOG (4) age: adult Fork Lengths (mm)	Open Low Wi ength (m): 31 Visual Obse Life His Min: 123 Life His	llow Shrub 00 Total Ele rvation, Boat tory: Residen Max: 411	it Mean: 285	1.5 Fime (s): 2098
Open Black Spruce sh Sampling M. tt-Mounted Electroford ual Observation, Gr rvations retic grayling a Count: 46 Find Method (No. of find s: ngnose sucker a Count: 10 Find b Count: 10 Find Count:	ce Forest Iethods fisher round Life Sta ish Measured: 33 sh): BEF (33) VO Life Sta	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) DB (9) VOG (4) age: adult Fork Lengths (mm)	Open Low Wi ength (m): 31 Visual Obse Life His Min: 123 Life His	llow Shrub 00 Total Ele rvation, Boat tory: Residen Max: 411	ıt Mean: 285 ıt	1.5 Fime (s): 2098 Median: 267
Open Black Spruce sh Sampling Market t-Mounted Electron ual Observation, Gr rvations retic grayling a Count: 46 Fi Method (No. of fission s: ngnose sucker a Count: 10 Fi Method (No. of fission Method (No. of fission)	ce Forest fethods fisher round Life Sta ish Measured: 33 sh): BEF (33) VO Life Sta ish Measured: 7 sh): BEF (7) VOC	3 (5 (Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) DB (9) VOG (4) age: adult Fork Lengths (mm)	Open Low Wi ength (m): 31 Visual Obse Life His Min: 123 Life His Min: 196	llow Shrub 00 Total Ele rvation, Boat tory: Residen Max: 411	it Mean: 285 it Mean: 358	1.5 Fime (s): 2098 Median: 267
	Latitude L es 63.06144 -1 NED (m)(ft): 762 Determination M drangle: Healy A Name: Butte Cre us Waters Catalog c Comments: IU8 nents: pH sensor omments: ality \ Stream np (C): 8.28 DG or: Clear nannel adient (%): 1 Area(sq. km): Dimensions (m): Wid Thalweg Dep ass: C3 Low gradie Vegetation Con Left Bank Vegeta	es 63.06144 -147.60517 NED (m)(ft): 762 2500 Determination Method: Non-Diff drangle: Healy A-2 Name: Butte Creek us Waters Catalog Number: c Comments: IU8 nents: pH sensor was malfunctioning omments: ality \ Stream Flow np (C): 8.28 DO (mg/L): 11.07 or: Clear Turbidity nannel adient (%): 1 Entrenc Area(sq. km): 434 Embedd Dimensions (m): Bankfull OHW Width 29.0 Thalweg Depth 1.12 ass: C3 Low gradient, meandering, po Vegetation Communities (Vie Left Bank Vegetation Type Open Low Willow Shrub	LatitudeLongitudeSample Coordinateses63.06144-147.60517CoordinatesNED (m)(ft):7622500Legal Descripe Determination Method:Non-Differential GPS Field Method: drangle:Healy A-2Legal Descripe Name:Butte CreekLegal DescripName:us Waters Catalog Number: c Comments:ILegal DescripLegal Descripc Comments:IU8IU8IU8nents:pH sensor was malfunctioning.IU8omments:IU8IU8ality \ Stream FlowIU8np (C):8.28DO (mg/L):np (C):8.28DO (mg/L):np (C):8.28DO (mg/L):nunelIU8adient (%):1Area(sq. km):434Embeddedness:NegligibleDimensions (m):BankfullOHWWettedDWidth29.018.9SubdorThalweg Depth1.120.66SubdorSubdormass:C3Left Bank Vegetation TypeHeight(m)Open Low Willow Shrub1	LatitudeLongitudeSampleLatitudees63.06144-147.60517Coordinates63.06142NED (m)(ft): 7622500Determination Method:Non-Differential GPS Field Measurementdrangle:Healy A-2Legal Description (MTRS)Name:Butte Creekus WatersCatalog Number:cComments:numers:PH sensor was malfunctioning.omments:DO (mg/L):ality \ Stream Flownp (C):8.28DO (mg/L):11.07DO (%):94.60Conductivityor:ClearTurbidity (NTU):0.32Thalweg Velonanneladient (%):1Entrenchment:Slightly EntrenchedArea(sq. km):434Embeddedness:NegligibleDimensions (m):Bankfull OHWWidth29.011Unvegetation Communities (Viereck et al. 1992)CanopyLeft Bank Vegetation TypeOpen Low Willow Shrub1Unvegetated	Latitude Longitude Sample Latitude Longitude es 63.06144 -147.60517 Coordinates 63.06142 -147.60439 NED (m)(ft): 762 2500 - -147.60439 WC betermination Method: Non-Differential GPS Field Measurement Datum: WC drangle: Healy A-2 Legal Description (MTRS): F021S001E Name: Butte Creek us Waters Catalog Number: - c Comments: IU8 - - - ments: pH sensor was malfunctioning. - - - mments: ality \ Stream Flow - - - - agient (%): 1 Entrenchment: Slightly Entrenched - - Area(sq. km): 434 Embeddedness: Negligible - <td>Latitude Longitude Sample Latitude Longitude Latitude <thlistude< th=""> Latitude L</thlistude<></td>	Latitude Longitude Sample Latitude Longitude Latitude Latitude <thlistude< th=""> Latitude L</thlistude<>

 Comments:
 Life Stage: adult
 Life History: Resident

 Total Fish Count: 4
 Fish Measured: 3
 Fork Lengths (mm)
 Min: 66
 Max: 83
 Mean: 76
 Median: 74

 Sampling Method (No. of fish):
 BEF (3) VOB (1)
 Comments:
 EF
 Comments:
 Comments:
 Comments:

Species: round whitefish Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 263 Max: 263 Total Fish Count: 1 Fish Measured: 1 Mean: 263 Median: 263 Sampling Method (No. of fish): BEF (1) **Comments:** Species: burbot Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 320 Max: 320 **Mean:** 320 Median: 320 Sampling Method (No. of fish): BEF (1) **Comments:** Instruments

Stream Gradient: handheld abney level Stream Velocity: Orange Float Turbidity: LaMotte 2020e turbidimeter Water Quality: YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape **Electrofisher:** Smith-Root GPP 2.5 **Transparency:**



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Appendix L22.–Page 4 of 4.

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1 1	- · · · · · · · · · · ·	01100110							
Station In	fo								
Observers:	Jonathan Kirs	sch, Ashley R	Reed				Date/	Fime: 08/04/2	011 10:25 AM
Station Coordinat	Latitude 62.85475	Longitude -148.22310		Sampl Coord		Latitude 62.85475	Longitude -148.22310		0
Coordinate USGS Qua Waterbody	NED (m)(ft): 50 e Determination drangle: Talke 7 Name: Watan us Waters Cata	n Method: etna Mts D-3 a Creek					Datum: V 5): S032N00 ⁷		
	c Comments: 1	-							
Visit Com	nents: pH sens	or was malfu	nctioning						
Wildlife Co	omments:								
Water Qu	ality \ Strea	m Flow							
Water Ten Water Cole	np (C): 11.75 or: Clear			DO (%): 98 7 (NTU): 6.33			y (µS/cm): 4 locity (m/s)(f	4 pH: (t/s): 1.50 4.92	
Stream Cl	hannel								
	adient (%): 1 Area(sq. km):		Entrencl Embedd		deratley derate	Entrenched			
Channel I		Bankful Vidth 22.0 Depth 1.00	II OHW	Wetted 14.0 0.60	Subdo	minant Subs	bstrate: Cobl trate 1: Grav trate 2: Boul	el	
Rosgen Cl	ass: B3 Modera	-	ed mode						ed pools Verv
Rösgen en		and profile.			inne do	innated ena	mer, with mi	equentity space	a pools. Very
Riparian '	Vegetation C	Communit	ies (Vie	reck et al.	1992)				
Dist. from Bank (m)	<u>Left Bank Ve</u>	getation Typ	<u>e</u>	Can Heig		Right Bank '	Vegetation T	ype	Canopy Height(m)
0 - 5	Closed Spruce	-Paper Birch	Forest	2	0	Closed Spruc	e-Paper Birc	h Forest	15
5 - 10	Closed Spruce	-Paper Birch	Forest	2	0	Closed Spruc	e-Paper Birc	h Forest	15
10 - 20	Closed Spruce	-Paper Birch	Forest	2	0	Closed Spruc	e-Paper Birc	h Forest	15
20 - 30	Closed Spruce	-Paper Birch	Forest	2	0	Closed Spruc	e-Paper Birc	h Forest	15
-	sh Sampling	, ,		Estimated		-	200 Total E ervation, Boa	t	Fime (s): 659
Total Fish	und whitefish 1 Count: 91 Method (No. o f	Fish Measu f fish): BEF	ired: 2	ge: juvenile/a Fork Lengtl (89)			story: Resid Max: 252	ent Mean: 243	Median: 243
Total Fish	rctic grayling Count: 103 Method (No. of s:	Fish Meas ı f fish): BEF	ired: 5	ge: juvenile/a Fork Lengtl (98)			story: Resid Max: 315	ent Mean: 249	Median: 252
	Count: 1 Method (No. of	Fish Meas t f fish): VOF	ired:	ge: juvenile/a Fork Lengtl			story: Resid Max:	ent Mean:	Median:
Total Fish	rctic grayling Count: 5 Method (No. of s:	Fish Meas t f fish): BEF	ired: 5	ge: juvenile Fork Lengtl	hs (mm)		story: Resid Max: 145	ent Mean: 128	Median: 127

 Species: round whitefish
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 195
 Mean:
 195
 Median:
 195

 Sampling Method (No. of Fish):
 BEF (1)
 EEF (1)
 EE

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



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FSS1102B010306.jpg

FSS1102B010307.jpg

FSS1102B010308.jpg



Station Info Observers: Raye Ann Neustel, Joe Buckwalter Date/Time: 08/04/2011 9:21 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.40550 -147.17411 Coordinates -147.17268 63.40526 63.40664 -147.17453 Elevation NED (m)(ft): 797 2615 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Healy B-1 Legal Description (MTRS): F017S003E28 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HU88. Within sight of Susitna Glacier Moraine. Unnamed trib to East Fork Susitna. Visit Comments: Wildlife Comments: Beaver dam complex (upstream & downstream). Water Quality \ Stream Flow Water Temp (C): 8.20 DO (mg/L): 9.93 DO (%): 84.30 Conductivity (µS/cm): 84 **pH:** 6.24 Water Color: Clear Turbidity (NTU): 0.20 Thalweg Velocity (m/s)(ft/s): 0.96 3.15 **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Slightly Entrenched Negligible Catchment Area(sq. km): 31 **Embeddedness:** Channel Dimensions (m): **Bankfull OHW** Wetted Dominant Substrate: Cobble Width 22.6 7.6 Subdominant Substrate 1: Gravel 0.70 Thalweg Depth 1.00 Subdominant Substrate 2: Sand Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Low Willow Shrub 0.7 Closed Tall Willow Shrub 0.9 5 - 10 Halophytic Grass Wet Meadow 0.3 Closed Tall Willow Shrub 0.9 0.3 **10 - 20** Halophytic Grass Wet Meadow Closed Tall Willow Shrub 0.9 0.3 0.9 20 - 30 Halophytic Grass Wet Meadow Closed Tall Willow Shrub **Key To Fish Sampling Methods** Estimated reach length (m): 276 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling	Life Sta	age: juvenile	Life H	istory: Resid	lent	
Total Fish Count: 12	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of	f fish): VOG (12)					
Comments:						
Species: slimy sculpin	Life Sta	age: juvenile/adult	Life H	istory: Resid	lent	
Total Fish Count: 6	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of	f fish): VOG (6)					
Comments:						
Species: slimy sculpin	Life Sta	age: juvenile	Life H	istory: Resid	lent	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 40	Max: 40	Mean: 40	Median: 40
Sampling Method (No. of	f fish): PEF (1)					
Comments:						
Species: slimy sculpin	Life Sta	age: adult	Life H	istory: Resid	lent	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 90	Max: 90	Mean: 90	Median: 90
Sampling Method (No. of	f fish): PEF (1)					
Comments:						

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1102c010021.jpg

FSS1102c010022.jpg



Station Info	
Observers: Raye Ann Neustel, Joe Buckwalter Date/Time: 08	/04/2011 11:28 AM
	itudeLongitude30010-147.06947
Elevation NED (m)(ft): 1082 3550	
Coordinate Determination Method:Non-Differential GPS Field MeasurementDatum: WGS84USGS Quadrangle:Healy B-1Legal Description (MTRS): F019S004E06	
Waterbody Name: Boulder Creek	
Anadromous Waters Catalog Number:	
Geographic Comments: HU48. Habitat transect located downstream of one clear tributary & one glacial	tributary.
Visit Comments: Wildlife Comments:	
Water Quality \ Stream Flow	
	H: 6.67
Water Color: Glacial, Low Turbidit Turbidity (NTU): 8.80 Thalweg Velocity (m/s)(ft/s): 0.59	
Stream Channel	
Stream Gradient (%):0.5Entrenchment:Slightly EntrenchedCatchment Area(sq. km):71Embeddedness:Low	
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Gravel	
Width27.217.3Subdominant Substrate 1: Silt/ClayThalweg Depth1.100.45Subdominant Substrate 2:	
Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-def	ined floodplains
	ince noouplains.
Riparian Vegetation Communities (Viereck et al. 1992)	
Dist. fromCanopyBank (m) Left Bank Vegetation TypeHeight(m) Right Bank Vegetation Type	Canopy Height(m)
Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type	Height(m)
Bank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub	Height(m) 1.9
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub	Height(m) 1.9 1.9
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub	Height(m) 1.9 1.9 1.9
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub	Height(m) 1.9 1.9 1.9
Bank (m) Left Bank Vegetation Type Height (m) Right Bank Vegetation Type 0 - 5 Closed Low Willow Shrub 1.3 Closed Low Willow Shrub 5 - 10 Closed Low Willow Shrub 1.3 Closed Tall Willow Shrub 10 - 20 Closed Low Willow Shrub 1.3 Closed Tall Willow Shrub 20 - 30 Closed Low Willow Shrub 1.3 Closed Tall Willow Shrub Key To Fish Sampling Methods Estimated reach length (m): 337 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground	Height(m) 1.9 1.9 1.9
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach Teach (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish Observations	Height(m) 1.9 1.9 1.9
Bank (m) Left Bank Vegetation Type Height (m) Right Bank Vegetation Type 0 - 5 Closed Low Willow Shrub 1.3 Closed Low Willow Shrub 5 - 10 Closed Low Willow Shrub 1.3 Closed Tall Willow Shrub 10 - 20 Closed Low Willow Shrub 1.3 Closed Tall Willow Shrub 20 - 30 Closed Low Willow Shrub 1.3 Closed Tall Willow Shrub Key To Fish Sampling Methods Estimated reach length (m): 337 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground	Height(m) 1.9 1.9 1.9 1.9
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Mean:Sampling Method (No. of fish):PEF (1) VOG (5)Fish Count:Fish Count:Fish Count:Fish Count:Fish Count:	Height(m) 1.9 1.9 1.9 1.9
Bank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type0-5Closed Low Willow Shrub1.3Closed Low Willow Shrub5-10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10-20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20-30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20-30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Sampling Method (No. of fish):PEF (1) VOG (5)Comments:Comments:Comments	Height(m) 1.9 1.9 1.9 1.9
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Mean:Sampling Method (No. of fish):PEF (1) VOG (5)Fish Count:Fish Count:Fish Count:Fish Count:Fish Count:	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35
Bank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Sampling Method (No. of fish):PEF (1) VOG (5)Comments:Species: slimy sculpinLife Stage: juvenile/adultLife History: Resident	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35
Bank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type0-5Closed Low Willow Shrub1.3Closed Low Willow Shrub5-10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10-20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20-30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20-30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Mean:Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count:1Fish Measured: 1Fork Lengths (mm)Min: 53Max: 53Mean:	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Mean:Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count: 1Fish Measured: 1Fork Lengths (mm)Min: 53Max: 53Mean:Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count: 1Fish Measured: 1Fork Lengths (mm)Min: 53Max: 53Mean:Sampling Method (No. of fish):PEF (1)VOG (5)Comments:Sign (mm)Min: 53Max: 53Mean:Sampling Method (No. of fish):PEF (1)Fork Lengths (mm)Min: 53Max: 53Mean:	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35
Bank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count:1Fish Measured: 1Fork Lengths (mm)Min: 53Max: 53Mean:Sampling Method (No. of fish):PEF (1)VOG (5)Comments:Sampling Method (No. of fish): PEF (1)Comments:Sampling Method (No. of fish):PEF (1)Comments:Max: 53Mean:	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35
Bank (m)Left Bank Vegetation TypeHeight (m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count:1Fish Measured: 1Fork Lengths (mm)Min: 53Max: 53Sampling Method (No. of fish):PEF (1)Comments:Sampling Method (No. of fish):PEF (1)Comments:Min: 53Max: 53Mean:Sampling Method (No. of fish):PEF (1)Comments:Instruments	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35
Bank (m)Left Bank Vegetation TypeHeight(m)Right Bank Vegetation Type0 - 5Closed Low Willow Shrub1.3Closed Low Willow Shrub5 - 10Closed Low Willow Shrub1.3Closed Tall Willow Shrub10 - 20Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow Shrub20 - 30Closed Low Willow Shrub1.3Closed Tall Willow ShrubKey To Fish Sampling MethodsEstimated reach length (m): 337(PEF)Backpack Electrofisher(VOG) Visual Observation, GroundFish ObservationsSpecies: slimy sculpinLife Stage: juvenileLife History: ResidentTotal Fish Count:6Fish Measured: 1Fork Lengths (mm)Min: 35Max: 35Species: slimy sculpinLife Stage: juvenile/adultLife History: ResidentTotal Fish Count:1Fish Measured: 1Fork Lengths (mm)Min: 53Max: 53Mean:Sampling Method (No. of fish):PEF (1)VOG (5)Comments:Sampling Method (No. of fish): PEF (1)Comments:InstrumentsStream Gradient:handheld abney levelChannel Depths:graduated wading rod	Height(m) 1.9 1.9 1.9 1.9 35 Median: 35



FSS1102c020027.jpg

FSS1102c020028.jpg

FSS1102c020029.jpg



FSS1102c020030.jpg

FSS1102c020031.jpg

FSS1102c020032.jpg

Station Info Observers: Raye Ann Neustel, Joe Buckwalter Date/Time: 08/04/2011 1:41 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.21684 -147.22313 Coordinates -147.21956 63.21714 63.21684 -147.22313 Elevation NED (m)(ft): 1071 3514 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Healy A-1 Legal Description (MTRS): F020S003E05 Waterbody Name: Valdez Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU34 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): 9.89 Water Temp (C): 9.27 **DO (%):** 86.10 Conductivity (µS/cm): 112 **pH:** 6.70 Water Color: Clear Turbidity (NTU): 0.10 Thalweg Velocity (m/s)(ft/s): 0.96 3.15 **Stream Channel** Stream Gradient (%): 0.75 **Entrenchment:** Slightly Entrenched **Catchment Area(sq. km):** 38 **Embeddedness:** High Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 42.0 9.0 Subdominant Substrate 1: Gravel Thalweg Depth 0.70 0.30 Subdominant Substrate 2: Sand Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 0.7 Open Low Willow Shrub Open Low Willow Shrub 1.35 0.7 5 - 10 Open Low Willow Shrub Open Low Willow Shrub 1.35 10 - 20 Open Low Willow Shrub 0.7 Open Low Willow Shrub 1.35 20 - 30 Open Low Willow Shrub 0.7 Open Low Willow Shrub 1.35 **Key To Fish Sampling Methods** Estimated reach length (m): 279 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile Life History: Resident Total Fish Count: 29 Fish Measured: 7 Fork Lengths (mm) Min: 24 Max: 36 Median: 30 Mean: 29 Sampling Method (No. of fish): PEF (7) VOG (22) Comments: 20 fry and 2 parr around 150mm Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 8 Fish Measured: 5 Fork Lengths (mm) Min: 30 Max: 41 **Mean: 35** Median: 35 Sampling Method (No. of fish): PEF (5) VOG (3) **Comments:** Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



FSS1102C030033.jpg

FSS1102C030034.jpg

FSS1102C030035.jpg

FSS1102C030036.jpg



Station Info Observers: Raye Ann Neustel, Joe Buckwalter Date/Time: 08/04/2011 3:52 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.11140 -147.47812 Coordinates -147.47378 63.11157 63.11140 -147.47812 Elevation NED (m)(ft): 779 2556 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Healy A-1 Legal Description (MTRS): F021S001E12 Waterbody Name: Windy Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.64 DO (mg/L): 9.54 DO (%): 85.80 Conductivity (µS/cm): 92 pH: 6.56 Water Color: Clear Turbidity (NTU): 0.60 Thalweg Velocity (m/s)(ft/s): 1.47 4.82 **Stream Channel** Stream Gradient (%): 3 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 134 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Boulder **Width** 23.0 15.1 Subdominant Substrate 1: Cobble Thalweg Depth 0.75 0.50 Subdominant Substrate 2: Gravel Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 2.5 0 - 5Closed Low Alder-Willow Shrub 1.3 Closed Tall Alder-Willow Shrub 30 30 5 - 10 Open White Spruce Forest Closed White Spruce Forest 10 - 20 Open White Spruce Forest 30 30 Closed White Spruce Forest 20 - 30 Closed Low Willow Shrub 1.3 Closed White Spruce Forest 30 **Kev To Fish Sampling Methods** Estimated reach length (m): 320 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 275 Max: 275 Median: 275 **Total Fish Count:** 1 Mean: 275 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 7 Fish Measured: 5 Fork Lengths (mm) Min: 35 Max: 161 Mean: 103 Median: 98 Sampling Method (No. of fish): PEF (5) VOG (2) **Comments: Species:** slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 8 Fish Measured: 3 Fork Lengths (mm) Min: 97 Max: 103 Mean: 100 **Median:** 100 Sampling Method (No. of fish): PEF (3) VOG (5) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 39 **Total Fish Count: 5** Fish Measured: 5 Fork Lengths (mm) Min: 35 Max: 44 **Mean:** 40

Sampling Method (No. of fish): PEF (5)

Comments:

 Species: round whitefish
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 205
 Mean:
 205

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Vertical State
 Vertical State
 Vertical State

Instruments

Channel Depths: graduated wading rod
Channel Widths: measuring tape
Electrofisher: Smith-Root LR-24
Transparency:



FSS1102C040049.jpg

FSS1102C040050.jpg

FSS1102C040051.jpg



Station Info Observers: Joe Buckwalter, Jonathan Kirsch Date/Time: 07/12/2011 10:48 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.10807 -151.49313 Coordinates -151.49313 62.10807 61.98945 -151.26994 Elevation NED (m)(ft): 51 167 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna A-3 Legal Description (MTRS): S023N012W04 Waterbody Name: Yentna River Anadromous Waters Catalog Number: 247-41-10200-2053 **Geographic Comments:** Visit Comments: Electrofished 9 subreaches on 7/12/11 and 1 more on 7/13/11. Wildlife Comments: 2 beavers in sampling event N. Water Quality \ Stream Flow Water Temp (C): 5.74 DO (mg/L): 13.25 **DO (%):** 104.20 Conductivity (µS/cm): 106 **pH:** 7.94 Water Color: Glacial, High Turbidit Turbidity (NTU): 128.00 Thalweg Velocity (m/s)(ft/s): 1.80 5.90

Stream Channel

Stream Gradient (%): 0.5	Entrenchm	ent: Sli	ightly Entrenched
Catchment Area(sq. km): 3313	Embedded	ness: Ve	ery High
Channel Dimensions (m): Ba	nkfull OHW	Wetted	Dominant Substrate: Sand
Width 2	230.0	195.0	Subdominant Substrate 1: Gravel
Thalweg Depth	4.60	2.70	Subdominant Substrate 2:
			1 17 11 1 1 1 1 1

Rosgen Class: D5 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	7	Closed Balsam Poplar-White Spruce Forest	33
5 - 10	Closed Tall Alder-Willow Shrub	7	Closed Balsam Poplar-White Spruce Forest	33
10 - 20	Closed Tall Alder-Willow Shrub	7	Closed Balsam Poplar-White Spruce Forest	33
20 - 30	Open White Spruce Forest	26	Closed Balsam Poplar-White Spruce Forest	33

Key To Fish Sampling Methods

Estimated reach length (m): 2100 Total Electrofishing Time (s):

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 196 Max: 196 Mean: 196 **Median:** 196 Sampling Method (No. of fish): BEF (1) **Comments:** Species: Chinook salmon Life Stage: adult Life History: Anadromous Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) Comments: ~20 lb, chrome bright. Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 6 Fork Lengths (mm) Min: 81 Total Fish Count: 16 Max: 89 **Mean: 85** Median: 85 Sampling Method (No. of fish): BEF (6) VOB (10) Comments: ID of retained specimens confirmed in the lab. Tag # 02D01_4: Life Stage: adult Species: threespine stickleback Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 82 Max: 82 **Mean: 82** Median: 82 Sampling Method (No. of fish): BEF (2) **Comments:**

Appendix L28.-Page 2 of 4.

Life History: Anadromous Species: sockeye salmon Life Stage: adult Total Fish Count: 13 Fork Lengths (mm) Min: Median: Fish Measured: Max: Mean: Sampling Method (No. of fish): BEF (2) VOB (11) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: pink salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: longnose sucker Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 390 Max: 390 **Total Fish Count:** 1 Fish Measured: 1 **Mean: 390** Median: 390 Sampling Method (No. of fish): BEF (1) **Comments:** Species: whitefish-unspecified Life Stage: adult Life History: Unknown **Total Fish Count:** 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: northern pike Life Stage: adult Life History: Resident Median: **Total Fish Count:** 4 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (4) **Comments:** Instruments

Stream Gradient:handheld abney levelChannel Depths:handheld sonar depth finderStream Velocity:GPS FloatChannel Widths:handheld laser rangefinderTurbidity:LaMotte 2020e turbidimeterElectrofisher:Smith-Root GPP 2.5Water Quality:YSI 556Transparency:



FSS1102D010206.jpg

FSS1102D010207.jpg

FSS1102D010209.jpg



FSS1102D010210.jpg Chinook salmon juvenile.

FSS1102D010211.jpg

FSS1102D010212.jpg

Appendix L29.–Station 155110210	1.			
Station Info				
Observers: Joe Buckwalter, Joe Giefer		Date/	Time: 09/15/20	011 11:17 AM
	Sample Coordinates	Latitude Longitud 61.49675 -148.8387	e Latitude 9 / 61.49657	
Elevation NED (m)(ft): 17 56 Coordinate Determination Method: Non- USGS Quadrangle: Anchorage B-5 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Knik River tributar	Legal Descrip	otion (MTRS): S016N00)3E12	
Visit Comments: Minnow trapping only-no coordinate (to the west) ar	electrofishing or habitat	assessment occurred. Set		tream
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):Water Color: Glacial, Low TurbiditTurb	DO (%): idity (NTU):	Conductivity (µS/cm): Thalweg Velocity (m/s)(pH: ft/s):	
Stream Channel				
Catchment Area(sq. km): 1 Emb	Subdo	Dominant Substrate: Silt minant Substrate 1: Gra minant Substrate 2:	•	
Rosgen Class:	Subu			
Riparian Vegetation Communities (Viereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m)	Right Bank Vegetation 7	<u> </u>	Canopy Height(m)
Key To Fish Sampling Methods				
(MTR) Minnow Trap				
Fish Observations				
Species: coho salmonLifeTotal Fish Count:8Fish Measured:Sampling Method (No. of fish):MTR (8)Comments:	Stage: juvenile 8 Fork Lengths (mm)	Life History: Anad) Min: 58 Max: 91	dromous Mean: 69	Median: 74
Species: Dolly VardenLifeTotal Fish Count:1Fish Measured:Sampling Method (No. of fish):MTR (1)Comments:	Stage: juvenile 1 Fork Lengths (mm)	Life History: Unkt Min: 82 Max: 82	nown Mean: 82	Median: 82
Species: Dolly VardenLifeTotal Fish Count:4Fish Measured:Sampling Method (No. of fish):MTR (4)Comments:	Stage:juvenile/adult4Fork Lengths (mm)	Life History: Unkt) Min: 103 Max: 144	nown Mean: 117	Median: 123

Comments:

Instruments

Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:



FSS1102F010841.jpg Site 02F01.

FSS1102F010842.jpg Site 02F01.

FSS1102F010845.jpg Site 02F01.



FSS1102F010846.jpg Site 02F01.

Appendix L305ta						
Station Info						
Observers: Joe Buckw	alter, Joe Giefer			Date/1	Fime: 09/15/2	2011 11:34 AM
		Sample Coordinates	Latitude 61.48809	Longitude -148.80398	Latitud 61.4882	e Longitude 0 -148.80538
USGS Quadrangle: An Waterbody Name: Anadromous Waters C	ion Method: Non-Differe chorage B-5	Legal Descrij	ption (MTRS		4E07	
	ow trapping onlyno electr inate (to the west) and anot	-		ccurred. Set 1	l trap at down	stream
Wildlife Comments:						
Water Quality \ Stre	eam Flow					
Water Temp (C): Water Color:	DO (mg/L): Turbidity (l	DO (%): NTU):	Conductivit Thalweg Vel		pH: t/s):	
Stream Channel						
Stream Gradient (%): Catchment Area(sq. kn Channel Dimensions (n Thalwe Rosgen Class:	n): Bankfull OHW Width	ness: Wetted I Subdo	Oominant Sul minant Subs minant Subs	trate 1: Silt/0		
	C	-14 -1 1002				
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Communities (Viere	CK et al. 1992) Canopy Height(m)	<u>Right Bank V</u>	Vegetation T	<u>vpe</u>	Canopy Height(m
Key To Fish Sampli	ng Methods					
(MTR) Minnow Trap						
Fish Observations Species: Chinook salmon Total Fish Count: 1 Sampling Method (No. Comments:	Fish Measured: 1 F	: juvenile fork Lengths (mm		story: Anad Max: 66	romous Mean: 66	Median: 66
Species: coho salmon	Life Stage	: juvenile	Life Hi	story: Anad	romous	
Total Fish Count: 1 Sampling Method (No. Comments:		ork Lengths (mm) Min: 67	Max: 67	Mean: 67	Median: 67
Species: Dolly Varden	Life Stage	: juvenile/adult	Life Hi	story: Unkn	own	

 Species: Dolly Varden
 Life Stage: juvenile/adult
 Life History: Unknown

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 86
 Mean:
 86
 Median:
 86

 Sampling Method (No. of fish):
 MTR (1)
 KTR (1)
 KTR

Instruments

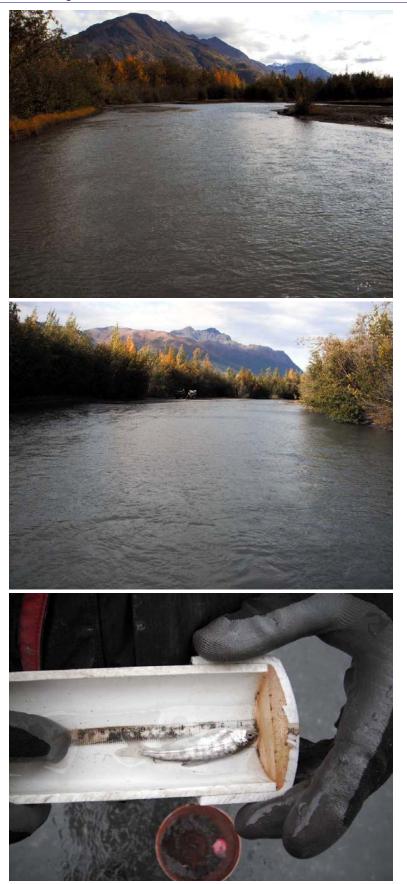
Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:



FSS1102F020848.jpg Site 02F02.

FSS1102F020849.jpg Site 02F02.

FSS1102F020850.jpg Site 02F02.



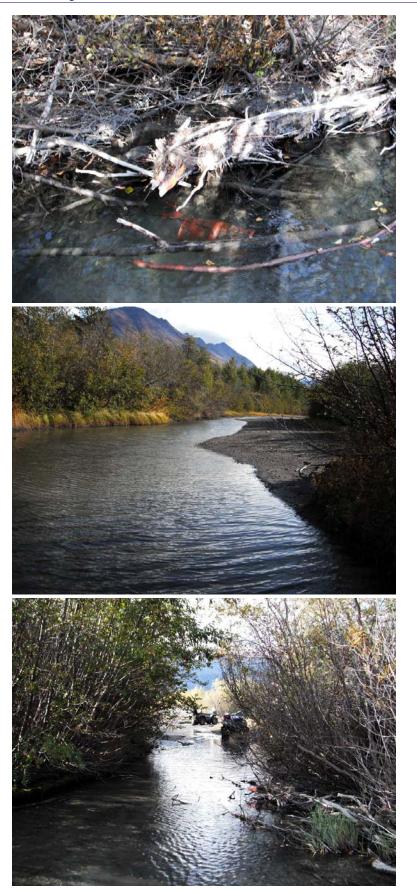
FSS1102F020852.jpg Site 02F02.

FSS1102F020853.jpg Site 02F02.

FSS1102F020891.jpg Site 02F02. Juvenile Chinook salmon.

Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/15/2011 11:48 AM Sample Latitude Longitude Coordinates -148.79094 61.48469 Elevation NED (m)(ft): 23 75 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E08 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear right-bank Knik River tributary--source appears to be springs along the margin of the Knik River braid plain at the base of the Friday Creek alluvial fan. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 0.5 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Silt/Clay Subdominant Substrate 1: Gravel Width **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 25 Fish Measured: 11 Fork Lengths (mm) Min: 46 Max: 59 **Mean: 54** Median: 52 Sampling Method (No. of fish): MTR (25) **Comments:** Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



FSS1102F030854.jpg Site 02F03.

FSS1102F030855.jpg Site 02F03.

FSS1102F030856.jpg Site 02F03.

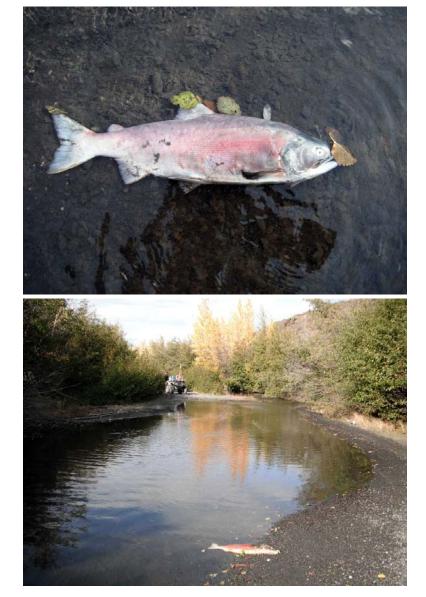
Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/15/2011 1:08 PM Sample Latitude Longitude Coordinates -148.69513 61.47498 Elevation NED (m)(ft): 54 177 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E14 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear, right-bank Knik River tributary. This stream flows along the edge of the Knik River floodplain in an area dominated by mature-stage cottonwood and alder, which was abandoned by the main channel, but may still be flooded annually. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. ATV trails run up stream bed through sockeye salmon spawning area. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 31 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Sand Width Subdominant Substrate 1: Gravel **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground (MTR) Minnow Trap **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count: 2** Fish Measured: 2 Fork Lengths (mm) Min: 57 Max: 63 Mean: 60 Median: 60 Sampling Method (No. of fish): MTR (2) **Comments:** Species: threespine stickleback Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 15 Fork Lengths (mm) Min: Max: Median: **Fish Measured:** Mean: Sampling Method (No. of fish): MTR (15) **Comments:** Species: sockeye salmon Life History: Anadromous Life Stage: carcass **Total Fish Count:** 4 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOG (4) Suspected Spawning: Yes **Comments:**

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 2 Median: Fish Measured: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (2) Comments: ~ 200 mm. Life Stage: adult spawning Life History: Anadromous Species: sockeye salmon Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) Comments: On redd.

Instruments

Stream Gradient: Stream Velocity: Turbidity: Water Quality:

Channel Depths: Channel Widths: Electrofisher: Transparency:



FSS1102F040859.jpg Sockeye salmon carcass.

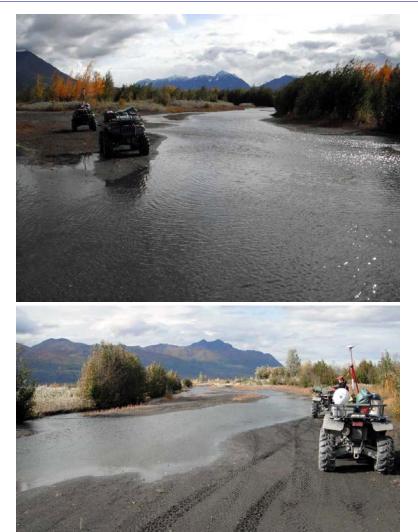
FSS1102F040861.jpg

Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/15/2011 1:22 PM Sample Latitude Longitude Coordinates -148.69250 61.46956 Elevation NED (m)(ft): 48 157 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E23 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear, right-bank Knik River tributary. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 30 Catchment Area(sq. km): **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Sand Width Subdominant Substrate 1: Gravel **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations**

No Fish Found

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



FSS1102F050863.jpg

FSS1102F050864.jpg

Observers: Joe Buckwalter, Joe Giefer		
	Date/Time:	09/15/2011 1:30 PM
SampleLatinCoordinates61.40	8	
Elevation NED (m)(ft): 50 164Coordinate Determination Method:Non-Differential GPS Field MeasuremUSGS Quadrangle:Anchorage B-5Legal Description (NWaterbody Name:Anadromous Waters Catalog Number:Geographic Comments:Downstream of 02F07.		1
Visit Comments: Visual observations of salmon onlyno electrofishing or ha bed through sockeye salmon spawning area.	itat assessment occurre	d. ATV trail in stream
Wildlife Comments:		
Water Quality \ Stream Flow		
	tivity (µS/cm): Velocity (m/s)(ft/s):	рН:
Stream Channel		
Stream Gradient (%):Entrenchment:Catchment Area(sq. km):30Embeddedness:		
	Substrate:	
WidthSubdominantThalweg DepthSubdominant		
Rosgen Class:		
Riparian Vegetation Communities (Viereck et al. 1992)		
Dist. fromCanopyBank (m)Left Bank Vegetation TypeHeight(m)Right B	nk Vegetation Type	Canopy Height(m)
0 - 5 5 - 10 10 - 20 20 - 30		
Key To Fish Sampling Methods		
(VOG) Visual Observation, Ground		
Fish Observations		
	e History: Anadromou Max: Mea	
Species: sockeye salmonLife Stage: carcassLifeTotal Fish Count:1Fish Measured:Fork Lengths (mm)Sampling Method (No. of fish):VOG (1)Comments:	e History: Anadromou Max: Me: Sus	
Instruments		
Instruments Stream Gradient: Channel Depth	:	

Transparency:



FSS1102F060866.jpg Sockeye redd.

FSS1102F060865.jpg

FSS1102F060867.jpg Adult sockeye.



FSS1102F060868.jpg

FSS1102F060869.jpg

FSS1102F060870.jpg

Station Info						
Observers: Joe Buckwalter	, Joe Giefer			Date/Ti	ime: 09/15/2	011 1:44 PM
		Sample Coordinates	Latitude 61.46707	Longitude -148.67900	/ Latitude 61.46768	0
Elevation NED (m)(ft): 51	167					
Coordinate Determination I				Datum: WO		
USGS Quadrangle: Anchor Waterbody Name:	age B-5	Legal Descri	otion (MTRS): S016N004E	E23	
Anadromous Waters Catalo	og Number:					
Geographic Comments: Tr		t sites 21B02, 02F04, 0	3F03, and 21	A01 (mouth).		
		spawning area. Socke				
Wildlife Comments:						
Water Quality \ Stream	Flow					
1 • 7	O (mg/L):	DO (%):	Conductivit	y (µS/cm):	pH:	
Water Color: Clear	Turbidi	ity (NTU):	Thalweg Vel	ocity (m/s)(ft/	's):	
Stream Channel						
Stream Gradient (%):	Entren	nchment:				
Catchment Area(sq. km):	29 Embed	ldedness:				
Channel Dimensions (m):	Bankfull OH		Dominant Sub			
	dth	Subdo	minant Subst	trate 1:		
Wi						
Thalweg De			minant Subs			
			minant Subs			
Thalweg De Rosgen Class:	pth	Subdo	minant Subs			
Thalweg De Rosgen Class:	pth ommunities (Vi	Subdo iereck et al. 1992) Canopy			pe	Canopy Height(m
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from	pth ommunities (Vi	Subdo iereck et al. 1992) Canopy		trate 2:	<u>pe</u>	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10	pth ommunities (Vi	Subdo iereck et al. 1992) Canopy		trate 2:	<u>pe</u>	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20	pth ommunities (Vi	Subdo iereck et al. 1992) Canopy		trate 2:	<u>pe</u>	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30	pth pmmunities (Vi tation Type	Subdo iereck et al. 1992) Canopy		trate 2:	<u>pe</u>	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling P	pth ommunities (Vi <u>tation Type</u> Methods	Subdo iereck et al. 1992) Canopy		trate 2:	<u>pe</u>	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling I (VOG) Visual Observation, C	pth ommunities (Vi <u>tation Type</u> Methods	Subdo iereck et al. 1992) Canopy		trate 2:	<u>pe</u>	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations	pth ommunities (Vi tation Type Methods Ground	Subdo iereck et al. 1992) Canopy Height(m)	Right Bank V	trate 2:		
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) Left Bank Vege 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon	pth ommunities (Vi tation Type Methods Ground Life St	Subdo iereck et al. 1992) Canopy Height(m)	Right Bank V	trate 2: Vegetation Ty		Height(m
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) Left Bank Vege 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4	pth ommunities (Vi tation Type Viethods Ground Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m)	Right Bank V	trate 2:	omous	
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) Left Bank Vege 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon	pth ommunities (Vi tation Type Viethods Ground Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m)	Right Bank V	trate 2: Vegetation Ty	omous	Height(m
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f	pth mmunities (Vi tation Type Viethods Ground Life St Fish Measured: ish): VOG (4)	Subdo iereck et al. 1992) Canopy Height(m)	<u>Right Bank V</u> Life His) Min:	trate 2: Vegetation Ty	omous Mean:	Height(m
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling M (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4	pth mmunities (Vi tation Type Viethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm	Right Bank V Life His) Min: Life His	trate 2: Vegetation Ty story: Anadro Max: story: Anadro	omous Mean:	Height(m
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f	pth mmunities (Vi tation Type Viethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm tage: carcass	<u>Right Bank V</u> Life His) Min: Life His	trate 2: Vegetation Ty story: Anadro Max: story: Anadro Max:	omous Mean: omous Mean:	Height(m
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4	pth mmunities (Vi tation Type Viethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm tage: carcass	<u>Right Bank V</u> Life His) Min: Life His	trate 2: Vegetation Ty story: Anadro Max: story: Anadro Max:	omous Mean: omous Mean:	Height(m Median: Median:
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments:	pth mmunities (Vi tation Type Viethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm tage: carcass	<u>Right Bank V</u> Life His) Min: Life His	trate 2: Vegetation Ty story: Anadro Max: story: Anadro Max:	omous Mean: omous Mean:	Height(m Median: Median:
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments:	pth mmunities (Vi tation Type Viethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm tage: carcass Fork Lengths (mm	<u>Right Bank V</u> Life His) Min: Life His	trate 2: Vegetation Ty story: Anadro Max: story: Anadro Max:	omous Mean: omous Mean:	Height(m Median: Median:
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling N (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Instruments	pth mmunities (Vi tation Type Vlethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm tage: carcass Fork Lengths (mm	Right Bank V Life His) Min: Life His) Min:	trate 2: Vegetation Ty story: Anadro Max: story: Anadro Max:	omous Mean: omous Mean:	Height(m Median: Median:
Thalweg De Rosgen Class: Riparian Vegetation Co Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling R (VOG) Visual Observation, C Fish Observations Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Species: sockeye salmon Total Fish Count: 4 I Sampling Method (No. of f Comments: Instruments Stream Gradient:	pth mmunities (Vi tation Type Vlethods Ground Life St Fish Measured: ish): VOG (4) Life St Fish Measured:	Subdo iereck et al. 1992) Canopy Height(m) tage: adult spawning Fork Lengths (mm tage: carcass Fork Lengths (mm	Right Bank V Life His) Min: Life His) Min:	trate 2: Vegetation Ty story: Anadro Max: story: Anadro Max:	omous Mean: omous Mean:	Height(m Median: Median:



FSS1102F070873.jpg

FSS1102F070874.jpg

FSS1102F070875.jpg



Observers: Joe Buckwalter, Raye	Ann Neustel			Date/Ti	me: 07/28/20	11 8:17 AM
		Sample Coordinates	Latitude 62.37194	Longitude -147.49338	Latitude / 62.63921	Longitude -147.38654
Elevation NED (m)(ft): 902 2959 Coordinate Determination Method USGS Quadrangle: Talkeetna Mts Waterbody Name: Oshetna River Anadromous Waters Catalog Num Geographic Comments: Aerial sur	B-1 nber:	ntial GPS Field M Legal Descri	leasurement ption (MTRS	Datum: W(): S026N011H	GS84 E06	-1+7.3805+
Visit Comments: Poor visibility in fast and turbulen Wildlife Comments:		shetna River is tu	rbid (glacial)	from Black Riv	ver confluence	down and is
Water Quality \ Stream Flow	7					
Water Temp (C): DO (mg Water Color:		90 (%): TU):	Conductivit Thalweg Vel	y (µS/cm): locity (m/s)(ft/	pH: s):	
Stream Channel						
Width Thalweg Depth Rosgen Class:	Embeddedn kfull OHW	Wetted Subde Subde	Dominant Sul ominant Subs ominant Subs	trate 1:		
Riparian Vegetation Commu	nities (Viereo	ck et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30	<u>Type</u>	Canopy Height(m)	<u>Right Bank ^v</u>	Vegetation Ty	<u>pe</u>	Canopy Height(m)
Key To Fish Sampling Metho	ods					
(VOH) Visual Observation, Helicop						
Fish Observations						
No Fish Found						
Instruments						

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station Info Observers: Joe Buckwalter, Raye Ann Neustel Date/Time: 07/28/2011 9:15 AM Sample Latitude Longitude Latitude Longitude Coordinates 62.30842 -147.50415 62.37084 -147.49115 Elevation NED (m)(ft): 991 3251 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts B-2 Legal Description (MTRS): S026N010E25 Waterbody Name: Little Oshetna River **Anadromous Waters Catalog Number:** Geographic Comments: Aerial survey from mouth 5.7 miles upstream. Visit Comments: Clear water. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

 Species: salmonid-unspecified
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 500
 Fish Measured:
 Fork Lengths (mm)
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOH (500)

 Comments:
 Schools of adult salmonids (probably Arctic grayling or whitefish sp.) seen.
 No salmon were observed.

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

FSS1102G020278.jpg



Station mil						
Observers: Joe Buck	walter, Raye Ann Neustel	1		Date/Time:	: 07/28/20	11 9:35 AM
		Sample Coordinate	Latitude s 62.28247	<u> </u>	Latitude 62.58866	Longitude -147.20250
USGS Quadrangle: Ta Waterbody Name: Ty Anadromous Waters (ntion Method: Non-Dif alkeetna Mts B-1 rone Creek	Legal Desc	ription (MTRS	Datum: WGS8 (): S025N011E05 downstream.	4	
	Beaver dam complex in J W147.42480).	oe Creek (Sonona C	reek tributary)	at GPS waypoint 0	018 (N62.32	2009
Water Quality \ Str	eam Flow					
Water Temp (C): Water Color:	DO (mg/L): Turbidit	DO (%): ty (NTU):	Conductivit Thalweg Ve	y (µS/cm): locity (m/s)(ft/s):	pH:	
Stream Channel						
Stream Gradient (%): Catchment Area(sq. k Channel Dimensions Thalm	m): Embedo (m): Bankfull OHV Width	Sub	Dominant Su dominant Subs dominant Subs	trate 1:		
Rosgen Class:	eg Depth	Sub	dominant Subs	trate 2:		
Riparian Vegetatio	n Communities (Vi	amonds at al. 100	•			
Dist. from Bank (m) <u>Left Bank</u>		Canopy		Vegetation Type		Canopy Height(m)
0 - 5 5 - 10 10 - 20 20 - 30						
Key To Fish Sampl	ing Methods					
(VOH) Visual Observat	tion, Helicopter					
		age: adult Fork Lengths (m bly Arctic grayling (m) Min:			Median:
Instruments						
Stream Gradient:		Chan	nel Depths:			
Stream Velocity:		Chan	nel Widths:			
Turbidity:		Elect	ofisher:			

Water Quality:

Transparency:

Observers: Joe Buckwalter, R	aye Ann Neustel			Date/Tin	ne: 07/28/20	11 10:18 AM
		Sample Coordinates	Latitude 62.66577	Longitude -147.03624	Latitude 62.67947	Longitude -147.15283
Elevation NED (m)(ft): 715 2. Coordinate Determination Me USGS Quadrangle: Talkeetna Waterbody Name: Tyone Rive Anadromous Waters Catalog N Geographic Comments: Aeria Visit Comments:	thod: Non-Differenti: Mts C-1 er Number:	Legal Descrip	easurement tion (MTRS	Datum: WG): C010N010W	S84 711	
Wildlife Comments:						
Water Quality \ Stream F	low					
Water Temp (C):DOWater Color:	(mg/L): DO Turbidity (NT) (%): U):	Conductivit <u>;</u> Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s)	рН:):	
Stream Channel						
	Entrenchmen Embeddednes Bankfull OHW W	ss: /etted D	ominant Sul			
Width Thalweg Depth			ninant Subst ninant Subst			
Rosgen Class:	-					
Riparian Vegetation Com	munities (Viereck	et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetat</u>	ion Type	Canopy Height(m)	Right Bank V	vegetation Typ	<u>e</u>	Canopy Height(m)
0 - 5						
5 - 10 10 - 20						
20 - 30						
Key To Fish Sampling Me	ethods					
(VOH) Visual Observation, Heli	icopter					
Fish Observations Species: salmonid-unspecified Total Fish Count: 200 Fish Sampling Method (No. of fish Comments: Schools of adult s): VOH (200)	k Lengths (mm)	Min:		Mean:	Median:
Instruments						
Stream Gradient:		Channel	Depths:			
Stream Velocity:		Channel	Widths:			

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station mild					
Observers: Joe Buckwalter, Raye Ann Neustel			Date/Tim	ne: 07/28/20	11 11:52 AM
	Sample Coordinates	Latitude 63.05892	Longitude -146.93490	/ Latitude 62.89566	Longitude -147.13509
Elevation NED (m)(ft): 904 2966					
Coordinate Determination Method: Non-Differen			Datum: WG		
USGS Quadrangle: Mt Hayes A-6	Legal Descrip	tion (MTRS): F021S004E3	5	
Waterbody Name: Clearwater Creek Anadromous Waters Catalog Number:					
Geographic Comments: Aerial survey from mouth	upstream 22 miles	to about 3 n	niles upstream of	f the Denali H	Highway
crossing.	1		1		6 ,
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): DO (mg/L): I	DO (%):	Conductivit	y (µS/cm):	pH:	
Water Color: Turbidity (N	NTU):	Thalweg Vel	ocity (m/s)(ft/s)	:	
Stream Channel					
Stream Gradient (%): Entrenchm	ent:				
Catchment Area(sq. km): Embeddedu	ness:				
Channel Dimensions (m): Bankfull OHW		ominant Sul			
Width The base Death		minant Subs			
Thalweg Depth	Subdo	minant Subs	trate 2:		
Rosgen Class:					
Riparian Vegetation Communities (Vieree	ck et al. 1992)				
Dist. from	Canopy				Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	<u>Right Bank '</u>	Vegetation Type	<u>e</u>	Height(m)
0-5					
5 - 10 10 - 20					
20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations					
Species: salmonid-unspecified Life Stage:	adult	Life Hi	story: Resident		
	ork Lengths (mm)	Min:	Max: N	lean:	Median:
Sampling Method (No. of fish): VOH (100)	A 1.	1: 6 1	N7 1	1	,
Comments: Schools of adult salmonids (probably a	Arctic grayling or	whitefish sp.)	seen. No salmo	on were obser	rved.
Instruments					
Stream Gradient:	Channel	Depths:			
Stream Velocity:	Channel	Widths:			
Turbidity:	Electrof	isher:			
Water Quality:	Transpa	rency:			

Observers: Joe Buckwalter, Raye Ann Neustel			Date/Tir	ne: 07/28/20	11 12:36 PM
	Sample Coordinates	Latitude 63.06563	Longitude -146.86098	/ Latitude 63.04264	Longitude -146.88088
Elevation NED (m)(ft): 940 3084			_		
Coordinate Determination Method: Non-Differentia USGS Quadrangle: Mt Hayes A-6			Datum: WG): F021S005E3		
Waterbody Name: Little Clearwater Creek	Legal Desert). 10215005E.		
Anadromous Waters Catalog Number:					
Geographic Comments: Aerial survey from mouth (ju	ist upstream of	Denali Highw	vay crossing) ab	out 2 miles u	pstream.
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
) (%):	Conductivit		pH:	
Water Color: Turbidity (NT	U):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel					
Stream Gradient (%): Entrenchmen					
Catchment Area(sq. km): Embeddednes					
Channel Dimensions (m): Bankfull OHW W Width		ominant Sub ninant Subs			
Thalweg Depth		minant Subs			
Rosgen Class:					
Riparian Vegetation Communities (Viereck	et al. 1992)				
Dist. from	Canopy				Canopy
Bank (m) <u>Left Bank Vegetation Type</u>		Right Bank V	Vegetation Typ	<u>e</u>	Height(m)
0 - 5					
5 - 10 10 - 20					
20 - 30					
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations					
Species: salmonid-unspecified Life Stage: ad	lult	Life Hi	story: Residen	t	
	x Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish): VOH (100) Comments: Schools of adult salmonids (probably Arc	ctic gravling or	whitefish sp.)	seen. No salm	on were obse	ved.
Instruments	0				
Stream Gradient:	Channel	Dontha			
Stream Velocity:		Depths: Widths:			

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Observers: Joe Buckwa	alter, Raye Ann Neuste	el		Date/Time	e: 07/28/20	11 1:41 PM
		Sample Coordinate	Latitude 63.18642	Longitude -146.71754 /	Latitude 63.16080	Longitude -146.54941
Elevation NED (m)(ft):	950 3117					
Coordinate Determinati	on Method: Non-Di	fferential GPS Field	Measurement	Datum: WGS	84	
USGS Quadrangle: Mt	•	-	cription (MTRS	5): F020S005E13	5	
Waterbody Name: Wes						
Anadromous Waters Ca	6	7 1				
Geographic Comments:		er / miles.				
Visit Comments: Glacia	l, high turbidity.					
Wildlife Comments:						
Water Quality \ Stre	am Flow					
Water Temp (C): Water Color:	DO (mg/L): Turbidi	DO (%): ity (NTU):	Conductivit Thalweg Ve	y (µS/cm): locity (m/s)(ft/s):	рН:	
Stream Channel						
Stream Gradient (%):	Entrer	nchment:				
Catchment Area(sq. km): Embed	ddedness:				
Channel Dimensions (m	n): Bankfull OH	W Wetted	Dominant Sul	bstrate:		
	Width	Sub	odominant Subs	trate 1:		
Thalweg	; Depth	Sub	odominant Subs	trate 2:		
Rosgen Class:						
Riparian Vegetation	Communities (Vi	iereck et al. 199	2)			
Dist. from		Canopy				Canopy
Bank (m) <u>Left Bank V</u>	egetation Type	Height(m	i) <u>Right Bank '</u>	Vegetation Type		Height(m)
0 - 5						
5 - 10						
10 - 20						
20 - 30						
5 - 10 10 - 20						

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

No Fish Found

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station Info

Observers: Joe Buckwalter, Raye	Ann Neustel			Date/Ti	me: 07/28/20	11 1:57 PM
		Sample Coordinates	Latitude 63.27272	Longitude -146.51971	/ Latitude 62.83702	Longitude -147.12493
Elevation NED (m)(ft): 931 3054						
Coordinate Determination Method	: Non-Different	ial GPS Field Me	easurement	Datum: W(JS 84	
USGS Quadrangle: Mt Hayes B-6		Legal Descrip	tion (MTRS): F019S006E	213	
Waterbody Name: Maclaren River						
Anadromous Waters Catalog Num						
Geographic Comments: Aerial sur	vey from glacier t	o mouth.				
Visit Comments: Wildlife Comments:						
Water Quality \ Stream Flow						
Water Temp (C): DO (mg/	'L): D() (%):	Conductivity	y (µS/cm):	pH:	
Water Color:	Turbidity (N7	(U):	Thalweg Vel	ocity (m/s)(ft/	s):	
Stream Channel						
Stream Gradient (%):	Entrenchme	nt:				
Catchment Area(sq. km):	Embeddedne	ss:				
Channel Dimensions (m): Banl	kfull OHW V	Vetted D	ominant Sub	ostrate:		
Width		Subdo	minant Subst	trate 1:		
Thalweg Depth		Subdo	minant Subst	trate 2:		
Rosgen Class:						
Riparian Vegetation Commun	nities (Vierecl	k et al. 1992)				
Dist. from		Canopy				Canopy
Bank (m) Left Bank Vegetation 7	<u>Type</u>	Height(m)	Right Bank V	Vegetation Ty	<u>pe</u>	Height(m)
0 - 5						
5 - 10						

20 - 30

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

No Fish Found

10 - 20

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station Info Observers: Joe Buckwalter, Raye Ann Neustel Date/Time: 07/28/2011 2:07 PM Sample Latitude Longitude Latitude Longitude Coordinates 63.16850 -146.49593 63.13440 -146.51462 Elevation NED (m)(ft): 892 2927 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Mt Hayes A-5 Legal Description (MTRS): F020S006E24 Waterbody Name: Boulder Creek **Anadromous Waters Catalog Number:** Geographic Comments: Aerial survey from mouth 3.7 miles upstream. Visit Comments: Clear stream. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

 Species: salmonid-unspecified
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 300
 Fish Measured:
 Fork Lengths (mm)
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOH (300)
 VOH (300)
 Comments:
 Schools of adult salmonids (probably Arctic grayling or whitefish sp.) seen.
 No salmon were observed.

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station Info

Observers: Joe Buckwalter, Raye Ann Neustel			Date/Time	e: 07/28/20	11 2:32 PM
	Sample Coordinates	Latitude 62.94556	Longitude -146.47989 /	Latitude 62.94567	Longitude -146.53054
Elevation NED (m)(ft): 845 2772 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Gulkana D-5 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Unnamed left-bank Maclaret	Legal Descrij	ption (MTRS	Datum: WGS): C014N007W3 am ID IU34).		
Visit Comments: Clear stream.					
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT) (%): U):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:	
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km): Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth Rosgen Class:	ss: Tetted I Subdo	Dominant Sub minant Subst minant Subst	trate 1:		
Riparian Vegetation Communities (Viereck	et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m)	Right Bank V	Vegetation Type		Canopy Height(m)
Key To Fish Sampling Methods					
(VOH) Visual Observation, Helicopter					
Fish Observations Species: salmonid-unspecified Life Stage: ad Total Fish Count: 300 Fish Measured: Ford Sampling Method (No. of fish): VOH (300) Comments: Schools of adult salmonids (probably Article)	k Lengths (mm) Min:			Median: ved.

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

FSS1102G100284.jpg

Station Info					
Observers: Joe Buckwalter, David Pluth			Date/Time:	: 08/05/2011	1:00 PM
Station Latitude Longitude Coordinates 62.50381 -147.06345	Sample Coordinates	Latitude 62.50381	Longitude -147.06345 /		Longitude 147.05959
 Elevation NED (m)(ft): 785 2575 Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna Mts C-1 Waterbody Name: Tyone Creek Anadromous Waters Catalog Number: Geographic Comments: Floodprone width is 30 m 	Legal Descrip		Datum: WGS8): C008N010W03		
Visit Comments: Dissolved oxygen probe not work	ing on YSI 556 w	ater quality m	eter.		
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 10.03DO (mg/L):IWater Color: ClearTurbidity (Note: Clear)	DO (%): NTU): 2.19	-	y (µS/cm): 283 ocity (m/s)(ft/s): (pH: 7.15 0.50 1.64	
Stream Channel					
Stream Gradient (%):0.5EntrenchmCatchment Area(sq. km):463EmbeddeduCharles (a)Charles (a)Charles (a)	ness: Moderate				
Channel Dimensions (m): Bankfull OHW Width 23.5 Thalweg Depth 1.02	22.6 Subdo	minant Subst	strate: Gravel trate 1: Silt/Clay trate 2: Cobble		
Rosgen Class: F4 Entrenched meandering riffle/poo				ratio.	
Riparian Vegetation Communities (Vieree			0 1		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Right Bank V	egetation Type		Canopy Height(m)
0 - 5 Closed Low Willow Shrub		Closed Low V			0.4
5 - 10 Closed Low Willow Shrub	0.4	Closed Low V	Villow Shrub		0.4
10 - 20 Open Black Spruce Forest	5	Closed Black	Spruce-White Spr	ruce Forest	7
20 - 30 Open Black Spruce Forest	5	Closed Black	Spruce-White Spr	ruce Forest	7
Key To Fish Sampling Methods	Estimated reach le	ength (m): 42	00 Total Electr	ofishing Tim	e (s): 4157
(BEF) Boat-Mounted Electrofisher	(VOB)	Visual Obse	ervation, Boat		
) Min: 249	story: Resident Max: 330 Me	ean: 290 M	edian: 289
			story: Resident Max: 67 Me	ean: 61 M	edian: 60
Species:longnose suckerLife Stage:Total Fish Count:7Fish Measured:6FeSampling Method (No. of fish):BEF (6) VOB (1Comments:	ork Lengths (mm)		story: Resident Max: 430 Me	ean: 410 M	(edian: 400
Species: slimy sculpinLife Stage:Total Fish Count:25Fish Measured:24ForSampling Method (No. of fish):BEF (24) VOB (Comments:	ork Lengths (mm)		story: Resident Max: 50 Me	ean: 39 M	edian: 34

Appendix L46.-Page 2 of 4.

Species: salmonid-unspecified Life Stage: juvenile Life History: Unknown Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Salmonid referred to in event a approximately 150 mm and probably round whitefish. Species: burbot Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 297 Max: 297 Mean: 297 Median: 297 Sampling Method (No. of fish): BEF (1) **Comments: Species:** Arctic grayling Life History: Resident Life Stage: juvenile **Total Fish Count:** 4 Fish Measured: 3 Fork Lengths (mm) Min: 63 Max: 73 Median: 68 **Mean:** 67 Sampling Method (No. of fish): BEF (4) Comments: Arctic grayling in event L approximately 60 mm. Species: longnose sucker Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 1 Fork Lengths (mm) Min: 40 Max: 40 **Mean:** 40 Median: 40 Sampling Method (No. of fish): BEF (1) VOB (1) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 70 Max: 76 **Mean:** 72 Median: 73 Sampling Method (No. of fish): BEF (3) **Comments:** Life History: Resident Species: burbot Life Stage: juvenile Fork Lengths (mm) Min: 202 Max: 256 Median: 229 **Total Fish Count:** 2 Fish Measured: 2 Mean: 229 Sampling Method (No. of fish): BEF (2) **Comments:**

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: Orange Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



FSS1103A010380.jpg

FSS1103A010381.jpg

FSS1103A010383.jpg



FSS1103A010385.jpg

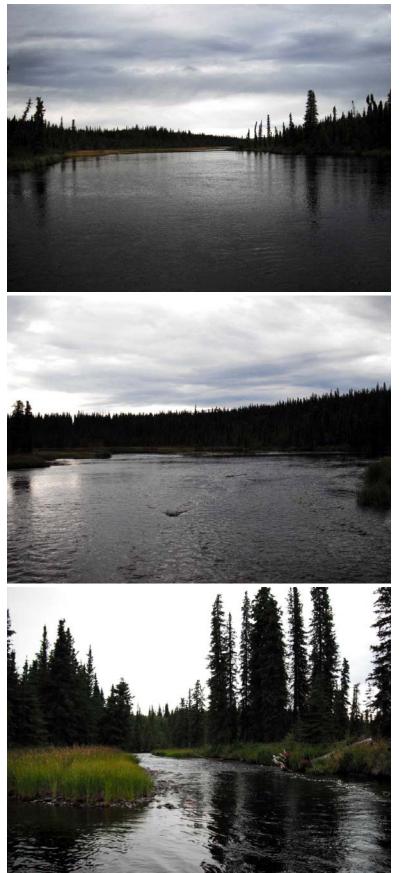
FSS1103A010387.jpg

Station Info							
Observers: Jonathan	Kirsch, Ashley F	Reed			Date/T	ime: 08/05/20	11 9:22 AM
StationLatitudCoordinates62.3001	8		Sample Coordinates	Latitude 62.29481	Longitude -146.61988	/ Latitude 62.30854	Longitude -146.60589
Elevation NED (m)(ft)		N D.CC (0004	
Coordinate Determina USGS Quadrangle: G		Non-Differentia	Legal Descri		Datum: W C006N008:		
Waterbody Name:			208an 200011	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Anadromous Waters (-		-41		T -1 T		
Geographic Comments Visit Comments: Habi			-				ros 200 211
	of upper reach po						168 309-311
Wildlife Comments:							
Water Quality \ Str	eam Flow						
Water Temp (C): 11.5	2 DO (mg/L):	: 10.51 DO	(%): 92.00	Conductivity	у (µS/cm): 88	pH: 7.4	5
Water Color: Clear	,	Turbidity (NTU	J): 1.71	Thalweg Vel	ocity (m/s)(ft	/s): 0.50 1.64	
Stream Channel							
Stream Gradient (%): Catchment Area(sq. kr		Entrenchment Embeddedness	•••				
Channel Dimensions ((m): Bankfu	ll OHW We		Dominant Sub	strate: Cobb	le	
	Width 13.0			minant Subst			
	eg Depth 0.80			minant Subst			1.1.*
Rosgen Class: C3 Low	gradient, meand	dering, point-bai	r, riffle/pool, al	luvial channel	s with broad,	well-defined fl	oodplains.
Riparian Vegetation	n Communit	ies (Viereck	et al. 1992)				
Dist. from			Canopy				Canopy
Bank (m) Left Bank	Vegetation Typ	<u>e</u>	Height(m)	<u>Right Bank V</u>	egetation Ty	pe	Height(m)
	ita Sprijaa Foras	+	12	Closed White	Sprilos Eoros	+	14
0-5 Closed Wh	ite Spruce Fores			Closed White	-		14 14
0-5 Closed Wh 5-10 Closed Wh	ite Spruce Fores	t	12	Closed White	Spruce Fores	t	14
0 - 5 Closed Wh 5 - 10 Closed Wh 10 - 20 Closed Bla	ite Spruce Fores ck Spruce-White	t e Spruce Forest	12 8	Closed White Closed Black	Spruce Fores Spruce-White	t e Spruce Forest	14 9
0 - 5 Closed Wh 5 - 10 Closed Wh 10 - 20 Closed Bla 20 - 30 Closed Bla	ite Spruce Fores ck Spruce-White ck Spruce-White	t e Spruce Forest e Spruce Forest	12 8 8	Closed White Closed Black Closed Black	Spruce Fores Spruce-White Spruce-White	t e Spruce Forest e Spruce Forest	14 9 9
0-5Closed Wh5-10Closed Wh10-20Closed Bla20-30Closed BlaKey To Fish Sample	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods	t e Spruce Forest e Spruce Forest	12 8 8 imated reach	Closed White Closed Black Closed Black ength (m): 22	Spruce Fores Spruce-White Spruce-White	t e Spruce Forest e Spruce Forest ectrofishing T	14 9 9
0 - 5 Closed Wh 5 - 10 Closed Wh 10 - 20 Closed Bla 20 - 30 Closed Bla	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods	t e Spruce Forest e Spruce Forest	12 8 8 imated reach	Closed White Closed Black Closed Black	Spruce Fores Spruce-White Spruce-White	t e Spruce Forest e Spruce Forest ectrofishing T	14 9 9
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla Key To Fish Sampl (BEF) Boat-Mounted F	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher	t e Spruce Forest e Spruce Forest Esti	12 8 8 imated reach 1 (VOB	Closed White Closed Black Closed Black ength (m): 22	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat	t e Spruce Forest e Spruce Forest ectrofishing T	14 9 9
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla Key To Fish Sampl (BEF) Boat-Mounted F Fish Observations Species: longnose suck	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er	t e Spruce Forest e Spruce Forest Esti	12 8 8 imated reach (VOB venile/adult	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat	t e Spruce Forest e Spruce Forest ectrofishing T	14 9 9 ime (s): 1102
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla Key To Fish Sampl (BEF) Boat-Mounted F	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork	12 8 8 imated reach 1 (VOB venile/adult Lengths (mm	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat	t e Spruce Forest e Spruce Forest ectrofishing T	14 9 9
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla Key To Fish Sampl (BEF) Boat-Mounted E Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu 5. of fish): BEF	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork	12 8 8 imated reach 1 (VOB venile/adult Lengths (mm 5)	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315	14 9 9 ime (s): 1102
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla Key To Fish Sample (BEF) Boat-Mounted F Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No Comments: Species: longnose suck Total Fish Count: 20	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu o. of fish): BEF er 90 Fish Measu	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork 7 (2) VOB (6505 Life Stage: juv ured: Fork	12 8 8 imated reach 1 (VOB venile/adult Lengths (mm 5)	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315	14 9 9 ime (s): 1102
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla Key To Fish Sampl (BEF) Boat-Mounted F Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No Comments: Species: longnose suck	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu o. of fish): BEF er 00 Fish Measu o. of fish): VOI	t e Spruce Forest E Spruce Forest Esti Life Stage: juv ured: 2 Fork F (2) VOB (6505 Life Stage: juv ured: Fork B (200)	12 8 (VOB) venile/adult Lengths (mm 5) venile Lengths (mm	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315	14 9 9 ime (s): 1102 Median: 315
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla (BEF) Boat-Mounted F Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No Comments: Species: longnose suck Total Fish Count: 20 Sampling Method (No Comments: Event Bo Species: slimy sculpin	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu o. of fish): BEF er 00 Fish Measu o. of fish): VOI observations wer	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork 7 (2) VOB (6505 Life Stage: juv ured: Fork B (200) e of tiny longno Life Stage: juv	12 8 8 imated reach 1 (VOB /enile/adult Lengths (mm 5) /enile Lengths (mm se sucker fry. /enile/adult	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285 Life His Min:	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345 story: Reside Max:	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315 ent Mean:	14 9 9 ime (s): 1102 Median: 315 Median:
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla 20-30 Closed Bla (BEF) Boat-Mounted F Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No Comments: Species: longnose suck Total Fish Count: 20 Sampling Method (No Comments: Event B of Species: slimy sculpin Total Fish Count: 39	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu 50 Fish Measu 50 Fish Measu 50 Sish Measu 50 Fish Measu	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork F (2) VOB (6505 Life Stage: juv ured: Fork B (200) e of tiny longno Life Stage: juv ured: Fork	12 8 8 imated reach 1 (VOB venile/adult Lengths (mm 5) venile Lengths (mm se sucker fry.	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285 Life His Min:	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345 story: Reside Max:	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315	14 9 9 ime (s): 1102 Median: 315
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla (BEF) Boat-Mounted F Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No Comments: Species: longnose suck Total Fish Count: 20 Sampling Method (No Comments: Event Bo Species: slimy sculpin	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu 50 Fish Measu 50 Fish Measu 50 Sish Measu 50 Fish Measu	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork F (2) VOB (6505 Life Stage: juv ured: Fork B (200) e of tiny longno Life Stage: juv ured: Fork	12 8 8 imated reach 1 (VOB /enile/adult Lengths (mm 5) /enile Lengths (mm se sucker fry. /enile/adult	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285 Life His Min:	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345 story: Reside Max:	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315 ent Mean:	14 9 9 ime (s): 1102 Median: 315 Median:
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla (BEF) Boat-Mounted E Fish Observations Species: longnose sucka Total Fish Count: 65 Sampling Method (No Comments: Species: longnose sucka Total Fish Count: 20 Sampling Method (No Comments: Event B of Species: slimy sculpin Total Fish Count: 39 Sampling Method (No	ite Spruce Fores ck Spruce-White ck Spruce-White ing Methods Electrofisher er 507 Fish Measu 507 Fish Measu 50 Fish Measu 50 of fish): VOI observations wer 50 Fish Measu 50 of fish): VOI	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork 7 (2) VOB (6505 Life Stage: juv ured: Fork B (200) e of tiny longno: Life Stage: juv ured: Fork B (39) Life Stage: juv	12 8 8 imated reach 1 (VOB venile/adult Lengths (mm se sucker fry. venile/adult Lengths (mm venile/adult Lengths (mm venile/adult	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285 Life His Min: Life His	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345 story: Reside Max: story: Reside Max:	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315 ent Mean: ent Mean:	14 9 9 ime (s): 1102 Median: 315 Median:
0-5 Closed Wh 5-10 Closed Wh 10-20 Closed Bla 20-30 Closed Bla 20-30 Closed Bla (BEF) Boat-Mounted F Fish Observations Species: longnose suck Total Fish Count: 65 Sampling Method (No Comments: Species: longnose suck Total Fish Count: 20 Sampling Method (No Comments: Event Bo Species: slimy sculpin Total Fish Count: 39 Sampling Method (No Comments: Species: slimy sculpin Total Fish Count: 39 Sampling Method (No	ite Spruce Fores ck Spruce-White ing Methods Electrofisher er 507 Fish Measu 50 Fish Measu 50 Fish Measu 50 Fish Measu 50 Fish Measu 50 of fish): VOI 51 State State State State State State 51 State	t e Spruce Forest e Spruce Forest Esti Life Stage: juv ured: 2 Fork 7 (2) VOB (6505 Life Stage: juv ured: Fork B (200) e of tiny longno Life Stage: juv ured: Fork B (39) Life Stage: juv ured: 2 Fork	12 8 8 imated reach 1 (VOB venile/adult Lengths (mm se sucker fry. venile/adult Lengths (mm	Closed White Closed Black Closed Black ength (m): 22 Visual Obse Life His Min: 285 Life His Min: Life His	Spruce Fores Spruce-White Spruce-White 70 Total El rvation, Boat story: Reside Max: 345 story: Reside Max: story: Reside Max:	t e Spruce Forest e Spruce Forest ectrofishing T ent Mean: 315 ent Mean: ent Mean:	14 9 9 ime (s): 1102 Median: 315 Median:

Species: round whitefish Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 210 Max: 245 Total Fish Count: 859 Fish Measured: 4 Mean: 220 Median: 227 Sampling Method (No. of fish): BEF (4) VOB (855) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident **Total Fish Count:** 5 Fish Measured: 5 Fork Lengths (mm) Min: 175 Max: 225 Mean: 195 Median: 200 Sampling Method (No. of fish): BEF (5) **Comments:** Life History: Resident **Species:** Arctic grayling Life Stage: juvenile/adult Total Fish Count: 127 Fish Measured: 2 Fork Lengths (mm) Min: 253 Max: 255 Median: 254 **Mean:** 254 Sampling Method (No. of fish): BEF (2) VOB (125) **Comments:** Species: longnose sucker Life History: Resident Life Stage: adult **Total Fish Count:** 1 Median: 385 Fish Measured: 1 Fork Lengths (mm) Min: 385 Max: 385 Mean: 385 Sampling Method (No. of fish): BEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 45 **Total Fish Count:** 1 Fish Measured: 1 Max: 45 Mean: 45 Median: 45 Sampling Method (No. of fish): BEF (1) **Comments:** Life History: Resident Species: round whitefish Life Stage: juvenile Fork Lengths (mm) Min: 145 Max: 193 **Median:** 169 **Total Fish Count:** 5 Fish Measured: 5 Mean: 163 Sampling Method (No. of fish): BEF (5) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 88 **Max:** 186 Median: 137 **Mean:** 137 Sampling Method (No. of fish): BEF (2) **Comments:**

Instruments

Stream Gradient:handheld abney levelChannel Depths:graduated wading rodStream Velocity:GPS FloatChannel Widths:handheld laser rangefinderTurbidity:LaMotte 2020e turbidimeterElectrofisher:Smith-Root GPP 2.5Water Quality:YSI 556Transparency:



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FSS1103B010311.jpg

FSS1103B010312.jpg

FSS1103B010315.jpg



FSS1103B010316.jpg

Station Info			
Station mile			
Observers: Raye Ann Neustel, Daniel Reed		Date/Time: 08/05/	2011 9:53 AM
StationLatitudeLongitudeCoordinates62.32573-147.36840	Sample Coordinates	Latitude Longitude Latitud 62.32449 -147.37042 62.3257	
Elevation NED (m)(ft): 997 3271			
Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna Mts B-1		easurement Datum: WGS84 btion (MTRS): S026N011E23	
Waterbody Name: Tyone Creek	Legai Descrip	(MIRS): 30201011E23	
Anadromous Waters Catalog Number:			
Geographic Comments: Mining marker 300 me	eters off of right bank	& near transect site.	
Visit Comments: Thalweg on river left.			
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 6.52DO (mg/L): 12.23Water Color: ClearTurbidity	DO (%): 99.70 y (NTU): 0.20	Conductivity (µS/cm): 257 pH: 7 Thalweg Velocity (m/s)(ft/s): 1.40 4.5	
Stream Channel			
Stream Gradient (%): 0.75 Entrenc	hment: Slightly En	trenched	
Catchment Area(sq. km): 94 Embedd	ledness: Low		
Channel Dimensions (m): Bankfull OHW		ominant Substrate: Cobble	
Width 10.4 Thalweg Depth 0.83		minant Substrate 1: Gravel minant Substrate 2: Boulder	
Rosgen Class: C3 Low gradient, meandering, po			l floodplains.
	-		
Riparian Vegetation Communities (Vie			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0-5 Closed Tall Alder-Willow Shrub		Closed Low Willow Shrub	1.3
5-10 Closed Tall Alder-Willow Shrub		Closed Low Willow Shrub	1.3
10 - 20 Closed Tall Alder-Willow Shrub		Closed Low Willow Shrub	1.3
20 - 30 Closed Tall Alder-Willow Shrub	1.5		
	1.5	Closed Tall Alder-Willow Shrub	2.3
Key To Fish Sampling Mathads			2.3
Key To Fish Sampling Methods	Estimated reach le	ength (m): 250	2.3
Key To Fish Sampling Methods (PEF) Backpack Electrofisher	Estimated reach le		2.3
(PEF) Backpack Electrofisher Fish Observations	Estimated reach le (VOG)	ength (m): 250 Visual Observation, Ground	2.3
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life State	Estimated reach le (VOG) age: juvenile/adult	ength (m): 250 Visual Observation, Ground Life History: Resident	
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Sta Total Fish Count: 9 Fish Measured: 6	Estimated reach lo (VOG) nge: juvenile/adult Fork Lengths (mm)	ength (m): 250 Visual Observation, Ground	
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life State	Estimated reach lo (VOG) nge: juvenile/adult Fork Lengths (mm)	ength (m): 250 Visual Observation, Ground Life History: Resident	
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Sta Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life Sta	Estimated reach le (VOG) nge: juvenile/adult Fork Lengths (mm) G (3) nge: juvenile/adult	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident	
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life State Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life State Total Fish Count: 21 Fish Measured: 11	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) o (3) age: juvenile/adult Fork Lengths (mm)	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident	
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Sta Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life Sta	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) o (3) age: juvenile/adult Fork Lengths (mm)	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident	Median: 262
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Stat Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life Stat Total Fish Count: 21 Fish Measured: 11 Sampling Method (No. of fish): PEF (11) VO Comments: VOC	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) G (3) G (10)	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident Min: 54 Max: 66 Mean: 60	Median: 262
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life Stat Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life Stat Total Fish Count: 21 Fish Measured: 11 Sampling Method (No. of fish): PEF (11) VO Comments: VOC	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) G (3) G (10) age: juvenile	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident	Median: 262 Median: 60
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life State Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life State Total Fish Count: 21 Fish Measured: 11 Sampling Method (No. of fish): PEF (11) VO Comments: Species: Arctic grayling Life State Total Fish Count: 3 Fish Measured: 3 Species: Arctic grayling Life State Total Fish Count: 3 Fish Measured: 3 Sampling Method (No. of fish): PEF (3)	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) G (3) G (10) age: juvenile	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident Min: 54 Max: 66 Mean: 60 Life History: Resident	Median: 262 Median: 60
(PEF)Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StateTotal Fish Count:9Fish Measured:Sampling Method (No. of fish):PEF (6) VOCComments:11Species: slimy sculpinLife StateTotal Fish Count:21Fish Measured:Species: slimy sculpinLife StateTotal Fish Count:21Sampling Method (No. of fish):PEF (11) VOComments:Species:Arctic graylingLife StateLife StateTotal Fish Count:3Species:Arctic graylingLife StateStateSpecies:Arctic graylingLife StateStateTotal Fish Count:3Sampling Method (No. of fish):PEF (3)Comments:State	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) G (3) G (10) age: juvenile Fork Lengths (mm) G (10)	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident Min: 54 Max: 66 Mean: 60 Life History: Resident Min: 124 Max: 173 Mean: 149	Median: 262 Median: 60
(PEF)Backpack ElectrofisherFish ObservationsSpecies: Arctic graylingLife StateTotal Fish Count:9Fish Measured:Sampling Method (No. of fish):PEF (6) VOCComments:11Species: slimy sculpinLife StateTotal Fish Count:21Fish Measured:Species: slimy sculpinLife StateTotal Fish Count:21Sampling Method (No. of fish):PEF (11) VOComments:Species:Arctic graylingLife StateLife StateTotal Fish Count:3Species:Arctic graylingLife StateStateSpecies:Arctic graylingLife StateStateTotal Fish Count:3Sampling Method (No. of fish):PEF (3)Comments:State	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) G (3) G (10) G (10) age: juvenile Fork Lengths (mm) G mm)	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident Min: 54 Max: 66 Mean: 60 Life History: Resident Min: 124 Max: 173 Mean: 149 Life History: Resident	Median: 262 Median: 60
(PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life State Total Fish Count: 9 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOC Comments: Species: slimy sculpin Life State Total Fish Count: 21 Fish Measured: 11 Sampling Method (No. of fish): PEF (11) VO Comments: Species: Arctic grayling Life State Total Fish Count: 3 Fish Measured: 3 Species: Arctic grayling Life State Total Fish Count: 3 Fish Measured: 3 Sampling Method (No. of fish): PEF (3) Comments: Species: slimy sculpin Life State	Estimated reach lo (VOG) age: juvenile/adult Fork Lengths (mm) G (3) G (10) age: juvenile Fork Lengths (mm) G (10)	ength (m): 250 Visual Observation, Ground Life History: Resident Min: 200 Max: 324 Mean: 263 Life History: Resident Min: 54 Max: 66 Mean: 60 Life History: Resident Min: 124 Max: 173 Mean: 149 Life History: Resident	Median: 262 Median: 60 Median: 148

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min: 41
 Mean: 41
 Median: 41

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Vertice
 Vertice
 Vertice

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1103c010057.jpg

FSS1103c010058.jpg



-continued-691



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FSS1103c010060.jpg

FSS1103c010061.jpg

Station Info				
Observers: Raye Ann Neustel, Daniel Reed			Date/Time: 08/05	5/2011 1:52 PM
Station Latitude Longitude Coordinates 62.74560 -147.47480	Sample Coordinates	Latitude 62.74645	Longitude / Latitu -147.47723 / 62.745	0
Elevation NED (m)(ft): 862 2828 Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna Mts C-1 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Mining camp approxin Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Quality \ Stream Flow Water Temp (C): 8.96 DO (mg/L): 10.35 Water Color: Humic Turbidity Stream Channel Stream Gradient (%): 0.5 Entrence Catchment Area(sq. km): 63 Embedd Channel Dimensions (m): Bankfull OHW Width 4.8 Thalweg Depth 0.70 Rosgen Class: E3 Low gradient, meandering riff	Legal Descrip nately 1 mile downstr DO (%): 89.60 y (NTU): 0.60 hment: Slightly En ledness: Negligible V Wetted E 4.5 Subdo 0.35 Subdo	otion (MTRS) ream. Unname Conductivity Thalweg Velo trenched Dominant Subst minant Subst	(μS/cm): 127 pH: ceity (m/s)(ft/s): 1.41 4. strate: Cobble rate 1: Boulder rate 2:	7.41 62
Rosgen Class: E3 Low gradient, meandering riff efficient and stable. High meander		w width/depth	ratio and little deposition	on. Very
Riparian Vegetation Communities (Vie	ereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
0 - 5 Closed Low Willow Shrub	0.7	Closed Low W	illow Shrub	0.6
5 - 10 Closed Low Willow Shrub	0.7	Closed Low W	illow Shrub	0.6
10 - 20 Closed Low Willow Shrub	0.7	Closed Low W	illow Shrub	0.6
20 - 30 Closed Low Willow Shrub				
20 - 30 Closed Low Willow Silfub	0.7	Closed Low W	illow Shrub	0.6
Key To Fish Sampling Methods	0.7 Estimated reach l			0.6
	Estimated reach l	ength (m): 25		0.6
Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations	Estimated reach l	ength (m): 25: Visual Obser Life His	5	0.6 Median:



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FSS1103c020066.jpg

FSS1103c020067.jpg



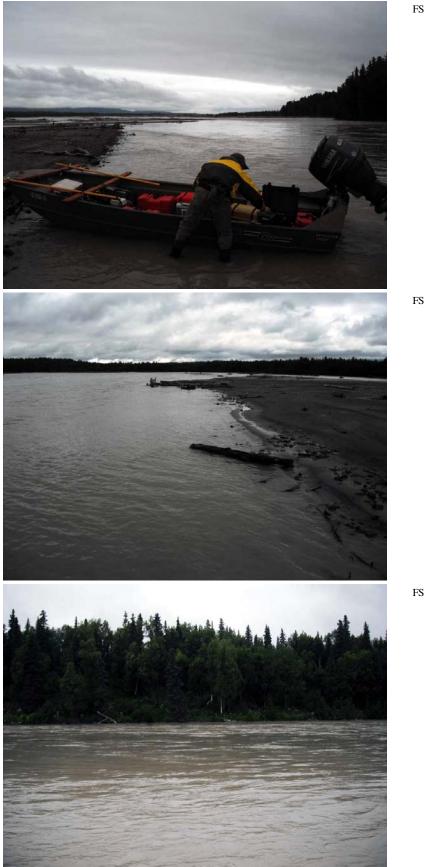
FSS1103c020069.jpg

Appendix L30. Station 1 SS1105D01.				
Station Info				
Observers: Joe Buckwalter, Jonathan Kirsch		Dat	e/Time: 07/13/2	011 10:00 AM
Station Latitude Longitude Coordinates 61.86531 -151.44310	Sample Coordinates	Latitude Longitu 61.86531 -151.443	de Latitude 10 / 61.95488	
Elevation NED (m)(ft): 68 223 Coordinate Determination Method: Non-Dif USGS Quadrangle: Tyonek D-4 Waterbody Name: Skwentna River Anadromous Waters Catalog Number: 247-4 Geographic Comments:	Legal Descrip	easurement Datum: btion (MTRS): S021N(WGS84)12W34	
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 7.28 DO (mg/L): 11.36 Water Color: Glacial, High Turbidit Turbidit		Conductivity (µS/cm) Thalweg Velocity (m/s		
Stream Channel				
	chment: Slightly En dedness: Low	trenched		
Channel Dimensions (m): Bankfull OHV Width 265.0	W Wetted D 190.0 Subdor	oominant Substrate: Co minant Substrate 1: Sa	nd	
Thalweg Depth3.32Rosgen Class:D3 Braided channel with longitu		minant Substrate 2: Gr		ke
		ars. Very wide channel	with crouing bai	кз.
Riparian Vegetation Communities (Vie	ereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>I</u>	Right Bank Vegetation	Туре	Canopy Height(m)
0 - 5 Closed Spruce-Paper Birch Forest	18 0	Closed Tall Alder-Willo	ow Shrub	4
5 - 10 Closed Spruce-Paper Birch Forest	18 0	Closed Tall Alder-Willo	ow Shrub	4
10 - 20 Closed Spruce-Paper Birch Forest		Closed Tall Alder-Willo		4
20 - 30 Closed Spruce-Paper Birch Forest		Open Balsam Poplar (B Forest	lack Cottonwood) 24
Key To Fish Sampling Methods	Estimated reach lo	ength (m): 2080 Total	l Electrofishing '	Fime (s): 5715
(BEF) Boat-Mounted Electrofisher	(VOB)	Visual Observation, B	oat	
Fish Observations				
Species: Dolly VardenLife StateTotal Fish Count:1Fish Measured:Sampling Method (No. of fish):VOB (1)Comments:	age: adult Fork Lengths (mm)	Life History: Un Min: Max:	known Mean:	Median:
Species: Pacific salmon-unspecifiedLife StateTotal Fish Count:1Fish Measured:Sampling Method (No. of fish):VOB (1)Comments:possibly sockeye.	age: adult Fork Lengths (mm)	Life History: And Min: Max:	adromous Mean:	Median:
Species: Chinook salmonLife StateTotal Fish Count:3Fish Measured:Sampling Method (No. of Fish):VOB (3)Comments:	age: adult Fork Lengths (mm)	Life History: And Min: Max:	adromous Mean:	Median:
Species: pink salmonLife StateTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):BEF (1)Comments:1	age: adult Fork Lengths (mm)	Life History: Ana Min: 335 Max: 335		Median: 335

Appendix L50.–Page 2 of 4.

Life Stage: adult Species: sockeye salmon Life History: Anadromous Total Fish Count: 6 Fork Lengths (mm) Min: Median: Fish Measured: Max: Mean: Sampling Method (No. of fish): BEF (1) VOB (5) **Comments:** Species: sculpin-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: general fish observation, no s Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (1) Comments: probably burbot Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 309 Max: 309 Median: 309 **Total Fish Count:** 1 Fish Measured: 1 Mean: 309 Sampling Method (No. of fish): BEF (1) **Comments:** Species: sculpin-unspecified Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 70 Max: 70 **Mean:** 70 Median: 70 Sampling Method (No. of fish): BEF (1) **Comments:**

Stream Gradient: handheld abney level	Channel Depths: handheld sonar depth finder
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



FSS1103D010214.jpg

FSS1103D010215.jpg

FSS1103D010216.jpg



FSS1103D010217.jpg

Station Info					
Observers: Joe Buckw	valter, Joe Giefer			Date/Time	e: 09/23/2011 11:20 AM
		Sample Coordinates	Latitude 61.48228	Longitude -148.78775	
USGS Quadrangle: An Waterbody Name: Kni Anadromous Waters C	tion Method: Non-Differenchorage B-5	Legal Descrip 0200 lowing with clear	ption (MTRS)		7 This channel is located
Visit Comments: Fish s Wildlife Comments:	sampling onlyno habitat as	ssessment occurred	l. Heavy ATV	use in and aroun	nd channel.
Water Quality \ Stre	eam Flow				
Water Temp (C): Water Color: Clear	DO (mg/L):	DO (%): NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
		ness: Wetted I Subdo		strate: Gravel arate 1: Silt/Clay arate 2:	
Rosgen Class:					
Riparian Vegetation	n Communities (Viere	ck et al. 1992)			
Dist. from Bank (m) <u>Left Bank V</u>	Vegetation Type	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m
0 - 5 5 - 10 10 - 20 20 - 30					
Key To Fish Sampli	ng Methods				
(PEF) Backpack Electro (VOG) Visual Observati	ofisher	(MTR)) Minnow Tra	ър	
Fish Observations Species: threespine stick Total Fish Count: 1 Sampling Method (No. Comments:	Fish Measured: 1 F	: juvenile/adult 'ork Lengths (mm		story: Unknown Max: 44 Mo	ean: 44 Median: 44
Species: sockeye salmor Total Fish Count: 10	8	ork Lengths (mm		story: Anadromo Max: 58 Mo	ean: 45 Median: 45
Species: Pacific salmon- Total Fish Count: 20 Sampling Method (No. Comments: 60-80 mm	Fish Measured: F . of fish): VOG (20)	: juvenile Fork Lengths (mm		story: Anadromo Max: Mo	ous ean: Median:

Instruments

Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:



FSS1103F010893.jpg



FSS1103F010894.jpg

FSS1103F010895.jpg



-continued-702



FSS1103F010896.jpg

FSS1103F010945.jpg Sockeye salmon juvenile.

Water Quality:

Station Info				0/22/2011 12 10 55
Observers: Joe Buckwalter, Joe Giefer	C	T - 494 - 1		09/23/2011 12:10 PM
	Sample Coordinates	Latitude 61.51030	Longitude L -148.74270 / 62	atitude Longitude 1.50711 -148.74389
Elevation NED (m)(ft): 131 430				
	tial GPS Field M		Datum: WGS84	
USGS Quadrangle: Anchorage C-5 Waterbody Name: Friday Creek	Legal Descri	ption (MTRS): S016N004E04	
Anadromous Waters Catalog Number:				
Geographic Comments: Upstream end of reach loca	ated where chann	el runs agains	t left-bank bedrock o	canyon wall.
Visit Comments: Fish sampledhabitat assessed on fairly clear. Low voltage required visually estimated at 10 m. Bankf	for electrofishing	g implies wate	r conductivity was h	
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): DO (mg/L): D	O (%):	Conductivit	y (µS/cm):	pH:
Water Color: Clear Turbidity (N	TU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%): 4 Entrenchme	ent: Moderatle	y Entrenched		
Catchment Area(sq. km): 149 Embeddedn	ess: Moderate			
			strate: Cobble	
Width Thalweg Depth		ominant Subst ominant Subst	trate 1: Gravel	
Rosgen Class:	Subu	minant Subs	ate 2. Sand	
	le of al 1007)			
Riparian Vegetation Communities (Vierec				-
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	Vegetation Type	Canopy Height(m)
0-5 Closed Paper Birch Forest	-	Unvegetated	regetation Type	
5 - 10 Closed Paper Birch Forest	18	Unvegetated		
10 - 20 Closed Paper Birch Forest	18	Unvegetated		
20 - 30 Closed Paper Birch Forest	18	Unvegetated		
		0	20	
• • •	Stimated reach	-		
(PEF) Backpack Electrofisher	(VOG) Visual Obse	ervation, Ground	
Fish Observations				
Species: Dolly Varden Life Stage:	adult	Life Hi	story: Unknown	
	rk Lengths (mm) Min:	Max: Mean	n: Median:
Sampling Method (No. of fish): VOG (3) Comments: Bright yellow spots.				
	juvenile/adult	Life Hi	story: Unknown	
Total Fish Count: 19 Fish Measured: 12 Fo			-	n: 149 Median: 165
Sampling Method (No. of fish): PEF (12) VOG (7)			
Comments:				
Instruments				
Stream Gradient: handheld optical clinometer	Channe	d Depths:		
Stream Velocity:		l Widths:		
Turbidity:	Electro	fisher: Smit	h-Root LR-24	
	T			

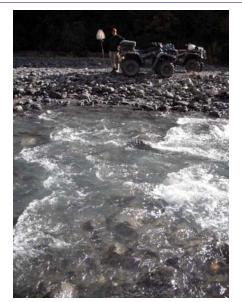
Transparency:



FSS1103F020897.jpg

FSS1103F020898.jpg

FSS1103F020899.jpg



FSS1103F020900.jpg

Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/23/2011 2:15 PM Sample Latitude Longitude Coordinates -148.70383 61.47714 Elevation NED (m)(ft): 51 167 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E15 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear, right-bank Knik River tributary at ATV trail crossing. This stream flows along the edge of the Knik River floodplain in an area dominated by mature-stage cottonwood and alder, which was abandoned by the main channel, but may still be flooded annually. Visit Comments: Visual observations of salmon only--no electrofishing or habitat assessment occurred. ATV trail in stream bed through sockeye salmon spawning area. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 28 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count:** 5 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (5) Comments: Salmon were on redds. Instruments **Stream Gradient: Channel Depths: Channel Widths:** Stream Velocity: **Turbidity: Electrofisher:** Water Quality: **Transparency:**



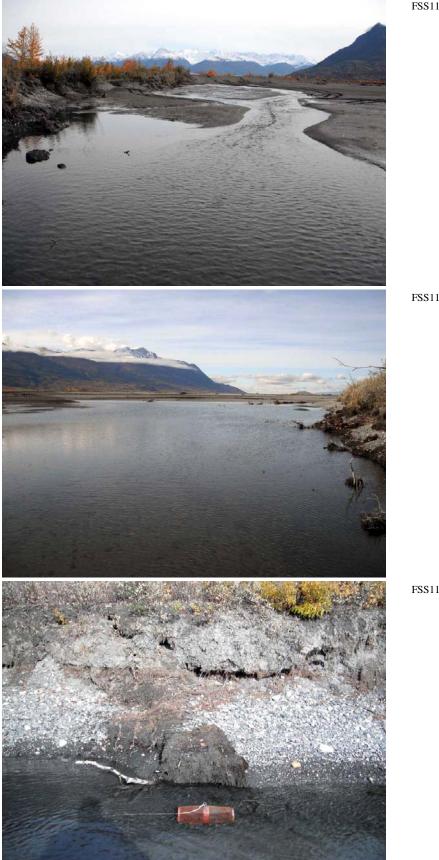
FSS1103F030902.jpg Sockeye redd.

FSS1103F030904.jpg

FSS1103F030905.jpg

Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 09/23/2011 2:35 PM Sample Latitude Longitude Coordinates 61.46702 -148.70517 Elevation NED (m)(ft): 34 112 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E22 Waterbody Name: Knik River Anadromous Waters Catalog Number: 247-50-10200 Geographic Comments: Knik River side channel flowing with clear hyporheic water (spring-fed). This channel is located within the currently-active braid plain of the Knik River. Visit Comments: Minnow trapping and visual observations only--no electrofishing or habitat assessment occurred. Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): Water Temp (C): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 3 Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 103 Fish Measured: 3 Fork Lengths (mm) Min: 48 Max: 53 Median: 50 Mean: 50 Sampling Method (No. of fish): MTR (3) VOG (100) Suspected Spawning: Yes Comments: ~50 mm. Redds present (photo 909). Instruments **Stream Gradient: Channel Depths:**

Stream Gradient:Channel Depths:Stream Velocity:Channel Widths:Turbidity:Electrofisher:Water Quality:Transparency:



FSS1103F040906.jpg

FSS1103F040907.jpg

FSS1103F040908.jpg

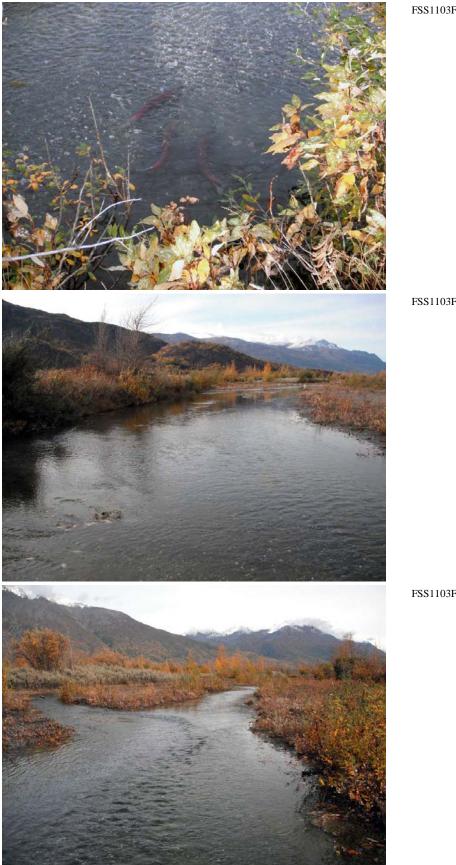


FSS1103F040909.jpg Suspected salmon (sockeye) redds.

Station Info						
Observers: Joe Bucky	walter, Joe Giefer			Date/Time	: 09/23/20	11 3:07 PM
		Sample	Latitude	Longitude /	Latitude	Longitude
	44 151	Coordinates	61.43610	-148.64620 /	61.43606	-148.67074
Elevation NED (m)(ft)					2.4	
	tion Method: Non-Diff			Datum: WGS8		
USGS Quadrangle: An Waterbody Name: Kn		Legal Descrip	otion (MTRS): S016N004E36	•	
•	Catalog Number: 247-50	0-10200				
	s: Clear Knik River side attached), now flowing currently-active braid Imagery (attached), an		r (spring-fed). r. This chanr stable in its c	. This channel is least the second seco	ocated with ing Maps A	in the erial
	ream waypoint located at no electrofishing or hab			nnel. Visual obse	rvations of	salmon
Water Quality \ Str Water Temp (C):	DO (mg/L):	DO (%):	Conductivit	v (uS/cm)•	pH:	
Water Color: Clear	-			ocity (m/s)(ft/s):	pii.	
Stream Channel						
	-	• .				
Stream Gradient (%):	Entreno					
Stream Gradient (%): Catchment Area(sq. kr	m): 1 Embedo	dedness:	aminant Sub	actuator Gravel		
Stream Gradient (%):	m): 1 Embedo (m): Bankfull OHV	dedness: V Wetted D		ostrate: Gravel trate 1 · Silt/Clav		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (m): 1 Embedd (m): Bankfull OHV Width	dedness: V Wetted D Subdow	minant Subs	trate 1: Silt/Clay		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwa	m): 1 Embedo (m): Bankfull OHV	dedness: V Wetted D Subdow		trate 1: Silt/Clay		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class:	m): 1 Embedd (m): Bankfull OHV Width eg Depth	dedness: V Wetted D Subdor Subdor	minant Subs	trate 1: Silt/Clay		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation	m): 1 Embedd (m): Bankfull OHV Width	dedness: V Wetted D Subdor Subdor ereck et al. 1992)	minant Subs	trate 1: Silt/Clay		Canony
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		Canopy Height(n
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay		Canopy Height(n
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vid <u>Vegetation Type</u>	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vid <u>Vegetation Type</u>	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vid <u>Vegetation Type</u>	dedness: V Wetted D Subdor Subdor ereck et al. 1992) Canopy	minant Subst	trate 1: Silt/Clay trate 2:		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (VOG) Visual Observat Fish Observations Species: sockeye salmo Total Fish Count: 10 Sampling Method (No	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vid Vegetation Type ing Methods ion, Ground n Life Sta 00 Fish Measured: p. of fish): VOG (100)	dedness: V Wetted D Subdox Subdox ereck et al. 1992) Canopy Height(m) <u>1</u> age: adult spawning Fork Lengths (mm)	minant Subst minant Subst Right Bank V	trate 1: Silt/Clay trate 2: <u>Vegetation Type</u> story: Anadromo		
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (VOG) Visual Observat Fish Observations Species: sockeye salmo Total Fish Count: 10 Sampling Method (No	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie Vegetation Type ing Methods ion, Ground n Life Sta 00 Fish Measured: p. of fish): VOG (100) roughout reach in pools a	dedness: V Wetted D Subdox Subdox ereck et al. 1992) Canopy Height(m) <u>1</u> age: adult spawning Fork Lengths (mm) and glides, on redds.	minant Subst minant Subst Right Bank V Life His Min:	trate 1: Silt/Clay trate 2: Vegetation Type story: Anadromo Max: Mo	ean:	Height(n
Stream Gradient (%): Catchment Area(sq. kr Channel Dimensions (Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (VOG) Visual Observat Fish Observations Species: sockeye salmo Total Fish Count: 10 Sampling Method (No	m): 1 Embedd (m): Bankfull OHV Width eg Depth n Communities (Vie Vegetation Type ing Methods ion, Ground n Life Sta 00 Fish Measured: p. of fish): VOG (100) roughout reach in pools a	dedness: V Wetted D Subdox Subdox ereck et al. 1992) Canopy Height(m) <u>1</u> age: adult spawning Fork Lengths (mm)	minant Subst minant Subst Right Bank V Life His Min: Life His	trate 1: Silt/Clay trate 2: Vegetation Type story: Anadromo Max: Mo	ean:	Height(n

Instruments

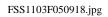
Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:



FSS1103F050914.jpg

FSS1103F050916.jpg

FSS1103F050917.jpg





FSS1103F050919.jpg

FSS1103F050920.jpg



FSS1103F050922.jpg Sockeye redd.

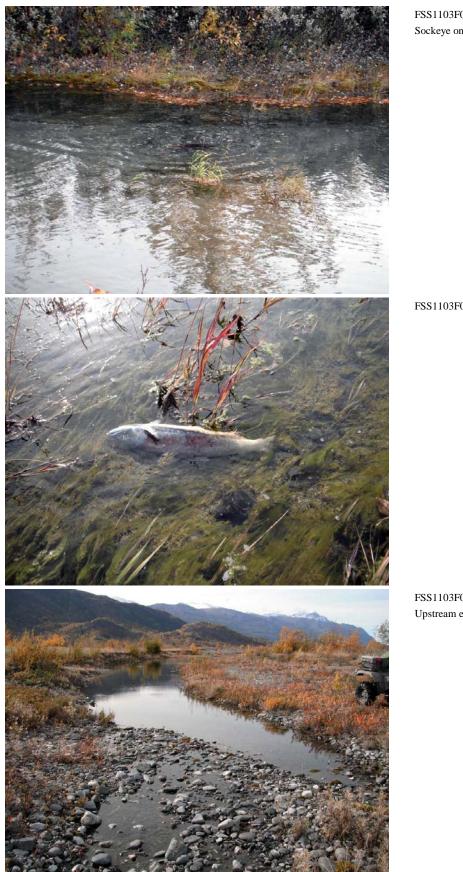
FSS1103F050923.jpg



FSS1103F050924.jpg Sockeye spawning.

FSS1103F050926.jpg Sockeye carcasses.

FSS1103F050928.jpg



FSS1103F050931.jpg Sockeye on redd.

FSS1103F050933.jpg

FSS1103F050935.jpg Upstream end of wetted channel.



FSS1103F050936.jpg Upstream end of wetted channel.

FSS1103F050937.jpg Spawning sockeye near upstream end of wetted channel.

Station Info

Observers: Joe Buckwalter, J	oe Giefer			Date/Time:	: 09/23/2011 3:52 PM
		Sample Coordinates	Latitude 61.46739	Longitude -148.70594	
Elevation NED (m)(ft): 34 11 Coordinate Determination Me USGS Quadrangle: Anchorag Waterbody Name: Knik River Anadromous Waters Catalog Geographic Comments: See (ethod: Non-Differen e B-5 x Number: 247-50-102			Datum: WGS8-): S016N004E22	4
Visit Comments: Visual obser	vations of salmon onl	yno fish collecti	on or habitat	assessment occurr	red.
Wildlife Comments:					
Water Quality \ Stream F	low				
Water Temp (C):DOWater Color: Clear	(mg/L): D Turbidity (N	O (%): TU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km): 3	Bankfull OHW	ess: Wetted D) Dominant Sub minant Subst		
Widt					
Widt Thalweg Dept			minant Subst		
Widt					
Widt Thalweg Dept	h	Subdo			
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) <u>Left Bank Vegetat</u> 0 - 5 5 - 10 10 - 20	h munities (Vierec	Subdor k et al. 1992) Canopy	minant Subst		Canopy Height(m)
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) <u>Left Bank Vegetat</u> 0 - 5 5 - 10 10 - 20 20 - 30	h umunities (Vierec <u>tion Type</u>	Subdor k et al. 1992) Canopy	minant Subst	crate 2:	10
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) <u>Left Bank Vegetat</u> 0 - 5 5 - 10 10 - 20	h umunities (Vierec tion Type ethods	Subdor k et al. 1992) Canopy	minant Subst	crate 2:	10
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) Left Bank Vegetat 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Mo (VOG) Visual Observation, Gro Fish Observations Species: sockeye salmon	h umunities (Vierec tion Type ethods ound Life Stage: sh Measured: Fo	Subdor k et al. 1992) Canopy	minant Subst	Vegetation Type	Height(m)
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) Left Bank Vegetat 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Me (VOG) Visual Observation, Gro Fish Observations Species: sockeye salmon Total Fish Count: 10 Fis Sampling Method (No. of fish	h umunities (Vierec tion Type ethods ound Life Stage: sh Measured: Fo	Subdor 2k et al. 1992) Canopy Height(m)	minant Subst	Vegetation Type	Height(m)
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Composition Dist. from Bank (m) Left Bank Vegetat 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Ma (VOG) Visual Observation, Grown Fish Observations Species: sockeye salmon Total Fish Count: 10 Fish Sampling Method (No. of fish Comments:	h umunities (Vierec tion Type ethods ound Life Stage: sh Measured: Fo	Subdor Ek et al. 1992) Canopy Height(m)	minant Subst	Vegetation Type	Height(m)
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) <u>Left Bank Vegetat</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Me (VOG) Visual Observation, Gro Fish Observations Species: sockeye salmon Total Fish Count: 10 Fis Sampling Method (No. of fish Comments: Instruments	h umunities (Vierec tion Type ethods ound Life Stage: sh Measured: Fo	Subdor Ek et al. 1992) Canopy Height(m)	minant Subst	Vegetation Type	Height(m)
Widt Thalweg Dept Rosgen Class: Riparian Vegetation Com Dist. from Bank (m) <u>Left Bank Vegetat</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Ma (VOG) Visual Observation, Gro Fish Observations Species: sockeye salmon Total Fish Count: 10 Fis Sampling Method (No. of fish Comments: Instruments Stream Gradient:	h umunities (Vierec tion Type ethods ound Life Stage: sh Measured: Fo	Subdor Ek et al. 1992) Canopy Height(m)	Minant Subst	Vegetation Type	Height(m)



FSS1103F060940.jpg Sockeye salmon on redd.

FSS1103F060941.jpg

FSS1103F060942.jpg

Station Info Observers: Joe Buckwalter Date/Time: 08/17/2011 9:54 AM Sample Latitude Longitude Latitude Longitude Coordinates 62.81148 -149.10049 62.83282 -149.42515 Elevation NED (m)(ft): 385 1263 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts D-5 Legal Description (MTRS): S031N002E04 Waterbody Name: Susitna River **Anadromous Waters Catalog Number:** Geographic Comments: This site represents Devils Canyon. No data were collected. Visit Comments: This site represents Devils Canyon. No data were collected. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Fish Measured:** Fork Lengths (mm) Min: Max: Median: **Total Fish Count:** 0 Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths: Turbidity: Electrofisher:** Water Quality: **Transparency:**

Station In	fo						
Observers	: Joe Buckwa	lter, David Pluth			Date/Ti	ime: 08/06/20)11 9:30 AM
Station Coordina		8	Sample Coordinates	Latitude 62.65552	Longitude -147.31278	/ Latitude 62.69473	Longitude -147.46353
	NED (m)(ft):						
		on Method: Non-Diff			Datum: W		
-	adrangle: Talk y Name: Susit		Legal Descrip	otion (MTRS): S030N0111	E25	
		talog Number:					
Geographi	c Comments:	MU9.					
Visit Com	subread	sor not working. Gene ch 5 in order to reach C en to mouth of Jay cree	Oshetna River mouth (s				
Wildlife C	omments:						
Water Qu	ality \ Strea	am Flow					
	np (C): 6.75	DO (mg/L): 10.95			y (µS/cm): 86	-	
Water Col	or: Glacial, Hi	gh Turbidit Turbidit	y (NTU): 254.00	Thalweg Vel	ocity (m/s)(ft/	(s): 2.50 8.20	
Stream C	hannel						
Stream Gr	adient (%):	Entreno	chment: Entrenched	l			
Catchmen	t Area(sq. km)	e: 8637 Embedo	dedness:				
Channel I	Dimensions (m	*			strate: Bould		
		Width 153.0 Depth 3.80			rate 1: Cobbl rate 2: Silt/C		
Rosgen Cl	-	ched, relatively low to				-	σh
Kösgen Ch	width/dep	-	moderate sindosity, m	ne/poor chan	ner on low gre	latents with hi	511
Riparian	Vegetation	Communities (Vie	ereck et al. 1992)				
Riparian Dist. from Bank (m)		Communities (Vie	Canopy	Right Bank V	egetation Ty	<u>pe</u>	Canopy Height(m)
Dist. from	Left Bank Vo		Canopy Height(m)	Right Bank V Open White S		<u>pe</u>	
Dist. from Bank (m)	Left Bank Vo Open Black S	egetation Type	Canopy Height(m) 1 orest 7 (pruce Forest	<u>pe</u>	Height(m)
Dist. from Bank (m) 0 - 5 5 - 10	Left Bank Ve Open Black S Open Black S	egetation Type Spruce-White Spruce Fe	Canopy Height(m)orest7orest7	Open White S	pruce Forest pruce Forest	<u>pe</u>	Height(m) 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20	Left Bank Vo Open Black S Open Black S Open Black S	egetation Type Spruce-White Spruce Fo Spruce-White Spruce Fo	Canopy Height(m)orest7orest7orest7	Open White S Open White S	pruce Forest pruce Forest pruce Forest	<u>pe</u>	Height(m) 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	Left Bank Vo Open Black S Open Black S Open Black S Open Black S	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe	Canopy Height(m)0orest70orest70orest7000 <td< td=""><td>Open White S Open White S Open White S Open White S</br></td><td>pruce Forest pruce Forest pruce Forest pruce Forest</td><td>_</td><td>Height(m) 7 7 7 7 7</td></td<>	Open White S Open White S Open White S 	pruce Forest pruce Forest pruce Forest pruce Forest	_	Height(m) 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Left Bank Vo Open Black S Open Black S Open Black S	egetation Type Spruce-White Spruce For Spruce-White Spruce For Spruce-White Spruce For Spruce-White Spruce For Spruce-White Spruce For	Canopy Height(m) I orest 7 0	Open White S Open White S Open White S Open White S ength (m): ##	pruce Forest pruce Forest pruce Forest pruce Forest	_	Height(m) 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele	egetation Type Spruce-White Spruce For Spruce-White Spruce For Spruce-White Spruce For Spruce-White Spruce For Spruce-White Spruce For	Canopy Height(m) I orest 7 0	Open White S Open White S Open White S Open White S ength (m): ##	pruce Forest pruce Forest pruce Forest pruce Forest ## Total El	_	Height(m) 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher	Canopy Height(m) orest 7 orest 7 orest 7 orest 7 0 orest 7 0 extimated reach letter (VOB)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse	pruce Forest pruce Forest pruce Forest pruce Forest ## Total El rvation, Boat	ectrofishing T	Height(m) 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta	Canopy I Height(m) I orest 7 0 borest 7 0 corest 7 0 corest 7 0 Estimated reach le (VOB)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse	Spruce Forest Spruce Forest Spruce Forest H# Total Ele rvation, Boat	ectrofishing T	Height(m) 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher	Canopy Height(m) 1 orest 7 6 orest 7 6 orest 7 6 orest 7 6 Estimated reach 16 (VOB)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse	Spruce Forest Spruce Forest Spruce Forest H# Total Ele rvation, Boat	ectrofishing T	Height(m) 7 7 7 7 2 3 3 7 3 3 7 3 7 7 7 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. ose	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe ag Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI	Canopy Height(m) 1 orest 7 0 orest 7 0 orest 7 0 orest 7 0 Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) B (4)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse	Spruce Forest Spruce Forest Spruce Forest H# Total Ele rvation, Boat	ectrofishing T	Height(m) 7 7 7 7 2 3 3 7 3 3 7 3 7 7 7 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment Species: A	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. os: rctic grayling	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI Life Sta	Canopy Height(m) 1 orest 7 0 orest 7 0 orest 7 0 corest 7 0 Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) B (4)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse Life His Min: 224	<pre>%pruce Forest %pruce Forest %pruce Forest %pruce Forest ## Total Ele rvation, Boat story: Reside Max: 231</pre>	ectrofishing T nt Mean: 228 nt	Height(m) 7 7 7 7 Cime (s): 5827 Median: 227
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment Species: A Total Fish	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. o s: rctic grayling a Count: 5	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI Life Sta Fish Measured: 4	Canopy Height(m) 1 orest 7 (orest 7 (orest 7 (corest 7 (Estimated reach le (VOB) age: juvenile/adult Fork Lengths (mm) B (4) age: juvenile	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse Life His Min: 224	<pre>%pruce Forest %pruce Forest %pruce Forest %pruce Forest ## Total Ele rvation, Boat story: Reside Max: 231</pre>	ectrofishing T nt Mean: 228	Height(m) 7 7 7 7 2 3 3 7 3 3 7 3 7 7 7 7 7 7 7 7
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment Species: A Total Fish	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. o s: retic grayling a Count: 5 Method (No. o	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI Life Sta	Canopy Height(m) 1 orest 7 (orest 7 (orest 7 (corest 7 (Estimated reach le (VOB) age: juvenile/adult Fork Lengths (mm) B (4) age: juvenile	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse Life His Min: 224	<pre>%pruce Forest %pruce Forest %pruce Forest %pruce Forest ## Total Ele rvation, Boat story: Reside Max: 231</pre>	ectrofishing T nt Mean: 228 nt	Height(m) 7 7 7 7 Cime (s): 5827 Median: 227
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment Species: A Total Fish Sampling Comment	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. o s: retic grayling a Count: 5 Method (No. o s:	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI Life Sta Fish Measured: 4	Canopy Height(m) 1 orest 7 0 orest 7 0 orest 7 0 orest 7 0 Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) B (4) B (1)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse Life His Min: 224 Life His Min: 158	<pre>%pruce Forest %pruce Forest %pruce Forest %pruce Forest ## Total Ele rvation, Boat story: Reside Max: 231</pre>	ectrofishing T nt Mean: 228 nt Mean: 167	Height(m) 7 7 7 7 Cime (s): 5827 Median: 227
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment Species: A Total Fish Sampling Comment Species: ge Total Fish	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. o s: retic grayling a Count: 5 Method (No. o s: eneral fish obse a Count: 2	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI Life Sta Fish Measured: 4 of fish): BEF (4) VOI	Canopy Height(m) 1 orest 7 0 orest 7 0 orest 7 0 orest 7 0 Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) B (4) B (1)	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse Life His Min: 224 Life His Min: 158	Spruce Forest Spruce Forest Spruce Forest Spruce Forest Total Electronic Reside Max: 231	ectrofishing T nt Mean: 228 nt Mean: 167	Height(m) 7 7 7 7 Cime (s): 5827 Median: 227
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: ro Total Fish Sampling Comment Species: A Total Fish Sampling Comment Species: ge Total Fish	Left Bank Vo Open Black S Open Black S Open Black S Open Black S ish Samplin at-Mounted Ele ervations ound whitefish a Count: 7 Method (No. of s: retic grayling a Count: 5 Method (No. of s: eneral fish obse a Count: 2 Method (No. of s:	egetation Type Spruce-White Spruce Fe Spruce-White Spruce Fe Spruce-White Spruce Fe g Methods ectrofisher Life Sta Fish Measured: 3 of fish): BEF (3) VOI Life Sta Fish Measured: 4 of fish): BEF (4) VOI	Canopy Height(m) 1 orest 7 0 orest 7 0 orest 7 0 corest 7 0 Estimated reach lo (VOB) age: juvenile/adult Fork Lengths (mm) B (4) B (1) age: juvenile/adult	Open White S Open White S Open White S Open White S ength (m): ## Visual Obse Life His Min: 224 Life His Min: 158	<pre>%pruce Forest %pruce Forest %pruce Forest %pruce Forest ## Total Ele rvation, Boat story: Reside Max: 231 story: Reside Max: 181</pre>	ectrofishing T nt Mean: 228 nt Mean: 167 nt	Height(m) 7 7 7 7 Vime (s): 5827 Median: 227 Median: 169

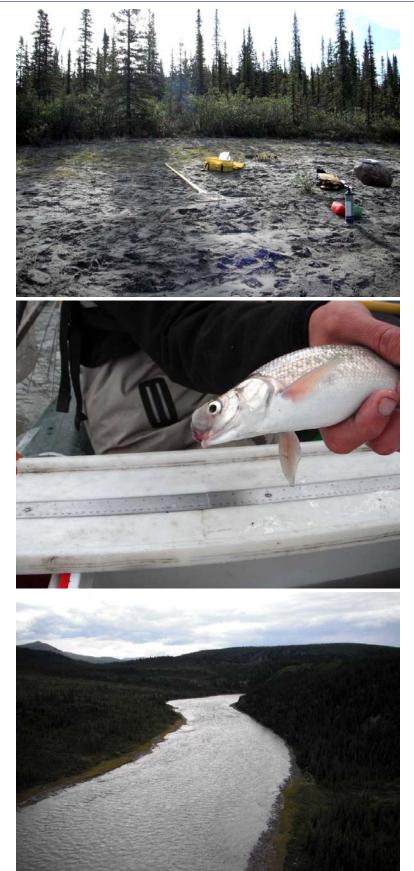
Appendix L58.-Page 2 of 5.

Life History: Resident Species: longnose sucker Life Stage: adult Fork Lengths (mm) Min: 362 Max: 405 Total Fish Count: 17 Fish Measured: 8 Mean: 379 Median: 383 Sampling Method (No. of fish): BEF (8) VOB (9) **Comments:** Species: whitefish-unspecified Life Stage: juvenile Life History: Resident **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 87 Max: 87 Median: 87 Mean: 87 Sampling Method (No. of fish): BEF (1) **Comments:** Species: sculpin-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 1 Fork Lengths (mm) Min: Max: Median: Fish Measured: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Fish Measured: 4 **Total Fish Count:** 7 Fork Lengths (mm) Min: 223 Max: 333 Mean: 262 Median: 278 Sampling Method (No. of fish): BEF (4) VOB (3) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 196 Max: 324 Mean: 233 **Median: 260** Sampling Method (No. of fish): BEF (6) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (2) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 135 Max: 273 Median: 204 **Mean: 223** Sampling Method (No. of fish): BEF (3) **Comments:** Species: Arctic grayling Life History: Resident Life Stage: adult Total Fish Count: 12 Fish Measured: 2 Fork Lengths (mm) Min: 335 Max: 360 Mean: 347 Median: 347 Sampling Method (No. of fish): BEF (2) VOB (10) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 320 Max: 325 Median: 322 **Total Fish Count:** 2 Fish Measured: 2 Mean: 322 Sampling Method (No. of fish): BEF (2) **Comments:** Species: burbot Life Stage: juvenile/adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 497 Max: 497 Median: 497 **Total Fish Count:** 1 Mean: 497 Sampling Method (No. of fish): BEF (1) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: adult Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 70 Max: 70 **Mean:** 70 Median: 70 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

inder
nder





FSS1104A010392.jpg

FSS1104A010395.jpg Round whitefish with fungus.

FSS1104A010397.jpg



FSS1104A010398.jpg

FSS1104A010399.jpg Looking downstream at Watana Canyon from sample reach.



Station In	fo						
Observers	Jonathan Ki	rsch, Ashley Reed			Date/T	ime: 08/06/2	011 10:35 AM
Station Coordinat		Longitude -148.46492	Sample Coordinates	Latitude 62.76426	Longitude -148.46492	Latitude / 62.76308	8
	NED (m)(ft): 6				_		
		on Method: Non-Diffe	rential GPS Field Me Legal Descrip		Datum: W		
-	idrangle: Talk y Name: Fog C		Legal Descrip	00011 (1 v 1 1 KS)	: 50511005	E23	
-	ous Waters Cat						
Geographi	c Comments:	IU25					
Visit Com	were ta	almon redds (almost cen ken in an effort to docun ted from TVHR reading	ment these redds, but				
Wildlife C	omments:						
Water Qu	ality \ Strea	ım Flow					
Water Ten	np (C): 6.33	DO (mg/L): 12.50	DO (%): 101.30	Conductivity	(μS/cm): 78	рН: 5.:	58
Water Col	or: Clear	Turbidity	(NTU): 16.80	Thalweg Velo	ocity (m/s)(ft	/s): 1.10 3.61	
Stream C	hannel						
Stream Gr	adient (%): 0	.5 Entrench	ment: Slightly En	trenched			
Catchment	t Area(sq. km)	: 156 Embedde	edness: Negligible				
Channel I	Dimensions (m			ominant Sub			
		Width 18.0 Depth 0.80		minant Subst minant Subst			
Rosgen Cl	-	radient, meandering, poi				-	floodplains
		Communities (Vier	-				
Dist. from			Canopy				Canopy
Bank (m)	<u>Left Bank Ve</u>	egetation Type	Height(m)	<u>Right Bank V</u>	egetation Ty	/pe	Height(m)
0 - 5	Closed Tall A	lder-Willow Shrub	3	Closed Spruce	-Paper Birch	Forest	14
5 - 10	Closed Tall A	lder-Willow Shrub	3	Closed Spruce	-Paper Birch	Forest	14
10 - 20							14
	Closed Spruce	e-Paper Birch Forest	18	Closed Spruce	-Paper Birch	Forest	14
20 - 30	-	e-Paper Birch Forest e-Paper Birch Forest		Closed Spruce Closed Spruce	-		
	-	e-Paper Birch Forest		Closed Spruce	-Paper Birch	Forest	14 14
Key To Fi	Closed Spruce	e-Paper Birch Forest g Methods	18 C	Closed Spruce	-Paper Birch	Forest ectrofishing	14 14
Key To Fi	Closed Spruce ish Samplin at-Mounted Ele	e-Paper Birch Forest g Methods	18 C	Closed Spruce ength (m): 220	-Paper Birch	Forest ectrofishing	14 14
Key To Fi (BEF) Boz Fish Obse Species: D	Closed Spruce ish Samplin at-Mounted Electronic crvations olly Varden	e-Paper Birch Forest g Methods ctrofisher Life Stag	18 (Estimated reach le (VOB) ge: juvenile/adult	Closed Spruce ength (m): 220 Visual Observer Life His	-Paper Birch 00 Total El rvation, Boat tory: Unkno	Forest ectrofishing 7	14 14 Fime (s): 947
Key To Fi (BEF) Boa Fish Obse Species: D Total Fish	Closed Spruce ish Samplin at-Mounted Electrons olly Varden a Count: 28 Method (No. o	e-Paper Birch Forest g Methods ctrofisher Life Stag	18 Estimated reach le (VOB) ge: juvenile/adult Fork Lengths (mm)	Closed Spruce ength (m): 220 Visual Observer Life His	-Paper Birch 00 Total El rvation, Boat tory: Unkno	Forest	14 14
Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling Comment	Closed Spruce ish Samplin at-Mounted Electrons olly Varden a Count: 28 Method (No. o	e-Paper Birch Forest g Methods ctrofisher Life Stag Fish Measured: 8 of fish): BEF (8) VOB	18 Estimated reach le (VOB) ge: juvenile/adult Fork Lengths (mm)	Closed Spruce ength (m): 220 Visual Observer Life His Min: 100	-Paper Birch 00 Total El rvation, Boat tory: Unkno	Forest ectrofishing 7 own Mean: 189	14 14 Fime (s): 947
Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling Comment Species: sli Total Fish	Closed Spruce ish Samplin at-Mounted Electrons olly Varden a Count: 28 Method (No. of s: imy sculpin a Count: 14 Method (No. of	e-Paper Birch Forest g Methods ctrofisher Life Stag Fish Measured: 8 of fish): BEF (8) VOB Life Stag	18 Estimated reach lo (VOB) ge: juvenile/adult Fork Lengths (mm) (20)	Closed Spruce ength (m): 220 Visual Obser Life His Min: 100 Life His	-Paper Birch 20 Total El rvation, Boat tory: Unkno Max: 245	Forest ectrofishing 7 own Mean: 189	14 14 Fime (s): 947
Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling Comment Species: sli Total Fish Sampling Comment	Closed Spruce ish Samplin at-Mounted Electrons olly Varden a Count: 28 Method (No. of s: imy sculpin a Count: 14 Method (No. of	e-Paper Birch Forest g Methods ctrofisher Life Stag Fish Measured: 8 of fish): BEF (8) VOB Life Stag Fish Measured: of fish): VOB (14)	18 Estimated reach lo (VOB) ge: juvenile/adult Fork Lengths (mm) (20) ge: juvenile/adult	Closed Spruce ength (m): 220 Visual Observer Life His Min: 100 Life His Min:	-Paper Birch 20 Total El rvation, Boat tory: Unkno Max: 245 tory: Reside	Forest ectrofishing 7 own Mean: 189 ent Mean:	14 14 Fime (s): 947 Median: 172

 Species: slimy sculpin
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 125
 Mean:
 125
 Median:
 125

 Sampling Method (No. of fish):
 BEF (1)
 EF (1)</

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1104B010319.jpg

FSS1104B010320.jpg

FSS1104B010321.jpg



FSS1104B010324.jpg

FSS1104B010329.jpg



FSS1104B010330.jpg



Station Info				
Observers: Raye Ann Neustel, Daniel Reed			Date/Time: 08/06	5/2011 7:56 AM
Station Latitude Longitude Coordinates 62.68477 -148.58492	Sample Coordinates	Latitude 62.68394	Longitude / Latitu -148.58511 / 62.685	0
Elevation NED (m)(ft): 874 2867				
Coordinate Determination Method: Non-Dif			Datum: WGS84	
USGS Quadrangle: Talkeetna Mts C-4 Waterbody Name:	Legal Descri	ption (NI 1 KS)	: \$030N005E18	
Anadromous Waters Catalog Number:				
Geographic Comments: Fog Creek has a serie River. Unnamed trib	s of 4 ledges less than utary of Fog Creek. H		2 km before confluence	with Susitna
Visit Comments: Very fast moving water in ma section approximately 2 km a			lel to river continually u	ntil canyon
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 6.38 DO (mg/L): 10.86	DO (%): 88.10	Conductivity	(µS/cm): 43 pH :	7.68
Water Color: Clear Turbidi	ty (NTU): 1.00	Thalweg Velo	city (m/s)(ft/s): 1.68 5.	51
Stream Channel				
	chment: Slightly Er dedness: Negligible			
Channel Dimensions (m): Bankfull OH	W Wetted I	Dominant Sub	strate: Boulder	
Width 18.6			rate 1: Cobble	
Thalweg Depth 1.00		minant Subst		10 11.
Rosgen Class: C2 Low gradient, meandering, p	oint-bar, riffie/pool, al	iuviai channei	s with broad, well-define	ed floodplains.
Riparian Vegetation Communities (Vi	ereck et al. 1992)			
Dist. from	Canopy			Canopy Usight(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)		egetation Type	Height(m)
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub	Canopy Height(m) 5	Closed Tall W		Height(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Closed Tall Willow Shrub	Canopy Height(m) 5 5	Closed Tall W Tall Scrub		Height(m) 5 6
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Closed Tall Willow Shrub10 - 20Closed Tall Willow Shrub	Canopy Height(m) 5 5 5	Closed Tall W Tall Scrub Fireweed	illow Shrub	Height(m) 5 6 3
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Closed Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Tall Willow Shrub	Canopy Height(m) 5 5 5 5	Closed Tall W Tall Scrub	illow Shrub	Height(m) 5 6
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Closed Tall Willow Shrub10 - 20Closed Tall Willow Shrub	Canopy Height(m) 5 5 5	Closed Tall W Tall Scrub Fireweed Closed Tall W	illow Shrub	Height(m) 5 6 3
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Closed Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Tall Willow Shrub	Canopy Height(m) 5 5 5 5 Estimated reach I	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 160	illow Shrub	Height(m) 5 6 3
Dist. from Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Closed Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Tall Willow ShrubKey To Fish Sampling Methods	Canopy Height(m) 5 5 5 5 Estimated reach I	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 160	illow Shrub illow Shrub	Height(m) 5 6 3
Dist. from Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Closed Tall Willow Shrub 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Life St	Canopy Height(m) 5 5 5 5 Estimated reach I	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 160	illow Shrub illow Shrub) vation, Ground tory: Anadromous	Height(m) 5 6 3 5
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Willow Shrub 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Life St Total Fish Count: 8 Fish Measured: 5	Canopy Height(m) 5 5 5 5 Estimated reach l (VOG)	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 160) Visual Obser Life His	illow Shrub illow Shrub) vation, Ground	Height(m) 5 6 3 5
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Willow Shrub 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Life State Species: Chinook salmon Life State Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO	Canopy Height(m) 5 5 5 5 Estimated reach l (VOG)	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 160) Visual Obser Life His	illow Shrub illow Shrub) vation, Ground tory: Anadromous	Height(m) 5 6 3 5
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Closed Tall Willow Shrub 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life St Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO Comments:	Canopy Height(m) 5 5 5 5 Estimated reach I (VOG) cage: juvenile Fork Lengths (mm G (3)	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 160) Visual Obser Life His) Min: 49	illow Shrub illow Shrub) vation, Ground tory: Anadromous Max: 61 Mean: 55	Height(m) 5 6 3 5
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Willow Shrub 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Life St Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO Comments: 10	Canopy Height(m) 5 5 5 5 Estimated reach l (VOG)	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 166) Visual Obser Life His) Min: 49 Life His	illow Shrub illow Shrub) vation, Ground tory: Anadromous	Height(m) 5 6 3 5
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Willow Shrub 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life St Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO Comments: Species: slimy sculpin Life St Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1)	Canopy Height(m) 5 5 5 5 Estimated reach I (VOG) cage: juvenile Fork Lengths (mm G (3)	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 166) Visual Obser Life His) Min: 49 Life His	illow Shrub illow Shrub) vation, Ground tory: Anadromous Max: 61 Mean: 55	Height(m) 5 6 3 5
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Closed Tall Willow Shrub 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life St Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO Comments: Species: slimy sculpin Life St Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments:	Canopy Height(m) 5 5 5 5 Estimated reach I (VOG) age: juvenile Fork Lengths (mm G (3) age: adult Fork Lengths (mm	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 166) Visual Obser Life His) Min: 49 Life His) Min: 94	illow Shrub illow Shrub vation, Ground tory: Anadromous Max: 61 Mean: 55 tory: Resident Max: 94 Mean: 94	Height(m) 5 6 3 5
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life St Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO Comments: Species: slimy sculpin Life St Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: slimy sculpin Life St	Canopy Height(m) 5 5 5 5 Estimated reach I (VOG) age: juvenile Fork Lengths (mm G (3) age: adult Fork Lengths (mm	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 166) Visual Obser Life His) Min: 49 Life His) Min: 94	illow Shrub illow Shrub) vation, Ground tory: Anadromous Max: 61 Mean: 55	Height(m) 5 6 3 5
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Willow Shrub 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Closed Tall Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life St Total Fish Count: 8 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) VO Comments: Species: slimy sculpin Life St Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) Comments: Species: slimy sculpin Life St	Canopy Height(m) 5 5 5 5 Estimated reach I (VOG) age: juvenile Fork Lengths (mm G (3) age: adult Fork Lengths (mm	Closed Tall W Tall Scrub Fireweed Closed Tall W ength (m): 166) Visual Obser Life His) Min: 49 Life His) Min: 94	illow Shrub illow Shrub vation, Ground tory: Anadromous Max: 61 Mean: 55 tory: Resident Max: 94 Mean: 94 tory: Resident	Height(m) 5 6 3 5

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 3
 Fish Measured:
 3
 Fork Lengths (mm)
 Min: 43
 Max: 50
 Mean: 46
 Median: 46

 Sampling Method (No. of fish):
 PEF (3)
 Comments:
 Fork Lengths (mm)
 Fork Lengths (mm)

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



FSS1104c010073.jpg Looking dowstream from transect site.

FSS1104c010074.jpg Looking upstream from transect site.

FSS1104c010076.jpg



-continued-735



FSS1104c010077.jpg Aerial photo of Fog Creek

FSS1104c010078.jpg Aerial photo of Fog Creek

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/06/2011 10:12 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.61421 -148.31099 Coordinates -148.31368 62.61258 62.61421 -148.31099 Elevation NED (m)(ft): 1031 3383 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-3 Legal Description (MTRS): S029N006E10 Waterbody Name: Tsisi Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.29 DO (mg/L): 10.90 DO (%): 88.30 Conductivity (µS/cm): 69 pH: 7.91 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): 1.36 4.46 **Stream Channel** Stream Gradient (%): 1.25 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 79 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Boulder **Width** 21.6 20.1 Subdominant Substrate 1: Cobble Thalweg Depth 0.94 0.53 Subdominant Substrate 2: Gravel Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 1 4 Closed Low Willow Shrub Closed Tall Willow Shrub 2.5 5 - 10 Closed Tall Willow Shrub 3.5 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 3.5 2.5 20 - 30 Closed Tall Willow Shrub 3.5 Closed Tall Willow Shrub 2.5 **Kev To Fish Sampling Methods** Estimated reach length (m): 285 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Fish Measured:** Max: Median: **Total Fish Count:** 1 Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOG (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 78 **Total Fish Count:** 3 Fish Measured: 3 Max: 92 **Mean:** 87 Median: 85 Sampling Method (No. of fish): PEF (3) **Comments: Species:** slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 55 **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 52 Max: 59 **Mean: 54** Sampling Method (No. of fish): PEF (4) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Median: 40 Total Fish Count: 11 Fork Lengths (mm) Min: 30 Max: 50 **Mean:** 43 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) VOG (5) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1104c020080.jpg

FSS1104c020081.jpg

FSS1104c020082.jpg



FSS1104c020084.jpg

FSS1104c020085.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/06/2011 7:41 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.76374 -148.40418 Coordinates -148.40220 62.76321 62.76370 -148.40413 Elevation NED (m)(ft): 721 2365 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts D-3 Legal Description (MTRS): S031N006E19 Waterbody Name: Fog Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 8.26 DO (mg/L): 10.95 DO (%): 93.10 Conductivity (µS/cm): 87 pH: 8.09 Water Color: Clear Turbidity (NTU): 0.20 Thalweg Velocity (m/s)(ft/s): 1.44 4.72 **Stream Channel** Stream Gradient (%): 0.75 Slightly Entrenched **Entrenchment:** Negligible **Catchment Area(sq. km):** 141 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble 9.9 9.4 Subdominant Substrate 1: Boulder Width Thalweg Depth 1.07 0.50 Subdominant Substrate 2: Rosgen Class: E3 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 3.5 25 Closed Tall Alder-Willow Shrub Open White Spruce Forest 25 5 - 10 Closed Tall Alder-Willow Shrub 3.5 Open White Spruce Forest 10 - 20 Closed Tall Alder-Willow Shrub 25 3.5 Open White Spruce Forest 20 - 30 Closed Tall Alder-Willow Shrub 3.5 Open White Spruce Forest 25 **Key To Fish Sampling Methods** Estimated reach length (m): 185 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: slimy sculpin Life Stage: juvenile Life History: Resident Fish Measured: 15 Fork Lengths (mm) Min: 30 Max: 50 Median: 40 Total Fish Count: 15 **Mean:** 42 Sampling Method (No. of fish): PEF (15) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Resident Total Fish Count: 21 Fish Measured: 15 Fork Lengths (mm) Min: 84 Max: 265 Mean: 123 Median: 174 Sampling Method (No. of fish): PEF (15) VOG (6) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 15 Fork Lengths (mm) Min: 70 Median: 90 **Total Fish Count:** 15 Max: 111 **Mean:** 88 Sampling Method (No. of fish): PEF (15) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 35 Fish Measured: 17 Fork Lengths (mm) Min: 54 Max: 64 **Mean: 58** Median: 59 Sampling Method (No. of fish): PEF (17) VOG (18) **Comments:**

 Species: Dolly Varden
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 18
 Fish Measured:
 18
 Fork Lengths (mm)
 Min:
 39
 Max:
 79
 Mean:
 46
 Median:
 59

 Sampling Method (No. of fish):
 PEF (18)
 Vertice
 Vertice

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1104c030087.jpg

FSS1104c030088.jpg



FSS1104c030090.jpg

FSS1104c030091.jpg

Station Info Observers: Joe Buckwalter, Jonathan Kirsch Date/Time: 07/14/2011 10:30 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.96491 -150.73813 Coordinates -150.73813 61.92617 61.96491 -150.69155 Elevation NED (m)(ft): 75 246 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-2 Legal Description (MTRS): S022N008W28 Waterbody Name: Kahiltna River Anadromous Waters Catalog Number: 247-41-10200-2053-3150 **Geographic Comments:** Visit Comments: pH displayed 7, but did not stabilize (drifting down), probably due to low conductivity. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 8.09 DO (mg/L): 10.94 DO (%): 92.50 Conductivity (µS/cm): 45 pH: Water Color: Glacial, High Turbidit Turbidity (NTU): 250.00 Thalweg Velocity (m/s)(ft/s): 2.78 9.12 **Stream Channel** Stream Gradient (%): 0.75 **Entrenchment:** Slightly Entrenched Catchment Area(sq. km): Negligible 2357 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble 80.0 Width 120.0 Subdominant Substrate 1: Gravel 1.50 Subdominant Substrate 2: Boulder Thalweg Depth 2.82 Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	5	Closed Tall Alder-Willow Shrub	5
5 - 10	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	27	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	27
10 - 20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	27	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	27
20 - 30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	27	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	27
Key To Fi	sh Sampling Methods Esti	mated reach	length (m): 1090 Total Electrofishing Tim	e (s): 2374
(BEF) Boa	t-Mounted Electrofisher	(VOE	B) Visual Observation, Boat	

Fish Observations

an:
an:
an:

Species: sculpin-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: whitefish-unspecified Life Stage: adult Life History: Unknown **Total Fish Count:** 3 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (3) Comments: Looked like humpback whitefish.

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: handheld sonar depth finder Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1104D010221.jpg

FSS1104D010222.jpg

FSS1104D010223.jpg



FSS1104D010224.jpg

Station Info Observers: Joe Buckwalter, David Pluth Date/Time: 08/07/2011 9:24 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.49302 -147.47168 Coordinates -147.47168 62.49302 62.53251 -147.45820 Elevation NED (m)(ft): 819 2687 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts B-1 Legal Description (MTRS): S028N011E29 Waterbody Name: Oshetna River **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Put-in above and took out below the confluence with the Black River. Oshetna River is clear while the Black River is turbid (glacial). pH sensor was not working. Habitat transect at large, light-colored granite boulder (1 M long) at wetted edge of right bank. At end of sample reach, continued to raft down the Oshetna River to within a mile of IU58, electrofishing intermittently (2311 seconds total). Observed all the same species that were caught/observed during sample reach. Took out at N 62 36.72', W 147 23.46'. Turbidity sample was contaminated. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.02 DO (mg/L): 11.21 DO (%): 92.50 Conductivity (µS/cm): 124 pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 1.94 6.36 **Stream Channel** Stream Gradient (%): 1.5 **Entrenchment:** Slightly Entrenched 891 **Embeddedness:** Negligible Catchment Area(sq. km): **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 48.0 Subdominant Substrate 1: Boulder 30.0 Thalweg Depth 1.62 0.80 Subdominant Substrate 2: Gravel Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5Open Black Spruce-White Spruce Forest 13 Closed Low Willow Shrub 1.4 5 - 10 Open Black Spruce-White Spruce Forest 13 Closed White Spruce Forest 14 10 - 20 Open Black Spruce-White Spruce Forest 13 Closed White Spruce Forest 14 20 - 30 Open Black Spruce-White Spruce Forest 13 Closed White Spruce Forest 14 **Key To Fish Sampling Methods** Estimated reach length (m): 5200 Total Electrofishing Time (s): 3188 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 31 Fish Measured: 7 Fork Lengths (mm) Min: 54 Max: 61 Mean: 56 Median: 57 Sampling Method (No. of fish): BEF (7) VOB (24) **Comments: Species:** Arctic grayling Life Stage: adult Life History: Resident Fish Measured: 6 Fork Lengths (mm) Min: 336 Max: 415 Median: 375 Total Fish Count: 11 Mean: 360 Sampling Method (No. of fish): BEF (6) VOB (5) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 13 Fish Measured: 12 Fork Lengths (mm) Min: 200 Max: 326 Mean: 251 Median: 263 Sampling Method (No. of fish): BEF (12) VOB (1)

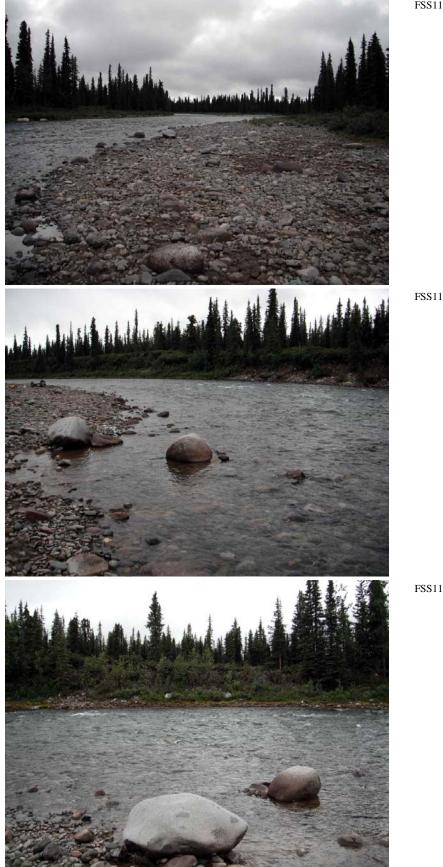
Comments:

Appendix L64.-Page 2 of 5.

Species: round whitefish Life Stage: adult Life History: Resident **Total Fish Count:** 7 Fork Lengths (mm) Min: 341 Max: 408 Fish Measured: 6 Mean: 387 Median: 374 Sampling Method (No. of fish): BEF (6) VOB (1) **Comments:** Species: longnose sucker Life Stage: adult Life History: Resident Total Fish Count: 16 Fish Measured: 8 Fork Lengths (mm) Min: 380 Max: 411 Mean: 389 Median: 395 Sampling Method (No. of fish): BEF (8) VOB (8) **Comments:** Life History: Unknown **Species:** general fish observation, no s **Life Stage:** juvenile **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (1) Comments: Event N is probably a round whitefish at approximately 200mm. Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 332 Max: 341 **Total Fish Count:** 2 Mean: 336 Median: 336 Sampling Method (No. of fish): BEF (2) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 261 Max: 318 Mean: 296 Median: 289 Sampling Method (No. of fish): BEF (3) **Comments:** Life History: Resident Species: Arctic grayling Life Stage: juvenile Median: 129 **Total Fish Count:** 9 Fish Measured: 7 Fork Lengths (mm) Min: 70 Max: 188 **Mean:** 146 Sampling Method (No. of fish): BEF (7) VOB (2) **Comments: Species:** slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 82 Max: 82 Median: 82 **Mean: 82** Sampling Method (No. of fish): BEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 24 Max: 49 **Mean: 35** Median: 36 Sampling Method (No. of fish): BEF (6) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity:	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



FSS1105A010401.jpg

FSS1105A010402.jpg

FSS1105A010403.jpg



FSS1105A010404.jpg

FSS1105A010406.jpg Lesions on round whitefish.



FSS1105A010407.jpg

FSS1105A010408.jpg



Appendix 205. Station 1 551105201.					
Station Info					
Observers: Jonathan Kirsch, Ashley Reed			Date/Time:	08/07/2011 1	0:48 AM
StationLatitudeLongitudeCoordinates62.50195-147.17393	Sample Coordinates	Latitude 62.50195	Longitude -147.17393		ongitude 17.16673
Elevation NED (m)(ft): 790 2592					
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna Mts C-1			Datum: WGS84): S028N012E23	4	
Waterbody Name: Sonona Creek Anadromous Waters Catalog Number: Geographic Comments: IU12	Legai Descrij	,uun (WTKS)	. 30201012223		
Visit Comments: pH sensor may have been malf	unctioning. Stream	velocity calcul	ated from TVHR 1	readings is 1.14	m/s.
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 7.92DO (mg/L): 10.71Water Color: ClearTurbidity	DO (%): 90.00 (NTU): 15.00	•	y (µS/cm): 184 ocity (m/s)(ft/s): 1	pH: 4.45 .10 3.61	
Stream Channel					
Stream Gradient (%): 0.5EntrenchCatchment Area(sq. km): 372Embedde	ment: Slightly Er edness: Negligible	trenched			
Channel Dimensions (m): Bankfull OHW	Wetted I	Oominant Sub	strate: Cobble		
Width 25.5			rate 1: Gravel		
Thalweg Depth 1.20 Rosgen Class: C3 Low gradient, meandering, poi			rate 2: Silt/Clay s with broad, well	-defined floodr	plains.
Riparian Vegetation Communities (Vier	-				
					G
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type		Canopy Ieight(m)
0 - 5 Open Tall Willow Shrub	-	Open Tall Wil			0.8
5 - 10 Open Tall Willow Shrub	2.2	Closed White	Spruce Forest		22
10 - 20 Open Tall Willow Shrub	2.2	Closed White	Spruce Forest		22
20 - 30 Open White Spruce Forest	20	Closed White	Spruce Forest		22
Key To Fish Sampling Methods	Estimated reach l	ength (m): 21	00 Total Electro	ofishing Time	(s): 921
(BEF) Boat-Mounted Electrofisher	(VOB)	Visual Obse	rvation, Boat		
Fish Observations					
Species: Arctic graylingLife StagTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):BEF (1)Comments:	ge: juvenile Fork Lengths (mm		story: Resident Max: 100 Me:	an: 100 Mee	lian: 100
Species: Arctic grayling Life Stag	ge: adult	Life His	story: Resident		
Total Fish Count:4Fish Measured:Sampling Method (No. of fish):VOB (4)Comments:	Fork Lengths (mm) Min:	Max: Me:	an: Meo	lian:
Species: slimy sculpinLife StagTotal Fish Count:21Fish Measured:Sampling Method (No. of fish):BEF (1) VOBComments:	-		story: Resident Max: 52 Mea	an: 52 Meo	lian: 52
Species: Arctic graylingLife StagTotal Fish Count:6Fish Measured: 1Sampling Method (No. of fish):BEF (1) VOBComments:			story: Resident Max: 290 Mea	an: 290 Meo	lian: 290

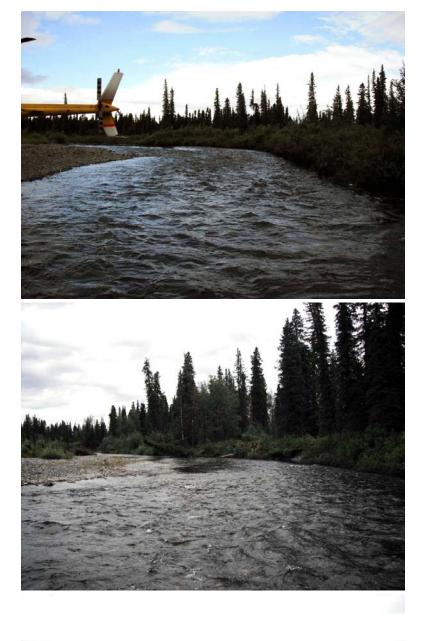
 Species: slimy sculpin
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 75
 Mean:
 75
 Median:
 75

 Sampling Method (No. of fish):
 BEF (1)
 EEF (1)</t

Instruments

Stream Gradient:handheld abney levelChannel Depths:graduated wading rodStream Velocity:GPS FloatChannel Widths:handheld laser rangefinderTurbidity:LaMotte 2020e turbidimeterElectrofisher:Smith-Root GPP 2.5Water Quality:YSI 556Transparency:



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FSS1105B010334.jpg



-continued-756

FSS1105B010335.jpg



Species: Arctic grayling

Total Fish Count: 14

Comments:

Sampling Method (No. of fish): PEF (11) VOG (3)

Observers: Raye Ann Neustel, Daniel Reed			Date/Time: 08/07	7/2011 9:24 AM
Station Latitude Longitude Coordinates 62.17855 -147.36518 Elevation NED (m)(ft): 1085 3560	Sample Coordinates	Latitude 62.17954	Longitude / Latitu -147.36516 / 62.178	8
Coordinate Determination Method: Non-Dif	ferential GPS Field M	leasurement	Datum: WGS84	
USGS Quadrangle: Talkeetna Mts A-1	Legal Descri	iption (MTRS)	: S024N011E12	
Waterbody Name: Tyone Creek Anadromous Waters Catalog Number:				
Geographic Comments: HU2.				
Visit Comments: Possible mining downstream	n, heavy equipment, A	tcos staged, ph	otos 99 & 100.	
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 3.60 DO (mg/L): 12.80	DO (%): 96.90	-	•	8.01
Water Color: Clear Turbidi	ty (NTU): 0.10	Thalweg Velo	ocity (m/s)(ft/s): 1.00 3.	28
Stream Channel				
		Intrenched		
	dedness: Negligible			
Channel Dimensions (m): Bankfull OHV Width 15.9		Dominant Sub ominant Subst		
Thalweg Depth 0.85		ominant Subst		
Rosgen Class: C3 Low gradient, meandering, p	oint-bar, riffle/pool, a	lluvial channel	s with broad, well-define	ed floodplains.
Riparian Vegetation Communities (Vi	ereck et al. 1992))		
Dist. from	Canopy			Canopy
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
		<u>Right Bank V</u> Scrub	egetation Type	
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)			Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Low Willow Shrub	Height(m)	Scrub	Villow Shrub	Height(m) 0.75
Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Willow Shrub	Height(m) 0.9 0.9	Scrub Closed Low V	Villow Shrub Villow Shrub	Height(m) 0.75 0.75
Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Willow Shrub10-20Closed Low Willow Shrub	Height(m) 0.9 0.9 0.9	Scrub Closed Low V Closed Low V Closed Low V	Villow Shrub Villow Shrub Villow Shrub	Height(m) 0.75 0.75 0.75
Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Willow Shrub10-20Closed Low Willow Shrub20-30Closed Low Willow Shrub	Height(m) 0.9 0.9 0.9 0.9 0.9 Estimated reach	Scrub Closed Low V Closed Low V Closed Low V length (m): 17	Villow Shrub Villow Shrub Villow Shrub	Height(m) 0.75 0.75 0.75
Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Willow Shrub10-20Closed Low Willow Shrub20-30Closed Low Willow ShrubKey To Fish Sampling Methods	Height(m) 0.9 0.9 0.9 0.9 0.9 Estimated reach	Scrub Closed Low V Closed Low V Closed Low V length (m): 17	Villow Shrub Villow Shrub Villow Shrub 5	Height(m) 0.75 0.75 0.75
Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Willow Shrub10-20Closed Low Willow Shrub20-30Closed Low Willow ShrubKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish Observations	Height(m) 0.9 0.9 0.9 0.9 0.9 Estimated reach	Scrub Closed Low V Closed Low V Closed Low V length (m): 17 G) Visual Obse	Villow Shrub Villow Shrub Villow Shrub 5	Height(m) 0.75 0.75 0.75
Bank (m)Left Bank Vegetation Type0-5Closed Low Willow Shrub5-10Closed Low Willow Shrub10-20Closed Low Willow Shrub20-30Closed Low Willow ShrubKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish Observations	Height(m) 0.9 0.9 0.9 0.9 Estimated reach (VOC	Scrub Closed Low V Closed Low V Closed Low V length (m): 17 3) Visual Obse Life His	Villow Shrub Villow Shrub Villow Shrub 5 rvation, Ground	Height(m) 0.75 0.75 0.75
Bank (m) Left Bank Vegetation Type 0-5 Closed Low Willow Shrub 5-10 Closed Low Willow Shrub 10-20 Closed Low Willow Shrub 20-30 Closed Low Willow Shrub 20-30 Closed Low Willow Shrub Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Arctic grayling Life St Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOG (1) Comments: Comments:	Height(m) 0.9 0.9 0.9 0.9 Estimated reach (VOC	Scrub Closed Low V Closed Low V Closed Low V length (m): 17 d) Visual Obse Life His n) Min:	Villow Shrub Villow Shrub 5 rvation, Ground t tory: Resident	Height(m) 0.75 0.75 0.75 0.75

Life History: Resident

Fish Measured: 11 Fork Lengths (mm) Min: 201 Max: 300 Mean: 231 Median: 250

Life Stage: juvenile/adult

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1105c010094.jpg

FSS1105c010093.jpg



FSS1105c010095.jpg



FSS1105c010096.jpg

-continued-761



FSS1105c010099.jpg

Station Info		
Observers: Raye Ann Neustel, Daniel Reed		Date/Time: 08/07/2011 10:28 AM
StationLatitudeLongitudeCoordinates62.18553-147.71104	SampleLatitudeCoordinates62.184	
Elevation NED (m)(ft): 1197 3927 Coordinate Determination Method: Non-Diffe USGS Quadrangle: Talkeetna Mts A-2 Waterbody Name: Little Oshetna River Anadromous Waters Catalog Number: Geographic Comments: HU15. Probable barrier	Legal Description (M1	TRS): S024N009E12
Visit Comments: Wildlife Comments:		
Water Quality \ Stream Flow		
Water Temp (C): 5.46DO (mg/L): 12.21Water Color: ClearTurbidity		ivity (μS/cm): 161 pH: 7.96 Velocity (m/s)(ft/s): 0.74 2.43
Stream Channel		
Stream Gradient (%): 0.75EntrenchCatchment Area(sq. km): 49Embeddet		
Channel Dimensions (m): Bankfull OHW		Substrate: Boulder
Width 43.0 Thalweg Depth 0.78		ubstrate 1: Cobble ubstrate 2: Gravel
Rosgen Class: F2 Entrenched, relatively low to m width/depth ratio.	noderate sinuosity, riffle/pool c	hannel on low gradients with high
Riparian Vegetation Communities (Vier	reck et al. 1992)	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>Right Ba</u> r	Canopy nk Vegetation Type Height(m
0 - 5 Willow Dwarf Shrub Tundra	0.1 Open Low	v Willow Shrub 0.6
5 - 10 Willow Dwarf Shrub Tundra	0.1 Open Low	v Willow Shrub 0.6
10 - 20 Open Tall Willow Shrub	1.7 Open Low	v Willow Shrub 0.6
20 - 30 Open Tall Willow Shrub	1.7 Open Low	w Willow Shrub 0.6
Key To Fish Sampling Methods	Estimated reach length (m)	:360
(PEF) Backpack Electrofisher	(VOG) Visual C	Observation, Ground
	ge: juvenile/adult Life Fork Lengths (mm) Min:	History: Unknown Max: Mean: Median:
	Fork Lengths (mm) Min: 20	History: Resident 00 Max: 214 Mean: 208 Median: 207
Species: slimy sculpinLife StagTotal Fish Count:17Fish Measured:17Sampling Method (No. of fish):PEF (17)Comments:	ge: adult Life Fork Lengths (mm) Min: 7	History: Resident 1 Max: 115 Mean: 88 Median: 93
• • • •	Fork Lengths (mm) Min: 57	History: Resident 7 Max: 57 Mean: 57 Median: 57

Appendix L67.–Page 2 of 4.

 Species: Dolly Varden
 Life Stage: juvenile
 Life History: Unknown

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 81
 Mean:
 81
 Median:
 81

 Sampling Method (No. of fish):
 PEF (1)
 Vertice
 Vertice</

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:

FSS1105c020105.jpg



FSS1105c020106.jpg



FSS1105c020108.jpg



FSS1105c020109.jpg

FSS1105c020110.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/07/2011 12:38 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.28793 -147.70688 Coordinates -147.70756 62.28690 62.28813 -147.70661 Elevation NED (m)(ft): 1086 3563 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts B-2 Legal Description (MTRS): S025N009E01 Waterbody Name: Gold Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU95 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow **Water Temp (C): 6.20** DO (mg/L): 11.26 **DO (%):** 91.10 Conductivity (µS/cm): 105 pH: 7.20 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): 0.74 2.43 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 53 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 29.5 9.1 Subdominant Substrate 1: Gravel Thalweg Depth 0.87 0.38 Subdominant Substrate 2: Boulder Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 0.7 0.3 Seral Herbs Seral Herbs 0.7 5-10 Seral Herbs Closed Low Willow Shrub 1 0.7 Closed Low Willow Shrub 10 - 20 Seral Herbs 1 20 - 30 Open Tall Willow Shrub 1.5 Closed Low Willow Shrub 1 **Key To Fish Sampling Methods** Estimated reach length (m): 200 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: **Total Fish Count: 5** Sampling Method (No. of fish): VOG (5) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 2 Fish Measured: 1 Fork Lengths (mm) Min: 79 Max: 79 **Mean:** 79 Median: 79 Sampling Method (No. of fish): PEF (1) VOG (1) **Comments: Species:** Arctic grayling Life Stage: adult Life History: Resident Median: 364 **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 364 Max: 364 Mean: 364 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Median: Total Fish Count: 3 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (3) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1105c030113.jpg

FSS1105c030114.jpg



Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/07/2011 2:18 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.44684 -147.54768 Coordinates -147.54899 62.44560 62.44684 -147.54768 Elevation NED (m)(ft): 970 3182 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Ouadrangle:** Talkeetna Mts B-2 Legal Description (MTRS): S027N010E11 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: HU113. Unnamed tributary to Black River. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.15 DO (mg/L): 10.33 DO (%): 91.90 Conductivity (µS/cm): 36 **pH:** 7.38 Water Color: Clear Turbidity (NTU): 0.70 Thalweg Velocity (m/s)(ft/s): 1.18 3.87 **Stream Channel** Stream Gradient (%): 1.75 **Entrenchment:** Entrenched **Catchment Area(sq. km):** 44 **Embeddedness:** Negligible **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Boulder Width 7.4 6.7 Subdominant Substrate 1: Cobble Thalweg Depth 0.75 0.30 Subdominant Substrate 2: Rosgen Class: G2 Entrenched "gully" step/pool and low width/depth ratio on moderate gradients. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 1 Closed Low Shrub Birch Closed Tall Willow Shrub 1.8 5 - 10 Closed Low Shrub Birch 1 Closed Tall Willow Shrub 1.8 10 - 20 Closed Low Shrub Birch Closed Tall Willow Shrub 1 1.8 20 - 30 Closed Low Shrub Birch 1 Closed Tall Willow Shrub 1.8 **Kev To Fish Sampling Methods** Estimated reach length (m): 230 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Unknown Max: Mean: Median: **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Sampling Method (No. of fish): VOG (2) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (2) **Comments: Species:** Arctic grayling Life Stage: juvenile Life History: Resident Median: 93 Total Fish Count: 10 Fish Measured: 1 Fork Lengths (mm) Min: 93 Max: 93 **Mean: 93** Sampling Method (No. of fish): PEF (1) VOG (9) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count: 5** Fish Measured: 5 Fork Lengths (mm) Min: 87 Max: 118 Mean: 100 **Median:** 102 Sampling Method (No. of fish): PEF (5) **Comments:**

Appendix L69.-Page 2 of 4.

 Species: slimy sculpin
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count: 5
 Fish Measured:
 Fork Lengths (mm)
 Min:
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOG (5)
 Comments:
 VOG (5)
 VOG (5)
 VOG (5)

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1105c040120.jpg

FSS1105c040121.jpg



Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/07/2011 4:25 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62,52160 -147,76030 Coordinates 62.52246 -147.76267 62.52160 -147.76030 Elevation NED (m)(ft): 1107 3632 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-2 Legal Description (MTRS): S028N009E15 Waterbody Name: Goose Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU16 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 8.80 DO (mg/L): 10.57 DO (%): 91.00 Conductivity (µS/cm): 25 pH: 6.80 Water Color: Clear Turbidity (NTU): 0.20 Thalweg Velocity (m/s)(ft/s): 0.68 2.23 **Stream Channel** Stream Gradient (%): 0.2 Slightly Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 51 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Sand Width 19.9 19.3 Subdominant Substrate 1: Gravel Thalweg Depth 0.60 0.39 Subdominant Substrate 2: Cobble Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0.4 0 - 5Open Low Mixed Shrub-Sedge Tussock Bog 0.3 Crustose Lichen 0.3 0.4 5 - 10 Open Low Mixed Shrub-Sedge Tussock Bog Wet Graminoid Herbaceous (emergent) 0.3 Wet Graminoid Herbaceous (emergent) 10 - 20 Open Low Mixed Shrub-Sedge Tussock Bog 0.4 20-30 Unvegetated Wet Graminoid Herbaceous (emergent) 0.4 **Key To Fish Sampling Methods** Estimated reach length (m): 340 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Max: Median: **Total Fish Count:** 12 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOG (12) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Total Fish Count: 20 Fish Measured: 8 Fork Lengths (mm) Min: 36 Max: 189 **Mean:** 74 **Median:** 112 Sampling Method (No. of fish): PEF (8) VOG (12) **Comments: Species:** slimy sculpin Life Stage: adult Life History: Resident Median: 94 **Total Fish Count:** 6 Fish Measured: 4 Fork Lengths (mm) Min: 73 Max: 116 **Mean: 94** Sampling Method (No. of fish): PEF (4) VOG (2) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 58 Total Fish Count: 73 Fish Measured: 10 Fork Lengths (mm) Min: 53 Max: 64 **Mean: 58**

Sampling Method (No. of fish): PEF (10) VOG (63) **Comments:**

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 16
 Fish Measured:
 16
 Fork Lengths (mm)
 Min:
 31
 Max:
 50
 Mean:
 38
 Median:
 40

 Sampling Method (No. of fish):
 PEF (16)
 Ferse
 Ferse

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1105c050128.jpg

FSS1105c050129.jpg



FSS1105c050131.jpg

FSS1105c050133.jpg

FSS1105c050134.jpg



Station Info					
Observers: Joe Buckwalter, Jonathan Kirsch			Date/T	'ime: 07/14/2	011 3:30 PM
StationLatitudeLongitudeCoordinates61.74941-150.69255	Sample Coordinates	Latitude 61.74941	Longitude -150.69255	Latitude / 61.70139	
Elevation NED (m)(ft): 26 85					
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Tyonek C-2	erential GPS Field Me Legal Descrip		Datum: W		
Waterbody Name: Yentna River	Legal Descrip	(1011 (1011 KS)	. 501711000	W 10	
Anadromous Waters Catalog Number: 247-41					
Geographic Comments: MA5. Lower Yentna F					
Visit Comments: Completed habitat transect and 3 on 7/15/11.	l electrofished right-b	ank tributary i	mouth on 7/1	4/11. E-fished	subreaches 1-
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 10.84 DO (mg/L): 10.28 Water Color: Glacial, High Turbidit Turbidity		Conductivity Thalweg Velo	-	pH: 8. (/s): 1.67 5.48	
Stream Channel					
Stream Gradient (%):0.25EntrenchCatchment Area(sq. km):15755Embedd	0,	trenched			
Channel Dimensions (m): Bankfull OHW	Wetted D	ominant Sub	strate: Grave	el	
Width 410.0		minant Subst			
Thalweg Depth6.24Rosgen Class:C4 Low gradient, meandering, po		minant Subst		well-defined	floodplains.
Riparian Vegetation Communities (Vie					
Dist. from	Canopy				Canopy
Dist. from	Canopy				
Bank (m) Left Bank Vegetation Type		Right Bank V	egetation Ty	<u>vpe</u>	Height(m)
Bank (m) Left Bank Vegetation Type 0 - 5 Closed Spruce-Paper Birch Forest	Height(m)	<mark>Right Bank V</mark> Closed Tall Al		<u>ype</u>	
in the second se	Height(m) <u>1</u>		lder Shrub		Height(m)
0 - 5 Closed Spruce-Paper Birch Forest	Height(m) <u>1</u> 10.5 (10.5 (Closed Tall Al	lder Shrub Paper Birch I	Forest	Height(m)
 0 - 5 Closed Spruce-Paper Birch Forest 5 - 10 Closed Spruce-Paper Birch Forest 	Height(m) <u>1</u> 10.5 (10.5 (10.5 (Closed Tall Al Open Spruce-I	lder Shrub Paper Birch I Paper Birch I	Forest Forest	Height(m) 3 10.5
 0 - 5 Closed Spruce-Paper Birch Forest 5 - 10 Closed Spruce-Paper Birch Forest 10 - 20 Closed Spruce-Paper Birch Forest 	Height(m) <u>1</u> 10.5 (10.5 (10.5 (Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce	lder Shrub Paper Birch I Paper Birch I -Paper Birch	Forest Forest 1 Forest	Height(m) 3 10.5 10.5 10.5
 0 - 5 Closed Spruce-Paper Birch Forest 5 - 10 Closed Spruce-Paper Birch Forest 10 - 20 Closed Spruce-Paper Birch Forest 20 - 30 Closed Spruce-Paper Birch Forest 	Height(m) I 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 Estimated reach lo 0	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce	lder Shrub Paper Birch I Paper Birch I Paper Birch Paper Birch	Forest Forest I Forest lectrofishing '	Height(m) 3 10.5 10.5 10.5
0 - 5Closed Spruce-Paper Birch Forest5 - 10Closed Spruce-Paper Birch Forest10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods	Height(m) I 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 Estimated reach lo 0	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ###	lder Shrub Paper Birch I Paper Birch I Paper Birch Paper Birch	Forest Forest I Forest lectrofishing '	Height(m) 3 10.5 10.5 10.5
0 - 5 Closed Spruce-Paper Birch Forest 5 - 10 Closed Spruce-Paper Birch Forest 10 - 20 Closed Spruce-Paper Birch Forest 20 - 30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: threespine stickleback Life State	Height(m) <u>1</u> 10.5 (10.5 (10.5 (10.5 (10.5 (Estimated reach lo (VOB) ge: adult	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ### Visual Obser Life His	Ider Shrub Paper Birch I Paper Birch I Paper Birch Paper Birch Total E rvation, Boat	Forest Forest Forest Iectrofishing '	Height(m) 3 10.5 10.5 10.5 Time (s): 7191
0 - 5Closed Spruce-Paper Birch Forest5 - 10Closed Spruce-Paper Birch Forest10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish Observations	Height(m) [10.5 (10.5 (10.5 (10.5 (10.5 (Estimated reach lo (VOB)	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ### Visual Obser Life His	lder Shrub Paper Birch I Paper Birch I -Paper Birch ## Total E rvation, Boat	Forest Forest Forest Iectrofishing '	Height(m) 3 10.5 10.5 10.5
0 - 5 Closed Spruce-Paper Birch Forest 5 - 10 Closed Spruce-Paper Birch Forest 10 - 20 Closed Spruce-Paper Birch Forest 20 - 30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: threespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments:	Height(m) I 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 Estimated reach lo (VOB) 0 ge: adult Fork Lengths (mm)	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ### Visual Obser Life His Min: 70	Ider Shrub Paper Birch I Paper Birch I Paper Birch Total E rvation, Boat tory: Unkno Max: 70	Forest Forest I Forest Iectrofishing 7 Wean: 70	Height(m) 3 10.5 10.5 10.5 Time (s): 7191
0 - 5 Closed Spruce-Paper Birch Forest 5 - 10 Closed Spruce-Paper Birch Forest 10 - 20 Closed Spruce-Paper Birch Forest 20 - 30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: threespine stickleback Life Sta Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments:	Height(m) <u>1</u> 10.5 (10.5 (10.5 (10.5 (10.5 (Estimated reach le (VOB) ge: adult Fork Lengths (mm) ge: juvenile Fork Lengths (mm)	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ### Visual Obser Life His Min: 70 Life His	Ider Shrub Paper Birch I Paper Birch I Paper Birch Paper Birch Total E rvation, Boat	Forest Forest I Forest Iectrofishing 7 Wean: 70	Height(m) 3 10.5 10.5 10.5 Time (s): 7191
 0-5 Closed Spruce-Paper Birch Forest 5-10 Closed Spruce-Paper Birch Forest 10-20 Closed Spruce-Paper Birch Forest 20-30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: threespine stickleback Life Stat Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments: Species: threespine stickleback Life Stat Total Fish Count: 209 Fish Measured: 2 Sampling Method (No. of fish): BEF (9) VOB Comments:	Height(m) <u>1</u> 10.5 (10.5 (10.5 (10.5 (10.5 (Estimated reach le (VOB) ge: adult Fork Lengths (mm) ge: juvenile Fork Lengths (mm)	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ### Visual Obser Life His Min: 70 Life His Min: 27	Ider Shrub Paper Birch I Paper Birch I Paper Birch Total E rvation, Boat tory: Unkno Max: 70	Forest Forest I Forest Iectrofishing 7 Wean: 70	Height(m) 3 10.5 10.5 10.5 Time (s): 7191 Median: 70
 0-5 Closed Spruce-Paper Birch Forest 5-10 Closed Spruce-Paper Birch Forest 10-20 Closed Spruce-Paper Birch Forest 20-30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: threespine stickleback Life Stat Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments: Species: threespine stickleback Life Stat Total Fish Count: 209 Fish Measured: 2 Sampling Method (No. of fish): BEF (9) VOB Comments:	Height(m) I 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 10.5 0 Estimated reach le (VOB) ge: adult Fork Lengths (mm) ge: juvenile Fork Lengths (mm) g(200)	Closed Tall Al Open Spruce-I Open Spruce-I Closed Spruce ength (m): ### Visual Obser Life His Min: 70 Life His Min: 27	Ider Shrub Paper Birch I Paper Birch I Paper Birch Total E rvation, Boat tory: Unkno Max: 70 tory: Unkno Max: 27	Forest Forest I Forest Iectrofishing 7 Wean: 70	Height(m) 3 10.5 10.5 10.5 Time (s): 7191 Median: 70

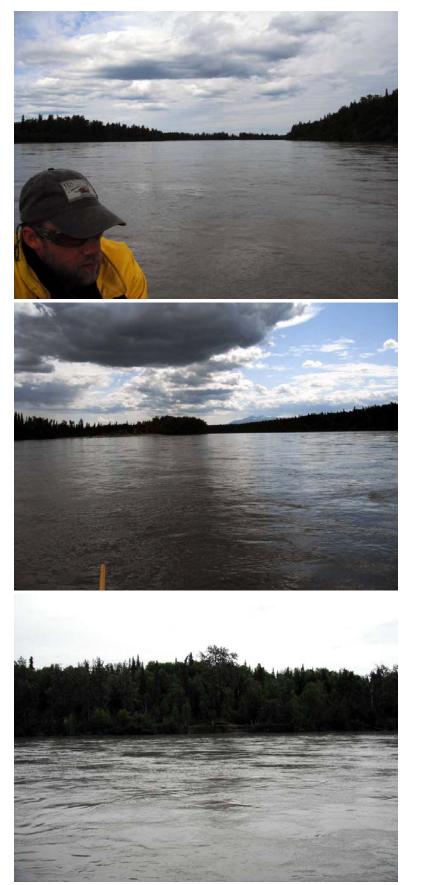
Appendix L71.-Page 2 of 5.

Life Stage: adult Species: sockeye salmon Life History: Anadromous **Total Fish Count: 62 Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (62) **Comments:** Species: humpback whitefish Life Stage: adult Life History: Unknown **Total Fish Count:** 4 Fish Measured: 2 Fork Lengths (mm) Min: 390 Max: 458 Median: 424 Mean: 424 Sampling Method (No. of fish): BEF (2) VOB (2) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident **Total Fish Count:** 5 Max: Median: Fish Measured: Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOB (5) **Comments:** Life History: Resident Species: sculpin-unspecified Life Stage: juvenile/adult **Total Fish Count:** 7 Fish Measured: 1 Fork Lengths (mm) Min: 60 Max: 60 Mean: 60 Median: 60 Sampling Method (No. of fish): BEF (1) VOB (6) **Comments:** Species: pink salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 7 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (7) **Comments:** Species: lamprey-unspecified Life Stage: juvenile/adult Life History: Unknown Median: Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 193 Max: 213 Mean: 203 Median: 203 Sampling Method (No. of fish): BEF (2) **Comments:** Species: burbot Life History: Resident Life Stage: juvenile/adult **Total Fish Count:** 3 Fish Measured: 2 Fork Lengths (mm) Min: 355 Max: 365 Mean: 360 **Median: 360** Sampling Method (No. of fish): BEF (2) VOB (1) **Comments:** Species: lamprey-unspecified Life Stage: juvenile Life History: Unknown Median: **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (2) **Comments:** Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 178 Max: 178 **Total Fish Count:** 1 Mean: 178 Median: 178 Sampling Method (No. of fish): BEF (1) **Comments:** Species: sculpin-unspecified Life Stage: juvenile Life History: Resident **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 37 Max: 55 Median: 46 **Mean:** 47 Sampling Method (No. of fish): BEF (6) **Comments: Species:** Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 230 Max: 230 Mean: 230 **Median:** 230 Sampling Method (No. of fish): BEF (1) **Comments:** Species: sculpin-unspecified Life Stage: adult Life History: Resident **Mean:** 75 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 Median: 75 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: handheld sonar depth finder Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1105D010232.jpg

FSS1105D010233.jpg

FSS1105D010234.jpg



FSS1105D010235.jpg

<i>Appendix L72.</i> Station 1 551 1007				
Station Info				
Observers: Joe Buckwalter, David Pluth		Date/7	Fime: 08/08/2	011 10:00 AM
StationLatitudeLongitudeCoordinates63.30504-147.38915	Sample Coordinates	Latitude Longitude 63.31106 -147.39440	Latitude) / 63.28021	0
Elevation NED (m)(ft): 768 2520 Coordinate Determination Method: Non USGS Quadrangle: Healy B-1		asurement Datum: V tion (MTRS): F018S002		
Waterbody Name: Susitna River Anadromous Waters Catalog Number: Geographic Comments:		× ,		
Visit Comments: Upper point of reach in a Susitna River mainstem a	clear, right bank Susitna Ri nd established a habitat tra			down to the
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 4.96DO (mg/L): 12.3Water Color: Glacial, High TurbiditTurbidit		Conductivity (µS/cm): 8 Thalweg Velocity (m/s)(f	-	
Stream Channel				
	renchment: Slightly Ent beddedness: High	renched		
Channel Dimensions (m): Bankfull	OHW Wetted De	ominant Substrate: Grav	rel	
Width 83.0		ninant Substrate 1: Silt/	Clay	
Thalweg Depth 1.88 Rosgen Class: C4 Low gradient, meanderin		ninant Substrate 2: uvial channels with broad	, well-defined	floodplains.
Riparian Vegetation Communities			,	1
Dist. from	Canopy			Canopy
Bank (m) <u>Left Bank Vegetation Type</u>		Right Bank Vegetation T	<u>'ype</u>	Height(m)
0-5 Open Low Willow Shrub		Open Low Willow Shrub		1.4
5 - 10 Open Low Willow Shrub10 - 20 Open Low Willow Shrub		Open Low Willow Shrub		1.4
10 - 20 Open Low Willow Shrub20 - 30 Open Low Willow Shrub		Open Low Willow Shrub Closed Low Willow Shrub	1	1.4 1.4
Key To Fish Sampling Methods		ngth (m): 7100 Total E		
(BEF) Boat-Mounted Electrofisher		Visual Observation, Boa	0	i iiie (s): 4007
· · ·	(10)	visual observation, boa		
Fish ObservationsSpecies: Arctic graylingLif	Stage: adult	Life History: Resid	ent	
Total Fish Count: 1 Fish Measured Sampling Method (No. of fish): VOB (1) Comments:	Fork Lengths (mm)	Min: Max:	Mean:	Median:
	Stage: adult 14 Fork Lengths (mm) VOB (8)	Life History: Resid Min: 349 Max: 415	ent Mean: 381	Median: 382
	 Stage: juvenile/adult 1 Fork Lengths (mm) VOB (7) 	Life History: Resid Min: 56 Max: 56	ent Mean: 56	Median: 56
Species: whitefish-unspecified Life Total Fish Count: 2 Fish Measured Sampling Method (No. of fish): VOB (2) Comments:	Stage: juvenile/adult Fork Lengths (mm)	Life History: Resid Min: Max:	ent Mean:	Median:

Appendix L72.-Page 2 of 6.

Life Stage: adult Species: humpback whitefish Life History: Unknown Fork Lengths (mm) Min: 378 Max: 443 **Total Fish Count:** 5 Fish Measured: 5 Mean: 413 **Median:** 410 Sampling Method (No. of fish): BEF (5) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 410 Max: 410 Mean: 410 **Median:** 410 Sampling Method (No. of fish): BEF (1) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 4 Fish Measured: 3 Fork Lengths (mm) Min: 215 Max: 310 **Mean:** 262 **Median:** 262 Sampling Method (No. of fish): BEF (3) VOB (1) **Comments:** Species: round whitefish Life History: Resident Life Stage: juvenile Max: 167 **Total Fish Count:** 4 Fish Measured: 2 Fork Lengths (mm) Min: 63 Mean: 115 **Median:** 115 Sampling Method (No. of fish): BEF (2) VOB (2) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 9 Fish Measured: 6 Fork Lengths (mm) Min: 205 Max: 296 Mean: 255 **Median: 250** Sampling Method (No. of fish): BEF (6) VOB (3) **Comments: Species:** Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 104 Max: 154 Mean: 129 Median: 129 Sampling Method (No. of fish): BEF (2) **Comments:** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 336 Max: 345 **Median:** 340 **Total Fish Count:** 6 Mean: 340 Sampling Method (No. of fish): BEF (2) VOB (4) **Comments:** Species: humpback whitefish Life History: Unknown Life Stage: juvenile **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 82 Max: 272 Mean: 182 Median: 177 Sampling Method (No. of fish): BEF (4) **Comments:** Species: humpback whitefish Life Stage: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 295 Max: 325 Median: 310 **Total Fish Count:** 5 Fish Measured: 3 Mean: 307 Sampling Method (No. of fish): BEF (3) VOB (2) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 5 Fork Lengths (mm) Min: 80 Max: 112 Median: 96 **Total Fish Count:** 5 **Mean: 90** Sampling Method (No. of fish): BEF (5) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: juvenile Fish Measured: 1 Fork Lengths (mm) Min: 47 Total Fish Count: 1 Max: 47 Median: 47 **Mean:** 47 Sampling Method (No. of fish): BEF (1) **Comments:** Species: longnose sucker Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 178 Max: 178 Mean: 178 **Median:** 178 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelChannel Depths:handheld sonar depth finderStream Velocity:GPS FloatChannel Widths:handheld laser rangefinderTurbidity:LaMotte 2020e turbidimeterElectrofisher:Smith-Root GPP 2.5Water Quality:YSI 556Transparency:

-continued-

786



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FSS1106A010427.jpg

FSS1106A010428.jpg

Appendix L72.-Page 4 of 6.



FSS1106A010430.jpg

FSS1106A010431.jpg

FSS1106A010432.jpg



FSS1106A010434.jpg

FSS1106A010435.jpg



FSS1106A010436.jpg

FSS1106A010437.jpg

rependix E75. Station 1 551100B01.			
Station Info			
Observers: Jonathan Kirsch, Ashley Reed		Date/Tim	ne: 08/08/2011 10:35 AM
Station Latitude Longitude Coordinates 63.37322 -147.00434	Sample Coordinates	Latitude Longitude 63.37322 -147.00434	Latitude Longitude 63.36795 -147.08594
Elevation NED (m)(ft): 816 2677			
Coordinate Determination Method: Non-Differ			
USGS Quadrangle: Healy B-1 Waterbody Name: East Fork Susitna River	Legal Descrip	otion (MTRS): F018S004E0	9
Anadromous Waters Catalog Number:			
Geographic Comments: IU10			
Visit Comments: Most fish caught within subread caddis fly larvae present. Stread			
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 3.85 DO (mg/L): 10.72	DO (%): 81.50	Conductivity (µS/cm): 39	рН: 7.85
Water Color: Glacial, High Turbidit Turbidity	(NTU): 150.00	Thalweg Velocity (m/s)(ft/s)	: 1.30 4.26
Stream Channel			
Stream Gradient (%):0.25Entrench	0.	trenched	
Catchment Area(sq. km): 206 Embedde			
Channel Dimensions (m): Bankfull OHW		Cominant Substrate: Gravel	
Width 40.0 Thalweg Depth 2.00		minant Substrate 1: Silt/Cla minant Substrate 2:	У
Rosgen Class: C4 Low gradient, meandering, point			ell-defined floodnlains
	_	a via chamers with broad, w	en denned noouplains.
Riparian Vegetation Communities (Vier			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy <u>e</u> Height(m)
0 - 5 Closed Tall Willow Shrub	2	Closed Low Willow Shrub	1.5
5 - 10 Closed Tall Willow Shrub	2	Closed Low Willow Shrub	1.5
10 - 20 Closed Tall Willow Shrub	2	Closed Low Willow Shrub	1.5
20 - 30 Closed Tall Willow Shrub	2	Closed Low Willow Shrub	1.5
Key To Fish Sampling Methods	Estimated reach l	ength (m): 6800 Total Elec	trofishing Time (s): 2304
(BEF) Boat-Mounted Electrofisher	(VOB)	Visual Observation, Boat	
Fish Observations			
Species: round whitefish Life Stag	ge: adult	Life History: Resident	
Total Fish Count:3Fish Measured:2	Fork Lengths (mm)	Min: 347 Max: 404 M	Median: 375 Median: 375
Sampling Method (No. of fish): BEF (2) VOB Comments:	(1)		
	ge: juvenile/adult	Life History: Resident	
	Fork Lengths (mm)	Min: Max: N	Iean: Median:
Sampling Method (No. of fish): VOB (2) Comments:			
	ge: juvenile	Life History: Resident	
	Fork Lengths (mm)	-	Iean: 45 Median: 45
Sampling Method (No. of fish): BEF (1) Comments:			
Species: round whitefish Life Stag	ge: juvenile/adult	Life History: Resident	
	Fork Lengths (mm)	-	

Comments:

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Life Stage: juvenile/adult Life History: Resident Species: Arctic grayling Total Fish Count: 17 Fish Measured: 5 Fork Lengths (mm) Min: 210 Max: 295 Median: 252 Mean: 239 Sampling Method (No. of fish): BEF (5) VOB (12) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 122 Max: 122 **Mean:** 122 **Median:** 122 Sampling Method (No. of fish): BEF (1) **Comments: Species:** Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 115 Max: 170 Mean: 142 **Median:** 142 Sampling Method (No. of fish): BEF (2) **Comments:** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 348 Max: 348 **Total Fish Count:** 1 Fish Measured: 1 **Mean: 348** Median: 348 Sampling Method (No. of fish): BEF (1) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 250 Max: 255 **Total Fish Count:** 2 Mean: 252 Median: 252 Sampling Method (No. of fish): BEF (2) **Comments:** Life History: Resident Species: sculpin-unspecified Life Stage: adult Fork Lengths (mm) Min: 70 Max: 70 Median: 70 **Total Fish Count:** 1 Fish Measured: 1 Mean: 70 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



FSS1106B010337.jpg

FSS1106B010338.jpg

FSS1106B010339.jpg

FSS1106B010340.jpg



Station In	fo			
Observers:	Raye Ann Neustel, Daniel Reed		Date/Time: 08/0	08/2011 9:34 AM
Station Coordinat	Latitude Longitude tes 62.73537 -149.39327	Sample Coordinates	Latitude Longitude Lati 62.73396 -149.39626 / 62.73	8
Elevation N	NED (m)(ft): 930 3051			
	e Determination Method: Non-Differenti			
-	drangle: Talkeetna Mts C-5	Legal Descr	iption (MTRS): S031N001W35	
Waterbody				
	us Waters Catalog Number: c Comments: HU85 Small dirt road parall	al to graak app	rovimately 50 Munriver of transact si	to and anding at
Geographi	that point. Unnamed tributar			te and ending at
Visit Comr	•			
Wildlife Co				
-				
Water Qu	ality \ Stream Flow			
) (%): 91.80		I: 7.23
Water Col	or: Clear Turbidity (NT	(U): 0.00	Thalweg Velocity (m/s)(ft/s): 0.80	2.62
Stream Cl	hannel			
Stream Gr	adient (%): 1 Entrenchmen	nt: Moderatle	ey Entrenched	
	Area(sq. km): 34 Embeddednes		5 Endeneda	
	-	etted	Dominant Substrate: Cobble	
			ominant Substrate 1: Sand	
	Thalweg Depth 1.06	0.85 Subd	ominant Substrate 2: Boulder	
Rosgen Cla	ass: B3 Moderately entrenched, moderate g stable plan and profile. Stable banks.	radient, riffle d	ominated channel, with infrequently s	paced pools. Very
Riparian V	Vegetation Communities (Viereck	k et al. 1992)		
Dist. from		Canopy		Canopy
	Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5	Open Low Mixed Shrub-Sedge Tussock Tundra	0.4	Open Low Willow Shrub	0.2
5 - 10	Open Low Willow Shrub	0.3	Unvegetated	
10 - 20	Crustose Lichen	0.1	Fireweed	0.2
20 - 30	Crustose Lichen	0.1	Mixed Herbs	0.2

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Estimated reach length (m): 290

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 32 Fish Measured: 7 Fork Lengths (mm) Min: 91 Max: 154 Mean: 122 Median: 122 Sampling Method (No. of fish): PEF (7) VOG (25) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 11 Fish Measured: 11 Fork Lengths (mm) Min: 36 Max: 79 Mean: 47 Median: 57 Sampling Method (No. of fish): PEF (11) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 69 Max: 78 **Mean:** 72 Median: 73 Sampling Method (No. of fish): PEF (3) **Comments:**

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 56 **Total Fish Count:** 8 Fish Measured: 1 Max: 56 **Mean: 56** Median: 56 Sampling Method (No. of fish): PEF (1) VOG (7) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 36 Max: 37 **Mean: 36** Median: 36 Sampling Method (No. of fish): PEF (2) **Comments:**

Instruments

Stream Gradient: handheld abney levelChannel Depths: graduated wading rodStream Velocity: transparent velocity head rodChannel Widths: measuring tapeTurbidity: LaMotte 2020e turbidimeterElectrofisher: Smith-Root LR-24Water Quality: YSI 556Transparency:



FSS1106c010136.jpg

FSS1106c010137.jpg

FSS1106c010138.jpg

FSS1106c010139.jpg



FSS1106c010141.jpg

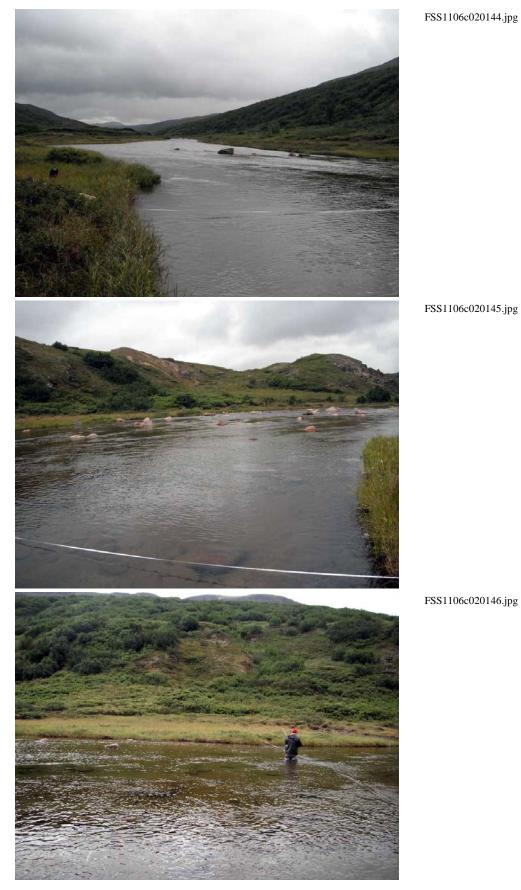
FSS1106c010142.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/08/2011 12:12 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.66417 -149.33535 Coordinates -149.33536 62.66400 62.66472 -149.33715 Elevation NED (m)(ft): 787 2582 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-5 Legal Description (MTRS): S030N001E30 Waterbody Name: Chunilna Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU79 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.23 DO (mg/L): 10.31 DO (%): 85.40 Conductivity (µS/cm): 24 **pH:** 6.36 Water Color: Clear Turbidity (NTU): 0.10 Thalweg Velocity (m/s)(ft/s): 0.21 0.69 **Stream Channel** Stream Gradient (%): 0.25 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 48 **Embeddedness:** Low **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Sand Width 25.1 24.0 Subdominant Substrate 1: Boulder Thalweg Depth 0.92 0.77 Subdominant Substrate 2: Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0.2 0.2 0 - 5Wet Sedge-Grass Meadow Tundra Wet Sedge-Grass Meadow Tundra 0.2 0.2 Wet Sedge-Grass Meadow Tundra 5 - 10 Wet Sedge-Grass Meadow Tundra 0.2 10 - 20 Wet Sedge-Grass Meadow Tundra Wet Sedge-Grass Meadow Tundra 0.2 20 - 30 Wet Sedge-Grass Meadow Tundra 0.2 Wet Sedge-Grass Meadow Tundra 0.2 **Key To Fish Sampling Methods** Estimated reach length (m): 157 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 12 Fork Lengths (mm) Min: 88 Max: 152 Median: 120 **Total Fish Count:** 43 Mean: 127 Sampling Method (No. of fish): PEF (12) VOG (31) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 68 **Total Fish Count:** 9 Fish Measured: 9 Max: 82 **Mean:** 75 Median: 75 Sampling Method (No. of fish): PEF (9) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Median: Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (1) **Comments:**

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 58 Total Fish Count: 11 Fish Measured: 3 Max: 65 **Mean:** 62 Median: 61 Sampling Method (No. of fish): PEF (3) VOG (8) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 29 Max: 37 **Mean:** 34 Median: 33 Sampling Method (No. of fish): PEF (4) **Comments:**

Instruments

Stream Gradient: handheld abney levelChannel Depths: graduated wading rodStream Velocity: transparent velocity head rodChannel Widths: measuring tapeTurbidity: LaMotte 2020e turbidimeterElectrofisher: Smith-Root LR-24Water Quality: YSI 556Transparency:



FSS1106c020145.jpg

FSS1106c020146.jpg



FSS1106c020148.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/08/2011 2:49 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 62.65472 -148.98683 Coordinates 62.65472 -148.98683 Elevation NED (m)(ft): 528 1732 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Talkeetna Mts C-4 Legal Description (MTRS): S030N002E25 Waterbody Name: Prairie Creek Anadromous Waters Catalog Number: 247-41-10200-2370-3301 **Geographic Comments:** Visit Comments: No electrofishing event due to numerous spawning Chinook salmon and suspected spawning sockeye salmon through entire sample reach. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.43 DO (mg/L): 11.40 **DO (%):** 102.00 Conductivity (µS/cm): 88 pH: 7.77 Water Color: Clear Turbidity (NTU): 0.40 Thalweg Velocity (m/s)(ft/s): 1.33 4.36 **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Slightly Entrenched **Embeddedness:** Negligible Catchment Area(sq. km): 285 **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 50.0 11.0Subdominant Substrate 1: Boulder Thalweg Depth 1.10 0.60 Subdominant Substrate 2: Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Height(m) Left Bank Vegetation Type **Right Bank Vegetation Type** 0 - 5 Closed White Spruce-Paper Birch-Balsam 35 Sedge-Willow Tundra 0.5 Poplar (Black Cottonwood Forest) 5 - 10 Closed White Spruce-Paper Birch-Balsam 35 Sedge-Willow Tundra 0.5 Poplar (Black Cottonwood Forest) 10 - 20 Closed White Spruce-Paper Birch-Balsam 35 25 Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest) Poplar (Black Cottonwood Forest) 20 - 30 Closed White Spruce-Paper Birch-Balsam 35 Closed White Spruce-Paper Birch-Balsam 25 Poplar (Black Cottonwood Forest) Poplar (Black Cottonwood Forest) **Key To Fish Sampling Methods** Estimated reach length (m): 300 (DIP) Dip Net (VOG) Visual Observation. Ground

Fish Observations

Species: Chinook salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count: 32** Fish Measured: 0 Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (32) Comments: photo # 157 Life History: Anadromous Species: Chinook salmon Life Stage: juvenile **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 34 Max: 35 Mean: 34 Median: 34 Sampling Method (No. of fish): DIP (2) **Comments:** Life History: Anadromous Species: coho salmon Life Stage: juvenile Total Fish Count: 10 Fish Measured: 10 Fork Lengths (mm) Min: 32 Max: 36 **Mean: 33** Median: 34 Sampling Method (No. of fish): DIP (10) **Comments:**

Appendix L76.-Page 2 of 4.

 Species: sockeye salmon
 Life Stage: adult
 Life History: Anadromous

 Total Fish Count:
 2
 Fish Measured:
 Fork Lengths (mm)
 Max:
 Mean:
 Median:

 Sampling Method (No. of Fish):
 VOG (2)
 VOG (2)
 VOG (2)
 VOG (2)
 VOG (2)

 Comments:
 photo # 171
 VOG (2)
 VOG (2)
 VOG (2)
 VOG (2)

Instruments

Channel Depths: graduated wading rod
Channel Widths: measuring tape
Electrofisher: Smith-Root LR-24
Transparency:



FSS1106c040157.jpg Spawned out Chinnok salmon.

FSS1106c040164.jpg spawning chinook

FSS1106c040171.jpg sockeye salmon



FSS1106c040174.jpg

FSS1106c040175.jpg aerial photo of stream with 2 adult salmon species and 3 juvenile salmon species documented

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/08/2011 4:07 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.96210 -148.07029 Coordinates -148.06820 62.96324 62.96210 -148.07029 Elevation NED (m)(ft): 743 2438 Datum: WGS84 Coordinate Determination Method: Non-Differential GPS Field Measurement USGS Quadrangle: Talkeetna Mts D-3 Legal Description (MTRS): F022S003W35 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HU54. Unnamed tributary of Watana Creek. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.90 DO (mg/L): 10.58 DO (%): 89.20 Conductivity (µS/cm): 131 **pH:** 7.62 Water Color: Clear Turbidity (NTU): 0.20 Thalweg Velocity (m/s)(ft/s): 0.68 2.23 **Stream Channel** Stream Gradient (%): 0.75 **Entrenchment:** Slightly Entrenched Moderate **Catchment Area(sq. km):** 90 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 14.8 9.6 Subdominant Substrate 1: Sand Thalweg Depth 0.49 0.32 Subdominant Substrate 2: Boulder Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 0.4 Closed Tall Willow Shrub 1.2 Wet Sedge-Grass Meadow Tundra 1.2 0.4 5 - 10 Closed Tall Willow Shrub Wet Sedge-Grass Meadow Tundra 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 1.2 1.5 20 - 30 Closed Tall Willow Shrub 1.2 Closed Tall Willow Shrub 1.5 **Kev To Fish Sampling Methods** Estimated reach length (m): 250 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 330 Max: 349 Median: 339 **Total Fish Count:** 2 Mean: 339 Sampling Method (No. of fish): PEF (2) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count: 32** Fish Measured: 11 Fork Lengths (mm) Min: 199 Max: 315 Mean: 264 Median: 257 Sampling Method (No. of fish): PEF (11) VOG (21) **Comments: Species:** Arctic grayling Life Stage: juvenile Life History: Resident Median: 63 **Total Fish Count: 24** Fish Measured: 10 Fork Lengths (mm) Min: 32 Max: 94 **Mean:** 42 Sampling Method (No. of fish): PEF (10) VOG (14) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Median: 86 Total Fish Count: 4 Fish Measured: 4 Fork Lengths (mm) Min: 69 Max: 103 **Mean:** 78 Sampling Method (No. of fish): PEF (4) **Comments:**

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 52 Fish Measured: 7 Fork Lengths (mm) Min: 52 Max: 65 **Mean: 58** Median: 58 Sampling Method (No. of fish): PEF (7) VOG (45) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 38 Max: 40 **Mean: 39** Median: 39 Sampling Method (No. of fish): PEF (4) **Comments:**

Instruments

Stream Gradient: handheld abney levelChannel Depths: graduated wading rodStream Velocity: transparent velocity head rodChannel Widths: measuring tapeTurbidity: LaMotte 2020e turbidimeterElectrofisher: Smith-Root LR-24Water Quality: YSI 556Transparency:



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FSS1106c050178.jpg

FSS1106c050179.jpg



FSS1106c050181.jpg

FSS1106c050182.jpg

Station Info				
Observers: Joe Buckwalter, Jonathan I	Kirsch, Raye Ann Neustel		Date/Time: 07/1	19/2011 2:30 PM
StationLatitudeLongitudeCoordinates62.52663-150.11449	Sample Coordinates	Latitude 62.53343	Longitude Latit -150.10374 / 62.45	8
Elevation NED (m)(ft): 145 476				
Coordinate Determination Method: N	Non-Differential GPS Field Me	asurement	Datum: WGS84	
USGS Quadrangle: Talkeetna C-1	Legal Descrip	tion (MTRS)	: S028N005W12	
Waterbody Name: Susitna River				
Anadromous Waters Catalog Number:	: 247-41-10200			
Geographic Comments: 16 miles upstr reach located a	ream of Talkeetna. Railroad run at mouth of Lane Creek (left ba			fish-collection
Visit Comments: Most of the fish (exce upstream end of the re		re collected fi	com clear water (Lane C	Creek) at the
Wildlife Comments:				
Watan Onalitza Straam Flore				
Water Quality \ Stream Flow				
Water Temp (C): 12.73 DO (mg/L):				[: 7.81
Water Color: Glacial, High Turbidit	Furbidity (NTU): 103.10	Thalweg Vel	ocity (m/s)(ft/s): 2.22	7.28
Stream Channel				
Stream Gradient (%): 0.5	Entrenchment: Slightly Ent	renched		
	Embeddedness: Negligible	licheneu		
	66	aminant Sub	strate: Cobble	
Width 167.0			rate 1: Gravel	
Thalweg Depth 5.14		ninant Subst		
				1.0. 1.1.
Rosgen Class: C3 Low gradient, meand	ering, point-bar, riffle/pool, all	uvial channel	s with broad, well-defin	hed floodplains.
Riparian Vegetation Communiti	es (Viereck et al. 1992)			
Dist. from Bank (m) Loft Bank Vegetation Type	Canopy Height(m)) ab t Dam's Y	logatetion True	Canopy Height(m)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
0 - 5	Open Balsam Poplar (Black Cottonwood) Forest	32	Closed Tall Alder-Willow Shrub	3
5 - 10	Open Balsam Poplar (Black Cottonwood) Forest	32	Closed Tall Alder-Willow Shrub	3
10 - 20	Open Balsam Poplar (Black Cottonwood) Forest	32	Closed Tall Alder-Willow Shrub	3
20 - 30	Low Scrub	1.1	Open Balsam Poplar (Black Cottonwood) Forest	32

Key To Fish Sampling Methods

Estimated reach length (m): #### Total Electrofishing Time (s): 4310

(BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat

Fish Observations

Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 219 Max: 310 Total Fish Count: 11 Fish Measured: 8 **Mean:** 274 Median: 264 Sampling Method (No. of fish): BEF (8) VOB (3) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 27 Fish Measured: 11 Fork Lengths (mm) Min: 56 Max: 73 **Mean:** 65 Median: 64 Sampling Method (No. of fish): BEF (11) VOB (16) **Comments:** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 47 Fish Measured: 21 Fork Lengths (mm) Min: 190 Max: 345 **Mean:** 275 Median: 267 Sampling Method (No. of fish): BEF (21) VOB (26) **Comments:**

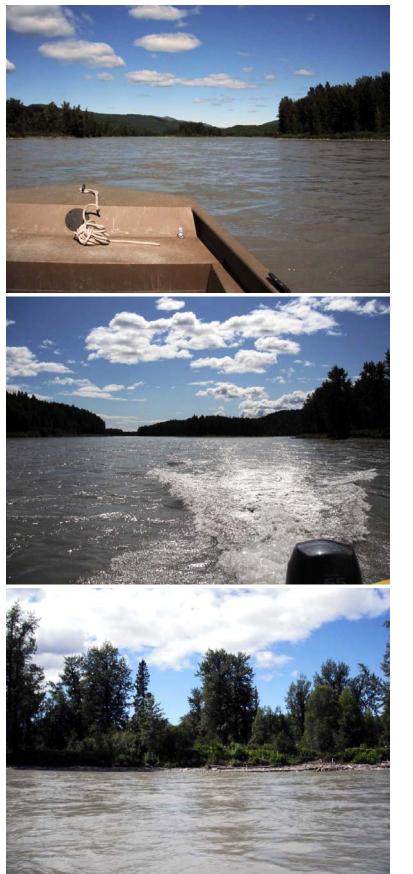
Appendix L78.-Page 2 of 5.

Species: rainbow trout Life Stage: adult Life History: Resident Total Fish Count: 11 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (11) **Comments:** Species: burbot Life Stage: juvenile/adult Life History: Resident Total Fish Count: 10 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (10) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 108 Fish Measured: 17 Fork Lengths (mm) Min: 51 Max: 66 Median: 58 **Mean:** 60 Sampling Method (No. of fish): BEF (17) VOB (91) **Comments:** Species: Chinook salmon Life Stage: adult Life History: Anadromous **Fish Measured: Total Fish Count:** 6 Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (6) **Comments:** Species: burbot Life Stage: adult Life History: Resident **Total Fish Count:** 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 179 Max: 179 Mean: 179 Median: 179 Sampling Method (No. of fish): BEF (1) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 109 Max: 168 Mean: 147 Median: 138 Sampling Method (No. of fish): BEF (3) **Comments:** Species: longnose sucker Life History: Resident Life Stage: adult **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 372 Max: 410 Mean: 391 Median: 391 Sampling Method (No. of fish): BEF (2) **Comments:** Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 153 Max: 385 Median: 269 **Total Fish Count:** 2 Fish Measured: 2 Mean: 269 Sampling Method (No. of fish): BEF (2) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 148 Max: 275 Mean: 211 **Total Fish Count:** 2 Median: 211 Sampling Method (No. of fish): BEF (2) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: juvenile Fish Measured: 11 Fork Lengths (mm) Min: 33 Total Fish Count: 11 Max: 50 Median: 41 **Mean:** 45 Sampling Method (No. of fish): BEF (11) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 12 Fish Measured: 12 Fork Lengths (mm) Min: 70 Max: 110 **Mean:** 79 Median: 90 Sampling Method (No. of fish): BEF (12) **Comments:** Species: longnose sucker Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 185 Max: 185 Mean: 185 **Median:** 185 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: handheld sonar depth finder Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1106D010240.jpg

FSS1106D010241.jpg

FSS1106D010242.jpg

FSS1106D010243.jpg



Appendix E77. Station 1 SS11071101.					
Station Info					
Observers: Joe Buckwalter, Joe Giefer			Date/T	`ime: 08/09/2	011 2:28 PM
StationLatitudeLongitudeCoordinates63.29768-147.51377	Sample Coordinates	Latitude 63.31049	Longitude -147.55004	Latitude / 63.28756	
Elevation NED (m)(ft): 776 2546					
Coordinate Determination Method: Non-Diff USGS Quadrangle: Healy B-2	ferential GPS Field Me Legal Descrip		Datum: W		
Waterbody Name: West Fork Susitna River	Legal Descrip) ; 10185001	655	
Anadromous Waters Catalog Number:					
Geographic Comments:	1 1 . 1 . 6	1.			4 6 1
Visit Comments: Started reach in a clear, right tributary.	bank tributary for sam	pling events A	A and B. Way	ypoint 009 is i	nouth of clear
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 2.43DO (mg/L): 12.46Water Color: Glacial, High TurbiditTurbidit			y (µS/cm): 81 ocity (m/s)(ft	pH: 7.	
Stream Channel					
Stream Gradient (%):0.2EntrendCatchment Area(sq. km):564Embedde	chment: Moderatley dedness: Moderate	Entrenched			
Channel Dimensions (m): Bankfull OHV	W Wetted D	Oominant Sub	strate: Silt/C	Clay	
Width 76.0		minant Subs			
Thalweg Depth 1.70 Rosgen Class: B5 Moderately entrenched, mode		minant Subst			ad pools Very
stable plan and profile. Stable ba		miniated chair	nei, with inn	equentity space	eu pools. Very
Riparian Vegetation Communities (Vie	ereck et al. 1992)				
	Canopy	Right Bank V	egetation T	<u>vpe</u>	Canopy Height(m)
Riparian Vegetation Communities (Vie Dist. from	Canopy Height(m)	Right Bank V Closed Tall W		vpe	
Riparian Vegetation Communities (Vie Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)		illow Shrub/	<u>vpe</u>	Height(m)
Riparian Vegetation Communities (Vie Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub	Canopy Height(m) 1 1.6 0 1.6 0	Closed Tall W	/illow Shrub /illow Shrub	<u>vpe</u>	Height(m)
Riparian Vegetation Communities (Vieto Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub 5 - 10 Open Tall Willow Shrub	Canopy Height(m) 1 1.6 0 1.6 0 1.6 0 1.6 0	Closed Tall W Closed Tall W	/illow Shrub /illow Shrub /illow Shrub	<u>vpe</u>	Height(m) 1.6 1.6
Riparian Vegetation Communities (Vieton Dist. from Dist. from Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub 5 - 10 Open Tall Willow Shrub 10 - 20 Open Tall Willow Shrub	Canopy Height(m) 1 1.6 0 1.6 0 1.6 0 1.6 0	Closed Tall W Closed Tall W Closed Tall W Closed Tall W	Villow Shrub Villow Shrub Villow Shrub Villow Shrub		Height(m) 1.6 1.6 1.6 1.6 1.6
Riparian Vegetation Communities (VieDist. fromLeft Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Open Tall Willow Shrub20 - 30Open Tall Willow Shrub	Canopy 1 Height(m) 1 1.6 0	Closed Tall W Closed Tall W Closed Tall W Closed Tall W	Villow Shrub Villow Shrub Villow Shrub Villow Shrub 00 Total E	lectrofishing '	Height(m) 1.6 1.6 1.6 1.6 1.6
Riparian Vegetation Communities (VieDist. fromLeft Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Open Tall Willow Shrub20-30Open Tall Willow ShrubKey To Fish Sampling Methods	Canopy 1 Height(m) 1 1.6 0	Closed Tall W Closed Tall W Closed Tall W Closed Tall W ength (m): 40 Visual Obse	Villow Shrub Villow Shrub Villow Shrub Villow Shrub 00 Total E prvation, Boat	lectrofishing '	Height(m) 1.6 1.6 1.6 1.6 1.6
Riparian Vegetation Communities (Viet Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub 5 - 10 Open Tall Willow Shrub 10 - 20 Open Tall Willow Shrub 20 - 30 Open Tall Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher	Canopy 1 Height(m) 1 1.6 0	Closed Tall W Closed Tall W Closed Tall W Closed Tall W ength (m): 40 Visual Obse Life His	Villow Shrub Villow Shrub Villow Shrub Villow Shrub 00 Total E	lectrofishing '	Height(m) 1.6 1.6 1.6 1.6 1.6
Riparian Vegetation Communities (Vie Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub 5 - 10 Open Tall Willow Shrub 10 - 20 Open Tall Willow Shrub 20 - 30 Open Tall Willow Shrub 20 - 30 Open Tall Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: slimy sculpin Life State Total Fish Count: 2 Fish Measured: 2 Sampling Method (No. of fish): BEF (2) Comments: Species: Arctic grayling Life State	Canopy Height(m) 1 1.6 (1.6 (1.6 (1.6 (0 Estimated reach le (VOB) age: juvenile Fork Lengths (mm)	Closed Tall W Closed Tall W Closed Tall W Closed Tall W ength (m): 40 Visual Obse Life His Min: 40	Villow Shrub Villow Shrub Villow Shrub Villow Shrub 00 Total E ervation, Boat story: Reside Max: 46	lectrofishing ' ent Mean: 43	Height(m) 1.6 1.6 1.6 1.6 1.6 Time (s): 2148
Riparian Vegetation Communities (Viet Dist. from Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub 5 - 10 Open Tall Willow Shrub 10 - 20 Open Tall Willow Shrub 20 - 30 Open Tall Willow Shrub 20 - 30 Open Tall Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: slimy sculpin Life State Total Fish Count: 2 Fish Measured: 2 Sampling Method (No. of fish): BEF (2) Comments: Species: Arctic grayling Life State Total Fish Count: 66 Fish Measured: 31 Sampling Method (No. of fish): BEF (44) VC Comments: Species: slimy sculpin Life State Life State	Canopy Height(m) 1 1.6 (1.6 (1.6 (1.6 (1.6 (Comparing to the second testimated reach lo (VOB) Age: juvenile Fork Lengths (mm) DB (22) Age: juvenile/adult	Closed Tall W Closed Tall W Closed Tall W Closed Tall W ength (m): 40 Visual Obse Life His) Min: 40 Life His	 Villow Shrub Villow Shrub Villow Shrub Villow Shrub Mo Total E Prvation, Boat Story: Reside Max: 46 Max: 353 Story: Reside 	ent Mean: 43 Mean: 277	Height(m) 1.6 1.6 1.6 1.6 Time (s): 2148 Median: 43 Median: 254
Riparian Vegetation Communities (Vie Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Willow Shrub 5-10 Open Tall Willow Shrub 10-20 Open Tall Willow Shrub 20-30 Open Tall Willow Shrub 20-30 Open Tall Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: slimy sculpin Life State Total Fish Count: 2 Fish Measured: 2 Sampling Method (No. of fish): BEF (2) Comments: Species: Arctic grayling Life State Total Fish Count: 66 Fish Measured: 31 Sampling Method (No. of fish): BEF (44) VC Comments:	Canopy Height(m) 1 1.6 (1.6 (1.6 (1.6 (1.6 (VOB) Estimated reach lo (VOB) age: juvenile Fork Lengths (mm) DB (22)	Closed Tall W Closed Tall W Closed Tall W Closed Tall W ength (m): 40 Visual Obse Life His) Min: 40 Life His	Villow Shrub Villow Shrub Villow Shrub Villow Shrub OO Total E ervation, Boat story: Reside Max: 46 Story: Reside Max: 353	ent Mean: 43 Mean: 277	Height(m) 1.6 1.6 1.6 1.6 Time (s): 2148 Median: 43

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Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Fish Measured: 16 Fork Lengths (mm) Min: 165 Max: 407 Total Fish Count: 33 **Mean:** 252 **Median:** 286 Sampling Method (No. of fish): BEF (16) VOB (17) **Comments:** Species: longnose sucker Life Stage: adult Life History: Resident Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 372 Max: 458 Mean: 419 Median: 415 Sampling Method (No. of fish): BEF (6) **Comments:** Life History: Resident Species: round whitefish Life Stage: juvenile/adult **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 314 Max: 314 **Mean:** 314 **Median:** 314 Sampling Method (No. of fish): BEF (1) **Comments: Species:** Arctic grayling Life Stage: adult Life History: Resident Median: 338 **Total Fish Count:** 6 Fish Measured: 2 Fork Lengths (mm) Min: 338 Max: 339 Mean: 338 Sampling Method (No. of fish): BEF (6) **Comments:** Species: humpback whitefish Life Stage: adult Life History: Unknown **Total Fish Count:** 5 Fish Measured: 5 Fork Lengths (mm) Min: 400 Max: 435 Mean: 420 Median: 417 Sampling Method (No. of fish): BEF (5) **Comments:** Species: humpback whitefish Life Stage: juvenile/adult Life History: Unknown **Fish Measured:** Max: Median: Total Fish Count: 1 Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 345 Max: 390 Mean: 366 Median: 367 Sampling Method (No. of fish): BEF (3) **Comments:**

Instruments

Channel Depths: graduated wading rod
Channel Widths: handheld laser rangefinder
Electrofisher: Smith-Root GPP 2.5
Transparency:



FSS1107A010439.jpg

FSS1107A010440.jpg

FSS1107A010441.jpg



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FSS1107A010444.jpg

FSS1107A010445.jpg



FSS1107A010446.jpg

FSS1107A010438.jpg

Station Info Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/09/2011 12:53 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.07611 -147.52875 Coordinates -147.51791 63.10460 63.02283 -147.41879 Elevation NED (m)(ft): 741 2431 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-2 Legal Description (MTRS): F021S001E10 Waterbody Name: Susitna River **Anadromous Waters Catalog Number:** Geographic Comments: MU10 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.42 DO (mg/L): 11.08 DO (%): 87.80 Conductivity (µS/cm): 89 **pH:** 7.06 Water Color: Glacial, High Turbidit Turbidity (NTU): 108.00 Thalweg Velocity (m/s)(ft/s): 1.00 3.28 **Stream Channel** Stream Gradient (%): 0.1 Moderatley Entrenched **Entrenchment: Catchment Area(sq. km):** 2405 **Embeddedness:** Very High **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Silt/Clay Width 210.0 200.0 Subdominant Substrate 1: Thalweg Depth 3.20 2.20 Subdominant Substrate 2: Rosgen Class: B5 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 3.3 5 Closed Tall Alder-Willow Shrub Open Black Spruce Forest 5 5 - 10 Closed Tall Alder-Willow Shrub 3.3 Open Black Spruce Forest 10 - 20 Closed Tall Alder-Willow Shrub 3.3 5 Open Black Spruce Forest 20 - 30 Closed Tall Alder-Willow Shrub 3.3 Closed Tall Willow Shrub 1 **Key To Fish Sampling Methods Estimated reach length (m): #### Total Electrofishing Time (s):** 8098 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 300 Max: 340 **Total Fish Count:** 4 Mean: 320 Median: 320 Sampling Method (No. of fish): BEF (2) VOB (2) **Comments:** Life Stage: juvenile/adult Life History: Resident Species: Arctic grayling **Total Fish Count:** 7 Fish Measured: 1 Fork Lengths (mm) Min: 210 Max: 210 Mean: 210 **Median:** 210 Sampling Method (No. of fish): BEF (1) VOB (6) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 235 Max: 280 **Total Fish Count:** 8 Fish Measured: 3 Mean: 250 Median: 257 Sampling Method (No. of fish): BEF (3) VOB (5) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 130 Max: 130 Mean: 130 Median: 130 Sampling Method (No. of fish): BEF (1)

Comments:

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Life Stage: adult Life History: Unknown Species: humpback whitefish Total Fish Count: 13 Fish Measured: 3 Fork Lengths (mm) Min: 365 Max: 415 Mean: 391 **Median: 390** Sampling Method (No. of fish): BEF (3) VOB (10) **Comments:** Species: humpback whitefish Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 6 Fish Measured: 2 Fork Lengths (mm) Min: 320 Max: 325 **Mean: 322** Median: 322 Sampling Method (No. of fish): BEF (2) VOB (4) **Comments:** Life History: Resident **Species:** Arctic grayling Life Stage: adult **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 340 Max: 365 **Median:** 352 **Mean:** 352 Sampling Method (No. of fish): BEF (2) **Comments: Species:** slimy sculpin Life Stage: juvenile/adult Life History: Resident **Fish Measured:** Fork Lengths (mm) Min: **Total Fish Count:** 1 Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: longnose sucker Life Stage: adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 355 Max: 415 Mean: 391 Median: 385 Sampling Method (No. of fish): BEF (3) **Comments:** Life History: Resident Species: burbot Life Stage: juvenile Fork Lengths (mm) Min: 165 Max: 165 **Median:** 165 Total Fish Count: 1 Fish Measured: 1 Mean: 165 Sampling Method (No. of fish): BEF (1) **Comments:**

Stream Gradient:	handheld abney level	Channel Depths:	handheld sonar depth finder
Stream Velocity:	GPS Float	Channel Widths:	handheld laser rangefinder
Turbidity: LaMotte	e 2020e turbidimeter	Electrofisher: S	mith-Root GPP 2.5
Water Quality: YS	I 556	Transparency:	



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FSS1107B010343.jpg

FSS1107B010344.jpg

FSS1107B010345.jpg



Station Info Date/Time: 08/09/2011 1 Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/09/2011 1	
	0:08 AM
	o ngitude 46.76554
Elevation NED (m)(ft): 942 3091	
Coordinate Determination Method:Non-Differential GPS Field MeasurementDatum: WGS84USGS Quadrangle:Mt Hayes A-6Legal Description (MTRS):F021S005E34	
Waterbody Name: Osar Creek	
Anadromous Waters Catalog Number:	
Geographic Comments: Approximately 20M from Denali Highway and Osar creek crossing. Visit Comments:	
Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C): 9.70 DO (mg/L): 9.14 DO (%): 80.40 Conductivity (μS/cm): 52 pH: 8.60 Water Color: Humic Turbidity (NTU): 2.20 Thalweg Velocity (m/s)(ft/s): 0.80 2.62	
Stream Channel	
Stream Gradient (%): 0.25Entrenchment:Slightly EntrenchedCatchment Area(sq. km):38Embeddedness:High	
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Cobble	
Width4.43.4Subdominant Substrate 1: BoulderThalweg Depth0.510.44Subdominant Substrate 2:	
Rosgen Class: E3 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Ver efficient and stable. High meander width ratio.	у
Riparian Vegetation Communities (Viereck et al. 1992)	
	Canopy
	Height(m)
0-5 Closed Tall Willow Shrub 12 Closed Tall Willow Shrub	8
5 - 10 Closed Tall Willow Shrub 12 Closed Tall Willow Shrub	8
10 - 20Closed Tall Willow Shrub12Closed Tall Willow Shrub	8
20 - 30 Closed Tall Willow Shrub12Closed Tall Willow Shrub	8
Key To Fish Sampling MethodsEstimated reach length (m): 165	
(PEF) Backpack Electrofisher (VOG) Visual Observation, Ground	
Fish Observations	
Species: burbotLife Stage: juvenileLife History: ResidentTotal Fish Count: 2Fish Measured: 2Fork Lengths (mm)Min: 141Max: 147Mean: 144Mean: 144	dian: 144
Sampling Method (No. of fish): PEF (2) Comments:	ulan. 177
Species: Arctic grayling Life Stage: adult Life History: Resident	
Total Fish Count:1Fish Measured:1Fork Lengths (mm)Min:337Max:337Mean: <th< td=""><td>dian: 337</td></th<>	dian: 337
Species: Arctic graylingLife Stage: juvenile/adultLife History: Resident	
Total Fish Count: 32 Fish Measured: 3 Fork Lengths (mm) Min: 214 Max: 244 Mean: 227 Me	dian: 229
Sampling Method (No. of fish): PEF (3) VOG (29) Comments:	
Sampling Method (No. of fish): PEF (3) VOG (29)	

Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 79 Max: 115 **Mean:** 97 Median: 97 Sampling Method (No. of fish): PEF (2) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 12 Fish Measured: 1 Fork Lengths (mm) Min: 67 Max: 67 **Mean:** 67 Median: 67 Sampling Method (No. of fish): PEF (1) VOG (11) **Comments: Species:** slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 19 Max: 25 **Mean:** 21 Median: 22 Sampling Method (No. of fish): PEF (3) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 265 Max: 289 Mean: 277 **Median:** 277 Sampling Method (No. of fish): PEF (2) **Comments:**

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:





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FSS1107c010189.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/09/2011 1:36 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.11925 -146.79703 Coordinates -146.79579 63.12165 63.11925 -146.79703Elevation NED (m)(ft): 1081 3547 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Mt Hayes A-6 Legal Description (MTRS): F021S005E04 Waterbody Name: Little Clearwater Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU52 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow **pH:** 7.25 Water Temp (C): 6.55 DO (mg/L): 10.35 DO (%): 84.30 Conductivity (µS/cm): 23 Water Color: Clear Turbidity (NTU): 0.20 Thalweg Velocity (m/s)(ft/s): 1.05 3.44 **Stream Channel** Stream Gradient (%): 2 Moderatley Entrenched **Entrenchment: Catchment Area(sq. km):** 55 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble **Width** 30.6 11.3 Subdominant Substrate 1: Boulder Thalweg Depth 1.01 0.70 Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 Closed Tall Willow Shrub 1.8 Unvegetated 5 - 10 Closed Tall Willow Shrub 1.8 Unvegetated 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 1.8 1.5 20 - 30 Closed Tall Willow Shrub 1.8 Closed Tall Willow Shrub 1.5 **Key To Fish Sampling Methods** Estimated reach length (m): 415 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fish Measured: 2 Fork Lengths (mm) Min: 70 Max: 80 Median: 75 **Total Fish Count: 5 Mean:** 75 Sampling Method (No. of fish): PEF (2) VOG (3) **Comments:** Life Stage: adult Life History: Resident Species: slimy sculpin Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 69 Max: 69 Mean: 69 Median: 69 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 57 Total Fish Count: 13 Fish Measured: 4 Fork Lengths (mm) Min: 52 Max: 63 **Mean: 59** Sampling Method (No. of fish): PEF (4) VOG (9) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 24 Max: 43 **Mean: 34** Median: 33 Sampling Method (No. of fish): PEF (6) **Comments:**

 Species: Dolly Varden
 Life Stage: juvenile/adult
 Life History: Unknown

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 87
 Mean:
 87
 Median:
 87

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Vertical Period
 87
 Mean:
 87
 Median:
 87

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:
Water Quality. 151 556	Transparency.



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FSS1107c020193.jpg



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Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/09/2011 3:33 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.97010 -147.20495 Coordinates -147.20762 62.96847 62.97010 -147.20495 Elevation NED (m)(ft): 725 2379 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts D-1 Legal Description (MTRS): F022S003E32 Waterbody Name: Waterfall Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU106 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.77 DO (mg/L): 10.85 DO (%): 91.10 Conductivity (µS/cm): 52 pH: 7.47 Water Color: Feric Turbidity (NTU): 7.30 Thalweg Velocity (m/s)(ft/s): 1.00 3.28 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 95 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel 9.5 6.5 Width Subdominant Substrate 1: Cobble Thalweg Depth 1.32 0.90 Subdominant Substrate 2: Sand Rosgen Class: E4 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Low Willow Shrub 1 Closed Low Willow Shrub 0.7 5 - 10 Closed Low Willow Shrub 1 Closed Low Willow Shrub 0.7 10 - 20 Closed Low Willow Shrub Closed Low Willow Shrub 1 0.7 28 Closed Low Willow Shrub 20 - 30 Open White Spruce Forest 0.7 **Key To Fish Sampling Methods** Estimated reach length (m): 350 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: burbot Life Stage: juvenile Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 71 Max: 122 Median: 96 **Total Fish Count:** 2 **Mean: 96** Sampling Method (No. of fish): PEF (2) **Comments:** Life Stage: juvenile/adult Life History: Resident Species: Arctic grayling Total Fish Count: 11 Fish Measured: 2 Fork Lengths (mm) Min: 246 Max: 265 Mean: 255 Median: 255 Sampling Method (No. of fish): PEF (2) VOG (9) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 42 Median: 76 **Total Fish Count:** 6 Fish Measured: 6 Max: 111 **Mean:** 62 Sampling Method (No. of fish): PEF (6) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 69 Max: 86 **Mean:** 74 Median: 77 Sampling Method (No. of fish): PEF (4)

Comments:

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count: 20** Fish Measured: 3 Fork Lengths (mm) Min: 53 Max: 67 **Mean:** 60 Median: 60 Sampling Method (No. of fish): PEF (3) VOG (17) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: juvenile Total Fish Count: 18 Fish Measured: 18 Fork Lengths (mm) Min: 30 Max: 50 **Mean:** 41 Median: 40 Sampling Method (No. of fish): PEF (18) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 134 Max: 134 Total Fish Count: 1 Fish Measured: 1 **Mean:** 134 Median: 134 Sampling Method (No. of fish): PEF (1) **Comments:**

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



FSS1107c030199.jpg

FSS1107c030200.jpg

FSS1107c030201.jpg



FSS1107c030208.jpg

FSS1107c030210.jpg

Station Info Observers: Joe Buckwalter, Jonathan Kirsch, Raye Ann Neustel Date/Time: 07/20/2011 11:40 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.68833 -150.30287 Coordinates 61.69322 -150.31167 61.59277 -150.38058 Elevation NED (m)(ft): 17 56 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek C-1 Legal Description (MTRS): S019N006W35 Waterbody Name: Susitna River Anadromous Waters Catalog Number: 247-41-10200 Geographic Comments: Downstream of the Deshka River mouth. Visit Comments: Lots of pink and sockeye salmon in the river. Our electrofishing efficiency was reduced by trying to avoid adult salmon. Anglers fishing the lower Deshka River reported catching coho salmon, but we did not find any in the mainstem Susitna River during this visit. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.30 DO (mg/L): 11.16 **DO (%):** 102.00 Conductivity (µS/cm): 63 **pH:** 7.62 Water Color: Glacial, High Turbidit Turbidity (NTU): 108.40 Thalweg Velocity (m/s)(ft/s): 2.50 8.20 **Stream Channel** Stream Gradient (%): 0.1 **Entrenchment:** Slightly Entrenched Catchment Area(sq. km): 33787 **Embeddedness:** Low **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel Width 300.0 250.0 Subdominant Substrate 1: Cobble Thalweg Depth 8.20 6.70 Subdominant Substrate 2: Sand Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Low Alder-Willow Shrub 1.2 Closed Tall Alder-Willow Shrub 3 1.2 3 5 - 10 Closed Low Alder-Willow Shrub Closed Tall Alder-Willow Shrub 1.2 3 **10 - 20** Closed Low Alder-Willow Shrub Closed Tall Alder-Willow Shrub 1.2 20 - 30 Closed Low Alder-Willow Shrub 30 Closed Spruce-Paper Birch Forest **Key To Fish Sampling Methods** Estimated reach length (m): #### Total Electrofishing Time (s): 4438 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 15 Fish Measured: 4 Fork Lengths (mm) Min: 205 Max: 273 Mean: 235 Median: 239 Sampling Method (No. of fish): BEF (4) VOB (11) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 57 Total Fish Count: 13 Fish Measured: 6 Fork Lengths (mm) Min: 52 Max: 63 Mean: 56 Sampling Method (No. of fish): BEF (6) VOB (7) **Comments:**

 Species: round whitefish
 Life Stage: juvenile
 Life History: Resident

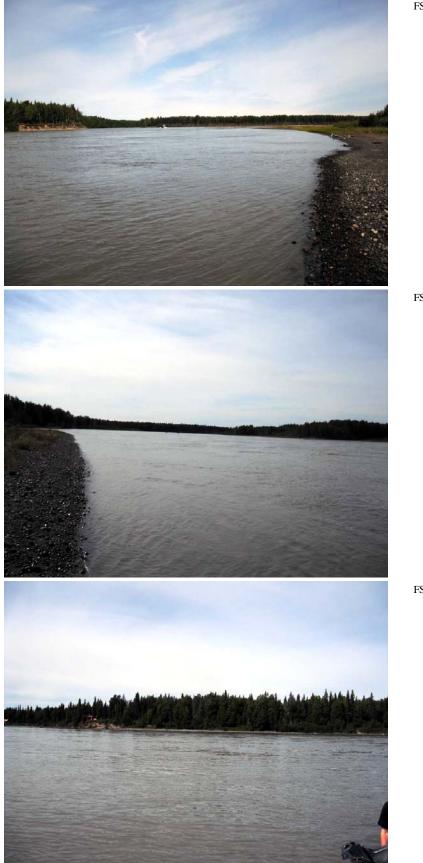
 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 94
 Mean:
 94
 Median:
 94

 Sampling Method (No. of fish):
 BEF (1)
 Comments:
 Comments:

Appendix L84.-Page 2 of 4.

Species: lamprey-unspecified Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 125 Max: 125 **Total Fish Count: 43** Fish Measured: 3 Mean: 125 Median: 125 Sampling Method (No. of fish): BEF (10) VOB (33) Comments: fork length estimated Species: pink salmon Life Stage: adult Life History: Anadromous Total Fish Count: 1295 Fish Measured: Fork Lengths (mm) Min: Median: Max: Mean: Sampling Method (No. of fish): VOB (1295) **Comments:** Species: sockeye salmon Life Stage: adult Life History: Anadromous Total Fish Count: 890 Fork Lengths (mm) Min: Max: Median: Fish Measured: Mean: Sampling Method (No. of fish): VOB (890) **Comments:** Species: burbot Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: **Total Fish Count:** 8 **Fish Measured:** Max: Mean: Median: Sampling Method (No. of fish): VOB (8) **Comments:** Species: rainbow trout Life Stage: adult Life History: Resident **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: lamprey-unspecified Life Stage: adult Life History: Unknown **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 125 Max: 125 Mean: 125 Median: 125 Sampling Method (No. of fish): BEF (2) Comments: Lengths estimated (difficult to measure). Species: slimy sculpin Life Stage: juvenile Life History: Resident Fish Measured: 4 Fork Lengths (mm) Min: 40 Max: 50 **Mean:** 45 Median: 45 **Total Fish Count:** 4 Sampling Method (No. of fish): BEF (4) **Comments:** Species: lamprey-unspecified Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 5 Fish Measured: 1 Fork Lengths (mm) Min: 131 Max: 131 Mean: 131 **Median:** 131 Sampling Method (No. of fish): BEF (1) VOB (4) **Comments:** Species: Pacific salmon-unspecified Life Stage: juvenile Life History: Anadromous Median: Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Species: longnose sucker Life Stage: adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 355 Max: 355 Mean: 355 **Total Fish Count:** 1 Median: 355 Sampling Method (No. of fish): BEF (1) **Comments:** Life History: Resident Species: longnose sucker Life Stage: juvenile **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 102 Max: 145 Mean: 117 **Median:** 123 Sampling Method (No. of fish): BEF (6) **Comments:**

Channel Depths: handheld sonar depth finder
Channel Widths: handheld laser rangefinder
Electrofisher: Smith-Root GPP 2.5
Transparency:



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FSS1107D010247.jpg



Appendix Los: Station 1 SS110010				
Station Info				
Observers: Joe Buckwalter, Joe Giefer		D	Date/Time: 08/10/2	011 11:51 AM
Station Latitude Longitude Coordinates 62.45961 -147.58261	Sample Coordinates	Latitude Long 62.45961 -147.5	itude Latitude 58261 / 62.47370	0
Elevation NED (m)(ft): 911 2989				
Coordinate Determination Method: Non-I			m: WGS84	
USGS Quadrangle: Talkeetna Mts B-2 Waterbody Name: Black River	Legal Descrip	otion (MTRS): S027	INUIUEUS	
Anadromous Waters Catalog Number:				
Geographic Comments:				
Visit Comments: Wetted width measured to was not included.	edge of flowing waterso	ome standing water b	etween boulders on	right bank
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 6.85 DO (mg/L): 10.68		Conductivity (µS/c	=	
Water Color: Glacial, Low Turbidit Turbi	aity (NTU): 7.63	Thalweg Velocity (n	n/s)(n/s): 1.39 4.56	
Stream Channel				
	enchment: Slightly En eddedness: Negligible	trenched		
Channel Dimensions (m): Bankfull Ol	HW Wetted D	ominant Substrate:	Boulder	
Width 37.0		minant Substrate 1:	Cobble	
Thalweg Depth 1.50		minant Substrate 2:		a
Rosgen Class: C2 Low gradient, meandering,	, point-bar, riffle/pool, all	luvial channels with l	broad, well-defined	floodplains.
Riparian Vegetation Communities (V	Viereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetat	ion Type	Canopy Height(m)
0 - 5 Closed Low Willow Shrub	1 (Closed Low Willow S	Shrub	1
5 - 10 Closed Low Willow Shrub	1 (Closed Low Willow S	Shrub	1
10 - 20 Closed Low Willow Shrub	1 (Closed Low Willow S	Shrub	1
20 - 30 Closed Low Willow Shrub	1 (Closed Low Willow S	Shrub	1
Key To Fish Sampling Methods	Estimated reach l	ength (m): 3500 To	atal Electrofishing	Time (s) , 1700
(BEF) Boat-Mounted Electrofisher		Visual Observation	_	Time (5) . 1700
(BEF) Boat-Mounted Electronsher		v Isuai Observation	, Doat	
Fish Observations				
Species: round whitefish Life	Stage: juvenile/adult	Life History:		M. P 260
Species: round whitefishLifeTotal Fish Count:8Fish Measured:	5 Fork Lengths (mm)	•		Median: 260
Species: round whitefish Life	5 Fork Lengths (mm)	•		Median: 260
Species: round whitefishLifeTotal Fish Count:8Fish Measured:3Sampling Method (No. of fish):BEF (5) VComments:	5 Fork Lengths (mm)	•	305 Mean: 278	Median: 260
Species: round whitefishLifeTotal Fish Count:8Fish Measured:3Sampling Method (No. of fish):BEF (5) VComments:5Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:	5 Fork Lengths (mm) OB (3)) Min: 215 Max: 3	305 Mean: 278	Median: 260 Median:
Species: round whitefishLifeTotal Fish Count:8Sampling Method (No. of fish):BEF (5) VComments:5Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:5Sampling Method (No. of fish):VOB (6)	5 Fork Lengths (mm) OB (3) Stage: juvenile/adult) Min: 215 Max: 3	305 Mean: 278 Resident	
Species: round whitefishLifeTotal Fish Count:8Sampling Method (No. of fish):BEF (5) VComments:5Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:5Sampling Method (No. of fish):VOB (6)Comments:	5 Fork Lengths (mm) OB (3) Stage: juvenile/adult Fork Lengths (mm)) Min: 215 Max: 3 Life History: 1) Min: Max:	305 Mean: 278 Resident Mean:	
Species: round whitefishLifeTotal Fish Count:8Sampling Method (No. of fish):BEF (5) VComments:5Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:5Sampling Method (No. of fish):VOB (6)Comments:5Species: general fish observation, no sLife	 Fork Lengths (mm) OB (3) Stage: juvenile/adult Fork Lengths (mm) Stage: juvenile/adult) Min: 215 Max: 3 Life History: 1) Min: Max: Life History: 1	305 Mean: 278 Resident Mean: Resident	Median:
Species: round whitefishLifeTotal Fish Count:8Sampling Method (No. of fish):BEF (5) VComments:5Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:5Sampling Method (No. of fish):VOB (6)Comments:5	5 Fork Lengths (mm) OB (3) Stage: juvenile/adult Fork Lengths (mm)) Min: 215 Max: 3 Life History: 1) Min: Max: Life History: 1	305 Mean: 278 Resident Mean:	
Species: round whitefishLifeTotal Fish Count:8Fish Measured:Sampling Method (No. of fish):BEF (5) VComments:5Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:Sampling Method (No. of fish):VOB (6)Comments:Species: general fish observation, no sLifeTotal Fish Count:5Fish Measured:	 5 Fork Lengths (mm) 5 OB (3) Stage: juvenile/adult Fork Lengths (mm) Stage: juvenile/adult Fork Lengths (mm)) Min: 215 Max: 3 Life History: 1) Min: Max: Life History: 1	305 Mean: 278 Resident Mean: Resident	
Species: round whitefishLifeTotal Fish Count:8Fish Measured:Sampling Method (No. of fish):BEF (5) VComments:Species: slimy sculpinLifeTotal Fish Count:6Fish Measured:Sampling Method (No. of fish):VOB (6)Comments:Species: general fish observation, no sLifeTotal Fish Count:5Fish Measured:Sampling Method (No. of fish):VOB (5)Comments:Sempling Method (No. of fish):VOB (5)Comments:	 5 Fork Lengths (mm) 5 OB (3) Stage: juvenile/adult Fork Lengths (mm) Stage: juvenile/adult Fork Lengths (mm)) Min: 215 Max: 3 Life History: 1) Min: Max: Life History: 1	305 Mean: 278 Resident Mean: Resident Mean:	Median:

```
Comments:
```

Life History: Resident Species: Arctic grayling Life Stage: juvenile **Total Fish Count:** 4 Fish Measured: 3 Fork Lengths (mm) Min: 160 Max: 185 **Median:** 172 Mean: 173 Sampling Method (No. of fish): BEF (3) VOB (1) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 12 Fish Measured: 5 Fork Lengths (mm) Min: 210 Max: 305 Mean: 251 Median: 257 Sampling Method (No. of fish): BEF (5) VOB (7) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident **Total Fish Count:** 4 Fish Measured: 1 Fork Lengths (mm) Min: 345 Max: 345 **Mean:** 345 Median: 345 Sampling Method (No. of fish): BEF (1) VOB (3) **Comments:** Species: salmonid-unspecified Life Stage: not recorded Life History: Unknown **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 50 Max: 50 **Mean: 50** Median: 50 Sampling Method (No. of fish): BEF (1) **Comments:**

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1108A010452.jpg

FSS1108A010455.jpg



FSS1108A010456.jpg

FSS1108A010459.jpg

FSS1108A010460.jpg

Station Info Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/10/2011 9:09 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.30904 -147.50218 Coordinates -147.50218 62.30904 62.32078 -147.48383 Elevation NED (m)(ft): 989 3245 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts B-1 Legal Description (MTRS): S026N011E30 Waterbody Name: Little Oshetna River **Anadromous Waters Catalog Number:** Geographic Comments: IU23 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.68 DO (mg/L): 11.70 DO (%): 91.00 Conductivity (µS/cm): 186 pH: 7.86 Water Color: Clear Turbidity (NTU): 1.42 Thalweg Velocity (m/s)(ft/s): 1.60 5.25 **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Slightly Entrenched **Catchment Area(sq. km):** 231 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 25.5 12.0 Subdominant Substrate 1: Gravel Thalweg Depth 1.50 0.52 Subdominant Substrate 2: Bedrock Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 2.5 2.5 Open Tall Willow Shrub Closed Tall Willow Shrub 2.5 5 - 10 Open Tall Willow Shrub Closed Tall Willow Shrub 2.5 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 1.8 2.5 20 - 30 Closed Tall Willow Shrub 1.8 Closed Tall Willow Shrub 2.5 **Kev To Fish Sampling Methods** Estimated reach length (m): 2100 Total Electrofishing Time (s): 932 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat

Fish Observations

Species: Arctic grayling Life Stage: adult Life History: Resident Fish Measured: 10 Fork Lengths (mm) Min: 330 Max: 365 Median: 347 Total Fish Count: 10 Mean: 341 Sampling Method (No. of fish): BEF (10) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 36 Fish Measured: 2 Fork Lengths (mm) Min: 280 Max: 300 Mean: 290 **Median:** 290 Sampling Method (No. of fish): BEF (2) VOB (34)

Comments:

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1108B010350.jpg

FSS1108B010351.jpg



Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/10/2011 9:20 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.13928 -147.92662 Coordinates -147.92446 63.14078 63.13915 -147.92661 Elevation NED (m)(ft): 978 3209 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-2 Legal Description (MTRS): F020S002W34 Waterbody Name: Butte Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU11 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.13 DO (mg/L): 11.33 DO (%): 91.30 Conductivity (µS/cm): 85 **pH:** 7.72 Water Color: Clear Turbidity (NTU): 0.50 Thalweg Velocity (m/s)(ft/s): 0.53 1.74 **Stream Channel** Stream Gradient (%): 0.5 Moderatley Entrenched **Entrenchment:** Negligible **Catchment Area(sq. km):** 77 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 20.9 20.6 Subdominant Substrate 1: Boulder Thalweg Depth 0.50 0.31 Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 1.5 Midgrass-Shrub Open Tall Willow Shrub 1.8 1.5 Midgrass-Shrub Open Tall Willow Shrub 1.8 5 - 10 10 - 20 Midgrass-Shrub 1.5 Open Tall Willow Shrub 1.8 1.5 20 - 30 Midgrass-Shrub Open Tall Willow Shrub 18 **Kev To Fish Sampling Methods** Estimated reach length (m): 245 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 30 Fish Measured: 5 Fork Lengths (mm) Min: 207 Max: 305 Median: 256 Mean: 250 Sampling Method (No. of fish): PEF (5) VOG (25) **Comments:** Life Stage: juvenile Life History: Resident Species: Arctic grayling **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 37 Max: 182 **Mean:** 63 Median: 109 Sampling Method (No. of fish): PEF (6) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 70 Median: 83 **Total Fish Count:** 4 Fish Measured: 4 Max: 97 Mean: 81 Sampling Method (No. of fish): PEF (4) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 10 Fish Measured: 2 Fork Lengths (mm) Min: 57 Max: 65 Mean: 61 Median: 61 Sampling Method (No. of fish): PEF (2) VOG (8) **Comments:**

Appendix L87.–Page 2 of 4.

Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 42 **Max:** 42 **Mean:** 42 Median: 42 Sampling Method (No. of fish): PEF (1) **Comments:** Life Stage: juvenile/adult Species: round whitefish Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 293 Max: 293 Mean: 293 Median: 293 Sampling Method (No. of fish): VOG (1) **Comments:** Instruments

Stream Gradient: handheld abney level Stream Velocity: transparent velocity head rod Turbidity: LaMotte 2020e turbidimeter Water Quality: YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 **Transparency:**



FSS1108c010214.jpg

FSS1108c010215.jpg

FSS1108c010216.jpg

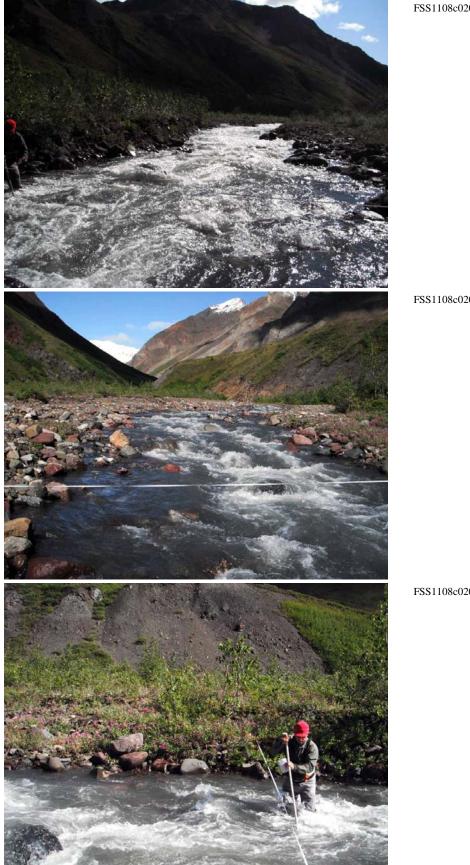


FSS1108c010217.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/10/2011 11:38 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.15421 -149.71345 Coordinates -149.71823 63.15593 63.15421 -149.71345 Elevation NED (m)(ft): 766 2513 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-6 Legal Description (MTRS): F020S011W30 Waterbody Name: Copeland Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU89 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): 97.30 **Water Temp (C):** 4.42 DO (mg/L): 12.66 Conductivity (µS/cm): 220 **pH:** 8.26 Water Color: Glacial, Low Turbidit Turbidity (NTU): 10.00 Thalweg Velocity (m/s)(ft/s): 0.96 3.15 **Stream Channel** Stream Gradient (%): 2 Moderatley Entrenched **Entrenchment:** Catchment Area(sq. km): 30 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Boulder Width 11.1 7.6 Subdominant Substrate 1: Cobble Thalweg Depth 1.02 0.59 Subdominant Substrate 2: Gravel Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 3 0.4 Open Tall Alder-Willow Shrub Ferns 3 0.4 5 - 10 Open Tall Alder-Willow Shrub Ferns 3 10 - 20 Open Tall Alder-Willow Shrub Fireweed 0.5 3 Closed Low Willow Shrub 20 - 30 Open Tall Alder-Willow Shrub 0.7 **Key To Fish Sampling Methods** Estimated reach length (m): 450 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 5 Fork Lengths (mm) Min: 104 Max: 143 Total Fish Count: 10 Mean: 124 Median: 123 Sampling Method (No. of fish): PEF (5) VOG (5) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 5 Fish Measured: 5 Fork Lengths (mm) Min: 35 Max: 47 **Mean:** 40 Median: 41 Sampling Method (No. of fish): PEF (5) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root LR-24

Water Quality: YSI 556

Transparency:



FSS1108c020230.jpg

FSS1108c020231.jpg

FSS1108c020232.jpg



Station In	fo				
Observers:	Raye Ann Neustel, Daniel Reed			Date/Time: 08/10/	/2011 1:24 PM
	Latitude Longitude des 63.24879 -148.99004	Sample Coordinates	Latitude 63.24705	Longitude / Latitud -148.98905 / 63.248	
	NED (m)(ft): 895 2936		r,		
	e Determination Method: Non-D ndrangle: Healy A-4			Datum: WGS84 : F019S008W24	
Waterbody		Legal Deseri		101/2000 121	
	us Waters Catalog Number:		CI 11. D.		
	c Comments: HU160. Unnamed t	tributary to Middle Fork	Chulitna Rive	er.	
Visit Comr Wildlife Co					
Water Qu	ality \ Stream Flow				
	np (C): 5.67 DO (mg/L): 10.62	. ,	-	φ (μS/cm): 134 pH:	
Water Col	or: Clear Turbic	lity (NTU): 0.30	Thalweg Vel	ocity (m/s)(ft/s): 1.59 5.2	22
Stream Cl	hannel				
		nchment: Moderatle ddedness: Negligible	y Entrenched		
Channel I	Dimensions (m): Bankfull OF			strate: Cobble	
	Width 26.5 Thalweg Depth 0.85			rate 1: Boulder rate 2: Gravel	
Rosgen Cla	ass: B3 Moderately entrenched, mo				ced pools Verv
Kösgen Ci	stable plan and profile. Stable		ommated enam	nei, with infequently spa	iced pools. Very
Riparian V	Vegetation Communities (V	viereck et al. 1992)			
Dist. from		Conony			~
	Left Bank Vegetation Type	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
	Left Bank Vegetation Type Closed Tall Willow Shrub		Right Bank V Unvegetated	egetation Type	
Bank (m)		Height(m)		egetation Type	
Bank (m) 0 - 5	Closed Tall Willow Shrub	Height(m)	Unvegetated	egetation Type	
Bank (m) 0 - 5 5 - 10 10 - 20	Closed Tall Willow Shrub Closed Tall Willow Shrub	Height(m) 3 3	Unvegetated Unvegetated	⁷ egetation <u>Type</u>	
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub	Height(m) 3 3 3	Unvegetated Unvegetated Unvegetated Unvegetated		
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub	Height(m) 3 3 3 1.7 Estimated reach	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26		
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher	Height(m) 3 3 3 1.7 Estimated reach	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26	0	
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S	Height(m) 3 3 1.7 Estimated reach (VOG	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26) Visual Obse Life His	0 rvation, Ground	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26) Visual Obse Life His	0 rvation, Ground	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) Version	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26) Visual Obse Life His	0 rvation, Ground	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) Vers:	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Invegetated Iength (m): 26 (r) Visual Obse Life His (n) Min: 95	0 rvation, Ground	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: Do Total Fish	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S a Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) Vers: olly Varden Life S a Count: 13 Fish Measured: 1	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12)	Unvegetated Unvegetated Unvegetated Invegetated Iength (m): 26 (b) Visual Obse Life His (1) Min: 95	0 rvation, Ground story: Unknown Max: 210 Mean: 149	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Da Total Fish Sampling Comments Species: Da Total Fish Sampling	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) Vo s: olly Varden Life S Count: 13 Fish Measured: 1 Method (No. of fish): PEF (13)	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12) Stage: juvenile	Unvegetated Unvegetated Unvegetated Invegetated Iength (m): 26 (b) Visual Obse Life His (1) Min: 95	0 rvation, Ground story: Unknown Max: 210 Mean: 149	Height(m) Median: 152
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: Do Total Fish Sampling Comments	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S a Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) VG s: olly Varden Life S a Count: 13 Fish Measured: 1 Method (No. of fish): PEF (13) s:	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12) Stage: juvenile	Unvegetated Unvegetated Unvegetated Invegetated Iength (m): 26 (b) Visual Obse Life His (1) Min: 95	0 rvation, Ground story: Unknown Max: 210 Mean: 149	Height(m) Median: 152
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comment: Species: Do Total Fish Sampling Comment:	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) VO s: olly Varden Life S Count: 13 Fish Measured: 1 Method (No. of fish): PEF (13) s:	Height(m) 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12) Stage: juvenile 13 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26 (b) Visual Obse Life His (a) Min: 95 Life His (b) Min: 35	0 rvation, Ground Max: 210 Mean: 149 Max: 210 Mean: 149 Max: 74 Mean: 56	Height(m) Median: 152
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: Do Total Fish Sampling Comments Stream Gr	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S a Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) Vers: olly Varden Life S a Count: 13 Fish Measured: 1 Method (No. of fish): PEF (13) s: hts adient: handheld abney level	Height(m) 3 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12) Stage: juvenile 3 Fork Lengths (mm Channel	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26 () Visual Obse Life His () Min: 95 Life His () Min: 35	0 rvation, Ground story: Unknown Max: 210 Mean: 149 story: Unknown Max: 74 Mean: 56	Height(m) Median: 152
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comment: Species: Do Total Fish Sampling Comment: Stream Gr Stream Vel	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) VO s: olly Varden Life S Count: 13 Fish Measured: 1 Method (No. of fish): PEF (13) s: hts adient: handheld abney level locity: transparent velocity head	Height(m) 3 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12) Stage: juvenile 3 Fork Lengths (mm Channel rod Channel	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26 (b) Visual Obse (c) Visual Obse	0 rvation, Ground story: Unknown Max: 210 Mean: 149 story: Unknown Max: 74 Mean: 56 aduated wading rod easuring tape	Height(m) Median: 152
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Da Total Fish Sampling Comments Species: Da Total Fish Sampling Comments Species: Da Total Fish Sampling Comments Stream Gri Stream Vel Turbidity:	Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub Closed Tall Willow Shrub sh Sampling Methods kpack Electrofisher rvations olly Varden Life S a Count: 18 Fish Measured: 6 Method (No. of fish): PEF (6) Vers: olly Varden Life S a Count: 13 Fish Measured: 1 Method (No. of fish): PEF (13) s: hts adient: handheld abney level	Height(m) 3 3 3 1.7 Estimated reach (VOG Stage: juvenile/adult 5 Fork Lengths (mm OG (12) Stage: juvenile 3 Fork Lengths (mm Channel	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 26 (a) Visual Obse Life His (b) Min: 95 Life His (c) Min: 35 (c) Min: 35 (c) Depths: gr (c) Widths: mu (c) fisher: Smit	0 rvation, Ground story: Unknown Max: 210 Mean: 149 story: Unknown Max: 74 Mean: 56	Height(m) Median: 152



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FSS1108c030243.jpg

FSS1108c030244.jpg



Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/10/2011 2:36 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.27781 -148.92708 Coordinates -148.92532 63.27874 63.27781 -148.92708Elevation NED (m)(ft): 948 3110 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Ouadrangle:** Healy B-4 Legal Description (MTRS): F019S007W08 Waterbody Name: Middle Fork Chulitna River Anadromous Waters Catalog Number: 247-41-10200-2381 Geographic Comments: HU49 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.88 DO (mg/L): 11.01 DO (%): 90.50 Conductivity (µS/cm): 203 pH: 7.85 Water Color: Clear Turbidity (NTU): 0.30 Thalweg Velocity (m/s)(ft/s): 1.09 3.58 **Stream Channel** Stream Gradient (%): 0.75 Moderatley Entrenched **Entrenchment: Catchment Area(sq. km):** 54 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 13.1 12.6 Subdominant Substrate 1: Gravel Thalweg Depth 0.57 0.47 Subdominant Substrate 2: Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 3 Closed Low Willow Shrub 1.2 Closed Tall Willow Shrub 3 5 - 10 Closed Tall Willow Shrub Closed Low Willow Shrub 1.2 10 - 20 Closed Tall Willow Shrub 3 Closed Low Willow Shrub 1.2 20 - 30 Closed Low Willow Shrub 1.3 Closed Low Willow Shrub 1.2 **Key To Fish Sampling Methods** Estimated reach length (m): 162 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: **Total Fish Count:** 1 Sampling Method (No. of fish): VOG (1) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 55 Max: 60 **Mean: 58** Median: 57 Sampling Method (No. of fish): PEF (4) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 13 Fork Lengths (mm) Min: 35 Median: 44 **Total Fish Count:** 43 Max: 53 **Mean:** 44 Sampling Method (No. of fish): PEF (13) VOG (30) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 53 Max: 53 **Mean: 53** Median: 53 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1108c040258.jpg Juvenile coho salmon.

FSS1108c040259.jpg Juvenile coho salmon.

FSS1108c040260.jpg Juvenile Chinook salmon, anal fin is not sickle shaped and leading edge is not longer than length of anal fin base.



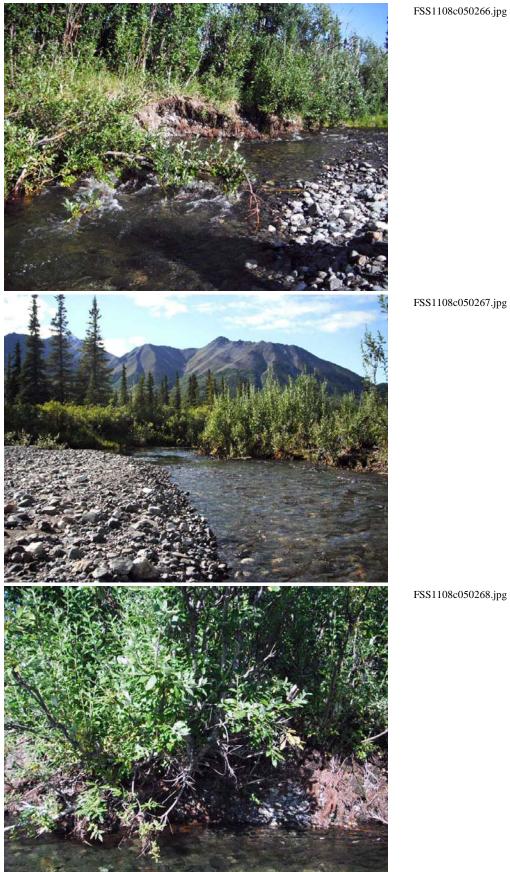
FSS1108c040261.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/10/2011 5:08 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.02336 -147.54752 Coordinates -147.54747 63.02121 63.02336 -147.54752 Elevation NED (m)(ft): 742 2434 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-2 Legal Description (MTRS): F022S001E09 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HU142. Unnamed tributary of Susitna River. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.83 DO (mg/L): 10.46 DO (%): 85.80 Conductivity (µS/cm): 44 **pH:** 6.07 Water Color: Clear Turbidity (NTU): 0.10 Thalweg Velocity (m/s)(ft/s): 1.14 3.74 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 45 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 18.0 3.5 Subdominant Substrate 1: Gravel Thalweg Depth 1.22 0.31 Subdominant Substrate 2: Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 6 0 - 5 Open White Spruce Forest 28 Closed Tall Willow Shrub 29 5 - 10 Open White Spruce Forest 28 Open White Spruce Forest 29 10 - 20 Open White Spruce Forest 28 Open White Spruce Forest 20 - 30 Open White Spruce Forest 28 Closed Tall Willow Shrub 3 **Key To Fish Sampling Methods** Estimated reach length (m): 280 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 4 Fork Lengths (mm) Min: 109 Max: 151 Median: 130 **Total Fish Count:** 4 Mean: 121 Sampling Method (No. of fish): PEF (4) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 39 **Total Fish Count:** 3 Fish Measured: 3 Max: 45 **Mean:** 42 Median: 42 Sampling Method (No. of fish): PEF (3) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 138 Max: 138 Mean: 138 Median: 138 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 244 Max: 300 **Total Fish Count:** 8 Fish Measured: 3 **Mean:** 274 Median: 272 Sampling Method (No. of fish): PEF (3) VOG (5) **Comments:**

Species: Arctic grayling Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 117 Max: 117 Total Fish Count: 1 Fish Measured: 1 Mean: 117 **Median:** 117 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) **Comments:** Instruments Channel Depths: graduated wading rod

Stream Gradient: handheld abney level Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root LR-24 Water Quality: YSI 556 **Transparency:**

> -continued-864



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Station Info

Turbidity:

Water Quality:

Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/10/2011 11:38 AM Sample Latitude Longitude Coordinates -149.27878 63.24817 Elevation NED (m)(ft): 672 2205 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-5 Legal Description (MTRS): F019S009W21 Waterbody Name: Squaw Creek **Anadromous Waters Catalog Number:** Geographic Comments: Waterfall. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Catchment Area(sq. km): Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 1010 - 2020 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Total Fish Count:** 0 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths:**

Electrofisher:

Transparency:

Appendix L/S. Station 1 SS1100D01.				
Station Info				
Observers: Joe Buckwalter, Jonathan Kirsch, R	aye Ann Neustel		Date/Time: 07/	21/2011 11:00 AM
Station Latitude Longitude Coordinates 61.78589 -150.34673	Sample Coordinates	Latitude 61.78589	Longitude / Lati -150.34673 / 61.7	tude Longitude 6472 -150.33906
Elevation NED (m)(ft): 30 98				
Coordinate Determination Method: Non-Diffe			Datum: WGS84	
USGS Quadrangle: Tyonek D-1 Waterbody Name: Deshka River	Legal Descrip	otion (MTRS	: S020N006W34	
Anadromous Waters Catalog Number: 247-41	-10200-2081			
Geographic Comments:				
Visit Comments: Habitat transect at orange sign was very clear (probably <1 N ²)				
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 17.94 DO (mg/L): 8.55	DO (%): 90.20	Conductivity	y (μS/cm): 63 pl	H: 7.26
Water Color: Clear Turbidity	(NTU):	Thalweg Vel	ocity (m/s)(ft/s): 0.78	2.56
Stream Channel				
Stream Gradient (%): 0.25 Entrencl	6.	trenched		
Catchment Area(sq. km): 1524 Embedd				
Channel Dimensions (m): Bankfull OHW Width 62.0			strate: Cobble rate 1: Gravel	
Thalweg Depth 2.90		minant Subst		
Rosgen Class: C3 Low gradient, meandering, po	int-bar, riffle/pool, all	uvial channel	s with broad, well-def	ined floodplains.
Riparian Vegetation Communities (Vie	reck et al. 1992)			
Dist. from	Canopy			Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)		Vegetation Type	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub	Height(m) <u>]</u> 1.5 (Closed Spruce	e-Paper Birch Forest	Height(m) 14.2
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub	Height(m) <u> </u> 1.5 (1.5 (Closed Spruce	e-Paper Birch Forest e-Paper Birch Forest	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub	Height(m) <u>1</u> 1.5 (1.5 (2.5 (Closed Spruce Closed Spruce Closed Spruce	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest	Height(m) 14.2
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub	Height(m) <u>1</u> 1.5 (1.5 (2.5 (Closed Spruce Closed Spruce Closed Spruce	e-Paper Birch Forest e-Paper Birch Forest	Height(m) 14.2 14.2
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub	Height(m) [1.5 (1.5 (2.5 (14.2 (Closed Spruce Closed Spruce Closed Spruce Closed Spruce	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest	Height(m) 14.2 14.2 14.2 14.2 14.2
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Spruce-Paper Birch Forest	Height(m) I 1.5 0 1.5 0 2.5 0 14.2 0	Closed Spruce Closed Spruce Closed Spruce Closed Spruce ength (m): 31	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest	Height(m) 14.2 14.2 14.2 14.2 14.2
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Spruce-Paper Birch ForestKey To Fis Sampling Methods	Height(m) I 1.5 0 1.5 0 2.5 0 14.2 0	Closed Spruce Closed Spruce Closed Spruce Closed Spruce ength (m): 31	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest	Height(m) 14.2 14.2 14.2 14.2 14.2
Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Willow Shrub 5 - 10 Open Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life State	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach lo (VOB) ge: juvenile	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat	Height(m) 14.2 14.2 14.2 14.2 14.2
Bank (m) Left Bank Vegetation Type 0-5 Open Tall Willow Shrub 5-10 Open Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life Stag Total Fish Count: 3 Fish Measured: 3	Height(m) [1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat	Height(m) 14.2 14.2 14.2 14.2 14.2 14.2
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach lo (VOB) ge: juvenile	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat	Height(m) 14.2 14.2 14.2 14.2 14.2 iing Time (s): 2393
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach la (VOB) ge: juvenile Fork Lengths (mm)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean:	Height(m) 14.2 14.2 14.2 14.2 14.2 14.2
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:	Height(m) [1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB) ge: juvenile Fork Lengths (mm) ge: juvenile	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean:	Height(m) 14.2 1
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub5 - 10Open Tall Willow Shrub10 - 20Closed Tall Willow Shrub20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife Stag	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach la (VOB) ge: juvenile Fork Lengths (mm)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean:	Height(m) 14.2 1
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4	Height(m) [1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB) ge: juvenile Fork Lengths (mm) ge: juvenile	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean:	Height(m) 14.2 1
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife Stag	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach la (VOB) ge: juvenile Fork Lengths (mm) ge: juvenile Fork Lengths (mm)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104 Life His Min: 107	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean: 5 story: Resident Max: 184 Mean: 5	Height(m) 14.2 14.5 14.5 14.5 15.5 1
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1	Height(m) [1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB) ge: juvenile Fork Lengths (mm) ge: juvenile	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104 Life His Min: 107	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean: 5 story: Resident Max: 184 Mean: 5	Height(m) 14.2 14.5 154 Median: 145
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StateTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StateTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife StateTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB) ge: juvenile Fork Lengths (mm) ge: adult Fork Lengths (mm)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104 Life His Min: 107 Life His Min: 500	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean: story: Resident Max: 184 Mean: story: Anadromous Max: 500 Mean: 5	Height(m) 14.2 14.5 14.5 14.5 15.5 1
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments: ID confirmed in lab. 3 cusps on superior	Height(m) [1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB) ge: juvenile Fork Lengths (mm) ge: adult Fork Lengths (mm) praoral bar (see photo	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104 Life His Min: 107 Life His Min: 500	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean: story: Resident Max: 184 Mean: story: Anadromous Max: 500 Mean: 5 e L. tridentata.	Height(m) 14.2 14.5 14.5 14.5 15.5 1
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments: ID confirmed in lab. 3 cusps on supSpecies: longnose suckerLife	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach le (VOB) ge: juvenile Fork Lengths (mm) ge: adult Fork Lengths (mm)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104 Life His Min: 107 Life His Min: 500	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean: 5 story: Resident Max: 184 Mean: 5 story: Anadromous Max: 500 Mean: 5 e L. tridentata. story: Resident	Height(m) 14.2 14.5 15.5 1
Bank (m)Left Bank Vegetation Type0-5Open Tall Willow Shrub5-10Open Tall Willow Shrub10-20Closed Tall Willow Shrub20-30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: round whitefishLife StagTotal Fish Count: 3Fish Measured: 3Sampling Method (No. of fish): BEF (3)Comments:Species: longnose suckerLife StagTotal Fish Count: 4Fish Measured: 4Sampling Method (No. of fish): BEF (4)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments:Species: Pacific lampreyLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments: ID confirmed in lab. 3 cusps on supSpecies: longnose suckerLife	Height(m) <u>1</u> 1.5 (1.5 (2.5 (14.2 (Estimated reach la (VOB) ge: juvenile Fork Lengths (mm) ge: adult Fork Lengths (mm) praoral bar (see photo ge: juvenile/adult Fork Lengths (mm)	Closed Spruce Closed Spruce Closed Spruce ength (m): 31 Visual Obse Life His Min: 104 Life His Min: 107 Life His Min: 500	e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest 00 Total Electrofish rvation, Boat story: Resident Max: 146 Mean: 5 story: Resident Max: 184 Mean: 5 story: Anadromous Max: 500 Mean: 5 e L. tridentata. story: Resident	Height(m) 14.2 14.5 15.5 1

Life History: Resident Species: slimy sculpin Life Stage: juvenile Total Fish Count: 13 Fish Measured: 10 Fork Lengths (mm) Min: 17 Max: 50 **Mean:** 40 Median: 33 Sampling Method (No. of fish): BEF (13) **Comments:** Species: Arctic lamprey Life Stage: adult Life History: Anadromous **Total Fish Count:** 9 Fish Measured: 6 Fork Lengths (mm) Min: 100 Max: 110 Mean: 103 Median: 105 Sampling Method (No. of fish): BEF (5) VOB (4) Comments: ID confirmed by Joe Buckwalter and Raye Ann Neustel on 10/5/11 (see key in Mecklenburg et al 2002). 2 cusp Species: Chinook salmon Life Stage: adult Life History: Anadromous Median: **Total Fish Count:** 53 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (53) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: juvenile/adult **Total Fish Count: 49** Fish Measured: 9 Fork Lengths (mm) Min: 53 Max: 67 **Mean: 57** Median: 60 Sampling Method (No. of fish): BEF (9) VOB (40) **Comments:** Species: threespine stickleback Life Stage: juvenile Life History: Unknown Total Fish Count: 36 Fish Measured: 8 Fork Lengths (mm) Min: 22 Max: 26 **Mean: 25** Median: 24 Sampling Method (No. of fish): BEF (26) VOB (10) **Comments:** Species: longnose sucker Life Stage: adult Life History: Resident Total Fish Count: 53 Fish Measured: 3 Fork Lengths (mm) Min: 355 Max: 390 Mean: 375 **Median:** 372 Sampling Method (No. of fish): BEF (3) VOB (50) **Comments: Species:** Arctic lamprey Life Stage: juvenile Life History: Anadromous Fish Measured: 1 Fork Lengths (mm) Min: 25 Max: 25 **Mean: 25** Median: 25 **Total Fish Count: 29** Sampling Method (No. of fish): BEF (24) VOB (5) Comments: Ammocoetes. 5 collected during C event all retained. ID confirmed by Joe Buckwalter and Raye Ann Neustel o Species: pink salmon Life Stage: adult Life History: Anadromous Total Fish Count: 3 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (3) **Comments:** Species: Arctic lamprey Life Stage: juvenile/adult Life History: Anadromous Median: Total Fish Count: 27 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (27) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Median: 59 **Total Fish Count: 50** Fish Measured: 17 Fork Lengths (mm) Min: 50 Max: 68 Mean: 56 Sampling Method (No. of fish): BEF (17) VOB (33) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Species: northern pike Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 330 Max: 330 Mean: 330 **Median: 330** Sampling Method (No. of fish): BEF (1) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 241 Max: 241 Mean: 241 Median: 241 Sampling Method (No. of fish): BEF (1) **Comments:**

 Species: threespine stickleback
 Life Stage: juvenile/adult
 Life History: Unknown

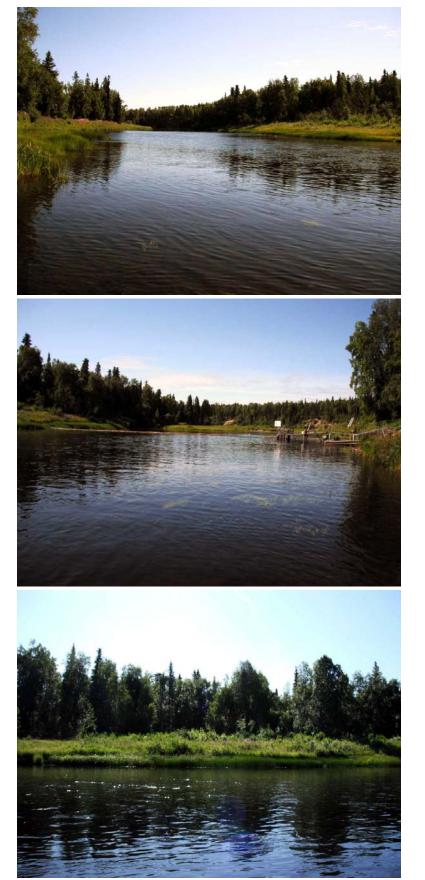
 Total Fish Count:
 2
 Fish Measured:
 2
 Fork Lengths (mm)
 Min:
 44
 Max:
 48
 Meain:
 46

 Sampling Method (No. of fish):
 BEF (2)
 EEF (2)
 EEF (2)
 EEF (2)
 EEF (2)

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: handheld sonar depth finder Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1108D010254.jpg

FSS1108D010255.jpg

FSS1108D010256.jpg



FSS1108D010257.jpg

FSS1108D010258.jpg Chinook salmon juvenile.

FSS1108D010259.jpg Pacific lamprey dentition.

Station Info			
Observers: Joe Buckwalter, Joe Giefer		Date/Time: 08/11/2011 9:30 A	М
StationLatitudeLongitudeCoordinates63.05169-149.60029	Sample Coordinates	Latitude Longitude / Latitude Longitu 63.05169 -149.60029 / 62.99753 -149.650	
Elevation NED (m)(ft): 430 1411 Coordinate Determination Method: Non-Diff USGS Quadrangle: Healy A-6 Waterbody Name: Chulitna River	Legal Descri	IeasurementDatum: WGS84ption (MTRS):F021S011W35	
Anadromous Waters Catalog Number: 247-4 Geographic Comments: Habitat transect and u of Middle and East Fo	pstream end of fish-c	ollection reach located just downstream of confluence nd Honolulu Creek.	e
mixed). Electrofishing was c		liddle Fork flow, left bank runs clearer (initially, until ank side of thalweg.	1
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 5.26 DO (mg/L): 9.34 Water Color: Glacial, High Turbidit Turbidit	DO (%): 73.70 y (NTU): 107.00	Conductivity (μS/cm): 203 pH: 7.86 Thalweg Velocity (m/s)(ft/s): 3.33 10.92	
Stream Channel			
Stream Gradient (%): 1EntrendCatchment Area(sq. km): 2006Embedde	chment: Moderatle dedness: Negligible	ey Entrenched	
Channel Dimensions (m): Bankfull OHV	V Wetted	Dominant Substrate: Cobble	
Width 90.0 Thalweg Depth 2.10		ominant Substrate 1: Gravel ominant Substrate 2: Boulder	
	erate gradient, riffle d	ominated channel, with infrequently spaced pools. V	'ery
Riparian Vegetation Communities (Vie	ereck et al. 1992)		
Riparian Vegetation Communities (Vie Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Cano <u>Right Bank Vegetation Type</u> Heigh	
Dist. from	Canopy	Cano	t(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation TypeCanoRight Bank Vegetation TypeHeight	nt(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Black Cottonwood Forest10 - 20Closed Black Cottonwood Forest	Canopy Height(m) 4 18 18	Right Bank Vegetation TypeCanoClosed Tall Alder Shrub4Open Spruce-Paper Birch Forest23Open Spruce-Paper Birch Forest23	at(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Black Cottonwood Forest	Canopy Height(m) 4 18	Right Bank Vegetation TypeCanoRight Bank Vegetation TypeHeightClosed Tall Alder Shrub4Open Spruce-Paper Birch Forest23	at(m) 3 3
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Black Cottonwood Forest10 - 20Closed Black Cottonwood Forest	Canopy Height(m) 4 18 18 18 18 Estimated reach	Right Bank Vegetation TypeCanoClosed Tall Alder Shrub4Open Spruce-Paper Birch Forest23Open Spruce-Paper Birch Forest23	
Dist. from Left Bank Vegetation Type 0 - 5 Closed Tall Alder Shrub 5 - 10 Closed Black Cottonwood Forest 10 - 20 Closed Black Cottonwood Forest 20 - 30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat	Canopy Height(m) 4 18 18 18 Estimated reach (DIP) age: adult	Right Bank Vegetation TypeCano Height Closed Tall Alder ShrubClosed Tall Alder Shrub4Open Spruce-Paper Birch Forest23Open Spruce-Paper Birch Forest23Open Spruce-Paper Birch Forest23Image the transform the transformation the transformatio	it(m)
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Alder Shrub 5 - 10 Closed Black Cottonwood Forest 10 - 20 Closed Black Cottonwood Forest 20 - 30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat Fish Observations Species: rainbow trout Life State Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments:	Canopy Height(m) 4 18 18 18 Estimated reach (DIP) age: adult Fork Lengths (mm	Kight Bank Vegetation Type Cano Right Bank Vegetation Type Height Closed Tall Alder Shrub 4 Open Spruce-Paper Birch Forest 23 Open Spruce-Paper Birch Forest 23 Open Spruce-Paper Birch Forest 23 Ingth (m): #### Total Electrofishing Time (s): 41 Dip Net Life History: Resident	412

Appendix L94.–Page 2 of 7.

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Fish Measured: 10 Fork Lengths (mm) Min: 56 **Total Fish Count: 28** Max: 67 Mean: 61 Median: 61 Sampling Method (No. of fish): BEF (10) VOB (18) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 210 Fish Measured: 33 Fork Lengths (mm) Min: 50 Max: 70 Mean: 60 Median: 60 Sampling Method (No. of fish): BEF (76) DIP (3) VOB (131) **Comments:** Species: salmonid-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fork Lengths (mm) Min: Max: Median: Fish Measured: Mean: Sampling Method (No. of fish): VOB (2) **Comments:** Life History: Resident Species: salmonid-unspecified Life Stage: juvenile Fork Lengths (mm) Min: **Total Fish Count:** 12 **Fish Measured:** Max: Mean: Median: Sampling Method (No. of fish): VOB (12) **Comments:** Species: pink salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) Suspected Spawning: Yes Comments: Really rotten. Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count: 5** Fish Measured: 5 Fork Lengths (mm) Min: 33 Max: 50 **Mean:** 40 Median: 41 Sampling Method (No. of fish): BEF (5) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 385 Max: 385 Median: 385 **Total Fish Count:** 1 Mean: 385 Sampling Method (No. of fish): BEF (1) **Comments:** Species: pink salmon Life History: Anadromous Life Stage: carcass Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Fork Lengths (mm) Min: 120 Max: 120 **Total Fish Count:** 1 Fish Measured: 1 Mean: 120 Median: 120 Sampling Method (No. of fish): BEF (1) **Comments:** Species: Pacific salmon-unspecified Life Stage: adult Life History: Anadromous Median: **Total Fish Count:** 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (1) **Comments:** Species: coho salmon Life Stage: adult Life History: Anadromous **Fish Measured:** Total Fish Count: 1 Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (1) Comments: Blush color. Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 90 Max: 90 Mean: 90 Median: 90 Sampling Method (No. of fish): BEF (1) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 73 Max: 89 **Mean:** 79 Median: 81 Sampling Method (No. of fish): BEF (6) **Comments:**

 Species: rainbow trout
 Life Stage: juvenile/adult
 Life History: Resident

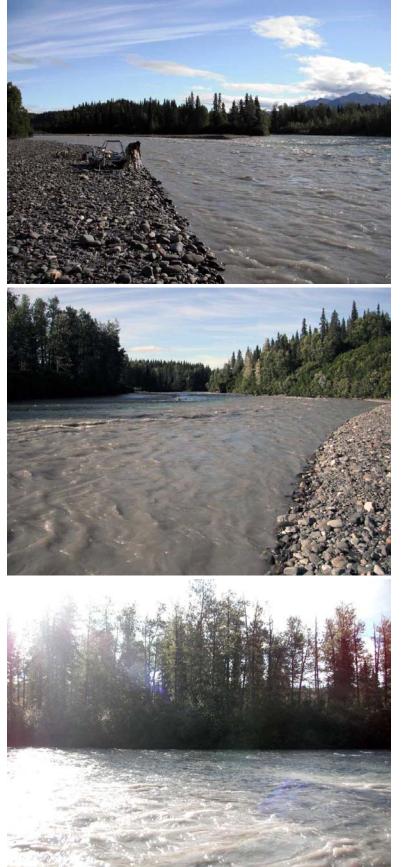
 Total Fish Count:
 2
 Fish Measured:
 2
 Fork Lengths (mm)
 Min:
 195
 Max:
 235
 Median:
 215

 Sampling Method (No. of fish):
 BEF (2)
 EF
 EF

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1109A010465.jpg

FSS1109A010466.jpg

FSS1109A010468.jpg



FSS1109A010469.jpg

FSS1109A010471.jpg Chinook salmon juveniles.

FSS1109A010472.jpg

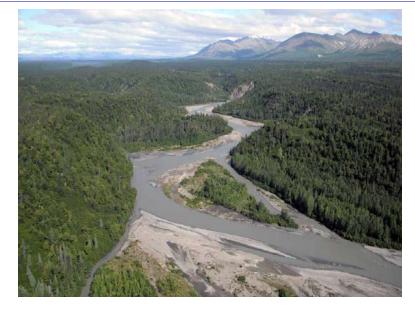


FSS1109A010474.jpg Mouth of Hurricane Gulch.

FSS1109A010473.jpg

FSS1109A010476.jpg

FSS1109A010477.jpg



Station Info Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/11/2011 9:09 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.18811 -146.71994 Coordinates -146.71994 63.18811 63.17903 -146.70401 Elevation NED (m)(ft): 951 3120 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Mt Hayes A-6 Legal Description (MTRS): F020S005E14 Waterbody Name: West Fork Maclaren River **Anadromous Waters Catalog Number:** Geographic Comments: IU3 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.75 DO (mg/L): 12.65 **DO (%):** 103.70 Conductivity (µS/cm): 147 pH: 7.19 Water Color: Glacial, Low Turbidit Turbidity (NTU): 13.80 Thalweg Velocity (m/s)(ft/s): 0.95 3.12 **Stream Channel** Stream Gradient (%): 0.2 Slightly Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 199 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Gravel Width 43.0 19.2 Subdominant Substrate 1: Silt/Clay Thalweg Depth 2.00 1.10 Subdominant Substrate 2: Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 2.2 Closed Tall Willow Shrub 1.8 Closed Tall Willow Shrub 5 - 10 Closed Tall Willow Shrub 1.8 Closed Tall Willow Shrub 2.2 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 1.8 2.2 20 - 30 Closed Tall Willow Shrub 1.8 Closed Tall Willow Shrub 22 **Kev To Fish Sampling Methods** Estimated reach length (m): 2500 Total Electrofishing Time (s): 1140 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation. Boat **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Fish Measured: 4 Fork Lengths (mm) Min: 230 Max: 310 **Median: 270 Total Fish Count:** 48 Mean: 260 Sampling Method (No. of fish): BEF (4) VOB (44) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count: 3** Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median:

Sampling Method (No. of fish): VOB (3)

 Comments:
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 2
 Fish Measured:
 Fork Lengths (mm)
 Min:
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOB (2)
 Comments:
 VOB (2)
 VOB (2)
 VOB (2)

 Species: Arctic grayling
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 2
 Fish Measured:
 2
 Fork Lengths (mm)
 Min:
 60
 Max:
 155
 Mean:
 107
 Median:
 107

 Sampling Method (No. of fish):
 BEF (2)
 Comments:
 Image: Comment State S

 Species: round whitefish
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 320
 Mean:
 320
 Median:
 320

 Sampling Method (No. of Fish):
 BEF (1)
 EEF (

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



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FSS1109b010354.jpg

FSS1109b010355.jpg

FSS1109b010356.jpg



Station Info

Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/11/2011 9:14 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.00426 -148.84548 Coordinates -148.84350 63.00527 63.00402 -148.84622 Elevation NED (m)(ft): 771 2530 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Ouadrangle:** Healy A-4 Legal Description (MTRS): F022S007W14 Waterbody Name: Portage Creek Anadromous Waters Catalog Number: 247-41-10200-2585 Geographic Comments: HU59 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.57 DO (mg/L): 12.77 DO (%): 98.90 Conductivity (µS/cm): 43 pH: 5.71 Water Color: Clear Turbidity (NTU): 0.75 Thalweg Velocity (m/s)(ft/s): 1.09 3.58 **Stream Channel** Stream Gradient (%): 1.75 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 56 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 15.9 13.6 Subdominant Substrate 1: Boulder Thalweg Depth 1.32 0.62 Subdominant Substrate 2: Gravel Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 24 Closed Tall Shrub Birch-Willow Shrub 12 Closed Tall Alder-Willow Shrub 12 24 5 - 10 Closed Tall Shrub Birch-Willow Shrub Closed Tall Alder-Willow Shrub Closed Tall Alder-Willow Shrub 10 - 20 Closed Tall Shrub Birch-Willow Shrub 12 24 20 - 30 Closed Tall Shrub Birch-Willow Shrub 12 Closed Tall Alder-Willow Shrub 24 **Kev To Fish Sampling Methods** Estimated reach length (m): 225 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 1 Fork Lengths (mm) Min: 115 Max: 115 **Median:** 115 Total Fish Count: 18 Mean: 115 Sampling Method (No. of fish): PEF (1) VOG (17) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fish Measured: 12 Fork Lengths (mm) Min: 57 **Total Fish Count:** 12 Max: 81 Mean: 71 Median: 69 Sampling Method (No. of fish): PEF (12) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 3 Fish Measured: 1 Fork Lengths (mm) Min: 37 Max: 37 **Mean: 37** Median: 37 Sampling Method (No. of fish): PEF (1) VOG (2) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Median: 78 Total Fish Count: 4 Fish Measured: 4 Fork Lengths (mm) Min: 75 Max: 81 **Mean:** 79 Sampling Method (No. of fish): PEF (4) **Comments:**

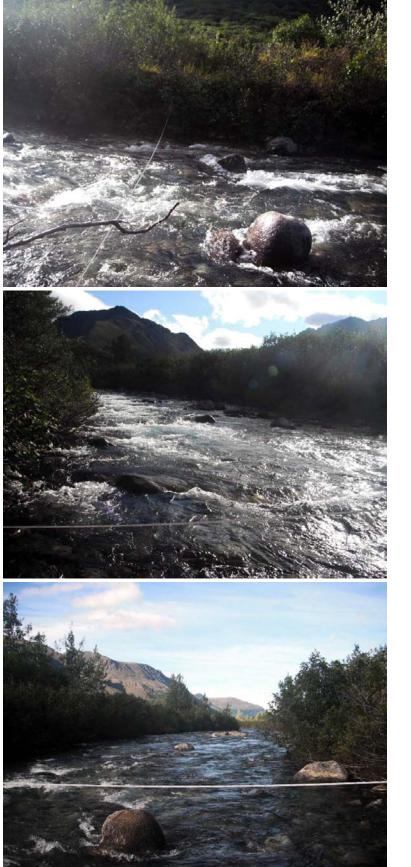
 Species: slimy sculpin
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 7
 Fish Measured: 2
 Fork Lengths (mm)
 Min: 65
 Max: 65
 Mean: 65

 Sampling Method (No. of fish):
 PEF (2) VOG (5)
 Comments:
 VOG (5)
 VOG (5)

Instruments

Channel Depths: graduated wading rod
Channel Widths: measuring tape
Electrofisher: Smith-Root LR-24
Transparency:



FSS1109c010274.jpg

FSS1109c010275.jpg

FSS1109c010277.jpg



Station Inf						
Station Im	fo					
Observers:	Raye Ann N	eustel, Daniel Re	ed		Date/Time: 08/11	/2011 11:18 AM
Station Coordinate	Latitude 63.14352	8	Sample Coordinates	Latitude 63.14658	Longitude / Latitu -149.87417 / 63.143	0
	NED (m)(ft): 6					
			n-Differential GPS Field M		Datum: WGS84	
	drangle: Heal Name: Ohio		Legal Descri	ption (MTRS): F020S012W28	
-		talog Number:				
Geographic	c Comments:	HU17. This cree	ek was sampled just downs	tream of Dena	li National Park boundary	<i>.</i>
Visit Comm			sample site. Cataraft Tea		section of this creek (10B	01)
Wildlife Co	omments:					
Water Qua	ality \ Strea	am Flow				
Water Tem Water Colo		DO (mg/L): 13. gh Turbidit Tur	.21 DO (%): 100.30 •bidity (NTU): 7.00		y (μS/cm): 149 pH: ocity (m/s)(ft/s): 1.40 4.5	
Stream Ch	nannel					
Stream Gra	adient (%): 1	.5 En	trenchment: Moderatle	y Entrenched		
Catchment	Area(sq. km)	: 117 En	nbeddedness: Negligible	;		
Channel D	imensions (m				ostrate: Cobble	
		Width 80.0 Depth 2.12		ominant Subs ominant Subs	trate 1: Boulder	
Rosgen Cla	-	-	ngitudinal and transverse			anks
			-	-		
Kiparian V	vegetation (Communities	(Viereck et al. 1992)			
Dist. from Bank (m)	Left Bank Ve	egetation Type	Canopy Height(m)	<u>Right Bank V</u>	Vegetation Type	Canopy Height(m)
Bank (m)		e getation Type rub Birch-Willow	Height(m)	Right Bank V Unvegetated	Vegetation Type	
Bank (m) 0 - 5 5 - 10	Open Tall Shi Open Tall Shi	rub Birch-Willow rub Birch-Willow	Height(m)Shrub30Shrub30		Vegetation Type	
Bank (m) 0 - 5 5 - 10	Open Tall Shi Open Tall Shi	rub Birch-Willow	Height(m)Shrub30Shrub30	Unvegetated	Vegetation Type	
Bank (m) 0 - 5 5 - 10 10 - 20	Open Tall Shi Open Tall Shi Open Tall Shi	rub Birch-Willow rub Birch-Willow	Height(m)Shrub30Shrub30Shrub30	Unvegetated Unvegetated	Vegetation Type	
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	Open Tall Shi Open Tall Shi Open Tall Shi	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow	Height(m)Shrub30Shrub30Shrub30	Unvegetated Unvegetated Unvegetated Unvegetated		
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach	Unvegetated Unvegetated Unvegetated Unvegetated length (m): 48		
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi sh Samplin, kpack Electrofi	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach	Unvegetated Unvegetated Unvegetated Unvegetated length (m): 48	30	
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi sh Samplin kpack Electrofi rvations olly Varden Count: 1 Method (No. o	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult d: 1 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Unvegetated length (m): 48) Visual Obse Life Hit	30 ervation, Ground story: Unknown	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Do Total Fish	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi Sh Samplin sh Samplin kpack Electroff rvations olly Varden Count: 1 Method (No. 6 Si Method (No. 6	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher Lif Fish Measured of fish): PEF (1)	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult 1: 1 Fork Lengths (mm fe Stage: juvenile 1: 1 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 48 () Visual Obse Life Hin () Min: 129	30 ervation, Ground story: Unknown	Height(m)
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Do Total Fish Sampling I	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi sh Samplin sh Samplin kpack Electroff rvations olly Varden Count: 1 Method (No. 6 :: Method (No. 6 ::	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher Lif Fish Measured of fish): PEF (1) Lif Fish Measured	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult 1: 1 Fork Lengths (mm fe Stage: juvenile 1: 1 Fork Lengths (mm	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 48 () Visual Obse Life Hin () Min: 129	30 ervation, Ground story: Unknown Max: 129 Mean: 129 story: Unknown	Height(m) Median: 129
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Do Total Fish Sampling I Comments	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi Sh Samplin kpack Electroff rvations olly Varden Count: 1 Method (No. o s: Method (No. o s: Method (No. o	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher Lif Fish Measured of fish): PEF (1) Lif Fish Measured	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult 1: 1 Fork Lengths (mm VOG (2)	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 48 () Visual Obse Life His () Min: 129 Life His () Min: 74	30 ervation, Ground story: Unknown Max: 129 Mean: 129 story: Unknown	Height(m) Median: 129
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Do Total Fish Sampling I Comments	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi Sh Samplin sh Samplin kpack Electroff rvations olly Varden Count: 1 Method (No. cost s: olly Varden Count: 3 Method (No. cost s: hts adient: handl	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher Lif Fish Measured of fish): PEF (1) Lif Fish Measured of fish): PEF (1)	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult d: 1 Fork Lengths (mm VOG (2) Chann	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 48 () Visual Obse Life His () Min: 129 Life His () Min: 74	30 ervation, Ground story: Unknown Max: 129 Mean: 129 story: Unknown Max: 74 Mean: 74	Height(m) Median: 129
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Do Total Fish Sampling I Comments Species: Do	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi Sh Samplin kpack Electrofi rvations olly Varden Count: 1 Method (No. co :: olly Varden Count: 3 Method (No. co :: tts adient: handl ocity: transp	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher Lift Fish Measured of fish): PEF (1) Lift Fish Measured of fish): PEF (1)	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult d: 1 Fork Lengths (mm VOG (2) Chann	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 48 (b) Visual Obse Life Hin (n) Min: 129 Life Hin (n) Min: 74	30 ervation, Ground story: Unknown Max: 129 Mean: 129 story: Unknown Max: 74 Mean: 74	Height(m) Median: 129
Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Do Total Fish Sampling I Comments Species: Do Total Fish Sampling I Comments Stream Gra Stream Vel Turbidity:	Open Tall Shi Open Tall Shi Open Tall Shi Open Tall Shi Sh Samplin kpack Electrofi rvations olly Varden Count: 1 Method (No. co :: olly Varden Count: 3 Method (No. co :: tts adient: handl ocity: transp	rub Birch-Willow rub Birch-Willow rub Birch-Willow rub Birch-Willow g Methods isher Lif Fish Measured of fish): PEF (1) Lif Fish Measured of fish): PEF (1)	Height(m) Shrub 30 Shrub 30 Shrub 30 Shrub 30 Estimated reach (VOC fe Stage: juvenile/adult d: 1 Fork Lengths (mm VOG (2) Add rod Chamma Electron	Unvegetated Unvegetated Unvegetated Unvegetated Iength (m): 48 (b) Visual Obse Life Hin (n) Min: 129 Life Hin (n) Min: 74	30 ervation, Ground story: Unknown Max: 129 Mean: 129 story: Unknown Max: 74 Mean: 74	Height(m) Median: 129

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/11/2011 11:22 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.13390 -149.12913 Coordinates -149.12960 63.13327 63.13386 -149.13080 Elevation NED (m)(ft): 759 2490 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-5 Legal Description (MTRS): F020S008W32 Waterbody Name: Crooked Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU109 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.63 DO (mg/L): 11.54 DO (%): 94.10 Conductivity (µS/cm): 38 pH: 5.95 Water Color: Clear Turbidity (NTU): 1.00 Thalweg Velocity (m/s)(ft/s): 1.14 3.74 **Stream Channel** Stream Gradient (%): 0.5 Slightly Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 73 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 15.3 9.7 Subdominant Substrate 1: Gravel Thalweg Depth 1.20 0.60 Subdominant Substrate 2: Sand Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 16 0 - 5 Unvegetated Open White Spruce Forest 5-10 Unvegetated Open White Spruce Forest 16 10-20 Unvegetated Open White Spruce Forest 16 20-30 Unvegetated Open White Spruce Forest 16 **Key To Fish Sampling Methods** Estimated reach length (m): 330 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 7 Fork Lengths (mm) Min: 58 Max: 64 Median: 61 Total Fish Count: 36 Mean: 60 Sampling Method (No. of fish): PEF (7) VOG (29) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 28 Fish Measured: 6 Fork Lengths (mm) Min: 58 Max: 62 **Mean: 59** Median: 60 Sampling Method (No. of fish): PEF (6) VOG (22) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous Median: 53 **Total Fish Count:** 47 Fish Measured: 17 Fork Lengths (mm) Min: 48 Max: 59 Mean: 51 Sampling Method (No. of fish): PEF (17) VOG (30) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1109c030283.jpg Photo used as documentation of riparian zone.

FSS1109c030284.jpg

FSS1109c030285.jpg Looking downstream from transect site, three species of juvenile salmon were caught near debris on river right.

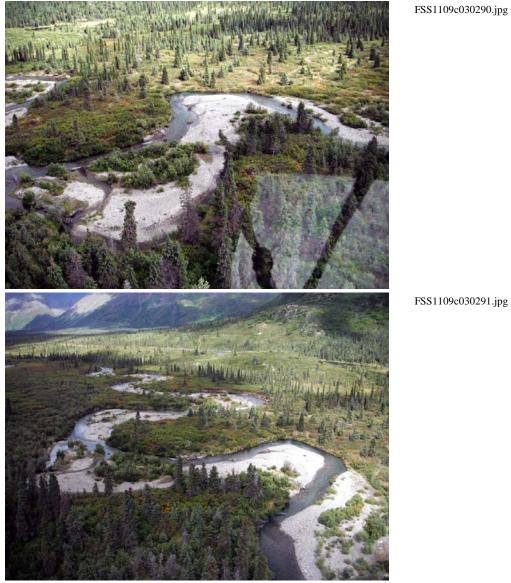
-continued-891



FSS1109c030286.jpg Looking upstream from transect site.

FSS1109c030287.jpg Juvenile coho and chinook salmon.

FSS1109c030289.jpg Juvenile sockeye salmon



FSS1109c030290.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/11/2011 3:22 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.13526 -148.88396 Coordinates -148.87979 63.13601 63.13526 -148.88396 Elevation NED (m)(ft): 947 3107 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Ouadrangle: Healy A-4** Legal Description (MTRS): F020S007W34 Waterbody Name: East Fork Chulitna River **Anadromous Waters Catalog Number:** Geographic Comments: HU20 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.98 DO (mg/L): 11.97 DO (%): 96.50 Conductivity (µS/cm): 194 **pH:** 7.36 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): 1.18 3.87 **Stream Channel** Stream Gradient (%): 0.75 Moderatley Entrenched **Entrenchment:** Negligible **Catchment Area(sq. km):** 50 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 85.0 18.5 Subdominant Substrate 1: Boulder Thalweg Depth 0.88 0.48 Subdominant Substrate 2: Gravel Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 2 Open Tall Willow Shrub Unvegetated 2 5 - 10 Open Tall Willow Shrub Unvegetated 10 - 20 Open Tall Willow Shrub 2 Unvegetated 2 20 - 30 Open Tall Willow Shrub Unvegetated **Key To Fish Sampling Methods** Estimated reach length (m): 340 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 20 Fork Lengths (mm) Min: 86 Max: 169 **Total Fish Count: 28** Mean: 116 Median: 127 Sampling Method (No. of fish): PEF (20) VOG (8) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 37 Max: 75 Mean: 64 Median: 56 Sampling Method (No. of fish): PEF (4) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Fish Measured: 3 Fork Lengths (mm) Min: 25 Median: 29 **Total Fish Count: 3** Max: 34 Mean: 30 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 83 Max: 105 **Mean: 90** Median: 94 Sampling Method (No. of fish): PEF (4) **Comments:**

Appendix L99.-Page 2 of 4.

 Species: slimy sculpin
 Life Stage: juvenile/adult
 Life History: Resident

 Total Fish Count:
 2
 Fish Measured:
 Fork Lengths (mm)
 Max:
 Mean:
 Median:

 Sampling Method (No. of Fish):
 VOG (2)
 VOG (2)
 VOG (2)
 VOG (2)
 VOG (2)

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



-continued-896



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FSS1109c040298.jpg

FSS1109c040299.jpg

Station In						
Station III	fo					
Observers:	Raye Ann Neus	tel, Jonathan Kirsch			Date/Time: 08/11/2	2011 7:40 PM
Station Coordinat		Longitude 147.28957	Sample Coordinates	Latitude 63.02699	Longitude / Latitud -147.28604 / 63.0271	0
	NED (m)(ft): 770					
		Iethod: Non-Differe			Datum: WGS84 : F022S002E12	
	drangle: Healy A Name: Alpine C		Legal Descri	puon (M 1 KS)	; F0225002E12	
Anadromo	us Waters Catalog	g Number:				
	c Comments: HU					
		ampling site from Alpi	ne Creek Lodge vi	ia ATV.		
Wildlife Co	omments:					
Water Qu	ality \ Stream	Flow				
Water Ten Water Cole	-	O (mg/L): 11.55 I Turbidity (1	DO (%): 90.40 NTU): 3.00	Conductivity Thalweg Velo	y (μS/cm): 65 pH: 7 poity (m/s)(ft/s): 1.05 3.44	
Stream Cl	nannel					
	adient (%): 1 Area(sq. km):	25 Entrenchm		ntrenched		
Channel D	Dimensions (m):	Bankfull OHW	Wetted I	Dominant Sub	strate: Cobble	
	Wid			minant Subst		
Rosgen Cla		ent, meandering riffle/	pool stream with lo	ominant Subst	rate 2: a ratio and little depositior	. Very
		table. High meander v				
Riparian V	Vegetation Col	mmunities (Viere	ck et al. 1992)			
Dist. from Bank (m)	Left Bank Veget	ation Type	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
0 - 5	Closed Spruce-Pa	aper Birch Forest	28	Closed Spruce	-Paper Birch Forest	25
5 - 10	Closed Spruce-Pa	aper Birch Forest	28	Closed Spruce	-Paper Birch Forest	25
		1	20			
10 - 20	Closed Spruce-Pa	-		Closed Spruce	-Paper Birch Forest	25
	-	aper Birch Forest	28	•	-Paper Birch Forest -Paper Birch Forest	25 25
20 - 30	Closed Spruce-Pa	aper Birch Forest aper Birch Forest	28	Closed Spruce	-Paper Birch Forest	
20 - 30 Key To Fi	Closed Spruce-Pa Closed Spruce-Pa	aper Birch Forest aper Birch Forest Aethods	28 28 Estimated reach l	Closed Spruce	-Paper Birch Forest	
20 - 30 Key To Fi	Closed Spruce-Pa Closed Spruce-Pa sh Sampling M kpack Electrofishe	aper Birch Forest aper Birch Forest Aethods	28 28 Estimated reach l	Closed Spruce	-Paper Birch Forest	
20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Ar Total Fish	Closed Spruce-Pa Closed Spruce-Pa sh Sampling M kpack Electrofishe rvations ctic grayling Count: 16 F Method (No. of fig	aper Birch Forest aper Birch Forest Aethods er Life Stage :	28 28 Estimated reach l (VOG : adult 'ork Lengths (mm	Closed Spruce length (m): 244) Visual Obser Life His	-Paper Birch Forest 4 rvation, Ground tory: Resident	
20 - 30 Key To Fi (PEF) Bac Fish Obse Species: An Total Fish Sampling Comments Species: An Total Fish	Closed Spruce-Pa Closed Spruce-Pa sh Sampling M kpack Electrofishe rvations ctic grayling Count: 16 F Method (No. of fiss: ctic grayling Count: 11 F Method (No. of fiss)	aper Birch Forest aper Birch Forest Aethods or Life Stage: Sish Measured: 2 F Sh): PEF (2) VOG (1 Life Stage: Sish Measured: 11 F	28 28 Estimated reach l (VOG : adult fork Lengths (mm (4) : juvenile/adult	Closed Spruce length (m): 244) Visual Obser Life His) Min: 334 Life His	 -Paper Birch Forest 4 tory: Resident Max: 334 Mean: 334 tory: Resident 	25

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:

FSS1109c050306.jpg



FSS1109c050307.jpg

Station Info

Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/11/2011 12:50 PM Sample Latitude Longitude Coordinates -149.29144 63.02794 Elevation NED (m)(ft): 913 2995 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Healy A-5 Legal Description (MTRS): F022S009W09 Waterbody Name: Honolulu Creek **Anadromous Waters Catalog Number:** Geographic Comments: Waterfall (approximate location). Visit Comments: HU36/Honolulu Creek was the target stream. There is a waterfall approximately 12 km upstream of the Honolulu Creek/Chulitna River confluence. No sampling data collected. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable Total Fish Count: 0 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): NON (0) **Comments:** Instruments **Stream Gradient: Channel Depths: Stream Velocity: Channel Widths:**

Turbidity:

Water Quality:

Channel Widths Electrofisher: Transparency:

rependix E102. Station 1 SS1110/101.				
Station Info				
Observers: Joe Buckwalter, Joe Giefer			Date/Time: 0	8/12/2011 12:40 PM
StationLatitudeLongitudeCoordinates63.20435-146.55463	Sample Coordinates	Latitude 63.20932	Longitude La -146.55297 / 63	AtitudeLongitude.16215-146.54977
Elevation NED (m)(ft): 892 2927				
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Mt Hayes A-6			Datum: WGS84): F020S006E02	
Waterbody Name: Maclaren River	Legal Descrip		. 10203000E02	
Anadromous Waters Catalog Number:				
Geographic Comments:				
Visit Comments: Put in at the mouth of a clear r 74 uS/cm conductivity, 59.5% electrofished down into Macla	saturation for dissolv	ed oxygen, 6	.78 mg/L dissolved o	xygen, pH 7.59} and
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 7.47 DO (mg/L): 7.32	DO (%): 61.10	Conductivit	y (µS/cm): 85	pH: 7.78
Water Color: Glacial, High Turbidit Turbidity	(NTU): 25.70	Thalweg Vel	ocity (m/s)(ft/s): 1.3	-
Stream Channel				
Stream Gradient (%): 0.1 Entrencl	hment: Slightly En	trenched		
Catchment Area(sq. km): 278 Embedde	•••			
Channel Dimensions (m): Bankfull OHW			strate: Gravel	
Width 70.0 Thalweg Depth 1.52		minant Subs minant Subs	trate 1: Silt/Clay	
Rosgen Class: D4 Braided channel with longitud				ng hanks
Rosgen Oluss. D + Draded chamier with longitud				ing outino.
Riparian Vegetation Communities (View	reck et al. 1992)			
Riparian Vegetation Communities (View Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Right Bank V	Vegetation Type	Canopy Height(m)
Dist. from	Canopy Height(m)	Right Bank V Open Low W		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) 1		illow Shrub	Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Open Low Willow Shrub	Canopy Height(m) <u>1</u> 1 (Open Low W	illow Shrub illow Shrub	Height(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Willow Shrub5 - 10Open Low Willow Shrub	Canopy Height(m) <u>1</u> 1 (1 (1 (Open Low W Open Low W	illow Shrub illow Shrub illow Shrub	Height(m) 1 1
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Willow Shrub5 - 10Open Low Willow Shrub10 - 20Open Low Willow Shrub	Canopy Height(m) <u>1</u> 1 (1 (1 (1 (Open Low W Open Low W Open Low W Open Low W	illow Shrub illow Shrub illow Shrub illow Shrub	Height(m) 1 1
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Willow Shrub5 - 10Open Low Willow Shrub10 - 20Open Low Willow Shrub20 - 30Open Low Willow Shrub	Canopy I Height(m) I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I	Open Low W Open Low W Open Low W Open Low W ength (m): 74	illow Shrub illow Shrub illow Shrub illow Shrub	Height(m) 1 1 1 1 1
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Willow Shrub5 - 10Open Low Willow Shrub10 - 20Open Low Willow Shrub20 - 30Open Low Willow ShrubKey To Fish Sampling Methods	Canopy I Height(m) I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I	Open Low W Open Low W Open Low W Open Low W ength (m): 74	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi	Height(m) 1 1 1 1
Dist. from Left Bank Vegetation Type 0 - 5 Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 10 - 20 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life Stag	Canopy Height(m) 1 1 (1 1 (1 1 (1 (VOB) ge: juvenile/adult	Open Low W Open Low W Open Low W Open Low W ength (m): 74 Visual Obse Life Hit	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi ervation, Boat	Height(m) 1 1 1 1 1 shing Time (s): 3839
Dist. from Left Bank Vegetation Type 0 - 5 Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 10 - 20 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations	Canopy Height(m) 1 1 (1 (1 (1 (1 (1 (1 (1 (1 (1	Open Low W Open Low W Open Low W Open Low W ength (m): 74 Visual Obse Life Hit	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi ervation, Boat	Height(m) 1 1 1 1 1 shing Time (s): 3839
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 10 - 20 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life Stag Total Fish Count: 13 Fish Measured: 6 Sampling Method (No. of fish): BEF (6) VOB Comments: Description	Canopy Height(m) 1 1 (1 (1 (1 (1 (1 (VOB) ge: juvenile/adult Fork Lengths (mm) (7)	Open Low W Open Low W Open Low W ength (m): 74 Visual Obse Life Hit Min: 199	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi ervation, Boat	Height(m) 1 1 1 1 1 shing Time (s): 3839
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 10 - 20 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life Stag Total Fish Count: 13 Fish Measured: 6 Sampling Method (No. of fish): BEF (6) VOB Comments: Description	Canopy Height(m) 1 1 (1 (1 (1 (1 (1 (1 (1 (1 (1	Open Low W Open Low W Open Low W ength (m): 74 Visual Obse Life Hit Min: 199	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi prvation, Boat story: Resident Max: 293 Mean	Height(m) 1 1 1 1 shing Time (s): 3839 : 251 Median: 246
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 10 - 20 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life Stag Total Fish Count: 13 Fish Measured: 6 Sampling Method (No. of fish): BEF (6) VOB Comments: Species: Arctic grayling Life Stag Total Fish Count: 24 Fish Measured: 3 Sampling Method (No. of fish): BEF (3) VOB Comments: Set (3) VOB Comments: Set (3) VOB Sampling Method (No. of fish): BEF (3) VOB Comments: Set (3) VOB	Canopy Height(m) 1 1 (1 (1 (1 (1 (1 (1 (1 (1 (1	Open Low W Open Low W Open Low W ength (m): 74 Visual Obse Life Hit Min: 199 Life Hit	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi prvation, Boat story: Resident Max: 293 Mean	Height(m) 1 1 1 1 shing Time (s): 3839 : 251 Median: 246
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Low Willow Shrub 5 - 10 Open Low Willow Shrub 10 - 20 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub 20 - 30 Open Low Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life Stag Total Fish Count: 13 Fish Measured: 6 Sampling Method (No. of fish): BEF (6) VOB Comments: Species: Arctic grayling Life Stag Total Fish Count: 24 Fish Measured: 3 Sampling Method (No. of fish): BEF (3) VOB Comments: Set (3) VOB Comments: Set (3) VOB Sampling Method (No. of fish): BEF (3) VOB Comments: Set (3) VOB	Canopy Height(m) 1 1 (1 (1 (1 (1 (1 (1 (1 (Estimated reach le (VOB) ge: juvenile/adult Fork Lengths (mm) ((7) ge: adult Fork Lengths (mm) ((21) ge: juvenile/adult Fork Lengths (mm)	Open Low W Open Low W Open Low W ength (m): 74 Visual Obse Life Hit Min: 199 Life Hit Min: 340	illow Shrub illow Shrub illow Shrub illow Shrub 00 Total Electrofi rvation, Boat story: Resident Max: 293 Mean story: Resident Max: 350 Mean	Height(m) 1 1 1 1 shing Time (s): 3839 : 251 Median: 246 : 345 Median: 345

Appendix L102.-Page 2 of 6.

Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 195 Max: 306 Total Fish Count: 10 Fish Measured: 9 Mean: 260 Median: 250 Sampling Method (No. of fish): BEF (9) VOB (1) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident **Total Fish Count:** 5 Fish Measured: 1 Fork Lengths (mm) Min: 52 Max: 52 Median: 52 **Mean: 52** Sampling Method (No. of fish): BEF (1) VOB (4) **Comments:** Life History: Resident **Species:** Arctic grayling Life Stage: juvenile **Total Fish Count:** 9 Fish Measured: 7 Fork Lengths (mm) Min: 72 Max: 160 **Mean:** 115 **Median:** 116 Sampling Method (No. of fish): BEF (7) VOB (2) **Comments:** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 246 Max: 314 Mean: 287 **Median:** 280 Sampling Method (No. of fish): BEF (3) **Comments:** Species: general fish observation, no s Life Stage: not recorded Life History: Unknown **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: burbot Life Stage: juvenile Life History: Resident Median: 98 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 98 Max: 98 **Mean: 98** Sampling Method (No. of fish): BEF (1) **Comments:** Species: salmonid-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 9 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (9) Comments: Event X either round whitefish or arctic grayling. Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 38 Max: 50 **Mean:** 44 Median: 44 Sampling Method (No. of fish): BEF (2) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 69 Max: 87 Median: 78 **Total Fish Count:** 4 Fish Measured: 4 **Mean:** 75 Sampling Method (No. of fish): BEF (4) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 325 Max: 325 Median: 325 **Total Fish Count:** 1 **Mean:** 325 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1110A010484.jpg

FSS1110A010485.jpg



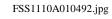
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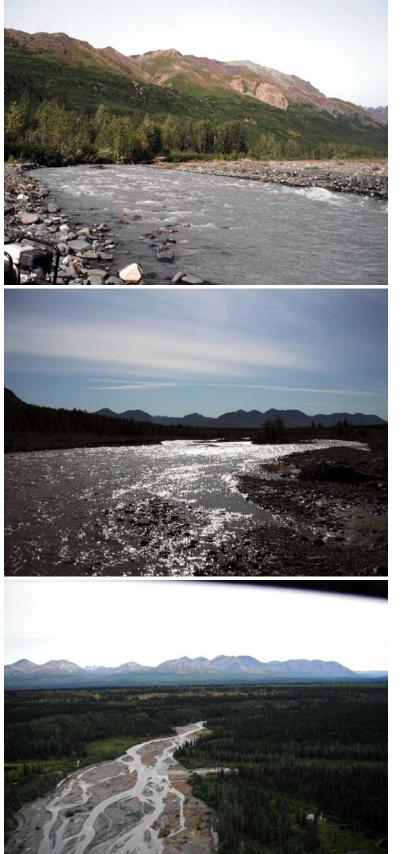
FSS1110A010493.jpg

Station Latitude Longitude Sample Latitude Longitude	08/12/2011 11:01 AM
Coordinates 63.07291 -149.78012 Coordinates 63.07291 -149.78012 Coordinates	Latitude Longitude 63.05680 -149.73851
Elevation NED (m)(ft): 539 1768	
Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS8	4
USGS Quadrangle: Healy A-6Legal Description (MTRS): F021S012W25Waterbody Name: Ohio Creek	
Anadromous Waters Catalog Number:	
Geographic Comments: IU19	
Visit Comments: Sampling efficiency very poor for all subreaches. River was very swift with multipl boulders, large woody debris as well. Given a backpack electrofisher/minnow traps likely that juvenile salmon would be documented here as habitat was favorable.	
Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C): 3.47 DO (mg/L): 11.12 DO (%): 83.80 Conductivity (µS/cm): 156	pH: 7.37
Water Color: Glacial, High TurbiditTurbidity (NTU): 47.50Thalweg Velocity (m/s)(ft/s): 3	3.33 10.92
Stream Channel	
Stream Gradient (%): 1.25 Entrenchment: Slightly Entrenched	
Catchment Area(sq. km):199Embeddedness:Moderate	
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Gravel	
Width85.019.8Subdominant Substrate 1: SandThalweg Depth2.200.90Subdominant Substrate 2: Silt/Clay	
Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with ero	ding hanks
	Juing Danks.
Riparian Vegetation Communities (Viereck et al. 1992)	
Dist. from Canopy	Canopy
Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type	Height(m)
0 - 5 Open Tall Willow Shrub 2.5 Open Tall Willow Shrub	2
5 - 10Open Tall Willow Shrub2.5Open Tall Willow Shrub	2
10 - 20Open Tall Willow Shrub2.5Closed Tall Alder-Willow Shrub	b 13
20 - 30 Closed Tall Willow Shrub2.5Closed Paper Birch Forest	13
Key To Fish Sampling Methods Estimated reach length (m): 3100 Total Electro	ofishing Time (s): 890
(BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat	
Fish Observations	
Fish Observations Life Stage: juvenile/adult Life History: Unknown	
	an: Median:
Species: Dolly VardenLife Stage: juvenile/adultLife History: UnknownTotal Fish Count:4Fish Measured:Fork Lengths (mm)Min:Max:Measured:Sampling Method (No. of fish):VOB (4)	an: Median:
Species: Dolly VardenLife Stage: juvenile/adultLife History: UnknownTotal Fish Count:4Fish Measured:Fork Lengths (mm)Min:Max:Measured:Sampling Method (No. of fish):VOB (4)Comments:	
Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 4 Fish Measured: Fork Lengths (mm) Min: Max: Measured: Sampling Method (No. of fish): VOB (4) Comments: Expecies: sockeye salmon Life Stage: adult Life History: Anadromotor	us
Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 4 Fish Measured: Fork Lengths (mm) Min: Max: Measured: Sampling Method (No. of fish): VOB (4) VOB (4) VOB	
Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 4 Fish Measured: Fork Lengths (mm) Min: Max: Measured: Sampling Method (No. of fish): VOB (4) Comments: Image: Species: sockeye salmon Life Stage: adult Life History: Anadromotic	us
Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 4 Fish Measured: Fork Lengths (mm) Min: Max: Measured: Sampling Method (No. of fish): VOB (4) Comments: Species: sockeye salmon Life Stage: adult Life History: Anadromou Total Fish Count: 2 Fish Measured: 1 Fork Lengths (mm) Min: 510 Meas: 510 Measured: Sampling Method (No. of fish): BEF (1) VOB (1) BEF (1) VOB (1) BEF	us
Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 4 Fish Measured: Fork Lengths (mm) Min: Max: Measured: Sampling Method (No. of fish): VOB (4) Comments: Kassing adult Life History: Anadromout Species: sockeye salmon Life Stage: adult Life History: Anadromout Total Fish Count: 2 Fish Measured: 1 Fork Lengths (mm) Min: 510 Meas: Measured: Sampling Method (No. of fish): BEF (1) VOB (1) Kassing activity suspected for event I. Kassing activity suspected for event I. Kassing activity suspected for event I. Species: slimy sculpin Life Stage: Life History: Resident Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Measured:	us an: 510 Median: 510
Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 4 Fish Measured: Fork Lengths (mm) Min: Max: Measured: Sampling Method (No. of fish): VOB (4) Comments: Iffe Stage: adult Life History: Anadronomoust Species: sockeye salmon Life Stage: adult Life History: Anadronomoust Total Fish Count: 2 Fish Measured: 1 Fork Lengths (mm) Min: 510 Meas: 510 Sampling Method (No. of fish): BEF (1) VOB (1) Sampling Method (No. of fish): BEF (1) VOB (1) Kastion of the stage: Kastion	us an: 510 Median: 510

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



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FSS1110B010361.jpg



Station Info					
Observers: Raye Ann Neustel, Daniel Reed			Date/T	ime: 08/12/20	011 9:19 AM
Station Latitude Longitude Coordinates 62.67037 -147.87374	Sample Coordinates		Longitude -147.87193	/ Latitude 62.67037	0
Elevation NED (m)(ft): 866–2841 Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna Mts C-2 Waterbody Name: Clarence Creek Anadromous Waters Catalog Number: Geographic Comments: HU133 Down river of well.	Legal Descrip	tion (MTRS):		E24	f the lake as
Visit Comments: Wildlife Comments: River otter 10m below trans	nsect site.				
Water Quality \ Stream Flow					
Water Temp (C): 6.99DO (mg/L): 12.07Water Color: ClearTurbidity	DO (%): 99.20 y (NTU): 0.50	Conductivity Thalweg Velo	-		31
Stream Channel					
Stream Gradient (%):0.5EntrencCatchment Area(sq. km):221Embedd	•••	trenched			
Channel Dimensions (m): Bankfull OHW Width 17.2 Thalweg Depth 1.15	16.5 Subdor 0.74 Subdor	ominant Subs minant Substr minant Substr	ate 1: Cobb ate 2: Grave	el	
Rosgen Class: C5 Low gradient, meandering, po	_	uvial channels	with broad,	well-defined f	loodplains.
Riparian Vegetation Communities (Vie					
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vo	egetation Ty	/pe	Canopy Height(m)
0 - 5 Mesic Sedge-Grass Meadow Tundra	0.5	Bluejoint Mead	low		0.5
5-10 Mesic Sedge-Grass Meadow Tundra	0.5	Bluejoint Mead	low		0.5
10 - 20 Mesic Sedge-Grass Meadow Tundra	0.5	Bluejoint Mead	low		0.5
20 - 30 Bluejoint Meadow	0.5	Fresh Grass M	arsh		0.5
Key To Fish Sampling Methods	Estimated reach le	ength (m): 150)		
(PEF) Backpack Electrofisher					
(PEF) Backpack Electrofisher Fish Observations					
Fish Observations Species: Arctic grayling Life State	ge: juvenile Fork Lengths (mm)		ory: Reside Max: 157	ent Mean: 57	Median: 96
Fish Observations Species: Arctic grayling Life State Total Fish Count: 25 Fish Measured: 25 Sampling Method (No. of fish): PEF (25) Comments: Comments:	0.	Min: 35	ory: Reside	Mean: 57	Median: 96 Median: 73
Fish ObservationsSpecies: Arctic graylingLife StateTotal Fish Count:25Sampling Method (No. of fish):PEF (25)Comments:Species: slimy sculpinLife StateTotal Fish Count:Total Fish Count:5Sampling Method (No. of fish):PEF (5)Comments:Comments:	Fork Lengths (mm)	Min: 35	ory: Reside Max: 157 ory: Reside	Mean: 57 ent Mean: 73	

 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 15
 Fish Measured:
 15
 Fork Lengths (mm)
 Min:
 23
 Max:
 49
 Mean:
 36

 Sampling Method (No. of fish):
 PEF (15)
 Comments:
 Vertical State
 Vertical State

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1110C010311.jpg

FSS1110C010312.jpg



FSS1110C010313.jpg

	10 AM gitude .95327
StationLatitudeLongitudeSampleLatitudeLongitudeLatitudeLongitudeCoordinates62.16504-147.95327Coordinates62.16392-147.9541462.16504-147.95414Elevation NED (m)(ft):12404068Coordinate Determination Method:Non-Differential GPS Field MeasurementDatum: WGS84	gitude
Coordinates62.16504-147.95327Coordinates62.16392-147.9541462.16504-147.95414Elevation NED (m)(ft):12404068Coordinate Determination Method:Non-Differential GPS Field MeasurementDatum:WGS84	0
Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84	
USCS Quadrongla, Talkastna Mts A 2 Logal Description (MTDS), SQ24N008E15	
Legal Description (MTRS): 5024N006E15	
Waterbody Name: Oshetna River	
Anadromous Waters Catalog Number:	
Geographic Comments: HU5	
Visit Comments: Upstream electrofishing pass only, electrofisher malfunction.	
Wildlife Comments:	
Water Quality \ Stream Flow Water Temp (C): 5.14 DO (mg/L): 12.58 DO (%): 99.30 Conductivity (μS/cm): 68 pH: 6.57 Water Color: Clear Turbidity (NTU): 0.85 Thalweg Velocity (m/s)(ft/s): 1.05 3.44	
Stream Channel	
Stream Gradient (%): 1 Entrenchment: Moderatley Entrenched	
Catchment Area(sq. km): 106 Embeddedness: Negligible	
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Boulder	
Width 84.9 20.9 Subdominant Substrate 1: Cobble	
Thalweg Depth 1.18 0.38 Subdominant Substrate 2: Gravel	
Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools stable plan and profile. Stable banks.	. Very
Riparian Vegetation Communities (Viereck et al. 1992)	
	anopy

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated		Crustose Lichen	0.1
5 - 10	Unvegetated		Crustose Lichen	0.1
10 - 20	Unvegetated		Crustose Lichen	0.1
20 - 30	Unvegetated		Crustose Lichen	0.1

Key To Fish Sampling Methods

Estimated reach length (m): 150

(PEF) Backpack Electrofisher

Fish Observations

Species: Arctic grayling	Life Sta	ge: juvenile	Life Hi	istory: Resid	lent	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 155	Max: 155	Mean: 155	Median: 155
Sampling Method (No. of	fish): PEF (1)					
Comments:						

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1110C020322.jpg

FSS1110C020323.jpg



FSS1110C020324.jpg

FSS1110C020325.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/12/2011 1:21 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.49775 -148.13780 Coordinates -148.13784 62.49724 62.49835 -148.13671 Elevation NED (m)(ft): 1008 3307 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Talkeetna Mts B-3 Legal Description (MTRS): S028N007E22 Waterbody Name: John Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU97 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 11.62 DO (mg/L): 8.74 DO (%): 82.20 Conductivity (µS/cm): 56 pH: 6.86 Water Color: Clear Turbidity (NTU): 0.52 Thalweg Velocity (m/s)(ft/s): 0.40 1.31 **Stream Channel** Stream Gradient (%): 0.25 **Entrenchment:** Slightly Entrenched Moderate **Catchment Area(sq. km):** 47 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Boulder **Width** 21.0 19.9 Subdominant Substrate 1: Sand Thalweg Depth 1.17 1.02 Subdominant Substrate 2: Cobble Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 0.2 0.5 Wet Sedge Meadow Tundra Closed Low Ericaceous Shrub 0.5 0.5 5 - 10 Closed Low Ericaceous Shrub Closed Low Ericaceous Shrub 10 - 20 Closed Low Ericaceous Shrub 0.5 Closed Low Ericaceous Shrub 0.5 20 - 30 Closed Low Ericaceous Shrub 0.5 Wet Sedge Meadow Tundra 0.2 **Kev To Fish Sampling Methods** Estimated reach length (m): 245 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Arctic grayling Life Stage: juvenile Life History: Resident Fish Measured: 13 Fork Lengths (mm) Min: 80 Max: 150 **Median:** 115 Total Fish Count: 36 Mean: 101 Sampling Method (No. of fish): PEF (13) VOG (23) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 3 Fork Lengths (mm) Min: 70 **Total Fish Count:** 3 Max: 84 **Mean:** 75 Median: 77 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 54 **Total Fish Count: 29** Fish Measured: 2 Fork Lengths (mm) Min: 51 Max: 58 **Mean: 54** Sampling Method (No. of fish): PEF (2) VOG (27) **Comments:**

Instruments

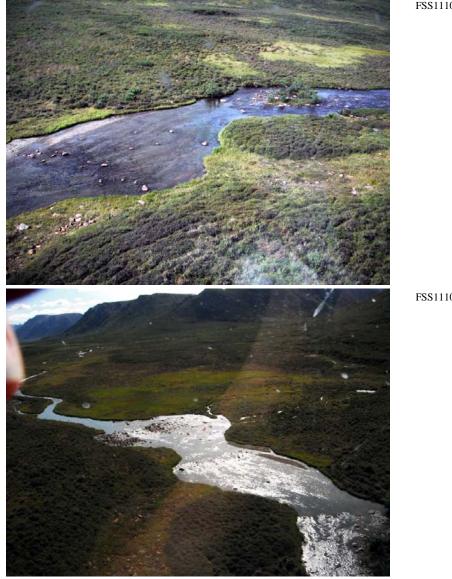
Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1110C030330.jpg



FSS1110C030331.jpg

FSS1110C030332.jpg

Station Info

Observers: Raye Ann Neustel, Da	aniel Reed	Date/Time: 08/	12/2011 1:22 PM
Station Latitude Longit		8 /	tude Longitude
Coordinates 62.41757 -148.42	Coordinates	62.41757 -148.42772 / 62.4	1685 -148.43073
Elevation NED (m)(ft): 1017 333	7		
Coordinate Determination Metho	d: Non-Differential GPS Field M	easurement Datum: WGS84	
USGS Quadrangle: Talkeetna Mts	B-3 Legal Descri	ption (MTRS): S027N006E19	
Waterbody Name:			
Anadromous Waters Catalog Nur	nber:		
Geographic Comments: HU73. U	Innamed tributary to the Talkeetna	River.	
Visit Comments: Wildlife Comments: 1 caribou.			
Water Quality \ Stream Flow	<i>y</i>		
Water Temp (C): 13.93 DO (mg	JL): 10.72 DO (%): 103.90	Conductivity (µS/cm): 65 pl	H: 7.38
Water Color: Clear	Turbidity (NTU): 0.50	Thalweg Velocity (m/s)(ft/s): 1.05	3.44
Stream Channel			
Stream Gradient (%): 0.5	Entrenchment: Slightly E	ntrenched	
Catchment Area(sq. km): 83	Embeddedness: Low		
Channel Dimensions (m): Bar	kfull OHW Wetted	Dominant Substrate: Cobble	
Width 7	25.0 22.4 Subdo	minant Substrate 1: Boulder	
Thalweg Depth ().84 0.42 Subd o	minant Substrate 2: Gravel	

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Willow Dwarf Shrub Tundra	0.2	Willow Dwarf Shrub Tundra	0.3
5 - 10	Willow Dwarf Shrub Tundra	0.2	Willow Dwarf Shrub Tundra	0.3
10 - 20	Willow Dwarf Shrub Tundra	0.2	Willow Dwarf Shrub Tundra	0.3
20 - 30	Willow Dwarf Shrub Tundra	0.2	Willow Dwarf Shrub Tundra	0.3

Estimated reach length (m): 285

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1110C040337.jpg



FSS1110C040338.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/12/2011 4:00 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62,57510 -147,90150 Coordinates -147.90164 62.57313 62.57510 -147.90150 Elevation NED (m)(ft): 1131 3711 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-2 Legal Description (MTRS): S029N008E26 Waterbody Name: Gilbert Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU23 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 10.01 DO (mg/L): 11.31 **DO (%):** 100.10 Conductivity (µS/cm): 20 **pH:** 6.62 Water Color: Feric Turbidity (NTU): 0.76 Thalweg Velocity (m/s)(ft/s): 0.53 1.74 **Stream Channel** Stream Gradient (%): 0.2 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 40 **Embeddedness:** Low Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Cobble Width 11.1 9.7 Subdominant Substrate 1: Boulder Thalweg Depth 1.22 0.91 Subdominant Substrate 2: Rosgen Class: E3 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 0.2 0.3 Tussock Tundra Tussock Tundra 0.2 0.3 5 - 10 Tussock Tundra Tussock Tundra 10 - 20 Tussock Tundra 0.2 Tussock Tundra 0.3 20 - 30 Tussock Tundra 0.2 Tussock Tundra 03 **Key To Fish Sampling Methods** Estimated reach length (m): 238 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Resident **Fish Measured:** Fork Lengths (mm) Min: Max: Median: **Total Fish Count:** 2 Mean: Sampling Method (No. of fish): VOG (2) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 71 Max: 71 Mean: 71 Median: 71 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 5 Fish Measured: 5 Fork Lengths (mm) Min: 31 Max: 50 Mean: 36 Median: 40 Sampling Method (No. of fish): PEF (5) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths:graduated wading rodChannel Widths:measuring tapeElectrofisher:Smith-Root LR-24Transparency:

FSS1110C050344.jpg





FSS1110C050346.jpg

	/1.			
Station Info				
Observers: Joe Buckwalter, Joe Giefer		Date/	Time: 08/13/2	011 10:00 AM
StationLatitudeLongitudeCoordinates63.27483-149.35990	Sample Coordinates	Latitude Longitude 63.27483 -149.3599	/	0
Elevation NED (m)(ft): 688 2257				
Coordinate Determination Method: Non-J USGS Quadrangle: Healy B-5		easurement Datum: V ption (MTRS): F019S00		
Waterbody Name: Bull River Anadromous Waters Catalog Number: 247 Geographic Comments:			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 5.93DO (mg/L): 12.23Water Color: Glacial, High TurbiditTurbidit		Conductivity (µS/cm): 2 Thalweg Velocity (m/s)(-	
Stream Channel				
	enchment: Entrenched eddedness: Negligible			
Channel Dimensions (m): Bankfull O		Dominant Substrate: Cob		
Width 25.0		minant Substrate 1: Grav		
Thalweg Depth 0.85 Rosgen Class: F3 Entrenched meandering rif		minant Substrate 2: Bou		
	-	gradients with high width		
Riparian Vegetation Communities (lereck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation 7	Гуре	Canopy Height(m)
0 - 5 Open Tall Willow Shrub	1.5	Open Tall Willow Shrub		1.5
5 - 10 Closed Tall Willow Shrub	2.5	Closed Tall Willow Shrut)	2.5
10 - 20 Closed Tall Willow Shrub	2.5	Closed Tall Willow Shrut)	2.5
20 - 30 Closed Tall Willow Shrub	2.5	Closed Tall Willow Shrut)	2.5
Key To Fish Sampling Methods	Estimated reach	ength (m): 6300 Total l	Electrofishing [Fime (s): 2291
(BEF) Boat-Mounted Electrofisher	(VOB)) Visual Observation, Boa	at	
Fish Observations				
	Stage: juvenile/adult	Life History: Resid		N N 140
Total Fish Count: 7 Fish Measured: Sampling Method (No. of fish): BEF (3) V Comments: Event BB Dolly Varden were o	OB (4)) Min: 125 Max: 162	Mean: 138	Median: 143
Species: Chinook salmon Life	Stage: carcass	Life History: Anac	lromous	
Total Fish Count:3Fish Measured:Sampling Method (No. of fish):VOB (3)Comments:event BB photos:501-502, egg	Fork Lengths (mm) Min: Max:	Mean:	Median:
	Stage: juvenile	Life History: Unki	ıown	
Total Fish Count:4Fish Measured:Sampling Method (No. of fish):VOB (4)Comments:Event BB-probobly a Dolly Va	Fork Lengths (mm	=	Mean:	Median:
			1	
Species: slimy sculpin Life	Stage: adult	Life History: Resid	lent	

Life Stage: juvenile Species: Chinook salmon Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 47 Max: 65 **Mean: 56** Median: 56 Sampling Method (No. of fish): BEF (2) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: Chinook salmon Life Stage: adult Life History: Anadromous Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 520 Max: 520 Mean: 520 Median: 520 Sampling Method (No. of fish): BEF (1) Suspected Spawning: Yes **Comments:** Species: Chinook salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count:** 3 Fish Measured: Fork Lengths (mm) Min: Mean: Max: Median: Sampling Method (No. of fish): VOB (3) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1111A010497.jpg

FSS1111A010498.jpg



FSS1111A010499.jpg

FSS1111A010501.jpg Chinook salmon carcass.

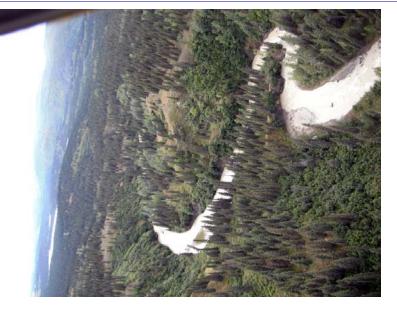
FSS1111A010503.jpg Chinook salmon juvenile.



FSS1111A010512.jpg

Appendix L109.–Page 6 of 6.

FSS1111A010513.jpg



Station In						
Station In	ıfo					
Observers	: Jonathan Kir	rsch, Stormy Haught			Date/Time: 08/13/	2011 12:23 PM
Station Coordinat	Latitude tes 63.16078	Longitude -149.15019	Sample Coordinates	Latitude 63.16078	Longitude / Latitud -149.15019 / 63.1822	
	NED (m)(ft): 7					
	e Determination adrangle: Healy		ifferential GPS Field M		Datum: WGS84): F020S008W19	
	-	Fork Chulitna River	Legal Descrip). 10205000 ((1)	
Anadromo	ous Waters Cat	alog Number: 247-	41-10200-2381-3260			
	ic Comments:					
		d sampling short of s	sufficiency goals due to	narrow canyo	n section.	
Wildlife C	omments:					
Water Qu	ality \ Strea	m Flow				
Water Ten Water Col	np (C): 6.64 or: Clear	DO (mg/L): 11.16 Turbid			y (μS/cm): 78 pH: 6 ocity (m/s)(ft/s): 2.36 7.7	
Stream Cl	hannel					
	adient (%): 0.	.75 Entre	nchment: Slightly Er	ntrenched		
	t Area(sq. km):		ddedness: Low			
Channel I	Dimensions (m)): Bankfull OH	(W Wetted I	Dominant Sul	ostrate: Cobble	
		Width 25.0			trate 1: Boulder	
Darran Cl	-	Depth 1.10			trate 2: Gravel	1 fla - dulaina
					ls with broad, well-defined	i nooupianis.
Riparian `	Vegetation (Communities (V	iereck et al. 1992)			
Dist. from Bank (m)	Left Bank Ve	egetation Type	Canopy Height(m)	<u>Right Bank V</u>	Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall A	lder-Willow Shrub	3.5	Closed Tall A	Ider-Willow Shrub	3
5 - 10	Closed Tall A	lder-Willow Shrub	3.5	Closed Spruc	e-Paper Birch Forest	29
10 - 20	Closed Tall A	lder-Willow Shrub	3.5	Closed Spruc	e-Paper Birch Forest	29
20 - 30	Closed Tall A	lder-Willow Shrub	3.5	Open Spruce-	Paper Birch Forest	29
Key To Fi	ish Sampling	g Methods	Estimated reach l	ength (m): 35	500 Total Electrofishing	Time (s): 1193
•	ish Sampling at-Mounted Elec	0			500 Total Electrofishing ervation, Boat	g Time (s): 1193
•	at-Mounted Elec	0				g Time (s): 1193
(BEF) Boa	at-Mounted Elec	ctrofisher) Visual Obse		; Time (s): 1193
(BEF) Boa Fish Obse Species: An Total Fish	ervations retic grayling n Count: 20	ctrofisher Life S Fish Measured: 3	(VOB) Stage: adult Fork Lengths (mm) Visual Obse	ervation, Boat	
(BEF) Boa Fish Obse Species: An Total Fish Sampling	ervations retic grayling n Count: 20 Method (No. o	ctrofisher Life S	(VOB) Stage: adult Fork Lengths (mm) Visual Obse	ervation, Boat story: Resident	
(BEF) Boa Fish Obse Species: A Total Fish Sampling Comment	ervations retic grayling a Count: 20 Method (No. o	Ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V((VOB) Stage: adult Fork Lengths (mm) OB (17)) Visual Obse Life Hi) Min: 330	ervation, Boat story: Resident Max: 400 Mean: 360	
(BEF) Boar Fish Obse Species: An Total Fish Sampling Comment Species: Do	ervations retic grayling n Count: 20 Method (No. o	ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V(Life S	(VOB) Stage: adult Fork Lengths (mm) Visual Obse Life Hi) Min: 330 Life Hi	story: Resident Max: 400 Mean: 360	Median: 365
(BEF) Boar Fish Obser Species: An Total Fish Sampling Comment Species: Do Total Fish Sampling	at-Mounted Electronic grayling a Count: 20 Method (No. o ss: olly Varden a Count: 6 Method (No. o	ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V(Life S	(VOB) Stage: adult Fork Lengths (mm OB (17) Stage: juvenile/adult Fork Lengths (mm) Visual Obse Life Hi) Min: 330 Life Hi	story: Resident Max: 400 Mean: 360	Median: 365
(BEF) Boa Fish Obse Species: An Total Fish Sampling Comment Species: Do Total Fish Sampling Comment	ervations retic grayling n Count: 20 Method (No. o ss: olly Varden n Count: 6 Method (No. o ss:	ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 3 of fish): BEF (3) V((VOB) Stage: adult Fork Lengths (mm) OB (17) Stage: juvenile/adult Fork Lengths (mm) OB (3)) Visual Obse Life Hi) Min: 330 Life Hi) Min: 110	ervation, Boat story: Resident Max: 400 Mean: 360 story: Unknown Max: 210 Mean: 168	Median: 365
(BEF) Boa Fish Obse Species: An Total Fish Sampling Comment Species: Do Total Fish Sampling Comment Species: Cl	ervations retic grayling a Count: 20 Method (No. o ss: olly Varden a Count: 6 Method (No. o ss: hinook salmon	ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 3 of fish): BEF (3) V(Life S	(VOB) Stage: adult Fork Lengths (mm) OB (17) Stage: juvenile/adult Fork Lengths (mm) OB (3) Stage: juvenile) Visual Obse Life Hi) Min: 330 Life Hi) Min: 110 Life Hi	ervation, Boat story: Resident Max: 400 Mean: 360 story: Unknown Max: 210 Mean: 168 story: Anadromous	Median: 365 Median: 160
(BEF) Boar Fish Obser Species: An Total Fish Sampling Comment Species: Da Total Fish Sampling Comment Species: Cl Total Fish	at-Mounted Electronic grayling a Count: 20 Method (No. of Sector) a Count: 6 Method (No. of Sector) Method (No. of Sector) Method (No. of Sector) a Count: 6	ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 3 of fish): BEF (3) V(Life S	(VOB) Stage: adult Fork Lengths (mm OB (17) Stage: juvenile/adult Fork Lengths (mm OB (3) Stage: juvenile Fork Lengths (mm) Visual Obse Life Hi) Min: 330 Life Hi) Min: 110 Life Hi	ervation, Boat story: Resident Max: 400 Mean: 360 story: Unknown Max: 210 Mean: 168	Median: 365
(BEF) Boar Fish Obser Species: An Total Fish Sampling Comment Species: Da Total Fish Sampling Comment Species: Cl Total Fish	at-Mounted Electronic grayling a Count: 20 Method (No. of Sector) a Count: 6 Method (No. of Sector) Method (No. of Sector) hinook salmon a Count: 6 Method (No. of Sector)	ctrofisher Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 2	(VOB) Stage: adult Fork Lengths (mm OB (17) Stage: juvenile/adult Fork Lengths (mm OB (3) Stage: juvenile Fork Lengths (mm) Visual Obse Life Hi) Min: 330 Life Hi) Min: 110 Life Hi	ervation, Boat story: Resident Max: 400 Mean: 360 story: Unknown Max: 210 Mean: 168 story: Anadromous	Median: 365 Median: 160
(BEF) Boa Fish Obse Species: An Total Fish Sampling Comment Species: Do Total Fish Sampling Comment Species: Cl Total Fish Sampling Comment Species: Shi	ervations retic grayling a Count: 20 Method (No. o ss: olly Varden a Count: 6 Method (No. o ss: hinook salmon a Count: 6 Method (No. o ss: imy sculpin	Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 2 of fish): BEF (2) V(Life S	(VOB) Stage: adult Fork Lengths (mm) OB (17) Stage: juvenile/adult Fork Lengths (mm) OB (3) Stage: juvenile Fork Lengths (mm) OB (4) Stage: juvenile/adult) Visual Obse Life Hi) Min: 330 Life Hi) Min: 110 Life Hi) Min: 58	ervation, Boat story: Resident Max: 400 Mean: 360 story: Unknown Max: 210 Mean: 168 story: Anadromous Max: 65 Mean: 61 story: Resident	Median: 365 Median: 160 Median: 61
(BEF) Boa Fish Obse Species: An Total Fish Sampling Comment Species: Do Total Fish Sampling Comment Species: Cl Total Fish Sampling Comment Species: sli Total Fish	ervations retic grayling a Count: 20 Method (No. o ss: olly Varden a Count: 6 Method (No. o ss: hinook salmon a Count: 6 Method (No. o ss: imy sculpin a Count: 2	Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 3 of fish): BEF (3) V(Life S Fish Measured: 2 of fish): BEF (2) V((VOB) Stage: adult Fork Lengths (mm) OB (17) Stage: juvenile/adult Fork Lengths (mm) OB (3) Stage: juvenile Fork Lengths (mm) OB (4)) Visual Obse Life Hi) Min: 330 Life Hi) Min: 110 Life Hi) Min: 58	ervation, Boat story: Resident Max: 400 Mean: 360 story: Unknown Max: 210 Mean: 168 story: Anadromous Max: 65 Mean: 61	Median: 365 Median: 160

Appendix L110.–Page 2 of 5. Species: Chinook salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count:** 3 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (3) Suspected Spawning: Yes Comments: Event MM suspected spawning activity. Event NN spawning activity observed. Species: rainbow trout Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments: Species:** slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 70 Max: 70 **Mean:** 70 Median: 70 Sampling Method (No. of fish): BEF (1) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod

Channel Widths: measuring tape

Transparency:

Electrofisher: Smith-Root GPP 2.5

Stream Velocity: GPS Float

Water Quality: YSI 556

Turbidity: LaMotte 2020e turbidimeter



FSS1111B010363.jpg

FSS1111B010364.jpg

FSS1111B010366.jpg



FSS1111B010367.jpg



FSS1111B010372.jpg

FSS1111B010373.jpg



Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/13/2011 3:20 PM Sample Latitude Longitude Coordinates 63.14770 -149.14000 Elevation NED (m)(ft): 748 2454 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Ouadrangle:** Healy A-5 Legal Description (MTRS): F020S008W29 Waterbody Name: Crooked Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: No habitat data collected, this site was by aerial survey only. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 76 **Embeddedness:** Catchment Area(sq. km): Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations**

	Species: coho salmon	Life St	age: adult	Life	History: Ana	adromous		
	Total Fish Count: 4	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
	Sampling Method (No. o	of fish): VOH (4)						
	Comments: These coho	salmon were observed	l by aerial survey.					
1								_

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Observers: Raye Ann Neustel, Daniel Reed			Date/Time: 08	/13/2011 10:08 AM
	Sample Coordinates	Latitude 62.84751	Longitude -149.03675	
Elevation NED (m)(ft): 642 2106 Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna Mts D-5 Waterbody Name: Devil Creek Anadromous Waters Catalog Number: Geographic Comments: This site represents a water	tial GPS Field Mo Legal Descrip	easurement otion (MTRS	Datum: WGS84): S032N002E23	npling occurred.
Visit Comments: No sampling effort.				
Wildlife Comments:				
Water Quality \ Stream Flow		~		
Water Temp (C): DO (mg/L): DO Water Color: Turbidity (N2)	Ο (%): ΓU):	Conductivit Thalweg Vel	y (µS/cm): p ocity (m/s)(ft/s):	H:
Stream Channel				
Stream Gradient (%):EntrenchmerCatchment Area(sq. km):Embeddedne				
Channel Dimensions (m): Bankfull OHW V		ominant Sul		
Width Thalweg Depth		minant Subs minant Subs		
Rosgen Class:				
Riparian Vegetation Communities (Vierec	k et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10	Canopy Height(m)	Right Bank V	Vegetation Type	Canopy Height(m)
10 - 20				
20 - 30				
Key To Fish Sampling Methods				
(NON) None				
Fish Observations				
•	not applicable rk Lengths (mm)		story: Not Applicable Max: Mean:	Median:
Instruments				
Stream Gradient:	Channe	Depths:		
Stream Velocity:	Channel	Widths:		
Turbidity:	Electrof	isher:		
Water Quality:	Transpa	renev.		
	-	ir ency.		

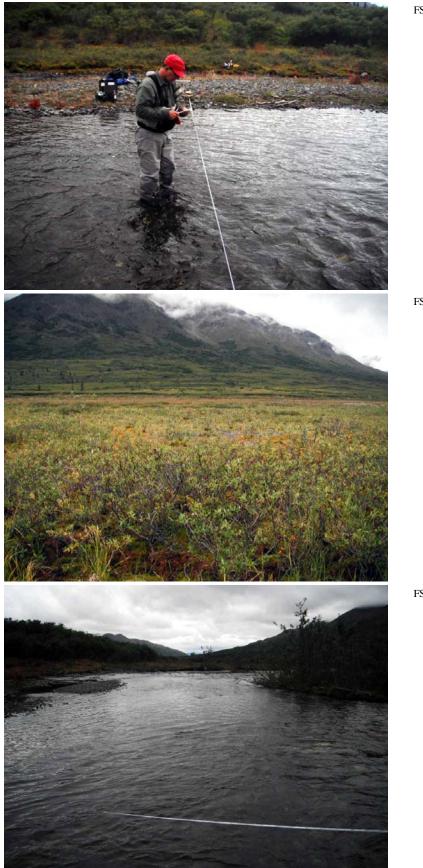
Observers: Raye Ann	Neustel, Daniel	Reed			Date/Time:	: 08/13/2011 10:16 AM
			Sample Coordinates	Latitude 62.83438	Longitude -148.64878	
Elevation NED (m)(ft) Coordinate Determina USGS Quadrangle: Ta Waterbody Name: Anadromous Waters (Geographic Comments	tion Method: alkeetna Mts D-4 Catalog Number	1 	Legal Descr	leasurement iption (MTRS	Datum: WGS8): S032N004E26	
Visit Comments: No s	ampling occurre	ed.				
Wildlife Comments:						
Water Quality \ Str	eam Flow					
Water Temp (C): Water Color:	DO (mg/L):	Turbidity	DO (%): (NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel						
Stream Gradient (%): Catchment Area(sq. k	m):	Entrench Embedde	dness:			
				Dominant Sub		
Channel Dimensions	Width	II OHW	Subd	ominant Subs	trate 1:	
Thalwa Rosgen Class:	Width eg Depth		Subd Subd	ominant Subs ominant Subs	trate 1:	
Thalwa Rosgen Class:	Width eg Depth n Communit	ies (Vier	Subd Subd eck et al. 1992 Canopy	ominant Substominant Subst	trate 1:	Canopy Height(n
Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10	Width eg Depth n Communit	ies (Vier	Subd Subd eck et al. 1992 Canopy	ominant Substominant Subst	trate 1: trate 2:	10
Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width eg Depth n Communit <u>Vegetation Typ</u>	ies (Vier <u>e</u>	Subd Subd eck et al. 1992 Canopy	ominant Substominant Subst	trate 1: trate 2:	10
Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width eg Depth n Communit <u>Vegetation Typ</u>	ies (Vier <u>e</u>	Subd Subd eck et al. 1992 Canopy	ominant Substominant Subst	trate 1: trate 2:	10
Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl	Width eg Depth n Communit <u>Vegetation Typ</u>	ies (Vier <u>e</u>	Subd Subd eck et al. 1992 Canopy	ominant Substominant Subst	trate 1: trate 2:	10
Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (NON) None	Width eg Depth n Communit <u>Vegetation Typ</u> ing Methods	ies (Vier <u>e</u> Life Stag ured:	Subd Subd eck et al. 1992 Canopy	ominant Substoominant Substoominant Substoominant Substoom	trate 1: trate 2: <u>Vegetation Type</u> story: Not Applic	Height(n
Thalwo Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (NON) None Fish Observations Species: no collection of Total Fish Count: 0 Sampling Method (No	Width eg Depth n Communit <u>Vegetation Typ</u> ing Methods	ies (Vier <u>e</u> Life Stag ured:	Subd Subd eck et al. 1992 Canopy Height(m) e: not applicable	ominant Substoominant Substoominant Substoominant Substoom	trate 1: trate 2: <u>Vegetation Type</u> story: Not Applic	
Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (NON) None Fish Observations Species: no collection of Total Fish Count: 0 Sampling Method (No Comments:	Width eg Depth n Communit <u>Vegetation Typ</u> ing Methods	ies (Vier <u>e</u> Life Stag ured:	Subd Subd eck et al. 1992 Canopy Height(m) e: not applicable Fork Lengths (mr	ominant Substoominant Substoominant Substoominant Substoom	trate 1: trate 2: <u>Vegetation Type</u> story: Not Applic	
Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (NON) None Fish Observations Species: no collection end Total Fish Count: 0 Sampling Method (New Comments: Instruments	Width eg Depth n Communit <u>Vegetation Typ</u> ing Methods	ies (Vier <u>e</u> Life Stag ured:	Subd Subd eck et al. 1992 Canopy Height(m) e: not applicable Fork Lengths (mr Chann	ominant Substominant Substominant Substominant Substom	trate 1: trate 2: <u>Vegetation Type</u> story: Not Applic	
Thalwa Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampl (NON) None Fish Observations Species: no collection end Total Fish Count: 0 Sampling Method (New Comments: Instruments Stream Gradient:	Width eg Depth n Communit <u>Vegetation Typ</u> ing Methods	ies (Vier <u>e</u> Life Stag ured:	Subd Subd eck et al. 1992 Canopy Height(m) e: not applicable Fork Lengths (mr Chann Chann	ominant Substominant Substominant Substominant Substom	trate 1: trate 2: <u>Vegetation Type</u> story: Not Applic	

Station Info			
Observers: Raye Ann Neustel, Daniel Reed		Date/Time: 08/13/	2011 10:53 PM
StationLatitudeLongitudeCoordinates62.91655-147.90203	Sample Coordinates	Latitude Longitude / Latitud 62.91655 -147.89921 / 62.9166	-
Elevation NED (m)(ft): 864 2835			
Coordinate Determination Method: Non-Dif USGS Quadrangle: Talkeetna Mts D-2		IeasurementDatum: WGS84ption (MTRS):\$033N008E26	
Waterbody Name: Watana Creek Anadromous Waters Catalog Number:	Legal Desch	puon (MTKS); 505510008E20	
Geographic Comments: HU18 Beaver dam co	mplex approximately	200m upstream.	
Visit Comments:			
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 7.24 DO (mg/L): 8.99	DO (%): 74.40	Conductivity (µS/cm): 118 pH: 5	5.89
Water Color: ClearTurbidi	ty (NTU): 0.20	Thalweg Velocity (m/s)(ft/s): 0.64 2.1	0
Stream Channel			
	chment: Slightly E	ntrenched	
	dedness: Moderate		
Channel Dimensions (m): Bankfull OH Width 15.1		Dominant Substrate: Gravel	
Thalweg Depth 0.55		ominant Substrate 1: Cooble	
Rosgen Class: C4 Low gradient, meandering, p	oint-bar, riffle/pool, a	lluvial channels with broad, well-defined	d floodplains.
Riparian Vegetation Communities (Vi	ereck et al. 1992)		
	,		
Dist. from Bank (m) Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) 2	<u>Right Bank Vegetation Type</u> Unvegetated	Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Unvegetated	
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub	Height(m)		
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Crustose Lichen	Height(m) 2 0.2	Unvegetated Unvegetated	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Crustose Lichen10 - 20Crustose Lichen20 - 30Crustose Lichen	Height(m) 2 0.2 0.2 0.2 0.2	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Crustose Lichen10 - 20Crustose Lichen20 - 30Crustose LichenKey To Fish Sampling Methods	Height(m) 2 0.2 0.2	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Crustose Lichen10 - 20Crustose Lichen20 - 30Crustose Lichen	Height(m) 2 0.2 0.2 0.2 0.2	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Willow Shrub5 - 10Crustose Lichen10 - 20Crustose Lichen20 - 30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish Observations	Height(m) 2 0.2 0.2 0.2 Estimated reach	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub length (m): 240	Height(m)
Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Crustose Lichen 10 - 20 Crustose Lichen 20 - 30 Crustose Lichen Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Life St	Height(m) 2 0.2 0.2 0.2 Estimated reach	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown	Height(m) 0.3 1.1
Bank (m) Left Bank Vegetation Type 0 - 5 Closed Tall Willow Shrub 5 - 10 Crustose Lichen 10 - 20 Crustose Lichen 20 - 30 Crustose Lichen 20 - 30 Crustose Lichen Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden	Height(m) 2 0.2 0.2 0.2 Estimated reach	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown	Height(m) 0.3 1.1
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose LichenWey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count:34Fish Measured:	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown	Height(m) 0.3 1.1
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count:34Fish Measured:34Sampling Method (No. of fish):PEF (34)Comments:Species: Dolly VardenLife St	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mn age: juvenile	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown a) Min: 83 Max: 270 Mean: 133 Life History: Unknown	Height(m) 0.3 1.1 Median: 176
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count: 34Fish Measured: 34Sampling Method (No. of fish): PEF (34)Comments:Species: Dolly VardenLife StTotal Fish Count: 13Fish Measured: 13	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mm	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown a) Min: 83 Max: 270 Mean: 133 Life History: Unknown	Height(m) 0.3 1.1
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count:34Fish Measured:34Sampling Method (No. of fish):PEF (34)Comments:Species: Dolly VardenLife St	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mn age: juvenile	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown a) Min: 83 Max: 270 Mean: 133 Life History: Unknown	Height(m) 0.3 1.1 Median: 176
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count: 34Fish Measured: 34Sampling Method (No. of fish): PEF (34)Comments:Species: Dolly VardenLife StTotal Fish Count: 13Fish Measured: 13Sampling Method (No. of fish): PEF (13)Comments:	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mn age: juvenile	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown a) Min: 83 Max: 270 Mean: 133 Life History: Unknown	Height(m) 0.3 1.1 Median: 176
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count: 34Fish Measured: 34Sampling Method (No. of fish): PEF (34)Comments:Species: Dolly VardenLife StTotal Fish Count: 13Fish Measured: 13Sampling Method (No. of fish): PEF (13)Comments:Species: slimy sculpinLife StTotal Fish Count: 6Fish Measured: 6	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mm age: juvenile Fork Lengths (mm	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown Min: 83 Max: 270 Mean: 133 Life History: Unknown Min: 35 Max: 78 Mean: 47 Life History: Resident	Height(m) 0.3 1.1 Median: 176
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count: 34Fish Measured: 34Sampling Method (No. of fish): PEF (34)Comments:Species: Dolly VardenLife StTotal Fish Count: 13Fish Measured: 13Sampling Method (No. of fish): PEF (13)Comments:Species: slimy sculpinLife StTotal Fish Count: 6Fish Measured: 6Sampling Method (No. of fish): PEF (13)Comments:Species: slimy sculpinLife StTotal Fish Count: 6Fish Measured: 6Sampling Method (No. of fish): PEF (6)	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mm age: juvenile Fork Lengths (mm age: adult	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown Min: 83 Max: 270 Mean: 133 Life History: Unknown Min: 35 Max: 78 Mean: 47 Life History: Resident	Height(m) 0.3 1.1 Median: 176 Median: 56
Bank (m)Left Bank Vegetation Type0-5Closed Tall Willow Shrub5-10Crustose Lichen10-20Crustose Lichen20-30Crustose Lichen20-30Crustose LichenKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StTotal Fish Count: 34Fish Measured: 34Sampling Method (No. of fish): PEF (34)Comments:Species: Dolly VardenLife StTotal Fish Count: 13Fish Measured: 13Sampling Method (No. of fish): PEF (13)Comments:Species: slimy sculpinLife StTotal Fish Count: 6Fish Measured: 13Sampling Method (No. of fish): PEF (13)Comments:Species: slimy sculpinLife StTotal Fish Count: 6Fish Measured: 6Sampling Method (No. of fish): PEF (6)Comments:	Height(m) 2 0.2 0.2 0.2 Estimated reach age: juvenile/adult Fork Lengths (mm age: juvenile Fork Lengths (mm age: adult	Unvegetated Unvegetated Closed Low Willow Shrub Closed Tall Alder-Willow Shrub Iength (m): 240 Life History: Unknown Min: 83 Max: 270 Mean: 133 Life History: Unknown Min: 35 Max: 78 Mean: 47 Life History: Resident	Height(m) 0.3 1.1 Median: 176 Median: 56

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

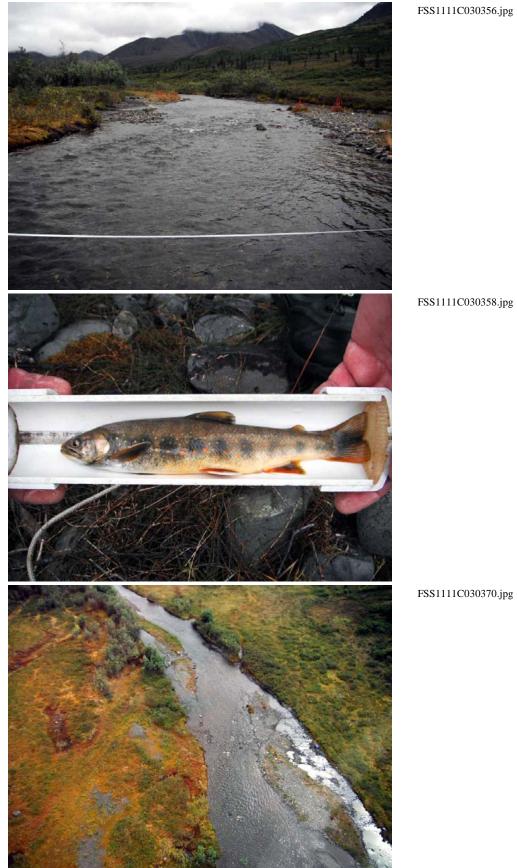
Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1111C030353.jpg

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FSS1111C030355.jpg



FSS1111C030371.jpg



Station Info			
Observers: Raye Ann Neustel, Daniel Reed		Date/Time: 08/13/2011 12	:04 PM
Station Latitude Longitude Coordinates 62.99728 -149.08085	Sample Coordinates	- /	ngitude 9.08337
Elevation NED (m)(ft): 659 2162			
Coordinate Determination Method: Non-Diff			
USGS Quadrangle: Talkeetna Mts D-5 Waterbody Name:	Legal Descri	ption (MTRS): F022S008W21	
Anadromous Waters Catalog Number: 247-41	1-10200-2585-3223		
Geographic Comments: HU111. Unnamed trib	outary of Portage Cre	ek.	
Visit Comments:			
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 5.78DO (mg/L): 11.98Water Color: ClearTurbidity	DO (%): 95.60 y (NTU): 0.10	Conductivity (μS/cm): 82 pH: 6.43 Thalweg Velocity (m/s)(ft/s): 1.33 4.36	
Stream Channel			
Stream Gradient (%): 1.5 Entrenc	hment: Moderatle	y Entrenched	
Catchment Area(sq. km): 62 Embedd	ledness: Negligible		
Channel Dimensions (m): Bankfull OHW		Dominant Substrate: Boulder	
Width 22.8 Thalweg Depth 1.81		ominant Substrate 1: Cobble ominant Substrate 2: Gravel	
Rosgen Class: B2 Moderately entrenched, mode			s. Verv
stable plan and profile. Stable ba		similare enamer, num intequenci, spaces poor	
Riparian Vegetation Communities (Vie	ereck et al. 1992)		
Dist. from	Canopy		Canopy
Rank (m) I off Don't Vegetation True			
Bank (m) <u>Left Bank Vegetation Type</u>			eight(m)
0 - 5 Closed Tall Shrub Birch-Willow Shr	rub 35	Fireweed	2
0 - 5 Closed Tall Shrub Birch-Willow Shr5 - 10 Closed Tall Shrub Birch-Willow Shr	rub 35 rub 35	Fireweed Open Tall Willow Shrub	2 5
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 	rub 35 rub 35 rub 35	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra	2 5 0.5
0 - 5 Closed Tall Shrub Birch-Willow Shr5 - 10 Closed Tall Shrub Birch-Willow Shr	rub 35 rub 35 rub 35	Fireweed Open Tall Willow Shrub	2 5
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 	rub 35 rub 35 rub 35	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub	2 5 0.5
 0 - 5 Closed Tall Shrub Birch-Willow Shr 5 - 10 Closed Tall Shrub Birch-Willow Shr 10 - 20 Closed Tall Shrub Birch-Willow Shr 20 - 30 Closed Tall Shrub Birch-Willow Shr 	rub 35 rub 35 rub 35 rub 35 rub 35	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub	2 5 0.5
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher 	rub 35 rub 35 rub 35 rub 35 rub 35	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242	2 5 0.5
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground	2 5 0.5
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations	rub 35 rub 35 rub 35 rub 35 rub 35	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown	2 5 0.5
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG nge: juvenile/adult Fork Lengths (mm	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Event State (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (19)	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown a) Min: 85 Max: 167 Mean: 119 Medi	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life Stat	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (19)	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown a) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life Stat	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (19) age: juvenile Fork Lengths (mm	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown a) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life Stat Total Fish Count: 76 Fish Measured: 37 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (19) age: juvenile Fork Lengths (mm	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown a) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life State Total Fish Count: 76 Fish Measured: 37 Sampling Method (No. of fish): PEF (37) VOC Comments: Species: slimy sculpin Life State	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG nge: juvenile/adult Fork Lengths (mm 3 (19) nge: juvenile Fork Lengths (mm 0G (39) nge: juvenile/adult	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous) Min: 38 Max: 66 Mean: 44 Medi Life History: Resident	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life Stat Total Fish Count: 76 Fish Measured: 37 Sampling Method (No. of fish): PEF (37) VO Comments: Species: slimy sculpin Life Stat Total Fish Count: 1 Fish Measured: 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (19) age: juvenile Fork Lengths (mm OG (39)	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous) Min: 38 Max: 66 Mean: 44 Medi Life History: Resident	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life State Total Fish Count: 76 Fish Measured: 37 Sampling Method (No. of fish): PEF (37) VOC Comments: Species: slimy sculpin Life State	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG nge: juvenile/adult Fork Lengths (mm 3 (19) nge: juvenile Fork Lengths (mm 0G (39) nge: juvenile/adult	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous) Min: 38 Max: 66 Mean: 44 Medi Life History: Resident	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life Stat Total Fish Count: 76 Fish Measured: 37 Sampling Method (No. of fish): PEF (37) VO Comments: Species: slimy sculpin Life Stat Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOG (1) Comments: 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG nge: juvenile/adult Fork Lengths (mm 3 (19) nge: juvenile Fork Lengths (mm 0G (39) nge: juvenile/adult	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous) Min: 38 Max: 66 Mean: 44 Medi Life History: Resident	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Sta Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life Sta Total Fish Count: 76 Fish Measured: 37 Sampling Method (No. of fish): PEF (37) VO Comments: Species: slimy sculpin Life Sta Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOG (1) Comments: Species: Dolly Varden Life Sta Total Fish Count: 27 Fish Measured: 27 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (39) age: juvenile/adult Fork Lengths (mm Age: juvenile/adult Fork Lengths (mm	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous) Min: 38 Max: 66 Mean: 44 Medi Life History: Resident) Min: Max: Mean: Medi Life History: Unknown	2 5 0.5 4
 0-5 Closed Tall Shrub Birch-Willow Shr 5-10 Closed Tall Shrub Birch-Willow Shr 10-20 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr 20-30 Closed Tall Shrub Birch-Willow Shr (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 28 Fish Measured: 9 Sampling Method (No. of fish): PEF (9) VOC Comments: Species: Chinook salmon Life State Total Fish Count: 76 Fish Measured: 37 Sampling Method (No. of fish): PEF (37) VOC Comments: Species: slimy sculpin Life State Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): VOG (1) Comments: Species: Dolly Varden Life State 	rub 35 rub 35 rub 35 rub 35 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (39) age: juvenile/adult Fork Lengths (mm Age: juvenile/adult Fork Lengths (mm	Fireweed Open Tall Willow Shrub Open Low Mixed Shrub-Sedge Tussock Tundra Closed Tall Alder Shrub length (m): 242) Visual Observation, Ground Life History: Unknown) Min: 85 Max: 167 Mean: 119 Medi Life History: Anadromous) Min: 38 Max: 66 Mean: 44 Medi Life History: Resident) Min: Max: Mean: Medi Life History: Unknown	2 5 0.5 4

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/13/2011 3:03 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.16846 -147.03502 Coordinates -147.03713 63.16788 63.16846 -147.03502 Elevation NED (m)(ft): 981 3219 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Healy A-1 Legal Description (MTRS): F020S004E19 Waterbody Name: Pass Creek **Anadromous Waters Catalog Number:** Geographic Comments: HU6 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 8.51 DO (mg/L): 10.21 DO (%): 87.30 Conductivity (µS/cm): 118 pH: 6.99 Water Color: Clear Turbidity (NTU): 0.03 Thalweg Velocity (m/s)(ft/s): 0.85 2.79 **Stream Channel** Stream Gradient (%): 0.25 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 53 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 13.8 12.4 Subdominant Substrate 1: Gravel Thalweg Depth 0.85 0.45 Subdominant Substrate 2: Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 0.3 Closed Tall Willow Shrub 13 Dry Forb Herbaceous 13 0.3 5 - 10 Closed Tall Willow Shrub Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 0.3 13 Dry Forb Herbaceous 20 - 30 Closed Tall Willow Shrub 13 Closed Tall Scrub 5 **Kev To Fish Sampling Methods** Estimated reach length (m): 218 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 3 Max: Mean: Median: **Fish Measured:** Fork Lengths (mm) Min: Sampling Method (No. of fish): VOG (3) **Comments:** Life Stage: juvenile/adult Species: slimy sculpin Life History: Resident **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 61 Max: 61 Mean: 61 Median: 61 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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Station mil				
Observers: Raye Ann Neustel, Daniel Reed			Date/Time: 08/1	3/2011 9:56 AM
	Sample	Latitude	Longitude	
Elevation NED (m)(ft): 748 2454	Coordinates	62.99865	-148.86176	
Coordinate Determination Method: Non-Differenti			Datum: WGS84	
USGS Quadrangle: Talkeetna Mts D-4	Legal Descrip	otion (MTRS): F022S007W22	
Waterbody Name: Portage Creek	0 2585			
Anadromous Waters Catalog Number: 247-41-1020 Geographic Comments: HU59	00-2383			
Visit Comments: No habitat data recorded. This targ data was collected during that visit.	At 11C09 on 8	/13/11, we sat	mpled fish in a short read	ch (~100 m)
approximately 1 km downstream of Wildlife Comments:	09C01 to confi	m the occurre	ence of juvenile Chinook	salmon.
Water Quality \ Stream Flow				
) (%):	Conductivit	y (µS/cm): pH	
Water Color: Turbidity (NT			ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%): Entrenchmen	nt:			
Catchment Area(sq. km): 60 Embeddednes	ss:			
Channel Dimensions (m): Bankfull OHW W		ominant Sul		
Width Thalweg Depth		minant Subs minant Subs		
Rosgen Class:	Subuo	linnant Subs	11 ate 2.	
	- et al. 1002)			
Riparian Vegetation Communities (Viereck	(et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
0 - 5				
5 - 10 10 - 20				
20 - 30				
Key To Fish Sampling Methods Es	timated reach l	ength (m): 50		
(PEF) Backpack Electrofisher	(VOG)	Visual Obse	rvation, Ground	
Fish Observations				
Species: Chinook salmon Life Stage: ju			story: Anadromous	
Total Fish Count: 25 Fish Measured: 14 For Sampling Method (No. of fish): PEF (14) VOG (11 Comments:	-) Min: 38	Max: 48 Mean: 42	Median: 43
Species: Dolly Varden Life Stage: ju	venile/adult	Life Hi	story: Unknown	
Total Fish Count: 10 Fish Measured: For	k Lengths (mm)		Max: Mean:	Median:
Sampling Method (No. of fish): VOG (10) Comments:				
Instruments				
Stream Gradient:	Channel	Depths:		
Stream Velocity:	Channel	Widths:		
Turbidity:	Electrof	isher:		
Water Quality:	Transpa	rency:		



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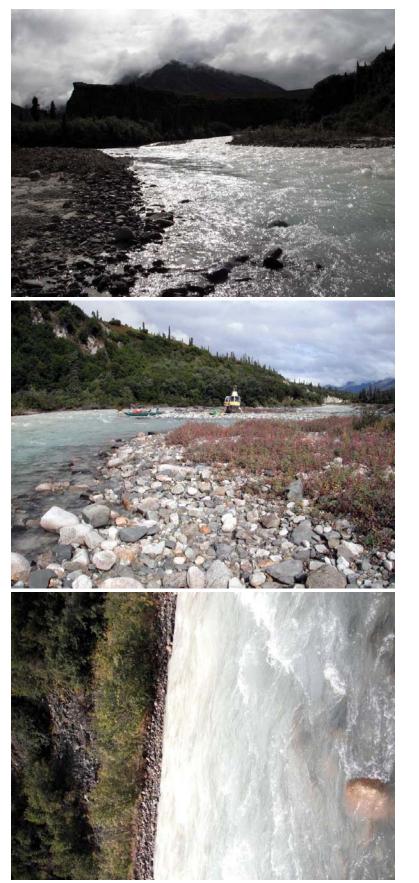
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				T (T)	
Observers: Raye Ann Net	ustel, Daniel Reed	G	T - 4 ¹ 4 - 1		08/13/2011 3:19 PM
		Sample Coordinates	Latitude 62.81700	Longitude -147.83733	
Elevation NED (m)(ft): 85 Coordinate Determination USGS Quadrangle: Talkee Waterbody Name: Jay Cre Anadromous Waters Cata Geographic Comments: N	a Method: Non-Differen etna Mts D-2 eek log Number:	ntial GPS Field M Legal Descri	leasurement ption (MTRS)	Datum: WGS84 : S032N009E31	ı
Visit Comments: No samp	pling occurred.				
Wildlife Comments:					
Water Quality \ Stream	n Flow				
Water Temp (C): Water Color:	DO (mg/L): D Turbidity (N	DO (%): NTU):	Conductivity Thalweg Velo	v (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km):	Entrenchm Embeddedr				
Channel Dimensions (m):			Dominant Sub		
W Thalweg D	Vidth Depth		ominant Subst ominant Subst		
Rosgen Class:					
Riparian Vegetation C	Communities (Viere	ck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Veg</u>	retation Type	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
0 - 5 5 - 10					
10 - 20					
20 - 30					
Key To Fish Sampling	Methods				
(NON) None					
Fish Observations					
Species: no collection effor	ē	not applicable ork Lengths (mm		tory: Not Applica Max: Mea	
Total Fish Count: 0 Sampling Method (No. of Comments:	fish): NON (0)				
Sampling Method (No. of	fish): NON (0)				
Sampling Method (No. of Comments:	? fish): NON (0)	Channe	d Depths:		
Sampling Method (No. of Comments: Instruments	fish): NON (0)		el Depths: el Widths:		
Sampling Method (No. of Comments: Instruments Stream Gradient:	? fish): NON (0)		el Widths:		

Station Info		
Observers: Joe Buckwalter, Joe Giefer	Date/Time: 08/14/2011	11:15 AM
StationLatitudeLongitudeCoordinates62.26967-148.43635Elevation NED (m)(ft):8342736Coordinate Determination Method:Non-DiffUSGS Quadrangle:Talkeetna Mts B-3	Coordinates 62.26967 -148.43635 / 62.29387 -1	Longitude 148.45131
Waterbody Name: Talkeetna River Anadromous Waters Catalog Number:	legal Description (WTRB), 502510005112	
Geographic Comments:	m downstroom of Close Cross confluence. Dight hould (Close Cross	h) flore in
less turbid than left-bank (Tal	m downstream of Clear Creek confluence. Right-bank (Clear Creekeetna River) flow. Water quality was sampled approximately 100 nixed. At the transect site there is an alluvial fan behind the right b	m
Wildlife Comments:		
Water Quality \ Stream Flow		
Water Temp (C): 5.46 DO (mg/L): 11.30 Water Color: Glacial, High Turbidit Turbidit	DO (%): 89.60 Conductivity (μS/cm): 60 pH: 7.58 y (NTU): 35.00 Thalweg Velocity (m/s)(ft/s): 2.80 9.18	
Stream Channel		
Stream Gradient (%): 2EntrenceCatchment Area(sq. km): 290Embedded		
Channel Dimensions (m): Bankfull OHW		
Width 36.0 Thalweg Depth 1.58	 18.0 Subdominant Substrate 1: Boulder 0.60 Subdominant Substrate 2: Gravel 	
	dinal and transverse bars. Very wide channel with eroding banks.	
Riparian Vegetation Communities (Vie	ereck et al. 1992)	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>Right Bank Vegetation Type</u>	Canopy Height(m)
Bank (m) Left Bank Vegetation Type	Height(m) <u>Right Bank Vegetation Type</u>	Height(m)
Bank (m)Left Bank Vegetation Type0-5Closed Tall Alder-Willow Shrub	Height(m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub	Height(m) 1.2
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub	Height(m) 1.2 1.2
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub	Height(m) 1.2 1.2 1.2 1.2 1.2
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow Shrub	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub	Height(m) 1.2 1.2 1.2 1.2 1.2
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow ShrubKey To Fish Sampling Methods	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow ShrubEstimated reach length (m): 3090Total Electrofishing Time	Height(m) 1.2 1.2 1.2 1.2 1.2
Bank (m)Left Bank Vegetation Type0-5Closed Tall Alder-Willow Shrub5-10Closed Tall Alder-Willow Shrub10-20Closed Tall Alder-Willow Shrub20-30Closed Tall Alder-Willow ShrubKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish Observations	Height (m) Right Bank Vegetation Type 2.5 Closed Tall Alder-Willow Shrub Estimated reach length (m): 3090 Total Electrofishing Time (VOB) Visual Observation, Boat Age: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 120 Max: 148 Mean: 137 Mean: 3 (38) Galage Galage Galage Galage Galage Galage	Height(m) 1.2 1.2 1.2 1.2 1.2
Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Alder-Willow Shrub 5-10 Closed Tall Alder-Willow Shrub 10-20 Closed Tall Alder-Willow Shrub 20-30 Closed Tall Alder-Willow Shrub 20-30 Closed Tall Alder-Willow Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 45 Fish Measured: 7 Sampling Method (No. of fish): BEF (7) VOF Comments: Event AA and BB Dolly Varden approximation	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Visual Observation, BoatMege: juvenile/adultLife History: UnknownFork Lengths (mm)Min: 120Max: 148Mean: 137Mage: juvenile/adultLife History: Resident	Height(m) 1.2 1.2 1.2 1.2 2 (s): 1286
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder-Willow Shrub5 - 10Closed Tall Alder-Willow Shrub10 - 20Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow Shrub20 - 30Closed Tall Alder-Willow ShrubKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:45Fish Measured:7Sampling Method (No. of fish):BEF (7) VOEComments:Event AA and BB Dolly Varden apSpecies:Dolly VardenLife StaTotal Fish Count:3Fish Measured:3Sampling Method (No. of fish):BEF (3)	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Visual Observation, BoatMeret History: UnknownFork Lengths (mm) Min: 120 Max: 148 Mean: 137 Mea	Height(m) 1.2 1.2 1.2 1.2 (s): 1286 edian: 134
Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Alder-Willow Shrub 5-10 Closed Tall Alder-Willow Shrub 10-20 Closed Tall Alder-Willow Shrub 20-30 Closed Tall Alder-Willow Shrub Key To Fish Sampling Methods (BEF) (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life Sta Total Fish Count: 45 Fish Measured: 7 Sampling Method (No. of fish): BEF (7) VOE Comments: Event AA and BB Dolly Varden ap Species: Dolly Varden Life Sta Total Fish Count: 3 Fish Measured: 3 Sampling Method (No. of fish): BEF (3) Comments:	Height (m)Right Bank Vegetation Type2.5Closed Tall Alder-Willow Shrub2.5Closed Tall Alder-Willow Shrub2.5Visual Observation, BoatMeret History: UnknownFork Lengths (mm) Min: 120 Max: 148 Mean: 137 Mea	Height(m) 1.2 1.2 1.2 1.2 (s): 1286 edian: 134
Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Alder-Willow Shrub 5-10 Closed Tall Alder-Willow Shrub 10-20 Closed Tall Alder-Willow Shrub 20-30 Closed Tall Alder-Willow Shrub Key To Fish Sampling Methods (BEF) (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life Sta Total Fish Count: 45 Total Fish Count: 45 Fish Measured: 7 Sampling Method (No. of fish): BEF (7) VOE Comments: Event AA and BB Dolly Varden ap Species: Dolly Varden Life Sta Total Fish Count: 3 Fish Measured: 3 Sampling Method (No. of fish): BEF (3) Comments: Instruments	Height (m) Right Bank Vegetation Type 2.5 Closed Tall Alder-Willow Shrub Estimated reach length (m): 3090 Total Electrofishing Time (VOB) Visual Observation, Boat Mean: 137 Mean: 137 Mean: 137 Mean: 138 Mean: 137 Mean: 138 Mean: 137 Mean: 137 Mean: 137 Mean: 138 Mean: 138 Mean: 137 Mean: 158 Mean: 137 Mean: 158 Mean: 137 Mean: 158 Me	Height(m) 1.2 1.2 1.2 1.2 (s): 1286 edian: 134
Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Alder-Willow Shrub 5-10 Closed Tall Alder-Willow Shrub 10-20 Closed Tall Alder-Willow Shrub 20-30 Closed Tall Alder-Willow Shrub Key To Fish Sampling Methods (BEF) (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life Stat Total Fish Count: 45 Fish Measured: 7 Sampling Method (No. of fish): BEF (7) VOE Comments: Event AA and BB Dolly Varden ap Species: Dolly Varden Life Stat Total Fish Count: 3 Fish Measured: 3 Sampling Method (No. of fish): BEF (3) Comments: Instruments Stream Gradient: handheld abney level	Height (m) Right Bank Vegetation Type 2.5 Closed Tall Alder-Willow Shrub Estimated reach length (m): 3090 Total Electrofishing Time (VOB) visual Observation, Boat (VOB) Prok Lengths (mm) Min: 120 Max: 148 Mean: 137 Mean: 3(38) oproximately 60-100 mm. Eife History: Resident Fork Lengths (mm) Min: 112 Max: 191 Mean: 158 Mean: 158 Montheau Life History: Resident Fork Lengths (mm) Min: 112 Max: 191 Mean: 158 Mean: 158	Height(m) 1.2 1.2 1.2 1.2 (s): 1286 edian: 134
Bank (m)Left Bank Vegetation Type0-5Closed Tall Alder-Willow Shrub5-10Closed Tall Alder-Willow Shrub10-20Closed Tall Alder-Willow Shrub20-30Closed Tall Alder-Willow Shrub20-30Closed Tall Alder-Willow ShrubKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count:45Fish Measured:7Sampling Method (No. of fish):BEF (7) VOEComments:Event AA and BB Dolly Varden apSpecies: Dolly VardenLife StateTotal Fish Count:3Fish Measured:3Sampling Method (No. of fish):BEF (3)Comments:InstrumentsStream Gradient:handheld abney levelStream Velocity:GPS Float	Height (m) Right Bank Vegetation Type 2.5 Closed Tall Alder-Willow Shrub Estimated reach length (m): 3090 Total Electrofishing Time (VOB) Visual Observation, Boat Mean: 137 Mean: 137 Mean: 137 Mean: 138 Mean: 138 Mean: 137 Mean: 138 Mean: 137 Mean: 138 Mean: 138 Mean: 137 Mean: 138	Height(m) 1.2 1.2 1.2 1.2 (s): 1286 edian: 134

957

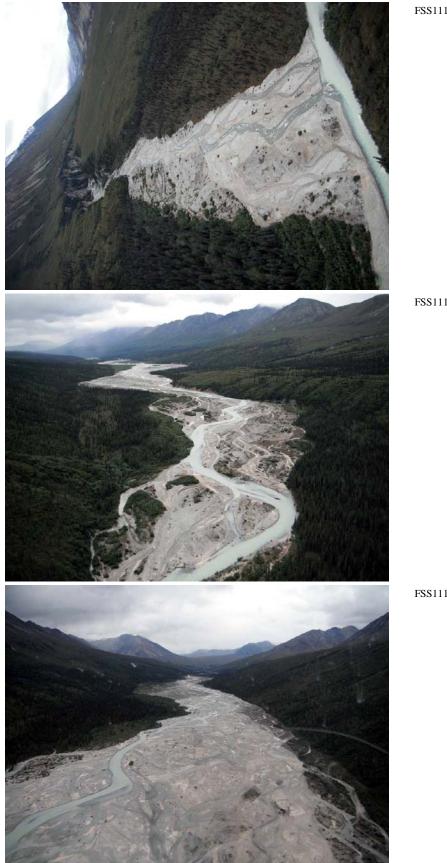


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Observer Les Dustrus	ltan Ioo Ciofan			Data/Tima	09/14/2011 4.19 DM
Observers: Joe Buckwa	inter, joe Gieler	Somula	Latitude		: 08/14/2011 4:18 PM
		Sample Coordinate		Longitude -148.63006	
Elevation NED (m)(ft): Coordinate Determination USGS Quadrangle: Talk Watarbady Nome:	on Method: Nor			Datum: WGS8): S028N004E36	4
Waterbody Name: Anadromous Waters Ca	talog Number•				
Geographic Comments:	Impassible water	fall downstream of targe		-	nally marked in GPS as
Visit Comments: Fly-by	and photo only.				
Wildlife Comments:					
Water Quality \ Strea	am Flow				
Water Temp (C): Water Color:	DO (mg/L): Tur	DO (%): rbidity (NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km)		ntrenchment: nbeddedness:			
Channel Dimensions (m		OHW Wetted	Dominant Sub	ostrate:	
Channel Dimensions (m	Dalikiuli				
	Width		dominant Subs		
Thalweg	Width		dominant Subs dominant Subs		
Thalweg Rosgen Class:	Width Depth	Sub	dominant Subs		
Thalweg Rosgen Class:	Width Depth	Sub	dominant Subs		
Thalweg Rosgen Class: Riparian Vegetation Dist. from	Width Depth	Sub (Viereck et al. 1992 Canopy	dominant Subst		Canopy Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from	Width Depth Communities	Sub (Viereck et al. 1992 Canopy	dominant Subst	trate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5 5 - 10	Width Depth Communities	Sub (Viereck et al. 1992 Canopy	dominant Subst	trate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5	Width Depth Communities	Sub (Viereck et al. 1992 Canopy	dominant Subst	trate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width Depth Communities egetation Type	Sub (Viereck et al. 1992 Canopy	dominant Subst	trate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width Depth Communities egetation Type	Sub (Viereck et al. 1992 Canopy	dominant Subst	trate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Va</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Width Depth Communities egetation Type	Sub (Viereck et al. 1992 Canopy	dominant Subst	trate 2:	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Va 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None	Width Depth Communities egetation Type og Methods	Sub (Viereck et al. 1992 Canopy Height(m) ife Stage: not applicable d: Fork Lengths (m)	dominant Subst	trate 2: Vegetation Type	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Va 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effe Total Fish Count: 0 Sampling Method (No. 6 Comments:	Width Depth Communities egetation Type og Methods	Sub (Viereck et al. 1992 Canopy Height(m) ife Stage: not applicable d: Fork Lengths (m)	dominant Subst	trate 2: Vegetation Type	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank Va 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effe Total Fish Count: 0 Sampling Method (No. 6 Comments:	Width Depth Communities egetation Type og Methods	Sub (Viereck et al. 1992 Canopy Height(m) ife Stage: not applicable d: Fork Lengths (m))	dominant Subst	trate 2: Vegetation Type	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effe Total Fish Count: 0 Sampling Method (No. 4 Comments: Instruments	Width Depth Communities egetation Type og Methods	Sub (Viereck et al. 1992 Canopy Height(m) (fe Stage: not applicable d: Fork Lengths (m)) Chan	dominant Subst	trate 2: Vegetation Type	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. 6 Comments: Instruments Stream Gradient:	Width Depth Communities egetation Type og Methods	Sub (Viereck et al. 1992 Canopy Height(m) (fe Stage: not applicable d: Fork Lengths (m)) Chan Chan	dominant Subst	trate 2: Vegetation Type	Height(m)

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Station Info Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/14/2011 9:11 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.63762 -148.02504 Coordinates -148.02504 62.63762 62.67307 -148.00257 Elevation NED (m)(ft): 831 2726 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-3 Legal Description (MTRS): S029N008E06 Waterbody Name: Kosina Creek **Anadromous Waters Catalog Number:** Geographic Comments: IU15 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow **Water Temp (C):** 8.22 DO (mg/L): 11.23 DO (%): 95.30 Conductivity (µS/cm): 44 **pH:** 6.46 Water Color: Clear Turbidity (NTU): 10.10 Thalweg Velocity (m/s)(ft/s): 2.28 7.48 **Stream Channel** Stream Gradient (%): 0.3 Moderatley Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 486 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble **Width** 38.0 29.0 Subdominant Substrate 1: Gravel Thalweg Depth 2.60 1.80 Subdominant Substrate 2: Boulder Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Closed Low Willow Shrub 0.3 Closed Low Willow Shrub 0.8 0.3 5 - 10 Closed Low Willow Shrub Closed Low Willow Shrub 0.8 10 - 20 Closed Low Willow Shrub 0.3 Closed Low Willow Shrub 0.8 20 - 30 Closed Tall Willow Shrub 1.5 Closed Low Willow Shrub 0.8 **Key To Fish Sampling Methods** Estimated reach length (m): 5400 Total Electrofishing Time (s): 2730 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Fish Measured: 3 Fork Lengths (mm) Min: 55 Max: 65 Median: 60 Total Fish Count: 16 Mean: 60 Sampling Method (No. of fish): BEF (3) VOB (13) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 4 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (4) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 295 Max: 295 Median: 295 Total Fish Count: 14 Fish Measured: 1 Mean: 295 Sampling Method (No. of fish): BEF (1) VOB (13) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 385 Max: 385 Mean: 385 Median: 385 Sampling Method (No. of fish): BEF (1)

Comments:

Appendix L121.–Page 2 of 4.

Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 85 Max: 85 Total Fish Count: 1 Fish Measured: 1 **Mean:** 85 Median: 85 Sampling Method (No. of fish): BEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 35 Max: 35 **Mean:** 35 Median: 35 Sampling Method (No. of fish): BEF (1) **Comments:** Instruments

Stream Gradient: handheld abney level Stream Velocity: GPS Float Turbidity: LaMotte 2020e turbidimeter Water Quality: YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape **Electrofisher:** Smith-Root GPP 2.5 **Transparency:**



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FSS1112B010378.jpg



Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/14/2011 8:59 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63.42035 -147.33152 Coordinates -147.33146 63.42189 63.42035 -147.33152 Elevation NED (m)(ft): 1054 3458 Datum: WGS84 Coordinate Determination Method: Non-Differential GPS Field Measurement USGS Ouadrangle: Healy B-1 Legal Description (MTRS): F017S002E22 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: HU33 Glacier within site of transect. Unnamed tributary of the Susitna River. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.55 DO (mg/L): 10.25 DO (%): 79.30 Conductivity (µS/cm): 117 **pH:** 5.06 Water Color: Clear Turbidity (NTU): 2.00 Thalweg Velocity (m/s)(ft/s): 0.96 3.15 **Stream Channel** Stream Gradient (%): 0.25 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km): Embeddedness:** 51 **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel Width 35.7 13.9 Subdominant Substrate 1: Cobble Thalweg Depth 1.03 0.60 Subdominant Substrate 2: Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 1 Closed Low Willow Shrub Unvegetated 0.1 5 - 10 Closed Low Willow Shrub 1 Alpine Herbs 10 - 20 Closed Low Willow Shrub 1 Alpine Herbs 0.1 20 - 30 Closed Low Willow Shrub 1 Open Low Willow Shrub 1.2 **Kev To Fish Sampling Methods** Estimated reach length (m): 195 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 2 Fork Lengths (mm) Min: 84 Max: 156 Median: 120 **Total Fish Count:** 3 Mean: 120 Sampling Method (No. of fish): PEF (2) VOG (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 49 **Total Fish Count:** 1 Fish Measured: 1 Max: 49 **Mean:** 49 Median: 49 Sampling Method (No. of fish): PEF (1) **Comments: Species:** Arctic grayling Life Stage: adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 330 Max: 335 **Total Fish Count:** 2 Mean: 332 Median: 332 Sampling Method (No. of fish): PEF (2) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 8 Fish Measured: 2 Fork Lengths (mm) Min: 275 Max: 280 Mean: 277 Median: 277 Sampling Method (No. of fish): PEF (2) VOG (6) **Comments:**

Appendix L122.–Page 2 of 4.

Species: Arctic grayling Life Stage: juvenile Life History: Resident Max: 37 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 37 **Mean:** 37 Median: 37 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life History: Resident Life Stage: adult **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 91 Max: 101 **Mean:** 96 Median: 96 Sampling Method (No. of fish): PEF (2) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: **Total Fish Count:** 2 Fork Lengths (mm) Min: Max: Fish Measured: Mean: Sampling Method (No. of fish): VOG (2) **Comments:** Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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Station Info					
Observers: Raye Ann Neustel, Daniel Reed			Date/Ti	me: 08/14/20	011 9:14 AM
0	Sample Coordinates	Latitude 63.33120	Longitude -146.70943	Latitude / 63.32985	0
Coordinate Determination Method: Non-Differential USGS Quadrangle: Mt Hayes B-6 Waterbody Name: West Fork McLaren River Anadromous Waters Catalog Number: Geographic Comments: HU3	GPS Field Me Legal Descrip		Datum: W0 : F018S005E		
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 4.20DO (mg/L): 11.49DO (Water Color: Glacial, High TurbiditTurbidity (NTU)		Conductivity Thalweg Velo	-	-	70
Stream Channel					
Stream Gradient (%): 0.5Entrenchment:Catchment Area(sq. km): 50Embeddedness:		trenched			
Channel Dimensions (m): Bankfull OHW Wet	tted D	ominant Sub	strate: Cobbl	e	
Width 14.7 10 Thalweg Depth 1.17 0.5		ninant Subst ninant Subst		er	
Rosgen Class: C3 Low gradient, meandering, point-bar,	riffle/pool, all	uvial channel	s with broad,	well-defined f	loodplains.
Riparian Vegetation Communities (Viereck e	et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Ty	pe	Canopy Height(m)
0-5 Unvegetated	1	Unvegetated			
5-10 Unvegetated	1	Unvegetated			
5 - 10 Unvegetated10 - 20 Unvegetated		Unvegetated Closed Tall W	ïllow Shrub		3
-	(-			3 4
10 - 20Unvegetated20 - 30Unvegetated	(Closed Tall W Closed Tall W	illow Shrub		
10 - 20Unvegetated20 - 30Unvegetated	((mated reach lo	Closed Tall W Closed Tall W	fillow Shrub	nd	
10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods Estin (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Life Stage: adu	(mated reach le (VOG)	Closed Tall W Closed Tall W ength (m): 20 Visual Obser Life His	fillow Shrub 5 rvation, Groun tory: Residen		
10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods Estime (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Life Stage: adu Total Fish Count: 2 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) VOG (1)	(mated reach lo (VOG) lt	Closed Tall W Closed Tall W ength (m): 20 Visual Obser Life His	fillow Shrub 5 rvation, Groun tory: Residen	nt	4
10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods Estime (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Life Stage: adu Total Fish Count: 2 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) VOG (1) Comments:	(mated reach lo (VOG) lt Lengths (mm)	Closed Tall W Closed Tall W ength (m): 20 Visual Obser Life His	fillow Shrub 5 rvation, Groun tory: Residen Max: 83	nt Mean: 83	4
10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods Estin (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Life Stage: adu Total Fish Count: 2 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) VOG (1) Comments: Instruments	(mated reach lo (VOG) lt Lengths (mm) Channel	Closed Tall W Closed Tall W ength (m): 20: Visual Obser Life His Min: 83	fillow Shrub 5 rvation, Groun tory: Residen Max: 83	nt Mean: 83	4
10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods Estimetics (PEF) Backpack Electrofisher Fish Observations Species: slimy sculpin Life Stage: adu Total Fish Count: 2 Fish Measured: 1 Fork I Sampling Method (No. of fish): PEF (1) VOG (1) Comments: Instruments Stream Gradient: handheld abney level	(mated reach lo (VOG) lt Lengths (mm) Channel	Closed Tall W Closed Tall W ength (m): 20: Visual Obser Life His Min: 83 Depths: gra Widths: me	fillow Shrub 5 rvation, Groun tory: Residen Max: 83	nt Mean: 83 g rod	4



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Appendix L124.–Station 1551112C05.			
Station Info			
Observers: Raye Ann Neustel, Daniel Reed		Date/Time: 08/1	4/2011 11:06 AM
Station Latitude Longitude Coordinates 62.94925 -146.54038	Sample Coordinates	Latitude Longitude / Latit 62.94959 -146.53900 / 62.94	
Elevation NED (m)(ft): 839 2753			
Coordinate Determination Method: Non-Differ			
USGS Quadrangle: Gulkana D-6 Waterbody Name: Maclaren River Anadromous Waters Catalog Number: Geographic Comments: IU34	Legal Descrip	otion (MTRS): C014N007W34	
Visit Comments: Large braided river. Sampled 1	l braid and side-chan	nel habitat.	
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 7.26DO (mg/L): 10.86Water Color: Glacial, High TurbiditTurbidity	DO (%): 90.00 (NTU): 51.50	Conductivity (µS/cm): 98 pH Thalweg Velocity (m/s)(ft/s): 1.05	: 7.74 3.44
Stream Channel			
Stream Gradient (%): 0.2EntrenchCatchment Area(sq. km): 969Embedde		trenched	
Channel Dimensions (m): Bankfull OHW		Oominant Substrate: Gravel	
Width 93.6 Thalweg Depth 1.50		minant Substrate 1: Cobble minant Substrate 2: Silt/Clay	
Rosgen Class: D4 Braided channel with longitudi		-	banks.
Riparian Vegetation Communities (Vier			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5 Wet Sedge-Herb Meadow Tundra	-	Mesic Sedge-Grass Meadow Tundra	0.3
5-10 Wet Sedge-Herb Meadow Tundra	0.3	Mesic Sedge-Grass Meadow Tundra	0.3
10 - 20 Wet Sedge-Herb Meadow Tundra	0.3	Mesic Sedge-Grass Meadow Tundra	0.3
20 - 30 Wet Sedge-Herb Meadow Tundra	0.3	Closed Low Willow Shrub	2
Key To Fish Sampling Methods	Estimated reach le	ength (m): 215	
(PEF) Backpack Electrofisher	(VOG)	Visual Observation, Ground	
	e	Life History: Resident) Min: 174 Max: 174 Mean: 17	74 Median: 174
	-	Life History: Resident) Min: 220 Max: 220 Mean: 22	20 Median: 220
Species: Arctic graylingLife StagTotal Fish Count:15Fish Measured:5Sampling Method (No. of fish):PEF (5) VOG (Comments:	-	Life History: Resident) Min: 62 Max: 174 Mean: 1	18 Median: 118
Species: slimy sculpinLife StagTotal Fish Count:71Fish Measured:16Sampling Method (No. of fish):PEF (16) VOCComments:	-	Life History: Resident) Min: 52 Max: 63 Mean: 50	5 Median: 57

Appendix L124.–Page 2 of 4.

Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 73 **Total Fish Count: 5** Fish Measured: 5 Max: 75 **Mean:** 74 Median: 74 Sampling Method (No. of fish): PEF (5) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 17 Fish Measured: 17 Fork Lengths (mm) Min: 26 Max: 50 Mean: 41 Median: 38 Sampling Method (No. of fish): PEF (17) **Comments:** Instruments

Stream Gradient: handheld abney level Stream Velocity: transparent velocity head rod Turbidity: LaMotte 2020e turbidimeter Water Quality: YSI 556

Channel Depths: graduated wading rod **Channel Widths:** Electrofisher: Smith-Root LR-24 **Transparency:**



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Station Info				
Observers: Raye Ann Neustel, Daniel Reed			Date/Time: 08/14/2011 1	2:57 PM
Station Latitude Longitude Coordinates 62.86964 -146.93925	Sample Coordinates	Latitude 62.86964	- /	o ngitude 46.94139
Elevation NED (m)(ft): 738 2421				
Coordinate Determination Method: Non-Differ			Datum: WGS84	
USGS Quadrangle: Gulkana D-6	Legal Descrip	otion (MTRS): C013N009W33	
Waterbody Name: Anadromous Waters Catalog Number:				
Geographic Comments: HU149. Unnamed tribu	itary to the Maclaren	River		
Visit Comments:	itary to the Waelaren	Kivel.		
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 6.41DO (mg/L): 10.71Water Color: ClearTurbidity	DO (%): 86.90 (NTU): 1.77		y (μS/cm): 71 pH: 7.22 ocity (m/s)(ft/s): 1.00 3.28	
Stream Channel				
Stream Gradient (%): 0.25EntrenchCatchment Area(sq. km): 54Embedde	0,	trenched		
Channel Dimensions (m): Bankfull OHW	Wetted D	ominant Sul	ostrate: Gravel	
Width 5.8	5.5 Subdor	minant Subs	trate 1: Cobble	
Thalweg Depth 0.51	0.31 Subdor	minant Subs	trate 2:	
Rosgen Class: E4 Low gradient, meandering riffle efficient and stable. High meander	-	w width/dept	h ratio and little deposition. Ver	у
Riparian Vegetation Communities (Vier	reck et al. 1992)			
Dist. from	Canopy		Vegetation Type]	Canopy Height(m

Bank (m)	Left Bank Vegetation Type	Height(m)	Right Bank Vegetation Type	Height(m)
0 - 5	Open White Spruce Forest	16	Open White Spruce Forest	18
5 - 10	Open White Spruce Forest	16	Open White Spruce Forest	18
10 - 20	Open White Spruce Forest	16	Open White Spruce Forest	18
20 - 30	Open White Spruce Forest	16	Open White Spruce Forest	18

Key To Fish Sampling Methods

Estimated reach length (m): 270

(PEF) Backpack Electrofisher

Fish Observations

Species: Arctic grayling	Life Sta	age: juvenile	Life H	istory: Resid	lent	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 112	Max: 118	Mean: 115	Median: 115
Sampling Method (No. o	f fish): PEF (2)					
Comments:						
Species: slimy sculpin	Life Sta	age: adult	Life H	istory: Resid	lent	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 69	Max: 74	Mean: 71	Median: 71
Sampling Method (No. o	f fish): PEF (4)					
Comments:						
Species: slimy sculpin	Life Sta	nge: juvenile/adult	Life H	istory: Resid	lent	
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 61	Max: 68	Mean: 63	Median: 64
Sampling Method (No. o	f fish): PEF (3)					
Comments:						
Species: slimy sculpin	Life Sta	nge: juvenile	Life H	istory: Resid	lent	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 39	Max: 50	Mean: 43	Median: 44
Sampling Method (No. o	f fish): PEF (4)					
Comments:						

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1112C040413.jpg

Station Info Observers: Raye Ann Neustel, Daniel Reed Date/Time: 08/14/2011 7:18 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 63,39439 -146,87052 Coordinates -146.86753 63.39560 63.39439 -146.87052 Elevation NED (m)(ft): 876 2874 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Mt Hayes B-6 Legal Description (MTRS): F017S005E31 Waterbody Name: East Fork Susitna River **Anadromous Waters Catalog Number:** Geographic Comments: HU1 Within site of Susitna glacier. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow **pH:** 7.19 **Water Temp (C): 2.75** DO (mg/L): 12.15 DO (%): 89.80 Conductivity (µS/cm): 43 Water Color: Glacial, High Turbidit Turbidity (NTU): 92.10 Thalweg Velocity (m/s)(ft/s): 1.40 4.59 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 79 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 38.0 35.0 Subdominant Substrate 1: Boulder Thalweg Depth 0.70 0.40 Subdominant Substrate 2: Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated		Closed Tall Willow Shrub	3.4
5 - 10	Open Low Willow Shrub	1.3	Closed Tall Willow Shrub	3.4
10 - 20	Open Low Willow Shrub	1.3	Closed Tall Willow Shrub	3.4
20 - 30	Open Low Willow Shrub	1.3	Closed Tall Willow Shrub	3.4

Estimated reach length (m): 290

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1112C050430.jpg

FSS1112C050431.jpg

FSS1112C050433.jpg



FSS1112C050434.jpg

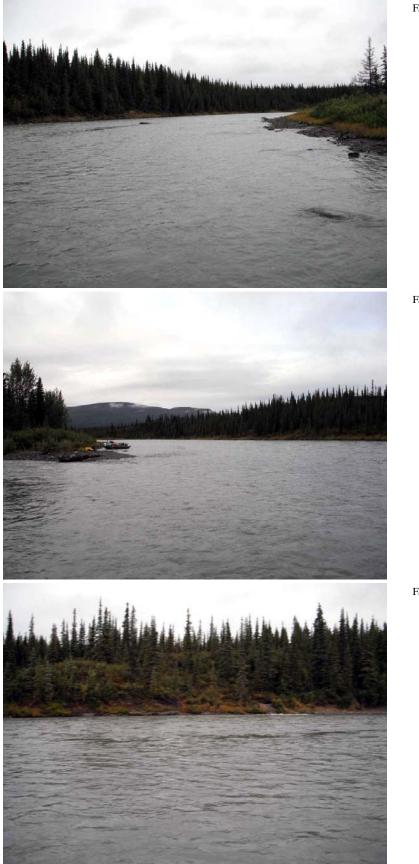
Station Info Observers: Joe Buckwalter, Joe Giefer Date/Time: 08/15/2011 9:52 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.88313 -146.95309 Coordinates -146.95309 62.88313 62.84805 -147.03869 Elevation NED (m)(ft): 734 2408 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Gulkana D-6 Legal Description (MTRS): C013N009W28 Waterbody Name: Maclaren River **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.46 DO (mg/L): 13.11 **DO (%):** 109.30 Conductivity (µS/cm): 101 **pH:** 7.25 Water Color: Glacial, High Turbidit Turbidity (NTU): 41.00 Thalweg Velocity (m/s)(ft/s): 1.67 5.48 **Stream Channel** Stream Gradient (%): 0.6 Slightly Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 1453 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble **Width** 62.0 55.0 Subdominant Substrate 1: Gravel Thalweg Depth 2.42 1.32 Subdominant Substrate 2: Silt/Clay Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 1 14 0 - 5Closed Low Willow Shrub Closed White Spruce Forest 13 5-10 Open Spruce-Balsam Poplar Closed White Spruce Forest 14 10 - 20 Open Spruce-Balsam Poplar 13 Closed White Spruce Forest 14 20 - 30 Open Spruce-Balsam Poplar 13 Closed White Spruce Forest 14 **Kev To Fish Sampling Methods** Estimated reach length (m): 7500 Total Electrofishing Time (s): 4753 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation. Boat **Fish Observations** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 51 Max: 68 Median: 59 Total Fish Count: 157 Fish Measured: 8 **Mean: 58** Sampling Method (No. of fish): BEF (16) VOB (141) **Comments:** Species: general fish observation, no s Life Stage: juvenile Life History: Resident **Total Fish Count:** 3 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (3) Comments: Event AA possibly longnose sucker. **Species:** Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 60 Fish Measured: 24 Fork Lengths (mm) Min: 216 Max: 312 Mean: 255 Median: 264 Sampling Method (No. of fish): BEF (30) VOB (30) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident Total Fish Count: 9 Fish Measured: 8 Fork Lengths (mm) Min: 205 Max: 314 Mean: 274 Median: 259 Sampling Method (No. of fish): BEF (8) VOB (1) **Comments:**

Appendix L127.-Page 2 of 4.

Life History: Resident Species: longnose sucker Life Stage: juvenile/adult Fish Measured: 16 Fork Lengths (mm) Min: 257 Max: 345 **Total Fish Count: 22** Mean: 296 Median: 301 Sampling Method (No. of fish): BEF (16) VOB (6) **Comments:** Species: salmonid-unspecified Life Stage: juvenile/adult Life History: Resident Total Fish Count: 20 Fish Measured: Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): VOB (20) Comments: Event BB possibly arctic grayling or round whitefish. Species: longnose sucker Life Stage: adult Life History: Resident **Total Fish Count:** 4 Fish Measured: 1 Fork Lengths (mm) Min: 380 Max: 380 **Median: 380** Mean: 380 Sampling Method (No. of fish): BEF (1) VOB (3) **Comments:** Life History: Resident **Species:** slimy sculpin Life Stage: juvenile Max: 50 Total Fish Count: 33 Fish Measured: 13 Fork Lengths (mm) Min: 33 **Mean:** 41 Median: 41 Sampling Method (No. of fish): BEF (13) VOB (20) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident **Total Fish Count:** 4 Fish Measured: 3 Fork Lengths (mm) Min: 110 Max: 139 Mean: 124 Median: 124 Sampling Method (No. of fish): BEF (3) VOB (1) **Comments:** Species: Arctic grayling Life Stage: adult Life History: Resident Median: **Total Fish Count:** 3 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): BEF (2) VOB (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 9 Fish Measured: 9 Fork Lengths (mm) Min: 92 Max: 189 **Median:** 140 **Mean:** 120 Sampling Method (No. of fish): BEF (9) **Comments:** Species: general fish observation, no s Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 17 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (17) **Comments:** Species: general fish observation, no s Life Stage: juvenile/adult Life History: Resident Median: **Total Fish Count:** 7 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (7) **Comments:** Species: humpback whitefish Life Stage: juvenile Life History: Unknown Median: 66 **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 66 Max: 66 Mean: 66 Sampling Method (No. of fish): BEF (1) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: adult **Total Fish Count:** 9 Fish Measured: 9 Fork Lengths (mm) Min: 69 Max: 86 Median: 77 **Mean:** 76 Sampling Method (No. of fish): BEF (9) **Comments:**

Instruments

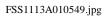
Channel Depths: handheld sonar depth finder
Channel Widths: handheld laser rangefinder
Electrofisher: Smith-Root GPP 2.5
Fransparency:
E



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FSS1113A010547.jpg

FSS1113A010548.jpg





FSS1113A010550.jpg



FSS1113A010551.jpg



Station Info Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/15/2011 9:11 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.65724 -147.03872 Coordinates -147.03872 62.65724 62.66999 -147.10063 Elevation NED (m)(ft): 708 2323 Datum: WGS84 Coordinate Determination Method: Non-Differential GPS Field Measurement USGS Quadrangle: Talkeetna Mts C-1 Legal Description (MTRS): C010N010W11 Waterbody Name: Tyone River **Anadromous Waters Catalog Number:** Geographic Comments: IU12 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 9.84 DO (mg/L): 10.90 DO (%): 96.30 Conductivity (µS/cm): 256 pH: 7.68 Water Color: Humic Turbidity (NTU): 6.46 Thalweg Velocity (m/s)(ft/s): 1.28 4.20 **Stream Channel** Stream Gradient (%): 0.3 Slightly Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 2315 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel Width 50.0 26.5 Subdominant Substrate 1: Silt/Clay Thalweg Depth 1.80 0.98 Subdominant Substrate 2: Cobble Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 4 0 - 5Closed Black Spruce-White Spruce Forest 22 Closed Tall Alder-Willow Shrub 22 20 5 - 10 Closed Black Spruce-White Spruce Forest Closed Black Spruce-White Spruce Forest 22 10 - 20 Closed Black Spruce-White Spruce Forest Closed Black Spruce-White Spruce Forest 20 20 - 30 Closed Black Spruce-White Spruce Forest 22 Closed Black Spruce-White Spruce Forest 20 **Kev To Fish Sampling Methods** Estimated reach length (m): 7700 Total Electrofishing Time (s): 4500 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation. Boat **Fish Observations** Species: longnose sucker Life Stage: juvenile/adult Life History: Resident Total Fish Count: 236 Fish Measured: 4 Fork Lengths (mm) Min: 290 Max: 345 Median: 317 Mean: 325 Sampling Method (No. of fish): BEF (4) VOB (232) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 203 Fish Measured: 11 Fork Lengths (mm) Min: 55 Max: 68 Mean: 60 Median: 61 Sampling Method (No. of fish): BEF (11) VOB (192) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident Median: 107 **Total Fish Count: 44** Fish Measured: 7 Fork Lengths (mm) Min: 64 Max: 150 **Mean: 82** Sampling Method (No. of fish): BEF (7) VOB (37) **Comments:** Species: burbot Life Stage: juvenile/adult Life History: Resident Median: Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (1) **Comments:**

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Species: round whitefish Life Stage: juvenile/adult Life History: Resident Total Fish Count: 7 Fork Lengths (mm) Min: Median: Fish Measured: Max: Mean: Sampling Method (No. of fish): VOB (7) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 11 Fish Measured: 3 Fork Lengths (mm) Min: 250 Max: 295 Mean: 273 **Median:** 272 Sampling Method (No. of fish): BEF (3) VOB (8) **Comments:** Life History: Resident Species: longnose sucker Life Stage: adult **Total Fish Count: 5** Fish Measured: 5 Fork Lengths (mm) Min: 349 Max: 410 Mean: 385 Median: 379 Sampling Method (No. of fish): BEF (5) **Comments: Species:** slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 45 Max: 45 **Mean:** 45 Median: 45 Sampling Method (No. of fish): BEF (1) **Comments:** Species: round whitefish Life Stage: juvenile Life History: Resident **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 177 Max: 177 Mean: 177 **Median:** 177 Sampling Method (No. of fish): BEF (1) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Median: 75 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 **Mean:** 75 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1113B010382.jpg

FSS1113B010383.jpg



Station Info Observers: Raye Ann Neustel, Bob Powers Date/Time: 08/16/2011 9:09 AM Station Latitude Longitude Sample Latitude Longitude Coordinates 61.47225 -152.79174 Coordinates 61.46988 -152.78895 Elevation NED (m)(ft): 793 2602 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek B-8 Legal Description (MTRS): S016N020W13 Waterbody Name: Skwentna River **Anadromous Waters Catalog Number:** Geographic Comments: HY132. This site is within site of glacial moraine. Clearwater stream just upstream of sample site. Site HY29 is upriver of this site and located on a glacier. Visit Comments: Small clearwater stream confluencing with Skwentna River in sample reach. No pictures taken at site. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.96 DO (mg/L): 11.21 DO (%): 88.60 Conductivity (µS/cm): 72 **pH:** 5.94 Water Color: Glacial, High Turbidit **Turbidity (NTU): 242.00** Thalweg Velocity (m/s)(ft/s): 1.33 4.36 **Stream Channel** Stream Gradient (%): 0.75 **Entrenchment:** Slightly Entrenched **Embeddedness:** Negligible **Catchment Area**(sq. km): 243 **Bankfull OHW** Wetted **Channel Dimensions (m):** Dominant Substrate: Cobble 14.2 Width 16.0 Subdominant Substrate 1: Gravel 0.40 Thalweg Depth 0.70 Subdominant Substrate 2: Sand Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Unvegetated Unvegetated 5 - 10 Unvegetated Unvegetated 10 - 20 Unvegetated Unvegetated 20-30 Unvegetated Unvegetated **Key To Fish Sampling Methods** Estimated reach length (m): 340 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 3 **Total Fish Count:** 3 Fork Lengths (mm) Min: 147 Max: 158 Mean: 152 Median: 152 Sampling Method (No. of fish): PEF (3) **Comments:** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident Total Fish Count: 12 Max: **Fish Measured:** Fork Lengths (mm) Min: Mean: Median: Sampling Method (No. of fish): VOG (12) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 5 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (5) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 19 Fish Measured: 19 Fork Lengths (mm) Min: 32 Max: 78 **Mean: 54** Median: 55 Sampling Method (No. of fish): PEF (19) **Comments:**

 Species: Arctic grayling
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 4
 Fish Measured: 4
 Fork Lengths (mm)
 Min: 38
 Max: 59
 Mean: 44
 Median: 48

 Sampling Method (No. of fish):
 PEF (4)
 Comments:
 Fish Measured: 4
 Fork Lengths (mm)
 Min: 38
 Max: 59
 Mean: 44
 Median: 48

Instruments

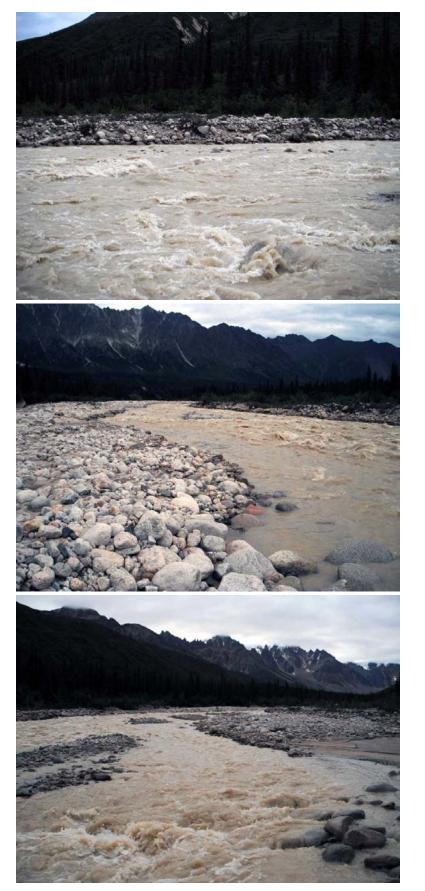
Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: Visual estimate
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:

Station Info					
Observers: Raye Ann Neustel, Bob Powers			Date/T	'ime: 08/16/20	011 10:59 AM
Station Latitude Longitude Coordinates 61.67820 -152.79501	Sample Coordinates	Latitude	Longitude	Latitude	0
Coordinates 61.67820 -152.79501 Elevation NED (m)(ft): 609 1998	Coordinates	61.67820	-152.79501	61.67951	-152.79761
Coordinate Determination Method: Non-Dif	fferential GPS Field Mea	asurement	Datum: W	GS84	
USGS Quadrangle: Tyonek C-8	Legal Descript	ion (MTRS): S018N019	W06	
Waterbody Name:					
Anadromous Waters Catalog Number: Geographic Comments: HY87. Short stream,	cample site located app	ovimataly 1	km hafara ar	ak baaamaa w	mustoon
	Unnamed tributary to the			ek becomes ve	ery steep,
Visit Comments: Channel widths were estimate	ed excessive depth.				
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 1.68 DO (mg/L): 13.05	DO (%): 93.40	Conductivit	y (μS/cm): 40) pH: 6.8	36
Water Color: Glacial, High Turbidit Turbidi	ty (NTU): 433.00 T	halweg Vel	ocity (m/s)(ft	/s): 1.85 6.07	
Stream Channel					
	chment: Slightly Entr dedness: Moderate	renched			
Channel Dimensions (m): Bankfull OHV		ominant Sul	ostrate: Cobb	le	
Width 52.0			trate 1: Bould		
Thalweg Depth 0.95	0.42 Subdom	ninant Subst	trate 2: Silt/C	Clay	
Rosgen Class: D3 Braided channel with longitu	idinal and transverse bar	s. Very wid	le channel wit	h eroding banl	KS .
Riparian Vegetation Communities (Vi	ereck et al. 1992)				
Riparian Vegetation Communities (Vi Dist. from	ereck et al. 1992) Canopy				Canopy
	Canopy	ight Bank V	Vegetation Ty	vpe	Canopy
Dist. from	Canopy Height(m) <u>R</u>	t <mark>ight Bank V</mark> ireweed	Vegetation T	<u>vpe</u>	Canopy
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>R</u> F		Vegetation Ty	vpe	Canopy Height(m)
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated	Canopy Height(m) <u>R</u> F F	ireweed	Vegetation T	<u>vpe</u>	Canopy Height(m) 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated	Canopy Height(m) <u>R</u> F F F	ireweed ireweed	Vegetation Ty	<u>vpe</u>	Canopy Height(m) 0.4 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated	Canopy Height(m) <u>R</u> F F F	ireweed ireweed ireweed ireweed		<u>vpe</u>	Canopy Height(m) 0.4 0.4 0.4
Dist. from Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated	Canopy Height(m) R F F F F F F F	ireweed ireweed ireweed ireweed ngth (m): 30			Canopy Height(m) 0.4 0.4 0.4
Dist. from Eff Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher	Canopy Height(m) R F F F F F F F	ireweed ireweed ireweed ireweed ngth (m): 30	15		Canopy Height(m) 0.4 0.4 0.4
Dist. from Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden	Canopy Height(m) R F F F F Estimated reach len (VOG)	ireweed ireweed ireweed ngth (m): 30 Visual Obse Life His	95 ervation, Grou story: Reside	und	Canopy Height(m) 0.4 0.4 0.4 0.4 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 15 Fish Measured: 7 Sampling Method (No. of fish): PEF (7) VO	Canopy Height(m) R F F F F Estimated reach ler (VOG)	ireweed ireweed ireweed ngth (m): 30 Visual Obse Life His	95 ervation, Grou story: Reside	ınd	Canopy Height(m) 0.4 0.4 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 15 Fish Measured: 7	Canopy Height(m) R F F F F Estimated reach ler (VOG)	ireweed ireweed ireweed ngth (m): 30 Visual Obse Life His	95 ervation, Grou story: Reside	und	Canopy Height(m) 0.4 0.4 0.4 0.4 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 15 Fish Measured: 7 Sampling Method (No. of fish): PEF (7) VO	Canopy Height(m) R F F F F Estimated reach ler (VOG)	ireweed ireweed ireweed ngth (m): 30 Visual Obse Life His	95 ervation, Grou story: Reside	und	Canopy Height(m) 0.4 0.4 0.4 0.4 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 15 Fish Measured: 7 Sampling Method (No. of fish): PEF (7) VO Comments: Description	Canopy Height(m) R F F F F Estimated reach len (VOG) age: juvenile/adult Fork Lengths (mm) G (8)	ireweed ireweed ireweed ngth (m): 30 Visual Obse Life His Min: 104	95 ervation, Grou story: Reside	ent Mean: 140	Canopy Height(m) 0.4 0.4 0.4 0.4 0.4
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 15 Fish Measured: 7 Sampling Method (No. of fish): PEF (7) VO Comments:	Canopy Height(m) R F F F Estimated reach ler (VOG) age: juvenile/adult Fork Lengths (mm) G (8)	ireweed ireweed ireweed ngth (m): 30 Visual Obse Life His Min: 104	95 ervation, Grou story: Reside Max: 182	ent Mean: 140	Canopy Height(m 0.4 0.4 0.4 0.4

Turbidity: LaMotte 2020e turbidimeter

Water Quality: YSI 556

Channel Widths: Visual estimate Electrofisher: Smith-Root LR-24 Transparency:



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FSS1113C020450.jpg

FSS1113C020451.jpg

FSS1113C020452.jpg



FSS1113C020453.jpg

Turbidity: LaMotte 2020e turbidimeter

Water Quality: YSI 556

Station Info				
Observers: Raye Ann Neustel, Bob Powers			Date/Time: 08/16/2	2011 12:26 PM
StationLatitudeLongitudeCoordinates61.81662-152.71891	Sample Coordinates	Latitude 61.81557	Longitude / Latitud -152.71549 / 61.8166	0
Elevation NED (m)(ft): 435 1427				
Coordinate Determination Method: Non-Differ			Datum: WGS84	
USGS Quadrangle: Tyonek D-8 Waterbody Name: Black and Tan Creek	Legal Descrip	uon (MTKS)): S020N019W22	
Anadromous Waters Catalog Number:				
Geographic Comments: HY110				
Visit Comments: Thalweg too fast and deep to wa	de, channel widths e	estimated.		
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 1.95DO (mg/L): 13.91Water Color: Glacial, High TurbiditTurbidity (-	y (μS/cm): 81 pH: 7 ocity (m/s)(ft/s): 1.85 6.0	
Stream Channel				
Stream Gradient (%): 1 Entrenchi	nent: Slightly En	trenched		
Catchment Area(sq. km): 92 Embeddee				
Channel Dimensions (m): Bankfull OHW Width 29.0			strate: Cobble rate 1: Boulder	
Thalweg Depth 0.88			rate 1: Gravel	
Rosgen Class: D3 Braided channel with longitudir	hal and transverse ba	urs. Very wid	e channel with eroding bar	ıks.
Riparian Vegetation Communities (Viero	eck et al. 1992)			
Dist. from	Canopy			Canopy
Bank (m) Left Bank Vegetation Type		Right Bank V	egetation Type	Height(m)
0-5 Unvegetated	I	Mixed Herbs		0.1
5-10 Unvegetated	1	Mixed Herbs		0.1
10 - 20 Unvegetated	1	Mixed Herbs		0.1
20 - 30 Mixed Herbs	0.1	Mixed Herbs		0.1
Key To Fish Sampling Methods	Estimated reach le	ength (m): 26	6	
(PEF) Backpack Electrofisher	(VOG)	Visual Obse	rvation, Ground	
Fish Observations				
• • •	e: juvenile/adult Fork Lengths (mm)		story: Unknown Max: Mean:	Median:
Sampling Method (No. of fish): PEF (1)	e: juvenile F ork Lengths (mm)		story: Unknown Max: 68 Mean: 68	Median: 68
Comments:				
Instruments				
	Channel	Depths: gr	aduated wading rod	
Instruments			aduated wading rod	

-continued-1000

Transparency:

Electrofisher: Smith-Root LR-24



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FSS1113C030457.jpg



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FSS1113C030459.jpg

FSS1113C030460.jpg

~ -						
Station In	fo					
Observers:	Raye Ann N	leustel, Bob Powers			Date/Time: 08/16	/2011 2:09 PM
Station Coordinat	Latitude 61.86274	0	Sample Coordinates	Latitude 61.86228	Longitude / Latitu -152.73510 / 61.862	
	NED (m)(ft):					
	e Determination Idrangle: Tyou		fferential GPS Field M		Datum: WGS84): S021N019W34	
Waterbody		ICK D-0	Legal Desch		. 50211017W54	
		talog Number:				
Geographi	c Comments:				of Skwentna River on rive a barrier to fish passage.	er left. This
Visit Comr		imple site has a steep s	stream flowing off of t	he hillside app	roximately 1 km upriver : stream reaches hillside.	from the
Wildlife Co	omments:			-		
Water Qu	ality \ Strea	am Flow				
Water Ten	np (C): 4.82	DO (mg/L): 11.40	DO (%): 88.80	Conductivity	y (μS/cm): 83 pH:	5.42
Water Cole	or: Clear	Turbidi	ity (NTU): 1.90	Thalweg Vel	ocity (m/s)(ft/s): 0.52 1.	71
Stream Cl	hannel					
Stream Gr	adient (%): 0	0.5 Entrem	chment: Moderatle	y Entrenched		
Catchment	t Area(sq. km)	: 10 Embed	Idedness: Moderate			
Channel I	Dimensions (m				ostrate: Silt/Clay	
		Width 8.0 Depth 0.80			t rate 1: Gravel t rate 2: Boulder	
Rosgen Cla	_	-			nel, with infrequently spa	aced pools. Very
		and profile. Stable b				1 2
D · · · ·						
Riparian	Vegetation	Communities (Vi	iereck et al. 1992)			
- Dist. from	C	Communities (Vi	iereck et al. 1992) Canopy Height(m)		Vegetation Type	Canopy Height(m)
Dist. from	<u>Left Bank Ve</u>		Canopy		Vegetation Type	
Dist. from Bank (m)	Left Bank Ve Closed Spruce	egetation Type	Canopy Height(m)	<u>Right Bank V</u>	Vegetation Type	
Dist. from Bank (m) 0 - 5 5 - 10	Left Bank Ve Closed Spruce Closed Spruce	egetation Type e-Paper Birch Forest	Canopy Height(m) 21	Right Bank V Unvegetated	Vegetation Type	
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20	Left Bank Vo Closed Spruce Closed Spruce Closed Spruce	e <mark>getation Type</mark> e-Paper Birch Forest e-Paper Birch Forest	Canopy Height(m) 21 21	Right Bank V Unvegetated Unvegetated	Vegetation Type	
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	Left Bank Vo Closed Spruce Closed Spruce Closed Spruce	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest	Canopy Height(m) 21 21 21 21	Right Bank V Unvegetated Unvegetated Unvegetated Fireweed		Height(m)
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Left Bank Vo Closed Spruce Closed Spruce Closed Spruce Closed Spruce	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods	Canopy Height(m) 21 21 21 21 21 Estimated reach	Right Bank V Unvegetated Unvegetated Unvegetated Fireweed length (m): 25		Height(m)
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac	Left Bank Ve Closed Spruce Closed Spruce Closed Spruce Closed Spruce sh Samplin kpack Electrof	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods	Canopy Height(m) 21 21 21 21 21 Estimated reach	Right Bank V Unvegetated Unvegetated Unvegetated Fireweed length (m): 25	5	Height(m)
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac	Left Bank Vo Closed Spruce Closed Spruce Closed Spruce Closed Spruce sh Samplin kpack Electrof	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher	Canopy Height(m) 21 21 21 21 21 Estimated reach	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25	5	Height(m)
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish	Left Bank Ve Closed Spruce Closed Spruce Closed Spruce Sh Samplin kpack Electrof rvations olly Varden Count: 30	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher Life St Fish Measured: 10	Canopy Height(m) 21 21 21 21 21 Estimated reach (VOC	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25 O Visual Obse Life His	5 ervation, Ground	Height(m) 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments	Left Bank Vo Closed Spruce Closed Spruce Closed Spruce Sh Samplin kpack Electrof rvations olly Varden Count: 30 Method (No. o	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher Life St Fish Measured: 16 of fish): PEF (16) Ve	Canopy Height(m) 21 21 21 21 Estimated reach (VOG tage: juvenile/adult 5 Fork Lengths (mn OG (14)	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25 O Visual Obse Life His	5 ervation, Ground story: Unknown	Height(m) 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Da Total Fish Sampling Comment: Species: Ch Total Fish	Left Bank Ve Closed Spruce Closed Spruce Closed Spruce Sh Samplin kpack Electrof rvations olly Varden Count: 30 Method (No. os: ninook salmon Count: 1	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher Life St Fish Measured: 16 of fish): PEF (16) Ve	Canopy Height(m) 21 21 21 21 21 Estimated reach (VOC	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25 Wisual Obse Life His Min: 89	5 ervation, Ground story: Unknown	Height(m) 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Da Total Fish Sampling Comment: Species: Ch Total Fish	Left Bank Ve Closed Spruce Closed Spruce Closed Spruce Sh Samplin kpack Electroff rvations olly Varden Count: 30 Method (No. of Count: 1 Method (No. of	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher Life St Fish Measured: 16 of fish): PEF (16) Vo Life St Fish Measured: 1	Canopy Height(m) 21 21 21 21 Estimated reach (VOC tage: juvenile/adult 5 Fork Lengths (mm OG (14) tage: juvenile	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25 Wisual Obse Life His Min: 89	5 ervation, Ground story: Unknown Max: 203 Mean: 14 story: Anadromous	Height(m) 0.3
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comment: Species: Ch Total Fish Sampling Comment: Species: so	Left Bank Vo Closed Spruce Closed Spruce Closed Spruce Sh Samplin kpack Electrof rvations olly Varden Count: 30 Method (No. o s: ninook salmon Count: 1 Method (No. o s: ckeye salmon	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher Life St Fish Measured: 1 of fish): PEF (16) Vo Life St Fish Measured: 1 of fish): PEF (1)	Canopy Height(m) 21 21 21 21 Estimated reach (VOG tage: juvenile/adult 5 Fork Lengths (mm OG (14) tage: juvenile Fork Lengths (mm	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25 i) Visual Obse Life His n) Min: 89 Life His n) Min: 37	55 ervation, Ground story: Unknown Max: 203 Mean: 141 story: Anadromous Max: 37 Mean: 37 story: Anadromous	Height(m) 0.3 1 Median: 146 Median: 37
Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac Fish Obse Species: Do Total Fish Sampling Comments Species: Cf Total Fish Sampling Comments	Left Bank Ve Closed Spruce Closed Spruce Closed Spruce Sh Samplin kpack Electroff rvations olly Varden Count: 30 Method (No. 6 s: ninook salmon Count: 1 Method (No. 6 s: ckeye salmon Count: 5 Method (No. 6	egetation Type e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest e-Paper Birch Forest g Methods isher Life St Fish Measured: 1 of fish): PEF (16) Vo Life St Fish Measured: 1 of fish): PEF (1)	Canopy Height(m) 21 21 21 21 Estimated reach (VOC tage: juvenile/adult 5 Fork Lengths (mm OG (14) tage: juvenile Fork Lengths (mm	Right Bank V Unvegetated Unvegetated Fireweed length (m): 25 i) Visual Obse Life His n) Min: 89 Life His n) Min: 37	55 ervation, Ground story: Unknown Max: 203 Mean: 14 story: Anadromous Max: 37 Mean: 37	Height(m) 0.3

Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 9 Fish Measured: 1 Fork Lengths (mm) Min: 66 Max: 66 **Mean:** 66 Median: 66 Sampling Method (No. of fish): PEF (1) VOG (8) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 36 Max: 62 **Mean:** 47 Median: 49 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 35 **Total Fish Count:** 2 Max: 37 **Mean:** 36 Median: 36 Sampling Method (No. of fish): PEF (2) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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Station Info Observers: Raye Ann Neustel, Bob Powers Date/Time: 08/16/2011 3:18 PM Station Latitude Longitude Sample Latitude Longitude Coordinates 61,91636 -152,65358 Coordinates 61.91636 -152.65358 Elevation NED (m)(ft): 357 1171 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-8 Legal Description (MTRS): S021N018W18 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Unnamed tributary of Skwentna River. This small tributary parallels Skwentna main channel for approximately 1km and ending in a large pond at upstream end. Visit Comments: Visual observations and dipnet only--Did not electrofish due to presence of spawning sockeye salmon. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.45 DO (mg/L): 11.01 DO (%): 91.90 Conductivity (µS/cm): 48 pH: 6.98 Water Color: Clear Turbidity (NTU): 2.00 Thalweg Velocity (m/s)(ft/s): 0.66 2.16 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Moderatley Entrenched Catchment Area(sq. km): **Embeddedness:** 1286 Moderate Bankfull OHW **Channel Dimensions (m):** Wetted Dominant Substrate: Gravel Width 21.1 14.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.85 0.43 Subdominant Substrate 2: Silt/Clay Rosgen Class: B4 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Fireweed 0.3 Closed Tall Willow Shrub 8 8 5-10 Fireweed 0.3 Closed Tall Willow Shrub 5 8 10 - 20 Open Tall Willow Shrub Closed Tall Willow Shrub 8 Closed Tall Willow Shrub 20 - 30 Unvegetated **Key To Fish Sampling Methods** Estimated reach length (m): 319 (DIP) Dip Net (VOG) Visual Observation, Ground **Fish Observations** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count: 38** Fish Measured: 5 Fork Lengths (mm) Min: 35 Max: 39 Mean: 36 Median: 37 Sampling Method (No. of fish): DIP (5) VOG (33) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count: 24** Fish Measured: 4 Fork Lengths (mm) Min: 36 Max: 38 **Mean: 37** Median: 37 Sampling Method (No. of fish): DIP (4) VOG (20) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous Median: 34 Total Fish Count: 307 Fish Measured: 7 Fork Lengths (mm) Min: 33 Max: 36 **Mean: 33** Sampling Method (No. of fish): DIP (7) VOG (300) **Comments:**

 Species: sockeye salmon
 Life Stage: adult spawning
 Life History: Anadromous

 Total Fish Count:
 350
 Fish Measured:
 Fork Lengths (mm)
 Min:
 Max:
 Mean:
 Median:

 Sampling Method (No. of fish):
 VOG (350)
 Comments:
 VOG (350)
 VOG (350)
 VOG (350)

Instruments

Stream Gradient: handh	eld abney level	Channel Depths:	graduated wading rod
Stream Velocity: transp	arent velocity head rod	Channel Widths:	measuring tape
Turbidity: LaMotte 2020	e turbidimeter	Electrofisher:	
Water Quality: YSI 556		Transparency:	



-continued-1009

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Station In	fo							
Observers:	Raye Ann N	eustel, Bob Po	owers			Date/1	Fime: 08/16/2	011 4:11 PM
Station Coordinat	Latitude es 61.98745	Longitude -152.69463		Sample Coordinates	Latitude 61.98716	Longitude -152.69457	Latitude	0
	NED (m)(ft):		5.00					
	e Determination drangle: Tyor		Non-Different	ial GPS Field M	leasurement ption (MTRS	Datum: W		
-	Name: Porta			Legal Descri	puon (MTTKS): 3022N015	9 W 23	
-			: 247-41-102	00-2053-3205-4	120			
Geographi	c Comments:	HY57						
Visit Comn	correga	ited timber cor	struction for	ory mining cam large machinery nented under 13	to cross wetla			
Wildlife Co								
Water Qu	ality \ Strea	m Flow						
-	ър (C): 7.32	DO (mg/L):	10.95 D) (%): 90.08	Conductivit	у (µS/cm): 5	6 pH: 6.	99
Water Colo	-	-	Furbidity (N	. ,			t/s): 1.06 3.48	
Stream Cl	nannel							
	adient (%): 0	.5	Entrenchme	nt: Slightly E	ntrenched			
	Area(sq. km)		Embeddedne	0.				
						4.4.011	.1.	
Channel D)imensions (m): Bankful	I OHW V	Vetted 1	Dominant Sul	ostrate: Cobt	ble	
Channel D		Width 33.9		23.4 Subdo	ominant Subs	trate 1: Grav	el	
	Thalweg	Width 33.9 Depth 0.49		23.4 Subdo 0.33 Subdo	ominant Substominant Substominant Subst	trate 1: Grav trate 2: Sand	el	
	Thalweg	Width 33.9 Depth 0.49		23.4 Subdo	ominant Substominant Substominant Subst	trate 1: Grav trate 2: Sand	el	ks.
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Rosgen Cla Riparian V Dist. from	Thalweg ass: D3 Braide Vegetation Left Bank Ve	Width 33.9 Depth 0.49 d channel with Communiti	n longitudinal	23.4 Subde 0.33 Subde and transverse b k et al. 1992) Canopy Height(m)	ominant Substominant Substominant Substomerstein von Substanting von Substanti	trate 1: Grav trate 2: Sand le channel wi	el th eroding ban	Canopy Height(m)
Rosgen Cla Riparian V Dist. from	Thalweg ass: D3 Braide Vegetation	Width 33.9 Depth 0.49 d channel with Communiti	n longitudinal	23.4 Subde 0.33 Subde and transverse b k et al. 1992) Canopy	ominant Substominant Substominant Substom	trate 1: Grav trate 2: Sand le channel wi	el th eroding ban	Canopy
Rosgen Cla Riparian Dist. from Bank (m)	Thalweg ass: D3 Braide Vegetation Left Bank Ve	Width 33.9 Depth 0.49 d channel with Communiti Egetation Type Spruce Forest	n longitudinal	23.4 Subde 0.33 Subde and transverse b k et al. 1992) Canopy Height(m)	ominant Substorminant Substorminant Substorminant Substorminants of the second	trate 1: Grav trate 2: Sand le channel wi	el th eroding ban	Canopy Height(m)
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Rosgen Cla Riparian V Dist. from Bank (m) 0 - 5 5 - 10 10 - 20	Thalweg ass: D3 Braide Vegetation Left Bank Ve Open White S Open White S	Width 33.9 Depth 0.49 d channel with Communiti Spruce Forest Spruce Forest Spruce Forest	n longitudinal	23.4 Subde 0.33 Subde and transverse b k et al. 1992) Canopy Height(m) 35 35	ominant Substorminant Substormin	trate 1: Grav trate 2: Sand le channel wi <u>Vegetation T</u> illow Shrub	el th eroding ban	Canopy Height(m) 0.3 0.3
Rosgen Cla Riparian Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30	Thalweg ass: D3 Braide Vegetation Left Bank Ve Open White S Open White S Open White S	Width 33.9 Depth 0.49 d channel with Communiti Spruce Forest Spruce Forest Spruce Forest Spruce Forest	n longitudinal les (Vierecl	23.4 Subdo 0.33 Subdo and transverse b k et al. 1992) Canopy Height(m) 35 35 35	minant Subst pars. Very wick Right Bank V Unvegetated Fireweed Open Low W Open Low W	trate 1: Grav trate 2: Sand le channel wi <u>Vegetation T</u> illow Shrub	el th eroding ban	Canopy Height(m) 0.3 0.3 0.7
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Rosgen Cla Riparian V Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (PEF) Bac	Thalweg ass: D3 Braide Vegetation Den White S Open White S Open White S Open White S Sh Samplin kpack Electrof	Width 33.9 Depth 0.49 d channel with Communiti Spruce Forest Spruce Forest Spruce Forest Spruce Forest Spruce Forest Spruce Forest Spruce Forest	n longitudinal les (Vierecl	23.4 Subde 0.33 Subde and transverse b k et al. 1992) Canopy Height(m) 35 35 35 35 35 stimated reach	minant Subst minant Subst pars. Very wick Sars. Very wick Present State Unvegetated Fireweed Open Low W Open Low W Iength (m): 17	trate 1: Grav trate 2: Sand de channel wi <u>Vegetation T</u> ïllow Shrub ïllow Shrub	el th eroding ban	Canopy Height(m) 0.3 0.3 0.7
Rosgen Cla Riparian V Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back	Thalweg ass: D3 Braide Vegetation Open White S Open White S Open White S Open White S Sh Samplin kpack Electrof	Width 33.9 Depth 0.49 d channel with Communiti Spruce Forest Spruce Forest Spruce Forest Spruce Forest Spruce Forest Spruce Forest Spruce Forest	e longitudinal	23.4 Subde 0.33 Subde and transverse b k et al. 1992) Canopy Height(m) 35 35 35 35 stimated reach (VOG	minant Subst minant Subst pars. Very wick Right Bank V Unvegetated Fireweed Open Low W Open Low W Iength (m): 17	trate 1: Grav trate 2: Sand le channel wi <u>Vegetation T</u> illow Shrub illow Shrub 75 ervation, Grou	el th eroding ban <u>vpe</u> und	Canopy Height(m) 0.3 0.3 0.7
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Rosgen Cla Riparian V Dist. from Bank (m) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fis (PEF) Back Fish Obset Species: Do Total Fish Sampling 5 Comments Species: Ch Total Fish	Thalweg ass: D3 Braide Vegetation of Open White S Open White S Open White S Open White S Open White S Open White S Sh Samplin kpack Electrof rvations olly Varden Count: 10 Method (No. of Stational Count: 62 Method (No. of Stational Count: 62	Width 33.9 Depth 0.49 d channel with Communiti getation Type Spruce Forest Spruce Forest Spruce Forest g Methods isher Fish Measu of fish): PEF	e Life Stage: jured: 2 For (2) VOG (8) Life Stage: jured: 2 For (2) For (2) For	23.4 Subde 0.33 Subde and transverse to k et al. 1992) Canopy Height(m) 35 35 35 35 stimated reach (VOG uvenile/adult tk Lengths (mm a)	minant Subst pars. Very wid Argent Bank V Unvegetated Fireweed Open Low W Open Low W Open Low W Iength (m): 17 Over State (1) Visual Obsection Life Hin (n) Min: 112 Life Hin (n) Min: 33	trate 1: Grav trate 2: Sand le channel wi <u>Vegetation T</u> illow Shrub illow Shrub illow Shrub 75 ervation, Grou story: Unkn Max: 117 story: Anada	el th eroding ban YPE und own Mean: 114 romous Mean: 44	Canopy Height(m) 0.3 0.3 0.7 0.7 0.7

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1113C060492.jpg

Station Info Observers: Raye Ann Neustel, Bob Powers Date/Time: 08/16/2011 5:36 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.89986 -152.53145 Coordinates -152.53152 61.89682 61.89986 -152.53145 Elevation NED (m)(ft): 591 1939 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-7 Legal Description (MTRS): S021N018W23 Waterbody Name: Chickak Creek **Anadromous Waters Catalog Number:** Geographic Comments: HY47 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.15 DO (mg/L): 12.01 DO (%): 94.50 Conductivity (µS/cm): 184 pH: 7.49 Water Color: Glacial, High Turbidit Turbidity (NTU): 86.00 Thalweg Velocity (m/s)(ft/s): 1.74 5.71 **Stream Channel** Moderatley Entrenched Stream Gradient (%): 1 **Entrenchment:** Moderate **Catchment Area(sq. km):** 37 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 17.0 13.0 Subdominant Substrate 1: Boulder Thalweg Depth 1.10 0.80 Subdominant Substrate 2: Gravel Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) <u>Right Bank Vegetation Type</u> Height(m) Bank (m) Left Bank Vegetation Type 0.4 0 - 5 Unvegetated Open Low Willow Shrub 0.4 5-10 Unvegetated Open Low Willow Shrub 10-20 Unvegetated Open Low Willow Shrub 0.4 20-30 Unvegetated Open Low Willow Shrub 0.4 **Key To Fish Sampling Methods** Estimated reach length (m): 360 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 3 Fork Lengths (mm) Min: 128 Max: 165 **Total Fish Count:** 6 Mean: 151 **Median:** 146 Sampling Method (No. of fish): PEF (3) VOG (3) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Turbidity: LaMotte 2020e turbidimeter Water Quality: YSI 556 **Transparency:**

-continued-1015



-continued-1016



FSS1113C070500.jpg

Station Info

Observers: Raye Ann Neustel, Bob P	Sample		Longitude	08/16/2011 3:31 PM
Elevation NED (m)(ft): 323 1060 Coordinate Determination Method: USGS Quadrangle: Tyonek D-7 Waterbody Name: Skwentna River Anadromous Waters Catalog Number Geographic Comments: This waypoin Visit Comments: Wildlife Comments:	Legal D	eld Measurement escription (MTRS):		-by only).
Water Quality \ Stream Flow				
Water Temp (C): DO (mg/L): Water Color:	: DO (%): Turbidity (NTU):	Conductivity Thalweg Veloc	-	рН:
Stream Channel				
Width Thalweg Depth		Dominant Subs Subdominant Substr Subdominant Substr	ate 1:	
Rosgen Class:				
Riparian Vegetation Communit Dist. from Bank (m) <u>Left Bank Vegetation Typ</u> 0 - 5 5 - 10 10 - 20	Canoj		getation Type	Canopy Height(m
20 - 30				
$\mathbf{V}_{a} = \mathbf{T}_{a} \mathbf{F}_{a} \mathbf{F}_{a}$				
Key To Fish Sampling Methods (NON) None				
• • • •	Life Stage: not applicat ured: Fork Lengths		ory: Not Applicat Iax: Mean	
(NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Meas Sampling Method (No. of fish): NO	Life Stage: not applicat ured: Fork Lengths		• • • •	
(NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Meas Sampling Method (No. of fish): NO Comments:	Life Stage: not applicat ured: Fork Lengths N (0)		• • • •	
(NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Meas Sampling Method (No. of fish): NO Comments: Instruments	Life Stage: not applicat ured: Fork Lengths N (0) Ct	(mm) Min: M	• • • •	
(NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Meas Sampling Method (No. of fish): NO Comments: Instruments Stream Gradient:	Life Stage: not applicat ured: Fork Lengths N (0) Ct Ct	(mm) Min: Min: Min: Min: Min: Min: Min: Min:	• • • •	

FSS1113c080484.jpg



Station Info

Observers: Raye Ann N	Neustel, Bob Pow	vers				Date/Time	e: 08/16/2	2011 11:59 AM
			Sampl		Latitude	Longitude		
Elemetter NED ()(#).	527 1760		Coord	linates	61.80640	-152.74854		
Elevation NED (m)(ft): Coordinate Determinati		n-Diffe	rential GPS I	Field Me	asurement	Datum: WGS	84	
USGS Quadrangle: Tyc		JII-DIIICI): S020N019W2		
Waterbody Name: Eme			Legui	Descrip		. 50201(01) (12		
Anadromous Waters Ca								
Geographic Comments:	-	waypoi	nt, approxim	nately .5 l	km upstream	of confluence wi	ith Skwent	na River.
Visit Comments: There River.	is a waterfall on t	this targe	et stream (H	Y139), aj	pproximately	.5 km from conf	fluence wi	th Skwentna
Wildlife Comments:								
Water Quality \ Stre	am Flow							
Water Temp (C):	DO (mg/L):		DO (%):		Conductivity	у (µS/cm):	pH:	
Water Color:	-	rbidity				ocity (m/s)(ft/s):	-	
Stream Channel								
Stream Gradient (%):	F	ntrench	mont.					
Catchment Area(sq. km		mbedde						
Cutemient in cu(bq. ini	. 1	mocuue		Б	ominant Sub	atroto.		
Channel Dimensions (n	n). Bankfull	OHW	Wattad					
Channel Dimensions (n	·	OHW	Wetted					
	Width	OHW	Wetted	Subdor	ninant Subst	trate 1:		
Thalweg Rosgen Class:	Width 3 Depth			Subdon Subdon		trate 1:		
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Width 3 Depth		eck et al. Can	Subdon Subdon 1992)	ninant Subst	trate 1:		Canopy Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width 3 Depth Communities <u>Gegetation Type</u>		eck et al. Can	Subdon Subdon 1992)	ninant Subst	trate 1: trate 2:		1.0
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width 3 Depth Communities <u>Gegetation Type</u>		eck et al. Can	Subdon Subdon 1992)	ninant Subst	trate 1: trate 2:		1.0
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Width 3 Depth Communities <u>Gegetation Type</u>		eck et al. Can	Subdon Subdon 1992)	ninant Subst	trate 1: trate 2:		Canopy Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Width 3 Depth Communities <u>Gegetation Type</u>		eck et al. Can	Subdon Subdon 1992)	ninant Subst	trate 1: trate 2:		1.0
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None	Width 3 Depth Communities Gegetation Type ng Methods	s (Vier	eck et al. Can	Subdon Subdon 1992) hopy ht(m) <u>F</u>	ninant Subst ninant Subst Right Bank V	trate 1: trate 2: <u>Vegetation Type</u> story: Not Appl		1.0
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments:	Width 3 Depth Communities Gegetation Type ng Methods	s (Vier	e: not applic	Subdon Subdon 1992) hopy ht(m) <u>F</u>	ninant Subst ninant Subst Right Bank V	trate 1: trate 2: <u>Vegetation Type</u> story: Not Appl	icable	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments:	Width 3 Depth Communities Gegetation Type ng Methods	s (Vier	e: not applic	Subdon Subdon 1992) hopy ht(m) <u>F</u>	ninant Subst ninant Subst Right Bank M Life His Min:	trate 1: trate 2: <u>Vegetation Type</u> story: Not Appl	icable	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments Stream Gradient:	Width 3 Depth Communities Gegetation Type ng Methods	s (Vier	e: not applic	Subdon Subdon 1992) hopy ht(m) <u>F</u> cable hs (mm)	ninant Subst ninant Subst Right Bank M Life His Min:	trate 1: trate 2: <u>Vegetation Type</u> story: Not Appl	icable	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments	Width 3 Depth Communities Gegetation Type ng Methods	s (Vier	e: not applic Fork Lengt	Subdon Subdon 1992) hopy ht(m) <u>F</u> cable hs (mm)	ninant Subst ninant Subst Right Bank V Life His Min: Depths: Widths:	trate 1: trate 2: <u>Vegetation Type</u> story: Not Appl	icable	Height(m)

Station In Observers	0						
Observers	lfo						
	: Joe Buckwalter, Joe G	iefer			Date/Ti	ime: 08/16/20)11 11:19 AM
Station Coordina	8		Sample Coordinates	Latitude 62.59899	Longitude -149.06262	/ Latitude 62.57173	Longitude -149.15877
	NED (m)(ft): 441 1447					~ ~~	
	e Determination Method adrangle: Talkeetna Mts		d GPS Field Me Legal Descrip		Datum: W		
-	y Name: Talkeetna River		Legal Descrip		. 5029110021	615	
	ous Waters Catalog Num		0-2370				
	ic Comments: At Prairie						
Visit Com		ng right bank startin rairie Creek mouth, m of Prairie Creek	but water quali				
Wildlife C	omments:						
Water Qu	ality \ Stream Flow						
	• • • • •	· ·	(%): 111.80	Conductivity	γ (μS/cm): 95	pH: 7.4	13
Water Col	or: Glacial, High Turbidi	t Turbidity (NT	U): 32.00	Thalweg Velo	ocity (m/s)(ft/	(s): 2.10 6.89	
Stream C	hannel						
	radient (%): 1.5 t Area(sq. km): 1826	Entrenchment Embeddednes	0.	trenched			
	-	kfull OHW W		ominant Sub	strate: Cobbl	e	
	Width 52			minant Subst		1	
	Thalweg Depth 1.			minant Subst			
Rosgen Cl	ass: C3 Low gradient, me	eandering, point-ba	r, riffle/pool, all	luvial channel	s with broad,	well-defined f	loodplains.
Riparian	Vegetation Commu	nities (Viereck	et al. 1992)				
Dist. from		P	Canopy Height(m)	Right Rank V	egetation Ty	тре	Canopy Height(m)
Bank (m)	Left Bank Vegetation	<u>l ype</u>	inergine(iii)				fieignt(iii)
Bank (m) 0 - 5			•	Closed White	Spruce Fores		16
	Left Bank Vegetation	ite Spruce Forest	9		-	t	-
0 - 5	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi	ite Spruce Forest ite Spruce Forest	9 9	Closed White	Spruce Fores	t t	16
0 - 5 5 - 10 10 - 20	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi	ite Spruce Forest ite Spruce Forest ite Spruce Forest	9 9 9	Closed White Closed White	Spruce Fores Spruce Fores	t t	16 16
0 - 5 5 - 10 10 - 20 20 - 30	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest	9 9 9	Closed White Closed White Closed White Closed White	Spruce Fores Spruce Fores Spruce Fores	t t t	16 16 16 16
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest	9 9 9 9 imated reach l	Closed White Closed White Closed White Closed White	Spruce Fores Spruce Fores Spruce Fores 00 Total El	t t t	16 16 16 16
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi ish Sampling Metho at-Mounted Electrofisher	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest	9 9 9 9 imated reach l	Closed White Closed White Closed White Closed White ength (m): 75	Spruce Fores Spruce Fores Spruce Fores 00 Total El	t t t	16 16 16 16
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: D	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi ish Sampling Metho at-Mounted Electrofisher ervations olly Varden	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest ods Est	9 9 9 9 imated reach le (VOB)	Closed White Closed White Closed White Closed White ength (m): 75 Visual Obse	Spruce Fores Spruce Fores Spruce Fores 00 Total El rvation, Boat tory: Unkno	t t t ectrofishing T wn	16 16 16 16 Time (s): 3449
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi ish Sampling Metho at-Mounted Electrofisher ervations olly Varden a Count: 72 Fish Me Method (No. of fish): H	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest ods Est Life Stage: ju easured: 30 Fork	9 9 9 9 imated reach le (VOB) venile/adult : Lengths (mm)	Closed White Closed White Closed White Closed White ength (m): 75 Visual Obse	Spruce Fores Spruce Fores Spruce Fores 00 Total El rvation, Boat	t t t ectrofishing T	16 16 16 16
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling Comment	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi ish Sampling Metho at-Mounted Electrofisher ervations olly Varden a Count: 72 Fish Method (No. of fish): Hese	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest ods Est Life Stage: jur easured: 30 Fork 3EF (33) VOB (39)	9 9 9 imated reach la (VOB) venile/adult t Lengths (mm)	Closed White Closed White Closed White ength (m): 75 Visual Obse Life His Min: 83	Spruce Fores Spruce Fores Spruce Fores 00 Total El rvation, Boat tory: Unkno Max: 403	t t t ectrofishing T wn Mean: 179	16 16 16 16 Time (s): 3449
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling Comment Species: ro Total Fish	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi ish Sampling Metho at-Mounted Electrofisher ervations olly Varden a Count: 72 Fish Method (No. of fish): Fist set ound whitefish a Count: 12 Fish Method Method (No. of fish): Fist	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest ods Est Life Stage: jur easured: 30 Fork 3EF (33) VOB (39) Life Stage: jur easured: 5 Fork	9 9 9 imated reach la (VOB) venile/adult t Lengths (mm)	Closed White Closed White Closed White ength (m): 75 Visual Obse Life His Min: 83	Spruce Fores Spruce Fores Spruce Fores 00 Total El rvation, Boat tory: Unkno Max: 403	t t t ectrofishing T wn Mean: 179	16 16 16 16 Time (s): 3449
0 - 5 5 - 10 10 - 20 20 - 30 Key To Fi (BEF) Boa Fish Obse Species: D Total Fish Sampling Comment Species: ro Total Fish Sampling Comment	Left Bank Vegetation 7 Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi Open Black Spruce-Whi ish Sampling Metho at-Mounted Electrofisher ervations olly Varden a Count: 72 Fish Method (No. of fish): Fist set ound whitefish a Count: 12 Fish Method Method (No. of fish): Fist	ite Spruce Forest ite Spruce Forest ite Spruce Forest ite Spruce Forest ods Est Life Stage: jur easured: 30 Fork 3EF (33) VOB (39) Life Stage: jur easured: 5 Fork	9 9 9 imated reach la (VOB) venile/adult t Lengths (mm) venile/adult t Lengths (mm)	Closed White Closed White Closed White Closed White ength (m): 75 Visual Obse Life His Min: 83 Life His Min: 282	Spruce Fores Spruce Fores Spruce Fores 00 Total El rvation, Boat tory: Unkno Max: 403	t t t t ectrofishing T wn Mean: 179 nt Mean: 291	16 16 16 16 Time (s): 3449 Median: 243

Appendix L138.-Page 2 of 6.

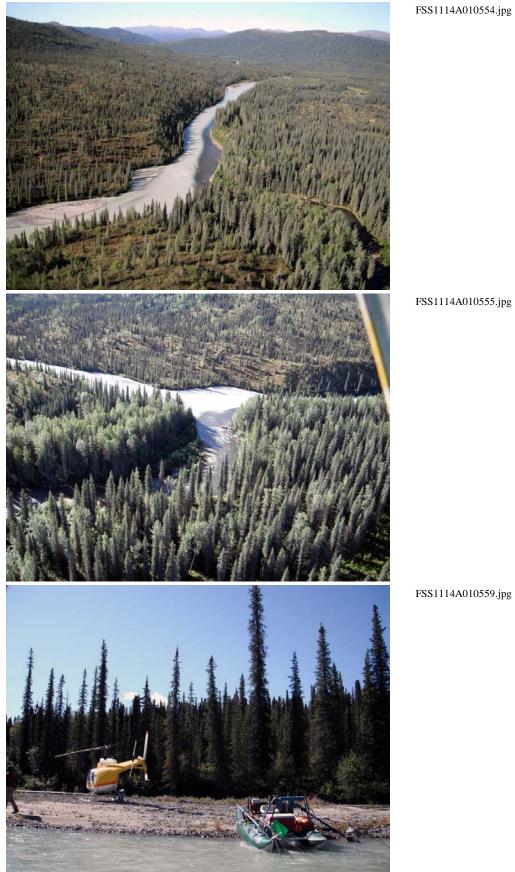
Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 148 Fish Measured: 28 Fork Lengths (mm) Min: 51 Max: 76 Mean: 63 Median: 63 Sampling Method (No. of fish): BEF (40) VOB (108) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 53 Fish Measured: 9 Fork Lengths (mm) Min: 52 Max: 66 Median: 59 **Mean: 57** Sampling Method (No. of fish): BEF (11) VOB (42) **Comments:** Species: Chinook salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 11 Fork Lengths (mm) Min: Max: Mean: Median: Fish Measured: Sampling Method (No. of fish): VOB (11) **Comments:** Life History: Anadromous Species: Pacific salmon-unspecified Life Stage: adult **Fish Measured: Total Fish Count:** 4 Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (4) Comments: Coho or Chinook. Species: Dolly Varden Life Stage: adult Life History: Unknown **Total Fish Count: 2 Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Median: 80 Total Fish Count: 96 Fish Measured: 3 Fork Lengths (mm) Min: 79 Max: 82 Mean: 80 Sampling Method (No. of fish): BEF (14) VOB (82) **Comments:** Species: round whitefish Life Stage: adult Life History: Resident Fish Measured: 1 Fork Lengths (mm) Min: 331 Max: 331 Median: 331 **Total Fish Count:** 1 **Mean:** 331 Sampling Method (No. of fish): BEF (1) **Comments:** Species: sockeye salmon Life Stage: adult Life History: Anadromous Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 500 Max: 500 Mean: 500 **Median: 500** Sampling Method (No. of fish): BEF (1) **Comments:** Species: salmonid-unspecified Life Stage: juvenile/adult Life History: Unknown Median: **Total Fish Count:** 2 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (2) Comments: ~350 mm. Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 74 Median: 75 **Total Fish Count:** 2 Max: 76 **Mean:** 75 Sampling Method (No. of fish): BEF (2) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: juvenile **Total Fish Count:** 7 Fish Measured: 7 Fork Lengths (mm) Min: 43 Max: 50 Median: 46 **Mean:** 46 Sampling Method (No. of fish): BEF (7) **Comments:** Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 204 Max: 204 Mean: 204 **Median:** 204 Sampling Method (No. of fish): BEF (1) **Comments:**

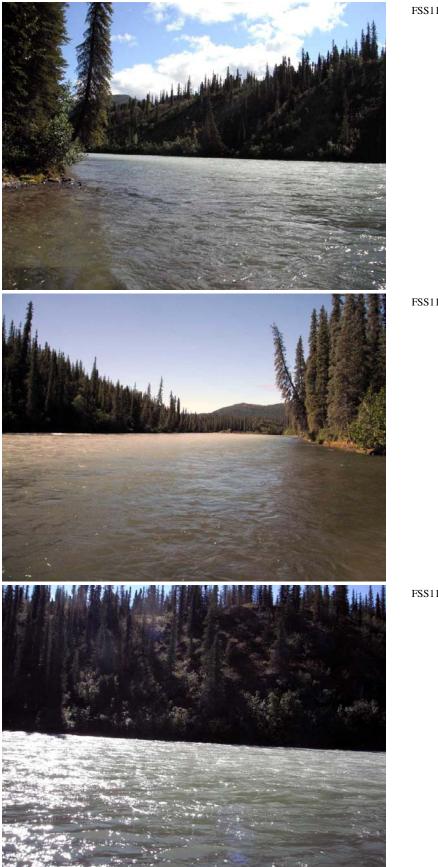
Instruments

Stream Gradient:handheld abney levelChannel Depths:graduated wading rodStream Velocity:GPS FloatChannel Widths:handheld laser rangefinderTurbidity:LaMotte 2020e turbidimeterElectrofisher:Smith-Root GPP 2.5Water Quality:YSI 556Transparency:

-continued-

1022





FSS1114A010563.jpg

FSS1114A010564.jpg

FSS1114A010565.jpg



-continued-1025

FSS1114A010569.jpg



Station Info Observers: Jonathan Kirsch, Stormy Haught Date/Time: 08/16/2011 10:28 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.66908 -147.86698 Coordinates -147.86698 62.66908 62.66764 -147.90938Elevation NED (m)(ft): 868 2848 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts C-2 Legal Description (MTRS): S030N008E24 Waterbody Name: Gilbert Creek **Anadromous Waters Catalog Number:** Geographic Comments: IU28 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow **pH:** 6.94 Water Temp (C): 9.86 DO (mg/L): 11.50 DO (%): 98.00 Conductivity (µS/cm): 64 Water Color: Clear Turbidity (NTU): 6.80 Thalweg Velocity (m/s)(ft/s): 0.28 0.92 **Stream Channel** Stream Gradient (%): 0.1 Slightly Entrenched **Entrenchment:** Catchment Area(sq. km): 221 **Embeddedness:** High **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Silt/Clay **Width** 22.0 20.0 Subdominant Substrate 1: Gravel Thalweg Depth 2.50 1.60 Subdominant Substrate 2: Cobble Rosgen Class: E5 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 0.9 Closed Low Willow Shrub 0.8 Closed Low Willow Shrub 0.9 5 - 10 Closed White Spruce-Paper Birch-Balsam Closed Low Willow Shrub 0.8 Poplar (Black Cottonwood Forest) 10 - 20 Closed Low Willow Shrub 0.9 Closed Low Willow Shrub 0.8 20 - 30 Closed Low Willow Shrub 0.9 Closed Low Willow Shrub 0.8 **Kev To Fish Sampling Methods** Estimated reach length (m): 3000 Total Electrofishing Time (s): 1465 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: Arctic grayling Life Stage: juvenile/adult Life History: Resident

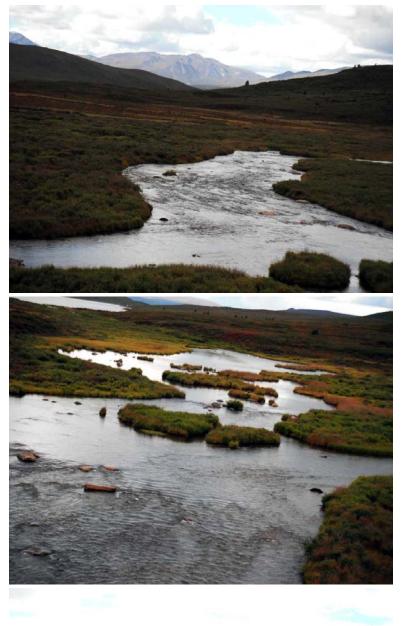
Total Fish Count: 223 Fish Measured: 3 Fork Lengths (mm) Min: 220 Max: 325 Mean: 265 Median: 272 Sampling Method (No. of fish): BEF (3) VOB (220) **Comments:** Species: round whitefish Life Stage: juvenile/adult Life History: Resident Total Fish Count: 33 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (33) **Comments:** Life Stage: adult Life History: Resident Species: Arctic grayling **Total Fish Count:** 9 Fish Measured: 9 Fork Lengths (mm) Min: 350 Max: 425 Median: 387 Mean: 388 Sampling Method (No. of fish): BEF (9) **Comments:**

Appendix L139.–Page 2 of 4.

Species: round whitefish Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 335 Max: 450 **Total Fish Count:** 4 Fish Measured: 4 Mean: 413 Median: 392 Sampling Method (No. of fish): BEF (4) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 **Mean:** 75 Median: 75 Sampling Method (No. of fish): BEF (1) **Comments:** Instruments

Stream Gradient: handheld abney levelStream Velocity: GPS FloatTurbidity: LaMotte 2020e turbidimeterWater Quality: YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1114B010385.jpg



FSS1114B010387.jpg

FSS1114B010386.jpg

-continued-1029

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FSS1114B010388.jpg

FSS1114B010389.jpg

1030

Station Inf	fo						
Observers:	Raye Ann N	leustel, Bob Powers			Date/T	ime: 08/17/2	011 9:41 AM
		-151.51735	Sample Coordinates	Latitude 62.54048	Longitude -151.52004	/ Latitude 62.54074	Longitude -151.51735
	VED (m)(ft): 4			<i>к</i> ,		CR0 4	
	drangle: Talk	on Method: Non-Dif teetna C-4		iption (MTRS	Datum: W): S028N012		
	Name: Cripp		Legar Deseri	prior (intras). 20201(012		
		talog Number:	1 1000			1000	
Geographic	c Comments:	HY 130 Approximate Chelatna Lake photos		tream of 4 velo	ocity barriers,	1000 meters t	ipstream of
Visit Comn	nents:						
Wildlife Co	omments:						
Water Qua	ality \ Strea	am Flow					
	р (С): 6.10	DO (mg/L): 11.79	DO (%): 94.80	Conductivit	у (µS/cm): 9	рН: 5.4	49
Water Colo	or: Glacial, Hi	gh Turbidit Turbidi t	ty (NTU): 80.00	Thalweg Vel	ocity (m/s)(ft	/s): 1.40 4.59	
Stream Ch	nannel						
	adient (%): 0		chment: Slightly E	ntrenched			
	Area(sq. km)		dedness: Moderate				
Channel D)imensions (m): Bankfull OHV Width 20.2		Dominant Sub ominant Subs			
		Depth 0.68		ominant Subs			
Rosgen Cla		radient, meandering, p	oint-bar, riffle/pool, a	lluvial channe	ls with broad,	well-defined	floodplains.
Riparian V	Vegetation	Communities (Vi	ereck et al. 1992))			
Dist. from			Canopy				Canopy
		egetation Type		<u>Right Bank V</u>	egetation Ty	<u>pe</u>	Height(m)
	Closed Tall V	Villow Shrub	3	Unvegetated			
5 - 10	CI 1 TE 11 TE		2	TT 1			
10 00	Closed Tall V		3	Unvegetated			
	Closed Tall V	Villow Shrub	3	Unvegetated			
20 - 30	Closed Tall V Closed Tall V	Villow Shrub Villow Shrub		-			
20 - 30	Closed Tall V	Villow Shrub Villow Shrub	3	Unvegetated Unvegetated)3		
20 - 30 Key To Fis	Closed Tall V Closed Tall V	Villow Shrub Villow Shrub g Methods	3 3 Estimated reach	Unvegetated Unvegetated		nd	
20 - 30 Key To Fis	Closed Tall V Closed Tall V sh Samplin kpack Electrof	Villow Shrub Villow Shrub g Methods	3 3 Estimated reach	Unvegetated Unvegetated length (m): 20		nd	
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden	Villow Shrub Villow Shrub g Methods ïsher Life Sta	3 3 Estimated reach (VOG age: juvenile/adult	Unvegetated Unvegetated length (m): 20 G) Visual Obse Life Hit	ervation, Grou	own	
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. 6	Villow Shrub Villow Shrub g Methods ïsher Life Sta	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mn	Unvegetated Unvegetated length (m): 20 G) Visual Obse Life Hit	ervation, Grou		Median: 123
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. o	Villow Shrub Villow Shrub g Methods Tsher Life St: Fish Measured: 4 of fish): PEF (4) VOO	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (7)	Unvegetated Unvegetated length (m): 20 3) Visual Obse Life Hin n) Min: 85	story: Unkno Max: 161	own Mean: 114	Median: 123
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Arc	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. o :: ctic grayling	Villow Shrub Villow Shrub g Methods Tisher Life Sta Fish Measured: 4 of fish): PEF (4) VOO Life Sta	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (7) age: juvenile/adult	Unvegetated Unvegetated length (m): 20 G) Visual Obse Life Hin n) Min: 85	story: Unkno Max: 161	wn Mean: 114	
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Aro Total Fish Sampling I	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. o :: ctic grayling Count: 1 Method (No. o	Villow Shrub Villow Shrub g Methods Tisher Life Sta Fish Measured: 4 of fish): PEF (4) VOO	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (7)	Unvegetated Unvegetated length (m): 20 G) Visual Obse Life Hin n) Min: 85	story: Unkno Max: 161	own Mean: 114	Median: 123 Median:
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Aro Total Fish Sampling I Comments	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. 6 s: ctic grayling Count: 1 Method (No. 6 s:	Villow Shrub Villow Shrub g Methods Tisher Life St: Fish Measured: 4 of fish): PEF (4) VOO Life St: Fish Measured: of fish): VOG (1)	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (7) age: juvenile/adult Fork Lengths (mm	Unvegetated Unvegetated length (m): 20 3) Visual Obse Life Hin a) Min: 85 Life Hin a) Min:	story: Unkno Max: 161 story: Reside Max:	wn Mean: 114 nt Mean:	
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Ard Total Fish Sampling I Comments Species: Do	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. o s: ctic grayling Count: 1 Method (No. o s: olly Varden	Villow Shrub Villow Shrub g Methods Tsher Life St: Fish Measured: 4 of fish): PEF (4) VOO Life St: Fish Measured: of fish): VOG (1) Life St:	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (7) age: juvenile/adult Fork Lengths (mm age: juvenile	Unvegetated Unvegetated length (m): 20 3) Visual Obse Life Hin n) Min: 85 Life Hin Min:	story: Unkno Max: 161 story: Reside Max: story: Unkno	wn Mean: 114 .nt Mean:	Median:
20 - 30 Key To Fis (PEF) Back Fish Obser Species: Do Total Fish Sampling I Comments Species: Ard Total Fish Sampling I Comments Species: Do Total Fish	Closed Tall V Closed Tall V sh Samplin kpack Electrof rvations olly Varden Count: 11 Method (No. 6 s: ctic grayling Count: 1 Method (No. 6 s: olly Varden Count: 6	Villow Shrub Villow Shrub g Methods Tisher Life St: Fish Measured: 4 of fish): PEF (4) VOO Life St: Fish Measured: of fish): VOG (1)	3 3 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (7) age: juvenile/adult Fork Lengths (mm	Unvegetated Unvegetated length (m): 20 3) Visual Obse Life Hin n) Min: 85 Life Hin Min:	story: Unkno Max: 161 story: Reside Max:	wn Mean: 114 .nt Mean:	

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1114C010506.jpg



FSS1114C010507.jpg

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FSS1114C010511.jpg

Station Info

5	Neustel, Bob Powers			Date/Time:	08/17/2011 12:11 PM
		Sample Coordinates	Latitude 62.54359	Longitude -151.53232	
Elevation NED (m)(ft): Coordinate Determinati USGS Quadrangle: Tal Waterbody Name: Crip Anadromous Waters Ca Geographic Comments:	ion Method: Non-Diffe lkeetna C-4 ople Creek			Datum: WGS8 S028N012W05	4
Visit Comments: A sam passag	npling event took place do ge.	ownstream of this sit	e (14C01). Th	nis site is a waterfa	ll/barrier to fish
Wildlife Comments:					
Water Quality \ Stre	eam Flow				
Water Temp (C): Water Color:	DO (mg/L): Turbidity	DO (%): / (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km	n): Entrench				
Channel Dimensions (n			Dominant Sub		
Thalwe	Width g Depth		minant Subst minant Subst		
Rosgen Class:					
Riparian Vegetation	Communities (Vier	reck et al. 1992)			
					~
Dist. from Bank (m) <u>Left Bank V</u>	Vegetation Type	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Vegetation Type		<u>Right Bank V</u>	egetation Type	
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30			<u>Right Bank V</u>	Vegetation Type	
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20			Right Bank V	egetation Type	
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	ng Methods Fort Life Stag Fish Measured:		Life His	Vegetation Type story: Not Applic Max: Me	Height(m)
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No. Comments:	ng Methods Fort Life Stag Fish Measured:	Height(m)	Life His	story: Not Applic	Height(m)
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No. Comments:	ng Methods Fort Life Stag Fish Measured:	Height(m) ge: not applicable Fork Lengths (mm	Life His	story: Not Applic	Height(m)
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No. Comments: Instruments	ng Methods Fort Life Stag Fish Measured:	Height(m) ge: not applicable Fork Lengths (mm Channe	Life His) Min:	story: Not Applic	Height(m)
Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No. Comments: Instruments Stream Gradient:	ng Methods Fort Life Stag Fish Measured:	Height(m) ge: not applicable Fork Lengths (mm Channe	Life His) Min: 1 Depths: 1 Widths:	story: Not Applic	Height(m)

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Station Info

Observers: Rave Ann Neustel, Rave Ann Neustel

Date/Time:	08/17/2011	10:28 AM
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Observers: Raye Ann Neustel, Raye Ann Neustel			Date/Time:	08/17/2011 10:28 AM
	Sample Coordinates	Latitude 62.51562	Longitude -151.47255	
Elevation NED (m)(ft): 421 1381 Coordinate Determination Method: Non-Different: USGS Quadrangle: Talkeetna C-3 Waterbody Name: Coffee Creek Anadromous Waters Catalog Number: 247-41-102 Geographic Comments: Visit Comments: This creek was not a target stream b Wildlife Comments:	00-2053-3170-40	easurement otion (MTRS	Datum: WGS84): S028N012W15	
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT	D (%): FU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%):EntrenchmenCatchment Area(sq. km):50Embeddedne				
Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth	Subdo	ominant Sub minant Subs minant Subs	trate 1:	
Rosgen Class:				
Riparian Vegetation Communities (Vierecl	s et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy	Right Bank V	Vegetation Type	Canopy Height(m)
Key To Fish Sampling Methods				
(VOH) Visual Observation, Helicopter				
	dult spawning k Lengths (mm)		story: Anadromou Max: Mea	
Instruments				
Stream Gradient:	Channel	Depths:		
Stream Velocity:		Widths:		
Turbidity:	Electrof	isher:		
Watar Quality	Tuonana			

Water Quality:

Transparency:



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Station Info

Water Quality:

Observers: Raye Ann Neustel, Bob Powers			Date/Time: 08/17/	2011 12:12 PM
	Sample Coordinates	Latitude 62.39438	Longitude -151.32061	
Elevation NED (m)(ft): 414 1358 Coordinate Determination Method: Non-Differen USGS Quadrangle: Talkeetna B-3 Waterbody Name: Lake Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: This was a visual observation from	Legal Descrip	tion (MTRS	Datum: WGS84): S027N011W28 ed.	
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):DWater Color:Turbidity (N		Conductivit Thalweg Vel	y (μS/cm): pH: ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%):EntrenchmeCatchment Area(sq. km):234Embeddedn				
Channel Dimensions (m): Bankfull OHW		ominant Sub		
Width Thalweg Depth		ninant Subs ninant Subs		
Rosgen Class:	54640			
Riparian Vegetation Communities (Vierec	ek et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m) <u>1</u>	Right Bank V	Vegetation Type	Canopy Height(m)
Key To Fish Sampling Methods				
(VOH) Visual Observation, Helicopter				
Fish ObservationsSpecies: Pacific salmon-unspecifiedLife Stage:Total Fish Count:15Fish Measured:FoSampling Method (No. of fish):VOH (15)Comments:	adult rk Lengths (mm)		story: Anadromous Max: Mean:	Median:
Instruments				
Stream Gradient:	Channel	Depths:		
Stream Velocity:	Channel			
Turbidity:	Electrofi	sher:		

Transparency:

Station Info Observers: Raye Ann Neustel, Bob Powers Date/Time: 08/17/2011 1:56 PM Sample Latitude Longitude Coordinates -151.95566 61.87301 Elevation NED (m)(ft): 396 1299 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-6 Legal Description (MTRS): S021N015W36 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: This is a waterfall 6 km upstream of Hayes River confluence. Unnamed tributary to Hayes River. Visit Comments: No sampling data collected. This is a waypoint for a waterfall and no possible landing site below to sample. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 77 **Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable Total Fish Count: 0 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): NON (0) **Comments:** Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station Info Observers: Raye Ann Neustel, Bob Powers Date/Time: 08/17/2011 2:16 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.82133 -152.18743 Coordinates -152.18743 61.82133 61.82209 -152.18575 Elevation NED (m)(ft): 305 1001 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-6 Legal Description (MTRS): S020N016W16 Waterbody Name: Hayes River **Anadromous Waters Catalog Number:** Geographic Comments: Glacial moraine 150 meters downstream, will be sampling side Chanel. glacier is close to site and Skwentna River Confluence Visit Comments: Sampled side stream due to no-landing area upstream. Glacier approximately 0.5 km upstream of transect site. Very large turbid river. Stream was not wadeable so channel widths were estimated. Rosgan clasification (C3) pertains only to the variables associated with the side channel and does not take into account the variable associated with the river as a whole. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 1.22 DO (mg/L): 13.58 DO (%): 96.00 Conductivity (µS/cm): 48 pH: 7.15 Water Color: Glacial, High Turbidit **Turbidity (NTU): 632.00** Thalweg Velocity (m/s)(ft/s): 1.25 4.10 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched 385 **Catchment Area(sq. km): Embeddedness:** High **Channel Dimensions (m): Bankfull OHW** Wetted Dominant Substrate: Cobble Width 10.8 8.7 Subdominant Substrate 1: Gravel Thalweg Depth 0.80 0.55 Subdominant Substrate 2: Silt/Clay Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5Closed Tall Willow Shrub 2.5 Unvegetated 5 - 10 Closed Tall Willow Shrub 2.5 Unvegetated 10 - 20 Closed Tall Willow Shrub 2.5 Unvegetated 20 - 30 Closed Tall Willow Shrub 2.5 Unvegetated

Key To Fish Sampling Methods

Estimated reach length (m): 205

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths:
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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<i>Appendix</i> E1405tation 1551114e00.	
Station Info	
Observers: Raye Ann Neustel, Bob Powers	Date/Time: 08/17/2011 4:33 PM
StationLatitudeLongitudeSampleCoordinates61.92752-152.28233Coordin	
Elevation NED (m)(ft): 356 1168	
Coordinate Determination Method: Non-Differential GPS Fi USGS Quadrangle: Tyonek D-7 Legal I	ield Measurement Datum: WGS84 Description (MTRS): S021N016W07
Waterbody Name: Old Man Creek	
Anadromous Waters Catalog Number:	
Geographic Comments: HY68	
Visit Comments: Picture of GPS screen taken at end of samplin	1g event. Actual start time: 1348.
Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C): 6.32 DO (mg/L): 12.50 DO (%): 10 Water Color: Glacial, High Turbidit Turbidity (NTU): 29.30	
Stream Channel	
Stream Gradient (%): 0.5 Entrenchment: Entr	enched
	ligible
Channel Dimensions (m): Bankfull OHW Wetted	Dominant Substrate: Cobble
	Subdominant Substrate 1: Boulder Subdominant Substrate 2: Gravel
Rosgen Class: D3 Braided channel with longitudinal and transv	
Riparian Vegetation Communities (Viereck et al. 1	· · ·
Dist. from Cano	ру Сапору
Bank (m) <u>Left Bank Vegetation Type</u> Heigh	
0 - 5 Closed Tall Willow Shrub 35	Unvegetated
5 - 10 Closed Tall Willow Shrub 35	Unvegetated
10 - 20Closed Tall Willow Shrub35	Unvegetated
20 - 30 Open Balsam Poplar (Black Cottonwood) 35 Forest 35	5 Unvegetated
Key To Fish Sampling Methods Estimated r	reach length (m): 270
(PEF) Backpack Electrofisher	(VOG) Visual Observation, Ground
Fish Observations	
Species: Dolly Varden Life Stage: juvenile/ad	ult Life History: Unknown
	s (mm) Min: 91 Max: 160 Mean: 130 Median: 125
Sampling Method (No. of fish): PEF (4) VOG (9)	
Comments:	
Species: sockeye salmon Life Stage: juvenile Total Fish Count: 27 Fish Measured: 6 Fork Length	Life History: Anadromous s (mm) Min: 33 Max: 37 Mean: 35 Median: 35
Sampling Method (No. of fish): PEF (6) VOG (21)	
Comments:	
Species: round whitefish Life Stage: juvenile/ad	-
_	s (mm) Min: 208 Max: 208 Mean: 208 Median: 208
Sampling Method (No. of fish): PEF (1)	
Comments:	Life History: Unknown
Comments: Life Stage: juvenile Species: Dolly Varden Life Stage: juvenile Total Fish Count: 27 Fish Measured: 27 Fork Length	Life History: Unknown s (mm) Min: 31 Max: 64 Mean: 46 Median: 47
Comments:Species: Dolly VardenLife Stage: juvenile	

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1114C080534.jpg

FSS1114C080535.jpg



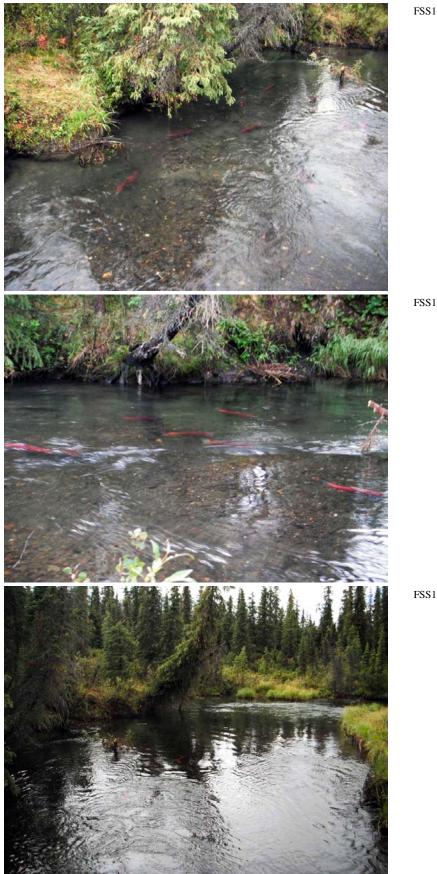
**					
Station Info					
Observers: Raye Ann Neustel, Bob Powers			Date/Ti	me: 08/17/2	2011 5:47 PM
StationLatitudeLongitudeCoordinates62.08061-152.71710	Sample Coordinates	Latitude 62.08162	Longitude -152.71817		
Elevation NED (m)(ft): 568 1864					
Coordinate Determination Method: Non-D USGS Quadrangle: Talkeetna A-6	offerential GPS Field Me Legal Descrip		Datum: WC		
Waterbody Name: Squaw Creek	Legal Descrip		J. 50251(01) (¥ 14	
Anadromous Waters Catalog Number: 247-	-41-10200-2053-3205-4	112-5045			
Geographic Comments: Puntilla Lake upstre	am approximately 500m	•			
Visit Comments: Transect site located approx salmon spawning behavior hiking a four wheeler trail of	observed. This site was s	ampled due t	o no-fly condi	tions. Acce	essed site by
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 9.14 DO (mg/L): 10.91	DO (%): 94.70	Conductivit	y (µS/cm): 92	pH: 7	.43
Water Color: Clear Turbio	lity (NTU): 8.70	Thalweg Vel	ocity (m/s)(ft/s	s): 0.74 2.43	3
Stream Channel					
	enchment: Slightly En eddedness: Moderate	trenched			
· • ·					
Channel Dimensions (m): Bankfull OF Width 10.9			ostrate: Gravel trate 1: Cobble		
Thalweg Depth 0.74		minant Subst		e	
Rosgen Class: C4 Low gradient, meandering,	point-bar, riffle/pool, all	uvial channe	ls with broad, y	well-defined	floodplains.
Riparian Vegetation Communities (V					
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Right Bank V	Vegetation Ty	<u>pe</u>	Canopy Height(m)
0 - 5 Closed Subalpine Fir Forest	35	Closed White	Spruce Forest		38
5 - 10 Closed Subalpine Fir Forest	35	Closed White	Spruce Forest		38
10 - 20 Closed Subalpine Fir Forest	35	Closed White	Spruce Forest		38
20 - 30 Closed Subalpine Fir Forest			Spruce Forest		38
Key To Fish Sampling Methods	Estimated reach le	ength (m): 46	58		
(DIP) Dip Net		0	ervation, Grour	nd	
Fish Observations					
	Stage: juvenile/adult	Life Hi	story: Unknov	wn	
Total Fish Count: 4 Fish Measured: Sampling Method (No. of fish): VOG (4) Comments:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
	Stage: carcass	Life Hi	story: Anadro	mous	
Total Fish Count:2Fish Measured:Sampling Method (No. of fish):VOG (2)Comments:photo # 765	Fork Lengths (mm)		-	Mean:	Median:
Species: sockeye salmon Life S	Stage: adult spawning	Life Hi	story: Anadro	mous	
Total Fish Count: 110 Fish Measured: Sampling Method (No. of fish): VOG (110 Comments: photo #'s 540-544	Fork Lengths (mm)	Min:	Max:	Mean:	Median:

Sampling Method (No. of fish) Comments: photo #'s 540-544 Species: sockeye salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 68 Fish Measured: 6 Fork Lengths (mm) Min: 42 Max: 48 **Mean:** 44 Median: 45 Sampling Method (No. of fish): DIP (6) VOG (62) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 47 Fish Measured: 6 Fork Lengths (mm) Min: 52 Max: 58 Mean: 55 Median: 55 Sampling Method (No. of fish): DIP (6) VOG (41) **Comments:**

Instruments

Stream Gradient: handheld abney level Stream Velocity: transparent velocity head rod Turbidity: LaMotte 2020e turbidimeter Water Quality: YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape **Electrofisher: Transparency:**



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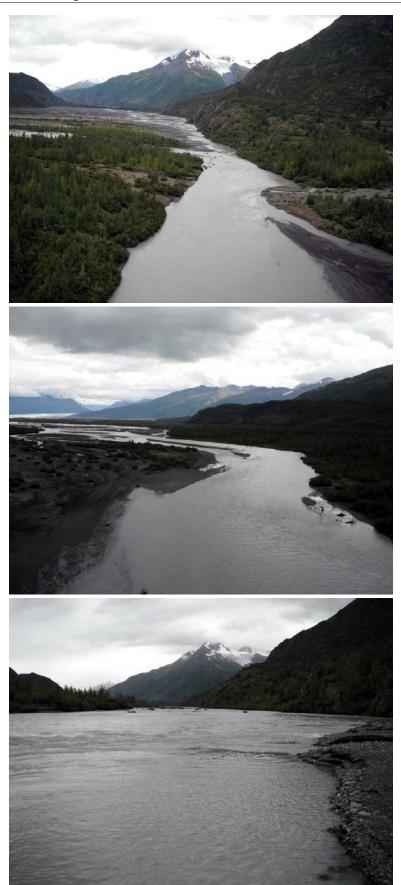
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Station Info				
Observers: Joe Buckwalter, Heidi Zimmer			Date/Time: 08/18/2	011 11:40 AM
StationLatitudeLongitudeCoordinates61.21695-148.67786	Sample Coordinates		ngitude / Latitude 8.67786 / 61.25587	8
Elevation NED (m)(ft): 107 351				
Coordinate Determination Method: Non-Dif			tum: WGS84	
USGS Quadrangle: Anchorage A-5 Waterbody Name: Lake Fork Knik River	Legal Descrip	otion (MTRS): SO	013N004E14	
Anadromous Waters Catalog Number: 247-5	0-10200-2160			
Geographic Comments: IM18. Habitat transec	et and upper end of read			
alluvial fan. Upper L lake bed.	ake George is drained.	Lake Fork Knik I	River flows, braided, ov	ver the former
Visit Comments: Photos 594-602 were taken o	f Knik glacier and Lak	e George just belo	w the sample reach	
Wildlife Comments:	r runk gracier and Eak	e eleorge, just bere	w the sample reach.	
Water Quality \ Stream Flow				
Water Temp (C): 3.73 DO (mg/L): 12.01	DO (%): 92.00	Conductivity (µS	/cm): 41 pH: 7.	62
Water Color: Glacial, High Turbidit Turbidi	· · ·		(m/s)(ft/s): 2.10 6.89	
Stream Channel				
	chment: Slightly En	trenched		
	dedness: High			
Channel Dimensions (m): Bankfull OH	W Wetted D	ominant Substra	te: Gravel	
Width 75.0		minant Substrate		
Thalweg Depth 2.50		minant Substrate	-	
Rosgen Class: D4 Braided channel with longitu	idinal and transverse ba	ars. Very wide cha	annel with eroding ban	KS.
Dinarian Vagatatian Communities (Vi	amonds at al. 1002)			
Riparian Vegetation Communities (Vi				<i></i>
Dist. from	Canopy	Right Bank Vegel	ation Type	Canopy Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vege Closed Tall Alder-		Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Open Tall Alder-Willow Shrub	Canopy Height(m) 1.6	Closed Tall Alder-	Willow Shrub	1.0
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Open Tall Alder-Willow Shrub	Canopy Height(m) 1.6 1.6	Closed Tall Alder- Closed Black Cott	Willow Shrub onwood Forest	Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Open Tall Alder-Willow Shrub	Canopy Height(m) 1.6 1.6 1.6	Closed Tall Alder-	Willow Shrub onwood Forest onwood Forest	Height(m) 3 14.5
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Open Tall Alder-Willow Shrub10 - 20Open Tall Alder-Willow Shrub20 - 30Closed Black Cottonwood Forest	Canopy Height(m) 1.6 1.6 1.6 14.5	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott	Willow Shrub onwood Forest onwood Forest onwood Forest	Height(m) 3 14.5 14.5 14.5 14.5
Dist. from Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach le	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing '	Height(m) 3 14.5 14.5 14.5 14.5
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Tall Alder-Willow Shrub5 - 10Open Tall Alder-Willow Shrub10 - 20Open Tall Alder-Willow Shrub20 - 30Closed Black Cottonwood Forest	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach le	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing '	Height(m) 3 14.5 14.5 14.5 14.5
Dist. from Eank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach la (VOB)	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing on, Boat	Height(m) 3 14.5 14.5 14.5 14.5
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Alder-Willow Shrub 5 - 10 Open Tall Alder-Willow Shrub 10 - 20 Open Tall Alder-Willow Shrub 20 - 30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach le (VOB) age: juvenile	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History	Willow Shrub onwood Forest onwood Forest Total Electrofishing 7 on, Boat	Height(m) 3 14.5 14.5 14.5 14.5 Time (s): 4147
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Fish Measured: 1	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach la (VOB)	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing on, Boat	Height(m) 3 14.5 14.5 14.5 14.5
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Tall Alder-Willow Shrub 5 - 10 Open Tall Alder-Willow Shrub 10 - 20 Open Tall Alder-Willow Shrub 20 - 30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach le (VOB) age: juvenile	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History	Willow Shrub onwood Forest onwood Forest Total Electrofishing 7 on, Boat	Height(m) 3 14.5 14.5 14.5 14.5 Time (s): 4147
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) 1	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach la (VOB) age: juvenile Fork Lengths (mm)	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History	Willow Shrub onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75	Height(m) 3 14.5 14.5 14.5 14.5 Time (s): 4147
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Sampling Method (No. of fish): BEF (1) Comments: Species: general fish observation, no s Life St Total Fish Count:	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach la (VOB) age: juvenile Fork Lengths (mm)	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History Min: 75 Mar Life History	Willow Shrub onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75 : Unknown	Height(m) 3 14.5 14.5 14.5 14.5 Time (s): 4147
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments: Species: general fish observation, no s Life St Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6)	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach le (VOB) age: juvenile Fork Lengths (mm) age: juvenile/adult	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History Min: 75 Mar Life History	Willow Shrub onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75 : Unknown	Height(m) 3 14.5 14.5 14.5 Time (s): 4147 Median: 75
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): BEF (1) Comments: Species: general fish observation, no s Life St Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: VOB (6) Comments:	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach la (VOB) age: juvenile Fork Lengths (mm) age: juvenile/adult Fork Lengths (mm)	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History Min: 75 Max Life History Min: Max	Willow Shrub onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75 : Unknown x: Mean:	Height(m) 3 14.5 14.5 14.5 Time (s): 4147 Median: 75
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Fish Measured: Sampling Method (No. of fish): BEF (1) Comments: Species: general fish observation, no s Life St Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: VOB (6) Comments:	Canopy Height(m) 1.6 1.6 1.6 14.5 Estimated reach le (VOB) age: juvenile Fork Lengths (mm) age: juvenile/adult	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History Min: Mar Life History	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75 : Unknown x: Mean: : Unknown	Height(m) 3 14.5 14.5 14.5 Time (s): 4147 Median: 75
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Sampling Method (No. of fish): BEF (1) Comments: Species: general fish observation, no s Life St Total Fish Count: Species: Dolly Varden Life St Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life St Total Fish Count: 3 Fish Measured: Sampling Method (No. of fish): BEF (2) VOB	Canopy Height(m) 1.6 1.6 1.6 1.6 14.5 Estimated reach le (VOB) age: juvenile Fork Lengths (mm) age: juvenile/adult Fork Lengths (mm) age: juvenile/adult	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History Min: Mar Life History	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75 : Unknown x: Mean: : Unknown	Height(m) 3 14.5 14.5 14.5 Time (s): 4147 Median: 75 Median:
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Tall Alder-Willow Shrub 5-10 Open Tall Alder-Willow Shrub 10-20 Open Tall Alder-Willow Shrub 20-30 Closed Black Cottonwood Forest Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life St Total Fish Count: 1 Fish Measured: 1 Sampling Method (No. of fish): BEF (1) Comments: Species: general fish observation, no s Life St Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life St Total Fish Count: 3 Fish Measured: 2	Canopy Height(m) 1.6 1.6 1.6 1.6 14.5 Estimated reach le (VOB) age: juvenile Fork Lengths (mm) age: juvenile/adult Fork Lengths (mm) age: juvenile/adult	Closed Tall Alder- Closed Black Cott Closed Black Cott Closed Black Cott ength (m): 6600 Visual Observati Life History Min: Mar Life History	Willow Shrub onwood Forest onwood Forest onwood Forest Total Electrofishing 7 on, Boat : Unknown x: 75 Mean: 75 : Unknown x: Mean: : Unknown	Height(m) 3 14.5 14.5 14.5 Time (s): 4147 Median: 75 Median:

Species: salmonid-unspecified Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 6 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (6) **Comments:** Species: salmonid-unspecified Life Stage: juvenile Life History: Unknown **Total Fish Count:** 2 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (2) **Comments:** Species: pygmy whitefish Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 109 Max: 109 Total Fish Count: 1 Fish Measured: 1 Mean: 109 Median: 109 Sampling Method (No. of fish): BEF (1) **Comments:** Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



FSS1115A010603.jpg Looking upstream at habitat transect (put-in--alluvial fan on right).

FSS1115A010604.jpg Looking downstream from habitat transect (put-in).

FSS1115A010605.jpg Looking upstream from habitat transect (put-in).



FSS1115A010606.jpg Looking downstream from habitat transect (put-in).

FSS1115A010607.jpg Right bank at habitat transect (put-in).

FSS1115A010608.jpg Left bank at habitat transect (putin).



FSS1115A010609.jpg Looking upstream from downstream end of reach.

FSS1115A010610.jpg

Looking downstream from downstream end of reach. Lake George and Knik Glacier in the background.

Station Info

	lter, Heidi Zimi	ner			Date/Time	: 08/18/2011 5:33 PM
			Sample Coordinates	Latitude 61.40919	Longitude -148.42451	
Elevation NED (m)(ft): 2	299 981					
Coordinate Determination		on-Differen			Datum: WGS8	
USGS Quadrangle: Ancl	-		Legal Descr	iption (MTRS	: S015N006E08	
Waterbody Name: Glaci		iver				
Anadromous Waters Cat Geographic Comments:	-	lot convon	(photos 613 614) appears to be	a fish passaga ha	rriar Dhoto 615 shows
Geographic Comments:			am of the canyo		a iisii-passage ba	mer. Flioto 015 shows
Visit Comments: Wildlife Comments:						
Water Quality \ Strea	m Flow					
Water Temp (C):	DO (mg/L):	D	OO (%):	Conductivit	y (µS/cm):	pH:
Water Color:	-	urbidity (N			ocity (m/s)(ft/s):	•
Stream Channel						
Stream Gradient (%):]	Entrenchm	ent:			
Catchment Area(sq. km)	: 1	Embeddedn	iess:			
Channel Dimensions (m): Bankfull	OHW	Wetted	Dominant Sul	strate:	
	Width			ominant Subs		
	D (1		Subd	ominant Subst	rate 2:	
Thalweg	Depth		Subu	ommant Subs	1400 21	
Thalweg Rosgen Class:	Depth		Subu			
-		es (Viereo				
Rosgen Class: Riparian Vegetation Dist. from	Communitie		ck et al. 1992 Canopy)		Сапору
Rosgen Class: Riparian Vegetation	Communitie		ck et al. 1992 Canopy)	Vegetation Type	Canopy Height(m)
Rosgen Class: Riparian Vegetation Dist. from	Communitie		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Ve</u> 0 - 5 5 - 10	Communitie		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Veg</u> 0 - 5 5 - 10 10 - 20	Communitie		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30	Communitio		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Ve</u> 0 - 5 5 - 10 10 - 20	Communitio		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Ve</u> 0 - 5 5 - 10 10 - 20 20 - 30	Communitio		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Communitio		ck et al. 1992 Canopy)		10
Rosgen Class: Riparian Vegetation (Dist. from Bank (m) Left Bank Ve 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None	Communitie egetation Type g Methods		ck et al. 1992 Canopy) <u>Right Bank V</u>		Height(m)
Rosgen Class:Riparian Vegetation (Dist. from Bank (m)Left Bank Vol0 - 55 - 1010 - 2020 - 30Key To Fish Samplin (NON) NoneFish Observations	Communitie egetation Type g Methods	Life Stage:	ck et al. 1992 Canopy Height(m)) <u>Right Bank V</u> Life His	7egetation Type	Height(m)
Rosgen Class: Riparian Vegetation (Dist. from Bank (m) Left Bank Ve 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effe	Communitie egetation Type g Methods	Life Stage: red: Fo	ck et al. 1992 Canopy Height(m)) <u>Right Bank V</u> Life His	7egetation Type	Height(m)
Rosgen Class: Riparian Vegetation (Dist. from Bank (m) Left Bank Verify 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effort Total Fish Count: 0	Communitie egetation Type g Methods	Life Stage: red: Fo	ck et al. 1992 Canopy Height(m)) <u>Right Bank V</u> Life His	7egetation Type	Height(m)
Rosgen Class: Riparian Vegetation (Interpretation of Dist. from Bank (m) Left Bank Version (Interpretation of Dist. from Bank (m) Left Bank Version (model) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Sampling Method (No. or Contemport)	Communitie egetation Type g Methods	Life Stage: red: Fo	ck et al. 1992 Canopy Height(m)) <u>Right Bank V</u> Life His	7egetation Type	Height(m)
Rosgen Class: Riparian Vegetation (Interpretation of Dist. from Bank (m) Left Bank Version (Interpretation of Dist. from Bank (m) Left Bank Version (model) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Sampling Method (No. of Comments:	Communitie egetation Type g Methods	Life Stage: red: Fo	ck et al. 1992 Canopy Height(m) not applicable ork Lengths (mr) <u>Right Bank V</u> Life His	7egetation Type	Height(m)
Rosgen Class: Riparian Vegetation (I) Dist. from Bank (m) Left Bank Velocity 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effor Total Fish Count: 0 Sampling Method (No. of Comments: Instruments	Communitie egetation Type g Methods	Life Stage: red: Fo	ck et al. 1992 Canopy Height(m) not applicable ork Lengths (mr Chann) <u>Right Bank V</u> Life His n) Min:	7egetation Type	Height(m)
Rosgen Class: Riparian Vegetation (Interpretation of Dist. from Bank (m) Left Bank Version (Interpretation of Dist. from Bank (m) Left Bank Version (model) 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Sampling Method (No. of Comments: Instruments Stream Gradient:	Communitie egetation Type g Methods	Life Stage: red: Fo	ck et al. 1992 Canopy Height(m) not applicable ork Lengths (mr Chann Chann) <u>Right Bank V</u> Life His n) Min: el Depths:	7egetation Type	Height(m)



FSS1115A020613.jpg

FSS1115A020615.jpg

Station Info					
Observers: Jonathan Kirsch, Stormy Haught			Date/Time	: 08/18/20	11 9:20 AM
Station Latitude Longitude Coordinates 61.48641 -148.46815	Sample Coordinates	Latitude 61.48641	Longitude -148.46815 /	Latitude 61.47360	Longitude -148.47881
Elevation NED (m)(ft): 261 856					
Coordinate Determination Method: Non-Differen	ntial GPS Field Me	asurement	Datum: WGS	84	
USGS Quadrangle: Anchorage B-4	Legal Descrip	tion (MTRS): S016N005E12	2	
Waterbody Name: Metal Creek					
Anadromous Waters Catalog Number:					
Geographic Comments: IM33					
Visit Comments: Very swift and muddy, continuous	s whitewater.				
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 4.71 DO (mg/L): 12.78 D Water Color: Glacial, High Turbidit Turbidity (N			y (µS/cm): 215 locity (m/s)(ft/s):	pH: 7.62 3.75 12.30	
Stream Channel					
Stream Gradient (%): 2 Entrenchme	ent: Entrenched				
Catchment Area(sq. km): 209 Embeddedn	ness: Moderate				
	Wetted D	ominont Sul	ostrate: Cobble		
Width 18.0			trate 1: Boulder		
Thalweg Depth 1.65			trate 2: Sand		
Rosgen Class: G3 Entrenched "gully" step/pool and	low width/depth ra	atio on mode	rate gradients.		
Riparian Vegetation Communities (Viered	rk et al. 1992)				

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder Shrub	2.2	Closed Tall Alder Shrub	2
5 - 10	Closed Tall Alder Shrub	2.2	Closed Black Cottonwood Forest	21
10 - 20	Closed Tall Alder Shrub	2.2	Closed Black Cottonwood Forest	21
20 - 30	Open Balsam Poplar (Black Cottonwood) Forest	16	Closed Black Cottonwood Forest	21

Key To Fish Sampling Methods

Estimated reach length (m): 1700 Total Electrofishing Time (s): 240

(BEF) Boat-Mounted Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1115B010393.jpg

FSS1115B010394.jpg

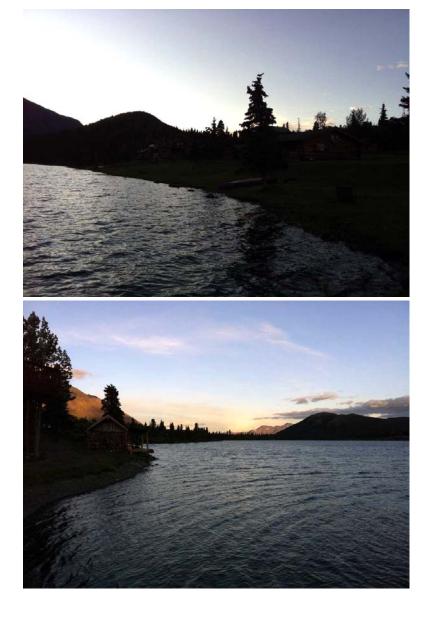
FSS1115B010395.jpg



Station Info

Observers: Raye Ann Neustel, Bob Powers			Date/Time:	08/18/2011 9:00 PM
•	Sample Coordinates	Latitude 62.09073	Longitude -152.73372	
Elevation NED (m)(ft): 572 1877 Coordinate Determination Method: Non-Different USGS Quadrangle: Talkeetna A-6 Waterbody Name: Puntilla Lake Anadromous Waters Catalog Number: 247-41-1 Geographic Comments: Visit Comments: No habitat data collected. This is sockeye salmon.	Legal Descrij 0200-2053-3205-4	ption (MTRS)		tion due to spawning
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):Water Color: ClearTurbidity (DO (%): NTU):	Conductivity Thalweg Velo	y (μS/cm): poity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%):EntrenchnCatchment Area(sq. km):5Embedded				
Channel Dimensions (m): Bankfull OHW		Dominant Sub		
Width Thalweg Depth		minant Subst minant Subst		
Rosgen Class:	Subu	innunt Subst	Tute 2.	
Riparian Vegetation Communities (Viere	eck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
0 - 5				
5 - 10 10 - 20				
5 - 10 10 - 20 20 - 30				
5 - 10 10 - 20				
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOG) Visual Observation, Ground Fish Observations Species: sockeye salmon Life Stage	e: adult spawning F ork Lengths (mm	Life His	tory: Anadromous Max: Mea	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOG) Visual Observation, Ground Fish Observations Species: sockeye salmon Life Stage Total Fish Count: 200 Fish Measured: H Sampling Method (No. of fish): VOG (200)		Life His	·	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOG) Visual Observation, Ground Fish Observations Species: sockeye salmon Life Stage Total Fish Count: 200 Fish Measured: H Sampling Method (No. of fish): VOG (200) Comments:	Fork Lengths (mm	Life His	·	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOG) Visual Observation, Ground Fish Observations Species: sockeye salmon Life Stage Total Fish Count: 200 Fish Measured: H Sampling Method (No. of fish): VOG (200) Comments: Instruments	Fork Lengths (mm Channe	Life His) Min:	·	
5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOG) Visual Observation, Ground Fish Observations Species: sockeye salmon Life Stage Total Fish Count: 200 Fish Measured: H Sampling Method (No. of fish): VOG (200) Comments: Instruments Stream Gradient:	Fork Lengths (mm Channe	Life His) Min: l Depths: l Widths:	·	

FSS1115C011508.jpg



FSS1115C011509.jpg

Station Info						
Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/19/2011 10:45 AM						
Station Latitude Longitude Coordinates 62.11377 -148.84763	Sample Coordinates	Latitude Longitude / Latitude 62.11377 -148.84763 / 62.11847	Longitude -148.84909			
Elevation NED (m)(ft): 616 2021						
Coordinate Determination Method: Non-Differen						
USGS Quadrangle: Talkeetna Mts A-4	Legal Descri	ption (MTRS): S023N003E02				
Waterbody Name: Sheep River Anadromous Waters Catalog Number:						
Geographic Comments: IM17						
Visit Comments: ph reading unstable (slowly driftin floated through 4 subreaches (560 our safety.		ing 10 minutes. Reach was not safely rafta g continuously, but saw no fish and decided				
Wildlife Comments:						
Water Quality \ Stream Flow						
Water Temp (C): 3.37DO (mg/L): 12.42DWater Color: Glacial, High TurbiditTurbidity (N	DO (%): 93.20 NTU): 100.00	Conductivity (µS/cm): 44 pH: 6.8 Thalweg Velocity (m/s)(ft/s): 3.90 12.79				
Stream Channel						
Stream Gradient (%): 3 Entrenchm	ent: Slightly E	ntrenched				
Catchment Area(sq. km): 234 Embeddedr	ness: Negligible					
Channel Dimensions (m): Bankfull OHW	Wetted 1	Dominant Substrate: Cobble				
Width 54.0		ominant Substrate 1: Boulder				
Thalweg Depth3.40		ominant Substrate 2: Sand				
Rosgen Class: D3 Braided channel with longitudina	al and transverse b	bars. Very wide channel with eroding bank	S.			
Riparian Vegetation Communities (Viereck et al. 1992)						
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)			
0 - 5 Closed Tall Alder-Willow Shrub	3	Open Tall Alder-Willow Shrub	1.5			
5 - 10 Closed Tall Alder-Willow Shrub	3	Open Tall Alder-Willow Shrub	1.5			
10 - 20 Closed Tall Alder-Willow Shrub	3	Closed Black Cottonwood Forest	11.4			
20 - 30 Closed Tall Alder-Willow Shrub	3	Open White Spruce Forest	14			

Key To Fish Sampling Methods

Estimated reach length (m): 560 Total Electrofishing Time (s): 160

(BEF) Boat-Mounted Electrofisher

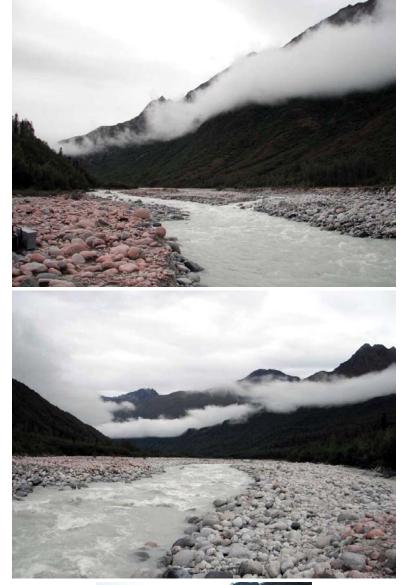
Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1116A010621.jpg

FSS1116A010622.jpg

FSS1116A010629.jpg



-continued-1065

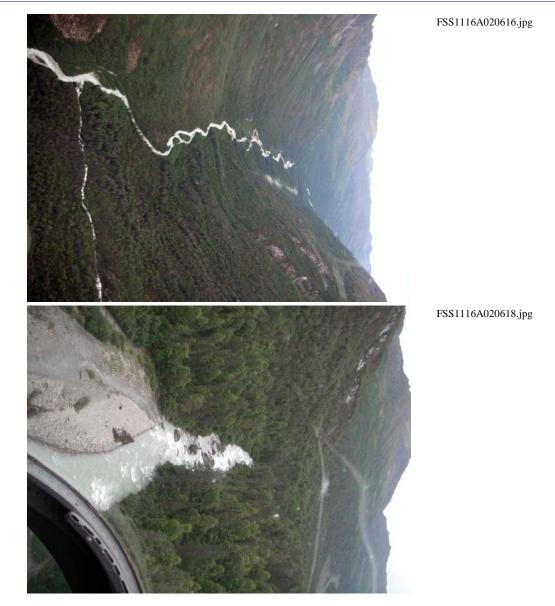
FSS1116A010630.jpg



Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/19/2011 9:04 AM Sample Latitude Longitude Coordinates -149.12354 61.94485 Elevation NED (m)(ft): 382 1253 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 **USGS Quadrangle:** Anchorage D-6 Legal Description (MTRS): S021N002E05 Waterbody Name: Kashwitna River **Anadromous Waters Catalog Number:** Geographic Comments: Fly-by only--not safely raftable (too swift and bouldery). Visit Comments: Fly-by only--not safely raftable (too swift and bouldery). Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (NON) None **Fish Observations** Species: no collection effort Life Stage: not applicable Life History: Not Applicable **Fish Measured:** Fork Lengths (mm) Min: Max: Median: **Total Fish Count:** 0 Mean: Sampling Method (No. of fish): NON (0) **Comments:**

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



Station Info	•						
		ustal Stormy Uan	aht		Doto/T	ime: 08/19/20	11 11·21 AM
Station	Latitude	eustel, Stormy Hau Longitude	gnt Sample	Latitude	Longitude	Latitude	Longitude
Coordinates		-149.45406	Coordinates		0	/ 61.76271	-149.48494
Elevation NE				011/001/	1.0110.000	011/02/1	1.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Coordinate D	Determination	n Method: Non-I	Differential GPS Field N		Datum: W		
USGS Quadr	0	-	Legal Descr	iption (MTRS): S019N001	W04	
Waterbody N							
		alog Number: Mining activity apr	proximately 100m upstro	eam at confluer	ice of Willow	and Canyon C	reeks
• •	ents: Fast wa	ter due to steep gra	dient. No photos taken s although readings wer	. No turbidity	taken. Stream	velocity calcu	lated from
	to dange	erous conditions.					
Wildlife Com	nments:						
Water Qual	lity \ Stream	m Flow					
Water Temp	(C): 6.50	DO (mg/L): 10.10	DO (%): 82.10	Conductivit	y (µS/cm): 57	pH: 7.1	7
Water Color:		-	idity (NTU):		ocity (m/s)(ft/	=	
Stream Cha	nnel						
Stream Grad		75 Entr	enchment: Slightly E	Entrenched			
Catchment A			eddedness: Low	Shuchened			
	mensions (m)		HW Wetted	Dominant Sul	ostrate: Bould	ler	
		Width 19.8		lominant Subs			
		Hum 17.0	15.) Dubu	oninant Subs	Hate 1. C0001		
		Depth 1.50		lominant Subs			
Rosgen Class	Thalweg I	Depth 1.50		lominant Subs	trate 2: Sand		loodplains.
0	Thalweg I s: C2 Low gra	Depth 1.50 adient, meandering	0.80 Subd , point-bar, riffle/pool, a	lominant Substalluvial channe	trate 2: Sand		oodplains.
Riparian Ve	Thalweg I s: C2 Low gra	Depth 1.50 adient, meandering	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992	lominant Substalluvial channe	trate 2: Sand		
Riparian Ve Dist. from	Thalweg I s: C2 Low gra	Depth 1.50 adient, meandering	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy	lominant Substalluvial channe	trate 2: Sand ls with broad,	well-defined f	Canopy
Riparian Ve Dist. from Bank (m) <u>L</u>	Thalweg I s: C2 Low gra egetation (Left Bank Veg	Depth 1.50 adient, meandering Communities (getation Type	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m)	lominant Substalluvial channe) <u>Right Bank V</u>	trate 2: Sand ls with broad, Vegetation Ty	well-defined f	Canopy Height(m
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C	Thalweg I s: C2 Low gra egetation (<u>Left Bank Veg</u> Closed Tall W	Depth 1.50 adient, meandering Communities (V getation Type Fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2	lominant Substalluvial channe) <u>Right Bank V</u> Closed Tall A	trate 2: Sand ls with broad, Vegetation Ty Ider-Willow S	well-defined f. De Shrub	Canopy Height(m 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S	well-defined f T pe Shrub Shrub	Canopy Height(m 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C	Thalweg I s: C2 Low gra egetation (Left Bank Veg Closed Tall W Closed Tall W Closed Tall W	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A	trate 2: Sand ls with broad, Vegetation Ty Ider-Willow S Ider-Willow S	well-defined f. P PE Shrub Shrub Shrub	Canopy Height(m 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S	well-defined f. P PE Shrub Shrub Shrub	Canopy Height(m 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C	Thalweg I s: C2 Low gra egetation (Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W	Depth 1.50 adient, meandering Communities (V getation Type fillow Shrub fillow Shrub fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A	trate 2: Sand ls with broad, Vegetation Ty Ider-Willow S Ider-Willow S Ider-Willow S	well-defined f DE Shrub Shrub Shrub Shrub	Canopy Height(m 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C	Thalweg I s: C2 Low gra egetation (Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W	Depth 1.50 adient, meandering Communities (V getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A	trate 2: Sand ls with broad, Vegetation Ty Ider-Willow S Ider-Willow S Ider-Willow S	well-defined f DE Shrub Shrub Shrub Shrub	Canopy Height(m 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-N	Thalweg I s: C2 Low gra egetation (Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec	Depth 1.50 adient, meandering Communities (V getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub fillow Shrub	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A	trate 2: Sand ls with broad, Vegetation Ty Ider-Willow S Ider-Willow S Ider-Willow S	well-defined f DE Shrub Shrub Shrub Shrub	Canopy Height(n 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec wations	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods etrofisher	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2 5 Estimated reach	lominant Substalluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T	Canopy Height(n 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish Boat-N Fish Observ Species: slimy	Thalweg I s: C2 Low gra egetation (Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec vations y sculpin	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods ctrofisher Life	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2 Estimated reach Stage: juvenile/adult	lominant Subst alluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A a length (m): 16 Life Hi	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total Ele story: Reside	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T nt	Canopy Height(n 10 10 10 10 10 ime (s): 450
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec Wations y sculpin Count: 1	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods etrofisher Life Fish Measured:	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2 Estimated reach Stage: juvenile/adult	lominant Subst alluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A a length (m): 16 Life Hi	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T	Canopy Height(n 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C Sampling M	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec Wations y sculpin Count: 1	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods ctrofisher Life	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2 Estimated reach Stage: juvenile/adult	lominant Subst alluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A a length (m): 16 Life Hi	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total Ele story: Reside	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T nt	Canopy Height(m 10 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec Wations y sculpin Count: 1	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods etrofisher Life Fish Measured:	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2 Estimated reach Stage: juvenile/adult	lominant Subst alluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A a length (m): 16 Life Hi	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total Ele story: Reside	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T nt	Canopy Height(m 10 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C Sampling M Comments:	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec vations y sculpin Count: 1 Lethod (No. of	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods etrofisher Life Fish Measured:	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 2 Estimated reach Stage: juvenile/adult	lominant Subst alluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A a length (m): 16 Life Hi	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total Ele story: Reside	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T nt	Canopy Height(m 10 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C Sampling M Comments:	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec vations y sculpin Count: 1 Lethod (No. of S	Depth 1.50 adient, meandering Communities (getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods etrofisher Life Fish Measured:	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 Estimated reach Stage: juvenile/adult 1 Fork Lengths (mr	lominant Subst alluvial channe) Right Bank V Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A a length (m): 16 Life Hi	trate 2: Sand ls with broad, <u>Vegetation Ty</u> Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total Ele story: Reside Max: 61	well-defined f. De Shrub Shrub Shrub ectrofishing T nt Mean: 61	Canopy Height(m 10 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C Sampling M Comments:	Thalweg I s: C2 Low gra egetation C Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec vations y sculpin Count: 1 Iethod (No. of s lient: handh	Depth 1.50 adient, meandering Communities (V getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods extrofisher Life Fish Measured: f fish): BEF (1)	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 Estimated reach Stage: juvenile/adult 1 Fork Lengths (mr Chann	lominant Subst alluvial channe) Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A A Closed Tall A Life Hia n) Min: 61	trate 2: Sand ls with broad, ls with broad, vegetation Ty Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total El story: Reside Max: 61	well-defined f. De Shrub Shrub Shrub ectrofishing T nt Mean: 61	Canopy Height(m 10 10 10 10 10
Riparian Ve Dist. from Bank (m) <u>L</u> 0 - 5 C 5 - 10 C 10 - 20 C 20 - 30 C Key To Fish (BEF) Boat-M Fish Observ Species: slimy Total Fish C Sampling M Comments: Instruments Stream Grad	Thalweg I s: C2 Low gra egetation (Left Bank Veg Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Mounted Elec vations y sculpin Count: 1 Lethod (No. of S lient: handh city: GPS F	Depth 1.50 adient, meandering Communities (V getation Type fillow Shrub fillow Shrub fillow Shrub fillow Shrub g Methods extrofisher Life Fish Measured: f fish): BEF (1)	0.80 Subd , point-bar, riffle/pool, a Viereck et al. 1992 Canopy Height(m) 2 2 2 2 Estimated reach Stage: juvenile/adult 1 Fork Lengths (mr Chann Chann	kine de la participa de la la vial channe Alla vial channe Alla channe Alla channe Closed Tall A Closed Ta	trate 2: Sand ls with broad, ls with broad, vegetation Ty Ider-Willow S Ider-Willow S Ider-Willow S Ider-Willow S 500 Total El story: Reside Max: 61	well-defined f. De Shrub Shrub Shrub Shrub ectrofishing T nt Mean: 61 ng rod	Canopy Height(m 10 10 10 10 10

Station Info								
Observers: Jo	onathan Kir	sch, Bob Powe	ers			Date/T	`ime: 08/19/20	011 9:50 AM
Station Coordinates	Latitude 61.09351	Longitude -148.74177		Sample Coordinates	Latitude 61.09351	Longitude -148.74177	Latitude / 61.09459	8
Elevation NED) (m)(ft): 3	52 1155						
Coordinate De	termination	n Method: N	Ion-Differentia	ll GPS Field Me	easurement	Datum: W	/GS84	
USGS Quadra	ngle: Anch	orage A-5		Legal Descrip	otion (MTRS	s): S012N004	E33	
Waterbody Na	me:							
Anadromous V	Vaters Cata	alog Number:						
Geographic Co	omments:]	HM21. Unnai	ned tributary to	o Lake Fork Kn	ik River.			
Visit Comment	ts: pH sens	or may have b	een malfunctio	oning. Stream v	vas too deep	and swift to w	ade, so depth v	vas estimated.
Wildlife Comn	-	2		U	•		· •	
Water Qualit	-		14.63 DO	(9/), 103 50	Conductivit)	50
Water Qualit Water Temp (Water Color: (C): 1.17	DO (mg/L):				y (µS/cm): 29 locity (m/s)(ft	pH: 4.5 (/s): 3.61 11.84	
Water Temp (C): 1.17 Glacial, Hig	DO (mg/L):		· · ·		• •	-	
Water Temp (Water Color: Stream Chan	C): 1.17 Glacial, Hig	DO (mg/L): h Turbidit 1		U): 300.00	Thalweg Vel	• •	-	
Water Temp (Water Color: (C): 1.17 Glacial, Hig nnel ent (%): 3	DO (mg/L): h Turbidit T	urbidity (NTU	U): 300.00		• •	-	
Water Temp (Water Color: (Stream Chan Stream Gradie Catchment Are	C): 1.17 Glacial, Hig mel ent (%): 3 ea(sq. km):	DO (mg/L): h Turbidit T 45	urbidity (NTU Entrenchment Embeddedness	U): 300.00	Thalweg Vel	locity (m/s)(ft	:/s): 3.61 11.84	
Water Temp (Water Color: (Stream Chan Stream Gradie	C): 1.17 Glacial, Hig unel ent (%): 3 ea(sq. km): ensions (m):	DO (mg/L): h Turbidit T 45 : Bankfull	urbidity (NTU Entrenchment Embeddedness OHW Wo	U): 300.00 : Moderatley s: Low etted D	Thalweg Vel	bstrate: Bould	der	
Water Temp (Water Color: (Stream Chan Stream Gradie Catchment Are	C): 1.17 Glacial, Hig anel ent (%): 3 ea(sq. km): ensions (m):	DO (mg/L): h Turbidit T 45	urbidity (NTU Entrenchment Embeddedness OHW Wa 1	U): 300.00 : Moderatley s: Low etted D 3.0 Subdo	Thalweg Vel 7 Entrenched Dominant Sul minant Subs	locity (m/s)(ft	der le	

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated	_	Unvegetated	_
5 - 10	Unvegetated		Unvegetated	
10 - 20	Unvegetated		Unvegetated	
20 - 30	Unvegetated		Closed Tall Alder Shrub	2.5

Key To Fish Sampling Methods

Estimated reach length (m): 278

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelChannel Depths:Stream Velocity:Orange FloatChannel Widths:handheld laser rangefinderTurbidity:LaMotte 2020e turbidimeterElectrofisher:Smith-Root LR-24Water Quality:YSI 556Transparency:



FSS1116C010550.jpg

FSS1116C010551.jpg

FSS1116C010552.jpg



Station Info

Observers: Jonathan Kirsch, Bob Powers			Date/Time: 0	8/19/2011 11:32 AM
StationLatitudeLongitudeCoordinates61.17384-148.62821	Sample Coordinates	Latitude 61.17367		AtitudeLongitude.17438-148.63077
Elevation NED (m)(ft): 170 558				
Coordinate Determination Method: Non-Differen			Datum: WGS84	
USGS Quadrangle: Anchorage A-5	Legal Descrip	tion (MTRS): S013N005E31	
Waterbody Name:				
Anadromous Waters Catalog Number:				
Geographic Comments: HM84. Unnamed tributary	y to Lake Fork Kn	ik River.		
Visit Comments: pH sensor may have been malfund	ctioning.			
Wildlife Comments:	-			
Water Quality \ Stream Flow				
Water Temp (C): 2.58DO (mg/L): 13.86DWater Color: Glacial, High TurbiditTurbidity (N	· · ·		y (µS/cm): 24 ocity (m/s)(ft/s): 1.6	pH: 5.32 8 5.51
Stream Channel				
Stream Gradient (%): 2 Entrenchme	ent: Slightly En	trenched		
Catchment Area(sq. km): 11 Embeddedm	ess: Low			
Channel Dimensions (m): Bankfull OHW	Wetted D	ominant Sul	ostrate: Cobble	
Width 30.0	8.0 Subdor	ninant Subs	trate 1: Boulder	
Thalweg Depth 2.40	0.70 Subdon	ninant Subs	trate 2: Gravel	
Rosgen Class: C2 Low gradient, meandering, point-	bar, riffle/pool, all	uvial channe	ls with broad, well-de	efined floodplains.
	-		,	1

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated		Unvegetated	
5 - 10	Unvegetated		Closed Tall Alder Shrub	3
10 - 20	Closed Tall Alder Shrub	3	Closed Tall Alder Shrub	3
20 - 30	Closed Tall Alder Shrub	3	Closed Tall Alder Shrub	3

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Estimated reach length (m): 206

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1116C020554.jpg

FSS1116C020555.jpg

FSS1116C020556.jpg

FSS1116C020557.jpg



Station Info			
Observers: Jonathan Kirsch, Bob Powers		Date/Time: 08/19/	2011 12:38 PM
StationLatitudeLongitudeCoordinates61.31829-148.53246	Sample Coordinates	Latitude Longitude Latitude 61.31829 -148.53246 61.3182	8
Elevation NED (m)(ft): 106 348 Coordinate Determination Method: Non-Differ USGS Quadrangle: Anchorage B-5 Waterbody Name: Fourteen Creek Anadromous Waters Catalog Number: Geographic Comments: HM131	rential GPS Field Mo Legal Descrip	easurement Datum: WGS84 Datum: WGS84 Dation (MTRS): S014N005E10	
Visit Comments: Very little current, and much of	channel was nearly	stagnant.	
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 8.58DO (mg/L): 12.50Water Color: Glacial, High TurbiditTurbidity	DO (%): 107.10 (NTU): 150.00	Conductivity (μS/cm): 90 pH: 6 Thalweg Velocity (m/s)(ft/s): 0.03 0.1	
Stream Channel			
Stream Gradient (%):0.05EntrenchCatchment Area(sq. km):134Embedded	0,	trenched	
Channel Dimensions (m): Bankfull OHW Width 25.0		Oominant Substrate: Silt/Clay minant Substrate 1:	
Thalweg Depth 0.90	0.85 Subdo	minant Substrate 2:	
Rosgen Class: C5 Low gradient, meandering, poin	nt-bar, riffle/pool, al	luvial channels with broad, well-defined	l floodplains.
Riparian Vegetation Communities (Vier	reck et al. 1992)		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
0 - 5 Open Tall Willow Shrub	1.5	Open Tall Willow Shrub	1.5
5 - 10 Open Tall Willow Shrub	1.5	Open Tall Willow Shrub	1.5
10 - 20 Open Tall Willow Shrub	1.5	Open Tall Willow Shrub	1.5
20 - 30 Open Tall Willow Shrub	1.5	Open Tall Willow Shrub	1.5
Key To Fish Sampling Methods	Estimated reach l	ength (m): 320	
(PEF) Backpack Electrofisher	(VOG)	Visual Observation, Ground	
· · ·	-	Life History: Unknown) Min: 125 Max: 260 Mean: 204	Median: 192
Species: sockeye salmonLife StagTotal Fish Count:2Fish Measured:1Sampling Method (No. of Fish):PEF (1) VOG (Comments:	Fork Lengths (mm)	Life History: Anadromous) Min: 550 Max: 550 Mean: 550	Median: 550
Species: slimy sculpinLife StagTotal Fish Count:1014Fish Measured:14Sampling Method (No. of fish):PEF (14) VOGComments:		Life History: Resident Min: 53 Max: 68 Mean: 59	Median: 60
Species: slimy sculpinLife StagTotal Fish Count:3Fish Measured:3Sampling Method (No. of fish):PEF (3)Comments:	e: adult Fork Lengths (mm)	Life History: Resident Min: 70 Max: 71 Mean: 70	Median: 70

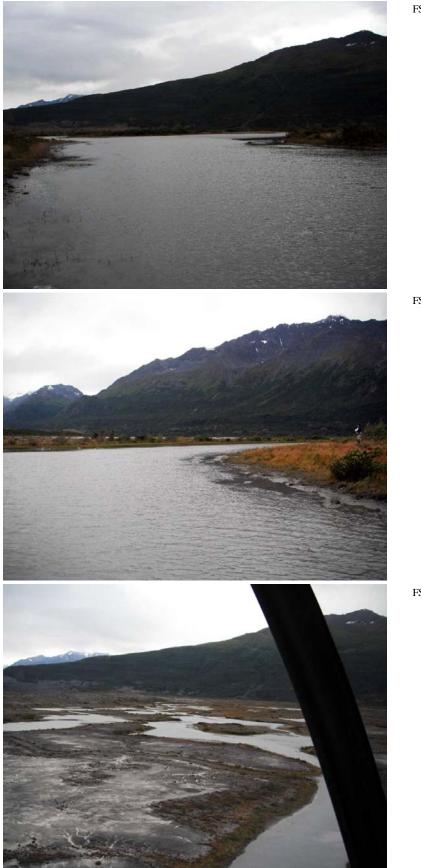
 Species: slimy sculpin
 Life Stage: juvenile
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 37
 Mean:
 37
 Median:
 37

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Vertical Period
 Vert

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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Station Info				
Observers: Jonathan Kirsch, Bob Powers			Date/Time: 08/1	9/2011 2:22 PM
Station Latitude Longitude Coordinates 61.71464 -148.80986	Sample Coordinates	Latitude 61.71443	Longitude / Latite -148.80947 / 61.71	
Elevation NED (m)(ft): 148 486				
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Anchorage C-5			Datum: WGS84 S019N004E30	
Waterbody Name:	Legal Descrip		50171004250	
Anadromous Waters Catalog Number:				
Geographic Comments: Small tributary to Mata Matanuska River flood		ream of Sutton	on River Left. Sample	d Channel within
Visit Comments: Wildlife Comments:	-			
Water Quality \ Stream Flow				
Water Temp (C): 7.34 DO (mg/L): 12.40	DO (%): 103.00	Conductivity	(µS/cm): 70 pH	: 5.49
Water Color: Glacial, Low Turbidit Turbidity	y (NTU): 70.00	Thalweg Velo	city (m/s)(ft/s): 1.36 4	.46
Stream Channel				
Stream Gradient (%): 0.2 Entrence	0,	trenched		
Catchment Area(sq. km): 32 Embedd				
Channel Dimensions (m): Bankfull OHW Width 12.0		ominant Subs ninant Substr		
Thalweg Depth 0.55		ninant Substr		
Rosgen Class: C4 Low gradient, meandering, po	int-bar, riffle/pool, all	uvial channels	with broad, well-defin	ed floodplains.
Riparian Vegetation Communities (Vie	reck et al. 1992)			
Dist. from	Canopy			Canopy
	1.			
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Right Bank Vo	egetation Type	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Open Tall Willow Shrub		<mark>Right Bank V</mark> e Open Tall Will		Height(m)
	2.1			_
 0 - 5 Open Tall Willow Shrub 5 - 10 Closed Paper Birch Forest 10 - 20 Closed Paper Birch Forest 	2.1 (18 (18 (Open Tall Will Unvegetated Unvegetated		_
0 - 5 Open Tall Willow Shrub5 - 10 Closed Paper Birch Forest	2.1 (18 (18 (Open Tall Will Unvegetated		_
 0 - 5 Open Tall Willow Shrub 5 - 10 Closed Paper Birch Forest 10 - 20 Closed Paper Birch Forest 	2.1 (18 (18 (Dpen Tall Will Unvegetated Unvegetated Unvegetated	ow Shrub	_
 0 - 5 Open Tall Willow Shrub 5 - 10 Closed Paper Birch Forest 10 - 20 Closed Paper Birch Forest 20 - 30 Closed Paper Birch Forest 	2.1 (18 (18 (18 (18 (Estimated reach la	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282	ow Shrub	_
 0-5 Open Tall Willow Shrub 5-10 Closed Paper Birch Forest 10-20 Closed Paper Birch Forest 20-30 Closed Paper Birch Forest Key To Fish Sampling Methods	2.1 (18 (18 (18 (18 (Estimated reach la	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282	low Shrub	_
 0 - 5 Open Tall Willow Shrub 5 - 10 Closed Paper Birch Forest 10 - 20 Closed Paper Birch Forest 20 - 30 Closed Paper Birch Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State 	2.1 (18 (18 (18 (18 (18 (18 (VOG) ge: juvenile	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282 Visual Obser Life Hist	low Shrub	_
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 0-5 Open Tall Willow Shrub 5-10 Closed Paper Birch Forest 10-20 Closed Paper Birch Forest 20-30 Closed Paper Birch Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State	2.1 (18 (18 (18 (18 (18 (VOG) ge: juvenile Fork Lengths (mm)	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282 Visual Obser Life Hist	ow Shrub	2
 0-5 Open Tall Willow Shrub 5-10 Closed Paper Birch Forest 10-20 Closed Paper Birch Forest 20-30 Closed Paper Birch Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 20 Fish Measured: 10 Sampling Method (No. of fish): PEF (10) VOC Comments: 	2.1 (18 (18 (18 (18 (18 (VOG) ge: juvenile Fork Lengths (mm)	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282 Visual Obser Life Hist Min: 35	ow Shrub	2
 0-5 Open Tall Willow Shrub 5-10 Closed Paper Birch Forest 10-20 Closed Paper Birch Forest 20-30 Closed Paper Birch Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life State Total Fish Count: 20 Fish Measured: 10 Sampling Method (No. of fish): PEF (10) VOC Comments: Species: Chinook salmon Life State Total Fish Count: 5 Fish Measured: 2 	2.1 (18 (18 (18 (18 (18 (18 ((VOG) ge: juvenile Fork Lengths (mm) G (10) ge: juvenile Fork Lengths (mm)	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282 Visual Obser Life Hist Min: 35	vation, Ground cory: Unknown Max: 82 Mean: 48	2 3 Median: 58
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 0-5 Open Tall Willow Shrub 5-10 Closed Paper Birch Forest 10-20 Closed Paper Birch Forest 20-30 Closed Paper Birch Forest 20-30 Closed Paper Birch Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Sta Total Fish Count: 20 Fish Measured: 10 Sampling Method (No. of fish): PEF (10) VOC Comments: Species: Chinook salmon Life Sta Total Fish Count: 5 Fish Measured: 2 Sampling Method (No. of fish): PEF (2) VOG Comments: Species: coho salmon Life Sta Total Fish Count: 2 Fish Measured: 2 Sampling Method (No. of fish): PEF (2) Comments: 	2.1 (18 U 18 U 18 U 18 U 18 U Estimated reach lo (VOG) ge: juvenile Fork Lengths (mm) G (10) ge: juvenile Fork Lengths (mm) G (3) ge: juvenile Fork Lengths (mm)	Dpen Tall Will Unvegetated Unvegetated Unvegetated ength (m): 282 Visual Obser Life Hist Min: 35 Life Hist Min: 59 Life Hist Min: 49	vation, Ground cory: Unknown Max: 82 Mean: 48 cory: Anadromous Max: 66 Mean: 62 cory: Anadromous Max: 74 Mean: 61	2 3 Median: 58 2 Median: 62
0 - 5Open Tall Willow Shrub5 - 10Closed Paper Birch Forest10 - 20Closed Paper Birch Forest20 - 30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count: 20Fish Measured: 10Sampling Method (No. of fish): PEF (10) VOCComments:Species: Chinook salmonLife StaTotal Fish Count: 5Fish Measured: 2Sampling Method (No. of fish): PEF (2) VOGComments:Species: coho salmonLife StaTotal Fish Count: 2Fish Measured: 2Sampling Method (No. of fish): PEF (2) VOGComments:Species: coho salmonLife StaTotal Fish Count: 2Fish Measured: 2Sampling Method (No. of fish): PEF (2)Comments:Species: slimy sculpinLife Sta	2.1 (18 (18 (18 (18 (18 (18 (WOG) ge: juvenile Fork Lengths (mm) G (10) ge: juvenile Fork Lengths (mm) G (3) ge: juvenile	Dpen Tall Will Unvegetated Unvegetated Unvegetated Ength (m): 282 Visual Obser Life Hist Min: 35 Life Hist Min: 49 Life Hist	vation, Ground cory: Unknown Max: 82 Mean: 48 cory: Anadromous Max: 66 Mean: 62	2 3 Median: 58 2 Median: 62 4 Median: 61
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Appendix L158.–Page 2 of 3.

Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 100 Max: 100 Total Fish Count: 1 Fish Measured: 1 **Mean:** 100 **Median:** 100 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 38 Max: 50 **Mean:** 44 Median: 44 Sampling Method (No. of fish): PEF (2) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 85 Max: 195 Total Fish Count: 8 Fish Measured: 8 **Mean:** 128 **Median:** 140 Sampling Method (No. of fish): PEF (8) **Comments:**

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1116C040566.jpg

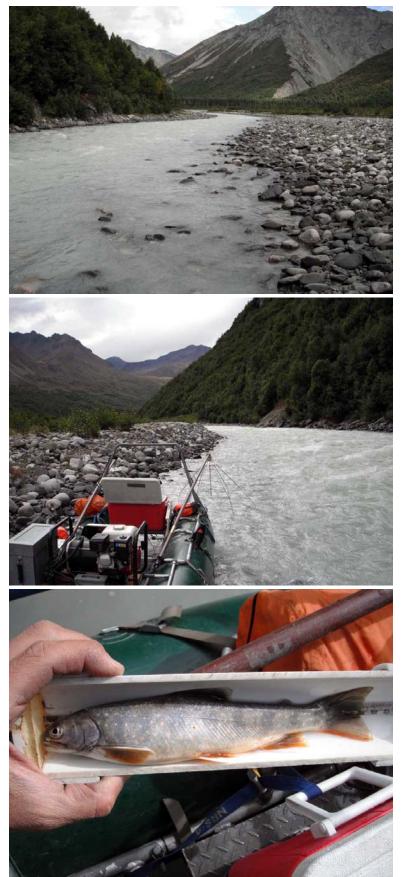


Station Info				
Observers: Joe Buckwalter, Heidi Zimmer			Date/Time: 08/20	0/2011 12:00 PM
StationLatitudeLongitudeCoordinates62.07210-148.19923	Sample Coordinates	Latitude 62.07210	Longitude / Latitu -148.19923 / 62.048	8
Elevation NED (m)(ft): 732 2402				
Coordinate Determination Method: Non-Diff USGS Quadrangle: Talkeetna Mts A-3			Datum: WGS84	
Waterbody Name: Chickaloon River	Legal Descrip	puon (MTTKS)	: S023N007E20	
Anadromous Waters Catalog Number:				
Geographic Comments:				
Visit Comments: Continued spot electrofishing Moss Creek), and observed or		econds tota) downstream of reach (approaching
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 5.34 DO (mg/L): 11.16	DO (%): 88.20	-	• •	7.66
Water Color: Glacial, High Turbidit Turbidit	y (NTU): 41.00	Thalweg Vel	ocity (m/s)(ft/s): 2.80 9.	18
Stream Channel				
Stream Gradient (%): 1.5 Entrend	6,	trenched		
Catchment Area(sq. km): 283 Embedd Channel Dimensions (m): Bankfull OHW	00	Jominout Curk	strate: Cobble	
Channel Dimensions (m): Bankfull OHV Width 18.0			rate 1: Boulder	
Thalweg Depth 2.00	0.80 Subdo	minant Subst	rate 2: Bedrock	
Rosgen Class: D4 Braided channel with longitud	dinal and transverse ba	ars. Very wid	e channel with eroding b	oanks.
B				
Riparian Vegetation Communities (Vie	ereck et al. 1992)			
Dist. from	Canopy			Canopy
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)		egetation Type	Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Open Low Alder Shrub	Canopy Height(m)		egetation Type	
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Alder Shrub5 - 10Open Low Alder Shrub	Canopy Height(m) 1.3 1.3	Closed Tall A Closed Paper	lder-Willow Shrub Birch Forest	Height(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Alder Shrub5 - 10Open Low Alder Shrub10 - 20Open Low Alder Shrub	Canopy Height(m) 1.3 1.3 1.3	Closed Tall A Closed Paper Closed Paper	lder-Willow Shrub Birch Forest Birch Forest	Height(m) 2 7.6 7.6
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Alder Shrub5 - 10Open Low Alder Shrub	Canopy Height(m) 1.3 1.3 1.3	Closed Tall A Closed Paper	lder-Willow Shrub Birch Forest Birch Forest	Height(m) 2 7.6
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Alder Shrub5 - 10Open Low Alder Shrub10 - 20Open Low Alder Shrub	Canopy Height(m) 1.3 1.3 1.3 1.3	Closed Tall A Closed Paper Closed Paper Closed Paper	lder-Willow Shrub Birch Forest Birch Forest	Height(m) 2 7.6 7.6 7.6 7.6
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Open Low Alder Shrub5 - 10Open Low Alder Shrub10 - 20Open Low Alder Shrub20 - 30Open Low Alder Shrub	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I	Closed Tall A Closed Paper Closed Paper Closed Paper	lder-Willow Shrub Birch Forest Birch Forest Birch Forest 00 Total Electrofishir	Height(m) 2 7.6 7.6 7.6 7.6
Dist. from Bank (m)Bank (m)Left Bank Vegetation Type0 - 5Open Low Alder Shrub5 - 10Open Low Alder Shrub10 - 20Open Low Alder Shrub20 - 30Open Low Alder ShrubKey To Fish Sampling Methods	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I	Closed Tall A Closed Paper Closed Paper Closed Paper ength (m): 30	lder-Willow Shrub Birch Forest Birch Forest Birch Forest 00 Total Electrofishir	Height(m) 2 7.6 7.6 7.6 7.6
Dist. from Left Bank Vegetation Type 0 - 5 Open Low Alder Shrub 5 - 10 Open Low Alder Shrub 10 - 20 Open Low Alder Shrub 20 - 30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life State	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I	Closed Tall A Closed Paper Closed Paper Closed Paper ength (m): 30 Visual Obse	lder-Willow Shrub Birch Forest Birch Forest Birch Forest 00 Total Electrofishir	Height(m) 2 7.6 7.6 7.6 7.6 7.6 7.6 7.6
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Low Alder Shrub 5 - 10 Open Low Alder Shrub 10 - 20 Open Low Alder Shrub 20 - 30 Open Low Alder Shrub 20 - 30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Fish Measured:	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB)	Closed Tall A Closed Paper Closed Paper Closed Paper ength (m): 30 Visual Obse Life His	lder-Willow Shrub Birch Forest Birch Forest Birch Forest 00 Total Electrofishir rvation, Boat	Height(m) 2 7.6 7.6 7.6 7.6
Dist. from Left Bank Vegetation Type 0 - 5 Open Low Alder Shrub 5 - 10 Open Low Alder Shrub 10 - 20 Open Low Alder Shrub 20 - 30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Life State	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB)	Closed Tall A Closed Paper Closed Paper Closed Paper ength (m): 30 Visual Obse Life His	lder-Willow Shrub Birch Forest Birch Forest D0 Total Electrofishir rvation, Boat tory: Unknown	Height(m) 2 7.6 7.6 7.6 7.6 7.6 7.6 7.6
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Low Alder Shrub 5-10 Open Low Alder Shrub 10-20 Open Low Alder Shrub 20-30 Open Low Alder Shrub 20-30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Comments:	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB)	Closed Tall A Closed Paper Closed Paper ength (m): 30 Visual Obse Life His) Min:	lder-Willow Shrub Birch Forest Birch Forest D0 Total Electrofishir rvation, Boat tory: Unknown	Height(m) 2 7.6 7.6 7.6 7.6 7.6 7.6 7.6
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Open Low Alder Shrub 5 - 10 Open Low Alder Shrub 10 - 20 Open Low Alder Shrub 20 - 30 Open Low Alder Shrub 20 - 30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life State Total Fish Count: 25 Fish Measured:	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB) nge: juvenile/adult Fork Lengths (mm)	Closed Tall A Closed Paper Closed Paper ength (m): 30 Visual Obse Life His Min: Life His	lder-Willow Shrub Birch Forest Birch Forest 00 Total Electrofishin rvation, Boat tory: Unknown Max: Mean:	Height(m) 2 7.6 7.6 7.6 7.6 7.6 7.6 7.6
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Low Alder Shrub 5-10 Open Low Alder Shrub 10-20 Open Low Alder Shrub 20-30 Open Low Alder Shrub 20-30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life State Total Fish Count: 25 Fish Measured: Sampling Method (No. of fish): VOB (25)	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB) ege: juvenile/adult Fork Lengths (mm)	Closed Tall A Closed Paper Closed Paper ength (m): 30 Visual Obse Life His Min: Life His	lder-Willow Shrub Birch Forest Birch Forest 00 Total Electrofishin rvation, Boat tory: Unknown Max: Mean: tory: Unknown	Height(m) 2 7.6 7.6 7.6 rg Time (s): 962 Median:
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Low Alder Shrub 5-10 Open Low Alder Shrub 10-20 Open Low Alder Shrub 20-30 Open Low Alder Shrub 20-30 Open Low Alder Shrub 20-30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life State Total Fish Count: 25 Sampling Method (No. of fish): VOB (25) Comments:	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB) age: juvenile/adult Fork Lengths (mm) age: juvenile Fork Lengths (mm)	Closed Tall A Closed Paper Closed Paper ength (m): 30 Visual Obse Life His) Min: Life His	lder-Willow Shrub Birch Forest Birch Forest Do Total Electrofishin rvation, Boat tory: Unknown Max: Mean: tory: Unknown Max: Mean:	Height(m) 2 7.6 7.6 7.6 rg Time (s): 962 Median:
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Low Alder Shrub 5-10 Open Low Alder Shrub 10-20 Open Low Alder Shrub 20-30 Open Low Alder Shrub 20-30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life State Total Fish Count: 25 Sampling Method (No. of fish): VOB (25) Comments: Species: Dolly Varden Life State Sampling Method (No. of fish): VOB (25) Comments: Species: Dolly Varden Life State	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB) ege: juvenile/adult Fork Lengths (mm)	Closed Tall A Closed Paper Closed Paper ength (m): 30 Visual Obse Uife His Min: Life His Min:	lder-Willow Shrub Birch Forest Birch Forest Do Total Electrofishin rvation, Boat tory: Unknown Max: Mean: tory: Unknown Max: Mean: tory: Unknown	Height(m) 2 7.6 7.6 7.6 rg Time (s): 962 Median: Median:
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Open Low Alder Shrub 5-10 Open Low Alder Shrub 10-20 Open Low Alder Shrub 20-30 Open Low Alder Shrub 20-30 Open Low Alder Shrub Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: salmonid-unspecified Life State Total Fish Count: 6 Fish Measured: Sampling Method (No. of fish): VOB (6) Comments: Species: Dolly Varden Life State Total Fish Count: 25 Sampling Method (No. of fish): VOB (25) Comments: Species: Dolly Varden Life State Sampling Method (No. of fish): VOB (25) Comments: Species: Dolly Varden Life State	Canopy Height(m) 1.3 1.3 1.3 1.3 Estimated reach I (VOB) definition (VOB) fork Lengths (mm) age: juvenile Fork Lengths (mm) age: juvenile/adult Fork Lengths (mm) age: juvenile/adult	Closed Tall A Closed Paper Closed Paper ength (m): 30 Visual Obse Life His Min: Min: Life His Min:	lder-Willow Shrub Birch Forest Birch Forest D0 Total Electrofishin rvation, Boat tory: Unknown Max: Mean: tory: Unknown Max: Mean: tory: Unknown Max: Mean:	Height(m) 2 7.6 7.6 7.6 rg Time (s): 962 Median: Median:

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



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FSS1117A010646.jpg

FSS1117A010650.jpg



FSS1117A010651.jpg

Station Info Observers: Joe Buckwalter, Heidi Zimmer Elevation NED (m)(ft): 544 1785 Coordinate Determination Method: Non-Differential GPS Field Measurement USGS Quadrangle: Anchorage D-4 Waterbody Name: Chickaloon River **Anadromous Waters Catalog Number:**

Geographic Comments: This site represents Hotel Rock. No data were collected.

Visit Comments: This iste represents Hotel Rock. No data were collected.

Wildlife Comments:

Water Quality \ Stream Flow

Water Temp (C): Water Color:	DO (mg/L): Tu	ırbidity	DO (%): (NTU):	Conductivity (µS/cm): Thalweg Velocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%):	E	ntrench	ment:		
Catchment Area(sq. km):	E	mbedde	dness:		
Channel Dimensions (m)	: Bankfull	OHW	Wetted	Dominant Substrate:	
,	Width			Subdominant Substrate 1:	
Thalweg I	Depth			Subdominant Substrate 2:	
Rosgen Class:					

Sample

Coordinates

Latitude

61.95751

Legal Description (MTRS): S022N006E35

Longitude

-148.29615

Datum: WGS84

Date/Time: 08/20/2011 11:06 AM

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m) <u>Right Bank Vegetation Type</u>	Canopy Height(m)
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(NON) None

Fish Observations

Species: no collection effort Life Stage: not applicable Life History: Not Applicable Median: **Total Fish Count:** 0 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): NON (0) **Comments:**

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

	-			
Station Info				
Observers: Raye Ann Neustel, Stormy Haugh	t		Date/Time: 08/2	0/2011 9:48 AM
StationLatitudeLongitudeCoordinates61.86244-148.20206	Sample Coordinates	Latitude 61.86244	Longitude / Latitu -148.20206 / 61.85	8
Elevation NED (m)(ft): 823 2700 Coordinate Determination Method: Non-Dif	forantial GDS Field M	laguramont	Datum: WGS84	
USGS Quadrangle: Anchorage D-4			: S021N007E32	
Waterbody Name: Boulder Creek		P (»,		
Anadromous Waters Catalog Number:				
Geographic Comments:				
Visit Comments: ATV tracks were observed pa estimated.	arallel to the river. The	e thalweg was	unwadeable, so channel	widths were
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 6.16 DO (mg/L): 8.82	DO (%): 71.20	Conductivity	γ (μS/cm): 253 pH	: 7.85
Water Color: Glacial, High Turbidit Turbidi	ty (NTU): 146.00	-	ocity (m/s)(ft/s): 1.50 4	.92
Stream Channel				
Stream Gradient (%): 0.5 Entren	chment: Moderatle	ey Entrenched		
	dedness: Moderate	5		
Channel Dimensions (m): Bankfull OHV	W Wetted	Dominant Sub	strate: Cobble	
Width 41.3		ominant Subst		
Thalweg Depth 2.10			rate 2: Silt/Clay	
Rosgen Class: D4 Braided channel with longitu	idinal and transverse l	bars. Very wid	e channel with eroding l	banks.
Riparian Vegetation Communities (Vi	ereck et al. 1992))		
Dist. from	Canopy			Canopy
Bank (m) Left Bank Vegetation Type	Height(m)	<u>Right Bank V</u>	egetation Type	Height(m
0 - 5 Open Tall Willow Shrub	3	Open Tall Wi	llow Shrub	3
5 - 10 Open Tall Willow Shrub	3	Open Tall Wi	llow Shrub	3
10 - 20 Open Tall Willow Shrub	3	Open Tall Wi	llow Shrub	3
20 - 30 Open Tall Willow Shrub	3	Closed Tall A	lder-Willow Shrub	12
Key To Fish Sampling Methods	Estimated reach	length (m): 25	00 Total Electrofishin	ng Time (s): 2344
(BEF) Boat-Mounted Electrofisher	(VOB	B) Visual Obse	rvation, Boat	
Fish Observations				
Fish Observations	age• juvenile/adult	Life His	story. Resident	
Species: rainbow trout Life St	age: juvenile/adult Fork Lengths (mn		story: Resident Max: 270 Mean: 15	6 Median: 188

Comments:						
Species: rainbow trout	Life St	age: juvenile	Life H	listory: Resid	lent	
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 41	Max: 101	Mean: 78	Median: 71
Sampling Method (No.	of fish): BEF (4)					
Comments:						
Species: rainbow trout	Life St	age: adult	Life H	listory: Resid	lent	
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No.	of fish): VOB (4)					
Comments:						

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: Visual estimate Electrofisher: Smith-Root GPP 2.5 Transparency:



FSS1117b010406.jpg

FSS1117b010408.jpg

FSS1117b010409.jpg

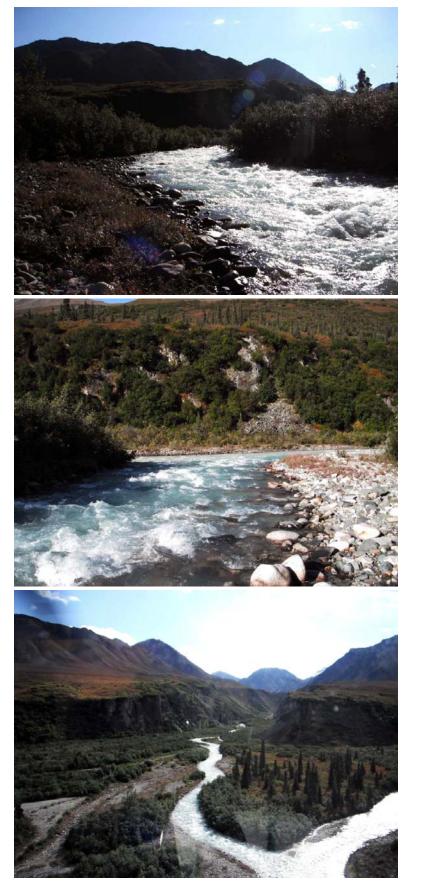
FSS1117b010411.jpg



Station Info				
Observers: Jonathan Kirsch, Bob Powers			Date/Time: 08/20/	2011 9:21 AM
StationLatitudeLongitudeCoordinates62.26995-148.43368ElemeticsNED(m)(ft):8282740	Sample Coordinates	Latitude 62.26874	Longitude / Latitud -148.42949 / 62.2694	
Elevation NED (m)(ft): 838 2749 Coordinate Determination Method: Non-Dif	ferential GPS Field Me	asurement	Datum: WGS84	
USGS Quadrangle: Talkeetna Mts B-3): S025N006E07	
Waterbody Name: Upper Talkeetna River	0			
Anadromous Waters Catalog Number:				
Geographic Comments: HU86	-1:			
Visit Comments: Thalweg unwadeablechanned				
Wildlife Comments: A caribou was observed i	lear the site.			
Water Quality \ Stream Flow				
Water Temp (C): 4.70 DO (mg/L): 12.09			y (μS/cm): 68 pH:	
Water Color: Glacial, Low Turbidit Turbidit	.y (NTU): 11.00	Fhalweg Vel	ocity (m/s)(ft/s): 3.33 10	.92
Stream Channel				
	chment: Slightly Ent	trenched		
	dedness: Low			
Channel Dimensions (m): Bankfull OHV			strate: Boulder	
Width 13.0 Thalweg Depth 1.10			rate 1: Cobble rate 2: Gravel	
Rosgen Class: C2 Low gradient, meandering, p				d floodplains.
	-			a 1100 aprillion
Riparian Vegetation Communities (Vie				
Dist. from Bank (m) Left Bank Vegetation Type	Canopy Height(m)	Diaht Doule V	logatation Truna	Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u> 0-5 Closed Tall Alder-Willow Shrub			/ <u>egetation Type</u> lder-Willow Shrub	4
5-10 Closed Tall Alder-Willow Shrub			lder-Willow Shrub	4
10 - 20 Closed Tall Alder-Willow Shrub			lder-Willow Shrub	4
20 - 30 Closed Tall Alder-Willow Shrub			lder-Willow Shrub	4
				4
Key To Fish Sampling Methods	Estimated reach le	ength (m): 40	0	
(PEF) Backpack Electrofisher	(VOG)	Visual Obse	rvation, Ground	
	· · · · ·	15441 0050	i vation, oround	
Fish Observations				
	age: juvenile/adult		story: Unknown	
	age: juvenile/adult Fork Lengths (mm)	Life Hi	story: Unknown	Median: 176
Species: Dolly VardenLife StateTotal Fish Count:12Fish Measured:5Sampling Method (No. of fish):PEF (5) VOOComments:	age: juvenile/adult Fork Lengths (mm)	Life His Min: 162	story: Unknown	Median: 176
Species: Dolly VardenLife StateTotal Fish Count:12Fish Measured:5Sampling Method (No. of fish):PEF (5) VOOComments:Species: slimy sculpinLife State	age: juvenile/adult Fork Lengths (mm) G (7) age: juvenile/adult Fork Lengths (mm)	Life His Min: 162 Life His	story: Unknown Max: 190 Mean: 177	Median: 176 Median: 45
Species: Dolly VardenLife StateTotal Fish Count:12Fish Measured: 5Sampling Method (No. of fish):PEF (5) VOOComments:Species: slimy sculpinLife StateTotal Fish Count:7Fish Measured: 3Sampling Method (No. of fish):PEF (3) VOOComments:	age: juvenile/adult Fork Lengths (mm) G (7) age: juvenile/adult Fork Lengths (mm)	Life His Min: 162 Life His	story: Unknown Max: 190 Mean: 177 story: Resident	
Species: Dolly VardenLife StateTotal Fish Count:12Fish Measured:5Sampling Method (No. of fish):PEF (5) VOOComments:Species: slimy sculpinLife StateTotal Fish Count:7Fish Measured:3Sampling Method (No. of fish):PEF (3) VOOComments:Instruments	age: juvenile/adult Fork Lengths (mm) G (7) age: juvenile/adult Fork Lengths (mm) G (4)	Life His Min: 162 Life His Min: 39	story: Unknown Max: 190 Mean: 177 story: Resident Max: 51 Mean: 45	
Species: Dolly VardenLife StateTotal Fish Count:12Fish Measured: 5Sampling Method (No. of fish):PEF (5) VOOComments:Species: slimy sculpinLife StateTotal Fish Count:7Fish Measured: 3Sampling Method (No. of fish):PEF (3) VOOComments:InstrumentsStream Gradient:handheld abney level	age: juvenile/adult Fork Lengths (mm) G (7) age: juvenile/adult Fork Lengths (mm) G (4) Channel	Life His Min: 162 Life His Min: 39 Depths: gr	story: Unknown Max: 190 Mean: 177 story: Resident Max: 51 Mean: 45 aduated wading rod	
Species: Dolly VardenLife StateTotal Fish Count:12Fish Measured: 5Sampling Method (No. of fish):PEF (5) VOOComments:Species: slimy sculpinLife StateTotal Fish Count:7Fish Measured: 3Sampling Method (No. of fish):PEF (3) VOOComments:Instruments	age: juvenile/adult Fork Lengths (mm) G (7) age: juvenile/adult Fork Lengths (mm) G (4) Channel	Life His Min: 162 Life His Min: 39 Depths: gr Widths: V	story: Unknown Max: 190 Mean: 177 story: Resident Max: 51 Mean: 45	

Water Quality: YSI 556

Electrofisher: **Transparency:**



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FSS1117C010569.jpg

FSS1117C010570.jpg

FSS1117C010571.jpg



Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/20/2011 11:34 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.14213 -148.29440 Coordinates -148.29662 62.14367 62.14184 -148.29369 Elevation NED (m)(ft): 891 2923 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts A-3 Legal Description (MTRS): S024N006E26 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HM92 at the confluence with HU7. All data was collected within the unnamed tributary of the Chickaloon River, near the confluence. Visit Comments: Wildlife Comments: Caribou antler shed next to helicopter. Water Quality \ Stream Flow Water Temp (C): 5.34 DO (mg/L): 11.99 DO (%): 93.20 Conductivity (µS/cm): 57 pH: 6.95 Water Color: Glacial, Low Turbidit Turbidity (NTU): 11.00 Thalweg Velocity (m/s)(ft/s): 1.43 4.69 **Stream Channel** Stream Gradient (%): 1 **Entrenchment:** Slightly Entrenched Catchment Area(sq. km): **Embeddedness:** 68 Low Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Cobble **Width** 10.2 Subdominant Substrate 1: Boulder 5.2 0.50 Thalweg Depth 1.10 Subdominant Substrate 2: Gravel Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Unvegetated Unvegetated 5 - 10 Unvegetated Unvegetated 10 - 20 Closed Tall Willow Shrub 3.5 Closed Tall Willow Shrub 3 20 - 30 Closed Tall Willow Shrub 3.5 Closed Tall Willow Shrub 3 **Key To Fish Sampling Methods** Estimated reach length (m): 270 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 3 Fish Measured: 2 Fork Lengths (mm) Min: 176 Max: 216 Mean: 196 **Median:** 196 Sampling Method (No. of fish): PEF (2) VOG (1) **Comments: Instruments**

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1117C020575.jpg

FSS1117C020576.jpg

FSS1117C020577.jpg



Station Info					
Observers: Jonathan Kirsch, Bob Powers			Date/T	Time: 08/20/2	011 1:00 PM
Station Latitude Longitude Coordinates 62.02034 -148.27693	Sample Coordinates	Latitude 62.02060	Longitude -148.27962	Latitude / 62.01954	
Elevation NED (m)(ft): 637 2090					
Coordinate Determination Method: Non-Diffe			Datum: W		
USGS Quadrangle: Talkeetna Mts A-3 Waterbody Name:	Legal Descri	ption (MTRS): S022N006	DE01	
Anadromous Waters Catalog Number:					
Geographic Comments: HM128. Unnamed trib	outary to the Chickalo	oon River.			
Visit Comments:					
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 6.56 DO (mg/L): 11.80 Water Color: Glacial, Low Turbidit Turbidity	DO (%): 96.20 7 (NTU): 8.00		y (µS/cm): 10 ocity (m/s)(ft	08 pH: 7. (/s): 1.40 4.59	
Stream Channel					
Stream Gradient (%): 1.2EntrenchCatchment Area(sq. km): 54Embedd	6,	ntrenched			
Channel Dimensions (m): Bankfull OHW		Dominant Sub			
Width 9.8		minant Subs			
Thalweg Depth 1.00 Rosgen Class: C2 Low gradient, meandering, po		minant Subs			floodplains
	-		s with broad,	, well-defilled	noouprains.
Riparian Vegetation Communities (Vie	reck et al. 1992)				
Dist. from	Canopy				Canopy
Bank (m) Left Bank Vegetation Type	Height(m)	<u>Right Bank V</u>		vpe	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Spruce-Paper Birch Forest	Height(m) 16.5	Closed Tall A	lder Shrub	<u>vpe</u>	Height(m) 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest	Height(m) 16.5 16.5	Closed Tall A Closed Tall A	lder Shrub lder Shrub	<u>vpe</u>	Height(m) 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest	Height(m) 16.5 16.5 16.5	Closed Tall A Closed Tall A Closed Tall A	lder Shrub lder Shrub lder Shrub	<u>vpe</u>	Height(m) 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest	Height(m) 16.5 16.5 16.5	Closed Tall A Closed Tall A	lder Shrub lder Shrub lder Shrub	<u>vpe</u>	Height(m) 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest	Height(m) 16.5 16.5 16.5	Closed Tall A Closed Tall A Closed Tall A Closed Tall A	lder Shrub lder Shrub lder Shrub lder Shrub	<u>vpe</u>	Height(m) 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch Forest	Height(m) 16.5 16.5 16.5 10 Estimated reach I	Closed Tall A Closed Tall A Closed Tall A Closed Tall A	lder Shrub lder Shrub lder Shrub lder Shrub 5		Height(m) 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack Electrofisher	Height(m) 16.5 16.5 16.5 10 Estimated reach I	Closed Tall A Closed Tall A Closed Tall A Closed Tall A Closed Tall A	lder Shrub lder Shrub lder Shrub lder Shrub 5		Height(m) 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF) Backpack ElectrofisherFish Observations	Height(m) 16.5 16.5 16.5 10 Estimated reach I	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29	lder Shrub lder Shrub lder Shrub lder Shrub 5	ınd	Height(m) 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count:535Fish Measured:	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His	lder Shrub lder Shrub lder Shrub lder Shrub 5 rvation, Grou	ınd	Height(m) 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count: 535Fish Measured: 35Sampling Method (No. of fish):	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His	lder Shrub lder Shrub lder Shrub lder Shrub 5 rvation, Grou	ınd	Height(m) 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOCComments:	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500)	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85	lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205	und own Mean: 130	Height(m) 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOOComments:Species: Dolly VardenLife State	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85	lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205	und own Mean: 130	Height(m) 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOOComments:Species: Dolly VardenLife State	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500)	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85	lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205	und own Mean: 130	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOCComments:Species: Dolly VardenLife StaTotal Fish Count:6Fish Measured:	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85	lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205	und own Mean: 130	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOCComments:Species: Dolly VardenLife StaTotal Fish Count:6Fish Measured:6Sampling Method (No. of fish):PEF (6)	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85	lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205	und own Mean: 130	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOOComments:Species: Dolly VardenLife StaTotal Fish Count:6Sampling Method (No. of fish):PEF (6)Comments:	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile Fork Lengths (mm	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85	lder Shrub lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205 story: Unkno Max: 73	und Mean: 130 own Mean: 65	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Fish Measured:Species: Dolly VardenLife StaTotal Fish Count:6Species: Dolly VardenLife StaTotal Fish Count:6Fish Measured:6Sampling Method (No. of fish):PEF (6)Comments:Eife StaInstruments	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile Fork Lengths (mm	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85 Life His) Min: 48	lder Shrub lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205 story: Unkno Max: 73	und own Mean: 130 own Mean: 65	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOOComments:Species: Dolly VardenLife StaTotal Fish Count:6Sampling Method (No. of fish):PEF (6)Comments:InstrumentsStream Gradient:handheld abney level	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile Fork Lengths (mm	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29) Visual Obse Life His) Min: 85 Life His) Min: 48	lder Shrub lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205 story: Unkno Max: 73	und Dwn Mean: 130 Dwn Mean: 65	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1
Bank (m)Left Bank Vegetation Type0-5Closed Spruce-Paper Birch Forest5-10Closed Spruce-Paper Birch Forest10-20Closed Spruce-Paper Birch Forest20-30Closed Paper Birch Forest20-30Closed Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count:535Sampling Method (No. of fish):PEF (35) VOCComments:Species: Dolly VardenLife StaTotal Fish Count:6Fish Measured:6Sampling Method (No. of fish):PEF (6)Comments:InstrumentsStream Gradient:handheld abney levelStream Velocity:transparent velocity head rod	Height(m) 16.5 16.5 16.5 10 Estimated reach I (VOG) ge: juvenile/adult Fork Lengths (mm G (500) ge: juvenile Fork Lengths (mm	Closed Tall A Closed Tall A Closed Tall A Closed Tall A ength (m): 29 Visual Obse Uife His Min: 85 Life His Min: 48	lder Shrub lder Shrub lder Shrub lder Shrub 5 rvation, Grou story: Unkno Max: 205 story: Unkno Max: 73	und Dwn Mean: 130 Dwn Mean: 65	Height(m) 2.1 2.1 2.1 2.1 2.1 2.1



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FSS1117C030580.jpg

Station Info				
Observers: Raye Ann Neustel, Stormy Haught			Date/Time: 08/23	/2011 11:33 AM
StationLatitudeLongitudeCoordinates61.89332-148.61595	Sample Coordinates	Latitude 61.89332	Longitude / Latitue -148.61595 / 61.872	8
Elevation NED (m)(ft): 612 2008			D / WCC04	
Coordinate Determination Method: Non-Diffe USGS Quadrangle: Anchorage D-5			Datum: WGS84): S021N005E19	
Waterbody Name: Kings River Anadromous Waters Catalog Number: Geographic Comments: IM38 Small cabin appr				s point.
Visit Comments: Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 5.21 DO (mg/L): 12.47 Water Color: Glacial, Low Turbidit Turbidity	DO (%): 98.20 (NTU): 21.00		y (μS/cm): 79 pH: pocity (m/s)(ft/s): 2.60 8.5	
Stream Channel				
Stream Gradient (%):1.25EntrenchCatchment Area(sq. km):124Embedde		Entrenched		
Channel Dimensions (m): Bankfull OHW			strate: Cobble	
Width 49.5 Thalweg Depth 0.94		minant Subs minant Subs	rate 1: Gravel	
Rosgen Class: D3 Braided channel with longitud				anks
		uis. Very wie		
Riparian Vegetation Communities (View	reck et al. 1992)			
Dist. from Bank (m) Left Bonk Vegetation Type	Canopy Height(m)	Diaht Donk 1	logatation True	Canopy Height(m)
Bank (m) Left Bank Vegetation Type	Height(m)		Vegetation Type	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated	Height(m)	Closed Tall V	illow Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated	Height(m)	Closed Tall V Closed Tall V	/illow Shrub /illow Shrub	Height(m) 12 12
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated	Height(m)	Closed Tall V Closed Tall V Closed Tall V	/illow Shrub /illow Shrub /illow Shrub	Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated10 - 20Unvegetated20 - 30Foliose and Fruticose Lichen	Height(m)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V	/illow Shrub /illow Shrub /illow Shrub /illow Shrub	Height(m) 12 12 12 12 12
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated10 - 20Unvegetated20 - 30Foliose and Fruticose LichenKey To Fish Sampling Methods	Height(m) 0.1 Estimated reach le	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30	/illow Shrub /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishin	Height(m) 12 12 12 12 12
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF)Boat-Mounted Electrofisher	Height(m) 0.1 Estimated reach le	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30	/illow Shrub /illow Shrub /illow Shrub /illow Shrub	Height(m) 12 12 12 12 12
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish Observations	Height(m) 0.1 Estimated reach le (VOB)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse	/illow Shrub /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishin rvation, Boat	Height(m) 12 12 12 12 12
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated10 - 20Unvegetated20 - 30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife Stag	Height(m) 0.1 Estimated reach le (VOB) ge: juvenile/adult	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit	 /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat 	Height(m) 12 12 12 12 12 g Time (s): 6975
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish Observations	Height(m) 0.1 Estimated reach lo (VOB) ge: juvenile/adult Fork Lengths (mm)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit	/illow Shrub /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishin rvation, Boat	Height(m) 12 12 12 12 12 g Time (s): 6975
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StagTotal Fish Count:238Fish Measured: 71	Height(m) 0.1 Estimated reach lo (VOB) ge: juvenile/adult Fork Lengths (mm)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit	 /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat 	Height(m) 12 12 12 12 12 g Time (s): 6975
Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Foliose and Fruticose Lichen Key To Fish Sampling Methods (BEF) Boat-Mounted Electrofisher Fish Observations Species: Dolly Varden Life Stag Total Fish Count: 238 Fish Measured: 71 Sampling Method (No. of fish): BEF (71) VOI Comments:	Height(m) 0.1 Estimated reach lo (VOB) ge: juvenile/adult Fork Lengths (mm)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit Min: 91	 /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat 	Height(m) 12 12 12 12 12 g Time (s): 6975
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StagTotal Fish Count: 238 Fish Measured: 71Sampling Method (No. of fish): BEF (71) VOIComments:Species: Dolly VardenLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (71) VOIComments:Species: Dolly VardenLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)	Height(m) 0.1 0.1 Estimated reach lo (VOB) ge: juvenile/adult Fork Lengths (mm) B (167) ge: juvenile	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit Min: 91	 /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat story: Unknown Max: 261 Mean: 151 story: Unknown 	Height(m) 12 12 12 12 g Time (s): 6975 Median: 176
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF) Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StagTotal Fish Count: 238 Fish Measured: 71Sampling Method (No. of fish): BEF (71) VOIComments:Species: Dolly VardenLife StagTotal Fish Count: 1Fish Measured: 71Sampling Method (No. of fish): BEF (71) VOIComments:Species: Dolly VardenLife StagTotal Fish Count: 1Fish Measured: 1Sampling Method (No. of fish): BEF (1)Comments:	Height(m) 0.1 Estimated reach le (VOB) ge: juvenile/adult Fork Lengths (mm) B (167) ge: juvenile Fork Lengths (mm)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit Min: 91 Life Hit	 /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat story: Unknown Max: 261 Mean: 151 story: Unknown 	Height(m) 12 12 12 12 g Time (s): 6975 Median: 176
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StagTotal Fish Count:238Fish Measured:71Sampling Method (No. of fish):BEF (71) VOIComments:Species: Dolly VardenLife StagTotal Fish Count:1Fish Measured:Species:Dolly VardenLife StagTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):BEF (1)Comments:Instruments	Height(m) 0.1 0.1 Estimated reach le (VOB) ge: juvenile/adult Fork Lengths (mm) B (167) ge: juvenile Fork Lengths (mm)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit Min: 91 Life Hit	 /illow Shrub /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat story: Unknown Max: 261 Mean: 151 story: Unknown Max: 75 Mean: 75 aduated wading rod 	Height(m) 12 12 12 12 g Time (s): 6975 Median: 176
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30Foliose and Fruticose LichenKey To Fish Sampling Methods(BEF)Boat-Mounted ElectrofisherFish ObservationsSpecies: Dolly VardenLife StagTotal Fish Count:238Fish Measured:71Sampling Method (No. of fish):BEF (71) VOIComments:Species: Dolly VardenLife StagTotal Fish Count:1Fish Measured:1Sampling Method (No. of fish):BEF (1)Comments:InstrumentsStream Gradient:handheld abney level	Height(m) 0.1 0.1 Estimated reach le (VOB) ge: juvenile/adult Fork Lengths (mm) B (167) ge: juvenile Fork Lengths (mm)	Closed Tall V Closed Tall V Closed Tall V Closed Tall V ength (m): 30 Visual Obse Life Hit Min: 91 Life Hit Min: 75	 /illow Shrub /illow Shrub /illow Shrub /illow Shrub 00 Total Electrofishing rvation, Boat story: Unknown Max: 261 Mean: 151 story: Unknown Max: 75 Mean: 75 aduated wading rod 	Height(m) 12 12 12 12 12 g Time (s): 6975 Median: 176



-continued-1101

FSS1120B010451.jpg



Station Info				
Observers: Jonathan Kirsch, Bob Powers			Date/Time: 08/2	0/2011 2:26 PM
Station Latitude Longitude Coordinates 61.88255 -148.60060	Sample Coordinates	Latitude 61.88501	Longitude / Latit -148.59934 / 61.88	8
Elevation NED (m)(ft): 576 1890				
Coordinate Determination Method: Non-Diffe	erential GPS Field Mo	easurement	Datum: WGS84	
USGS Quadrangle: Anchorage D-5	Legal Descrip	otion (MTRS): S021N005E30	
Waterbody Name:				
Anadromous Waters Catalog Number:				
Geographic Comments: HM51 at confluence with	ith HM 69. Unnamed	l tributary to	Kings River, near the co	nfluence.
Visit Comments:				
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 7.40 DO (mg/L): 11.62	DO (%): 96.50	Conductivit	у (µS/cm): 105 рН	: 7.87
Water Color: Glacial, Low Turbidit Turbidity	(NTU): 12.00	Thalweg Vel	ocity (m/s)(ft/s): 1.71 5	.61
Stream Channel				
Stream Gradient (%): 1 Entrencl	0,	trenched		
Catchment Area(sq. km): 126 Embedde				
Channel Dimensions (m): Bankfull OHW			ostrate: Boulder	
Width 19.6			trate 1: Cobble	
Thalweg Depth 1.50			trate 2: Gravel	
Rosgen Class: C2 Low gradient, meandering, point	nt-bar, riffle/pool, al	luvial channe	ls with broad, well-defin	ed floodplains.
Riparian Vegetation Communities (View	reck et al. 1992)			
Dist. from Bank (m) Left Bank Vegetation Type	Canopy Height(m)	Dight Barls	Vegetation Type	Canopy Height(m)

Bank (m)	Left Bank Vegetation Type	Height(m)	<u>Right Bank Vegetation Type</u>	Height(m)
0 - 5	Closed Tall Alder Shrub	2	Open Balsam Poplar (Black Cottonwood) Forest	16
5 - 10	Open Balsam Poplar (Black Cottonwood) Forest	24	Open Balsam Poplar (Black Cottonwood) Forest	16
10 - 20	Closed Tall Alder Shrub	2	Open Balsam Poplar (Black Cottonwood) Forest	16
20 - 30	Closed Tall Alder Shrub	2	Open Balsam Poplar (Black Cottonwood) Forest	16

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Estimated reach length (m): 310

(VOG) Visual Observation, Ground

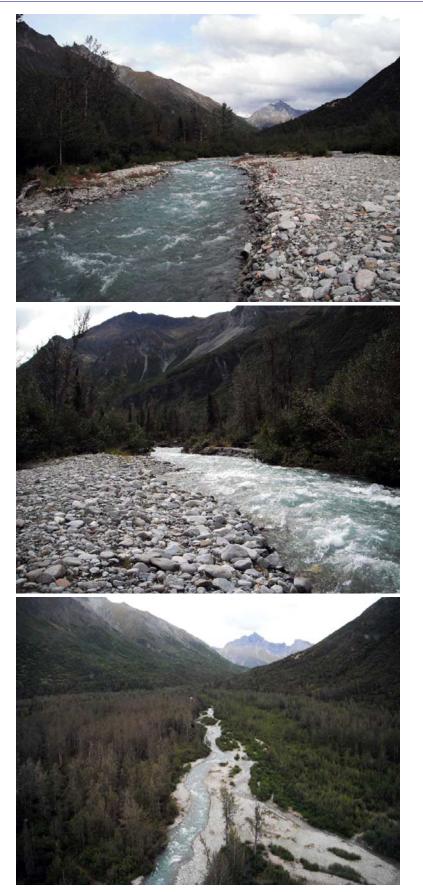
Fish Observations

Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count: 33** Fish Measured: 13 Fork Lengths (mm) Min: 89 Max: 157 Mean: 133 Median: 123 Sampling Method (No. of fish): PEF (13) VOG (20) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 72 **Total Fish Count:** 4 Fish Measured: 4 Max: 76 **Mean:** 74 Median: 74 Sampling Method (No. of fish): PEF (4) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1117C040582.jpg

FSS1117C040583.jpg

FSS1117C040584.jpg

FSS1117C040585.jpg



Station Info					
)				
Observers:	Jonathan Kirsch, Bob Pow	vers	Dat	te/Time: 08/20/2	011 3:43 PM
Station Coordinates Elevation NE	Latitude Longitude 61.77470 -148.84056 ED (m)(ft): 366 1201	Sample Coordinates	Latitude Longitu 61.77470 -148.840	ide / Latitude 056 / 61.77200	
		Non-Differential GPS Field M		: WGS84	
	rangle: Anchorage D-5	Legal Descri	ption (MTRS): S020N	003E36	
	Name: Granite Creek Waters Catalog Number	: 247-50-10220-2105			
	Comments: HM61				
Visit Comme Wildlife Com					
Water Qual	lity \ Stream Flow				
Water Temp Water Color:		12.27 DO (%): 100.40 Turbidity (NTU): 8.00	Conductivity (µS/cm) Thalweg Velocity (m/s	-	
Stream Cha	nnel				
Stream Grad Catchment A		Entrenchment: Moderatle Embeddedness: Low	ey Entrenched		
	-	II OHW Wetted	Dominant Substrate: C	obble	
	Width 28.0		ominant Substrate 1: B		
5	Thalweg Depth 1.80		ominant Substrate 2: C		1 1 17
Rosgen Class	stable plan and profile.	ed, moderate gradient, riffle d Stable banks.	ominated channel, with	infrequently space	ed pools. Very
Riparian Ve	egetation Communiti	ies (Viereck et al. 1992))		
Dist. from Bank (m) <u>L</u>	Left Bank Vegetation Type	Canopy <u>e</u> Height(m)	Right Bank Vegetation	<u>n Type</u>	Canopy Height(m)
0-5 C	Closed Paper Birch Forest	12	Closed Paper Birch For	rest	10
5-10 C	Closed Paper Birch Forest	12	Closed Paper Birch For	rest	10
10 - 20 C	Closed Paper Birch Forest	6	Closed Black Cottonwo	ood Forest	• •
					20
20 - 30 C	Closed Paper Birch Forest	6	Closed Black Cottonwo	ood Forest	20 20
	Closed Paper Birch Forest			ood Forest	
Key To Fish	-	Estimated reach			
Key To Fish	n Sampling Methods wack Electrofisher	Estimated reach	length (m): 360		
Key To Fish (PEF) Backp Fish Observ Species: Dolly Total Fish C	n Sampling Methods back Electrofisher vations ly Varden	Estimated reach (VOG Life Stage: juvenile/adult ared: 19 Fork Lengths (mn	length (m): 360 G) Visual Observation, C Life History: Ur	Ground	
Key To Fish (PEF) Backp Fish Observ Species: Dolly Total Fish C Sampling M Comments: Species: Chin Total Fish C	n Sampling Methods wack Electrofisher vations ly Varden Count: 219 Fish Measu lethod (No. of fish): PEF	Estimated reach (VOG Life Stage: juvenile/adult ared: 19 Fork Lengths (mm (19) VOG (200) Life Stage: juvenile ared: 2 Fork Lengths (mm	length (m): 360 j) Visual Observation, C Life History: Ur n) Min: 85 Max: 20 Life History: Ar	Ground Iknown 1 Mean: 149 Iadromous	20

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1117C050587.jpg

Station Info

Observers: Jonathan K	Kirsch, Bob Powers			Date/Time:	08/20/2011 11:11 AM
		Sample Coordinates	Latitude 62.23235	Longitude -148.43828	
Elevation NED (m)(ft): Coordinate Determinati USGS Quadrangle: Tal Waterbody Name: Talk Anadromous Waters Ca Geographic Comments:	ion Method: Non-Diff lkeetna Mts A-3 keetna River atalog Number:	Legal Descri	iption (MTRS	Datum: WGS84 (c): S025N005E25 points HU107 and	
Visit Comments: No ha Wildlife Comments:	abitat or fish data collect	red.			
Water Quality \ Stre	eam Flow				
Water Temp (C): Water Color:	DO (mg/L): Turbidit	DO (%): y (NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km	n): Embedo				
Channel Dimensions (r Thalweş	Width	Subd	Dominant Sub ominant Subst ominant Subst	rate 1:	
Rosgen Class:					
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10		Canopy		Vegetation Type	Canopy Height(m)
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5		Canopy		vegetation Type	
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Vegetation Type	Canopy		⁷ egetation Type	
Riparian Vegetation Dist. from Bank (m) Left Bank V 0 - 5 5 - 10 10 - 20 20 - 30	Vegetation Type	Canopy		Vegetation Type	
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Vegetation Type ng Methods fort Life Sta Fish Measured:	Canopy	<u>Right Bank V</u> Life His	Vegetation Type Story: Not Applica Max: Mea	Height(m)
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No.	Vegetation Type ng Methods fort Life Sta Fish Measured:	Canopy Height(m)	<u>Right Bank V</u> Life His	story: Not Applica	Height(m)
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No. Comments:	Vegetation Type ng Methods fort Life Sta Fish Measured:	Canopy Height(m) age: not applicable Fork Lengths (mn	<u>Right Bank V</u> Life His	story: Not Applica	Height(m)
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments	Vegetation Type ng Methods fort Life Sta Fish Measured:	Canopy Height(m)	<u>Right Bank V</u> Life His a) Min:	story: Not Applica	Height(m)
Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection ef Total Fish Count: 0 Sampling Method (No. Comments: Instruments Stream Gradient:	Vegetation Type ng Methods fort Life Sta Fish Measured:	Canopy Height(m)	<u>Right Bank V</u> Life His a) Min: el Depths: el Widths:	story: Not Applica	Height(m)

Station Info

Observers: Jonathan Kin	rsch, Bob Powers	~ -			08/20/2011 11:27 AM
		Sample Coordinates	Latitude 62.17316	Longitude -148.33479	
USGS Quadrangle: Talka Waterbody Name: Chick	on Method: Non-Different eetna Mts A-3 kaloon River	ial GPS Field M	leasurement	Datum: WGS84 : S024N006E15	
Anadromous Waters Cat	-			·	1. 1
	This site represents a water	fall barrier below	v target stream	point HU7. No sa	mpling occurred.
Visit Comments: No hab	ntat of fish data collected.				
Wildlife Comments:					
Water Quality \ Strea	am Flow				
Water Temp (C): Water Color:	DO (mg/L): DO Turbidity (NT	О (%): ГU):	Conductivity Thalweg Velo	y (μS/cm): pcity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km):	Entrenchmer : Embeddedne				
Channel Dimensions (m)): Bankfull OHW V	Vetted 1	Dominant Sub	strate:	
	Width		ominant Subst		
Thalweg	Depth	Subdo	ominant Subst	rate 2:	
Rosgen Class:					
Riparian Vegetation	Communities (Vierecl	k et al. 1992)			
Dist. from		Canopy			Canopy
Bank (m) <u>Left Bank Ve</u>	egetation Type		<u>Right Bank V</u>	egetation Type	Height(m)
0 - 5					
5 - 10					
10 - 20					
20 - 30					
Key To Fish Sampling	g Methods				
(NON) None					
Fish Observations					
Species: no collection effo	0	not applicable r k Lengths (mm		tory: Not Applica Max: Mea	
Total Fish Count: 0 Sampling Method (No. o Comments:			.,		
Total Fish Count: 0 Sampling Method (No. o					
Total Fish Count: 0 Sampling Method (No. o Comments:			el Depths:		
Total Fish Count: 0 Sampling Method (No. o Comments: Instruments		Channe			
Total Fish Count: 0 Sampling Method (No. o Comments: Instruments Stream Gradient:		Channe	el Depths: el Widths:		
Total Fish Count:0Sampling Method (No. oComments:InstrumentsStream Gradient:Stream Velocity:		Channe	el Depths: el Widths: fisher:		

Station Info					
Observers: Joe Buckwalter, Heidi Zimmer			Date/1	Fime: 08/21/2	011 8:55 AM
Station Latitude Longitude Coordinates 61.78461 -147.40798	Sample Coordinates	Latitude 61.78461	Longitude -147.40798		8
 Elevation NED (m)(ft): 673 2208 Coordinate Determination Method: Non-Diffe USGS Quadrangle: Anchorage D-2 Waterbody Name: South Fork Matanuska River Anadromous Waters Catalog Number: Geographic Comments: IM11. 	rential GPS Field Me Legal Descrip		Datum: W): S020N011		
Visit Comments: Station marked at waters edge, braided with 2 channels at habi vegetation at station disturbed l confluence. Right bank white s Wildlife Comments:	tat transect. Measure by tributary delta. Sa	ements reflect imple reach ei	primary cha nded just bel	nnel only. Lef ow East Fork M	t-bank
Water Quality \ Stream Flow					
Water Temp (C): 2.28 DO (mg/L): 12.90 Water Color: Glacial, High Turbidit Turbidity	DO (%): 94.00 (NTU): 280.00	Conductivity Thalweg Vel	-	6 pH: 7. t/s): 3.00 9.84	
Stream Channel					
Stream Gradient (%): 1.5EntrenchCatchment Area(sq. km): 339Embeddet	•	Entrenched			
Channel Dimensions (m): Bankfull OHW	Wetted D	ominant Sub	strate: Cobb	ole	
Width 132.0		minant Subst			
Thalweg Depth 2.05 Rosgen Class: D3 Braided channel with longitudi		minant Subst			ks
Riparian Vegetation Communities (Vier					
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank V	egetation T	ype	Canopy Height(m)
0-5 Unvegetated	(Open Low Al	der-Willow S	Shrub	1
5-10 Unvegetated	(Open Low Al	der-Willow S	Shrub	1
10 - 20 Unvegetated	(Open Low Al	der-Willow S	Shrub	1
20 - 30 Unvegetated	(Closed White	Spruce Fore	st	15
Key To Fish Sampling Methods(BEF)Boat-Mounted Electrofisher	Estimated reach lo (VOB)	e ngth (m): 50 Visual Obse		-	Fime (s): 2195
• · ·	ge: juvenile Fork Lengths (mm) (5)		story: Unkn Max: 81	own Mean: 76	Median: 76
Species: Dolly Varden Life Stag	Fork Lengths (mm)	Min:	story: Unkn Max:	own Mean:	Median:
Species: Dolly VardenLife StagTotal Fish Count:19Fish Measured:12	ge: juvenile/adult		story: Unkn	own	

 Species: Arctic grayling
 Life Stage: juvenile
 Life History: Resident

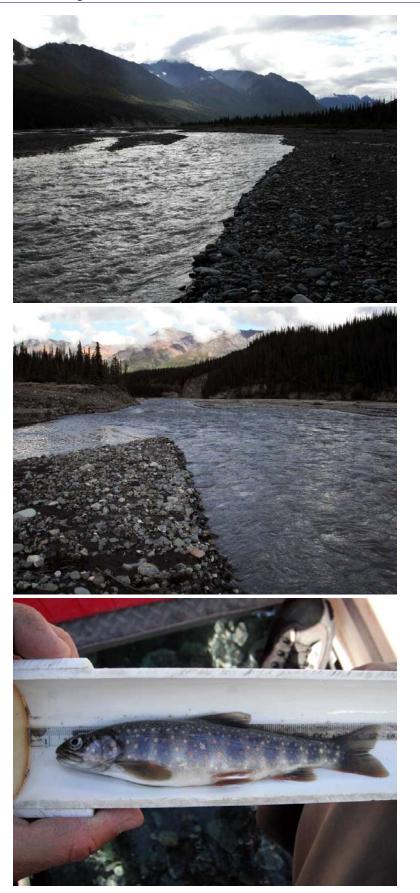
 Total Fish Count:
 2
 Fish Measured:
 2
 Fork Lengths (mm)
 Min:
 110
 Max:
 111
 Median:
 111

 Sampling Method (No. of fish):
 BEF (2)
 Comments:
 Image: Comment State Stat

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

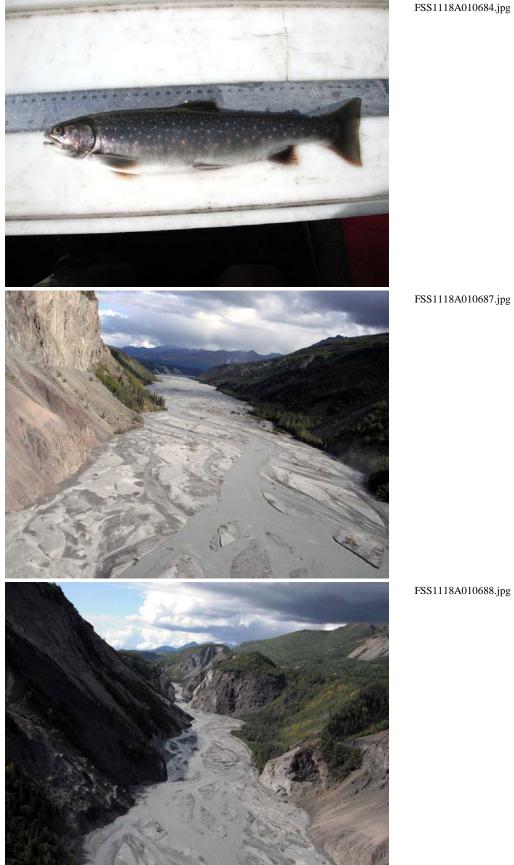
Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



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Sampling Method (No. of fish): BEF (1)

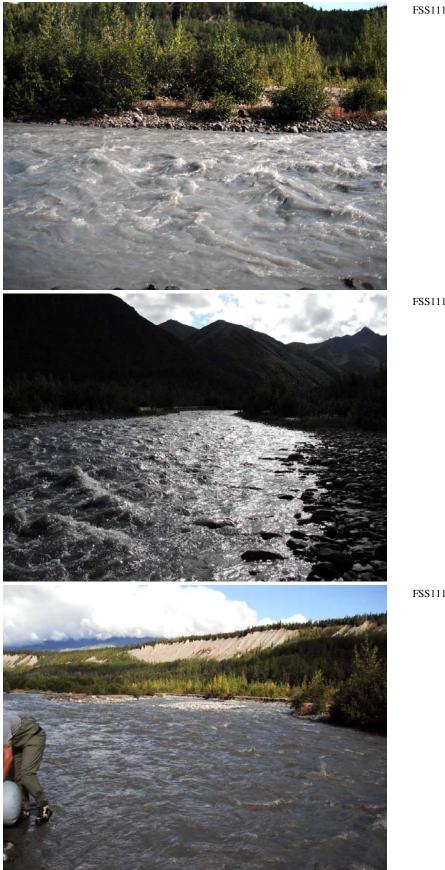
Comments:

Station Info Observers: Raye Ann Neustel, Stormy Haught Date/Time: 08/21/2011 8:15 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.74872 -147.93613 Coordinates -147.93613 61.74872 61.76588 -147.97497 Elevation NED (m)(ft): 463 1519 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-3 Legal Description (MTRS): S019N008E12 Waterbody Name: Gravel Creek **Anadromous Waters Catalog Number:** Geographic Comments: IM29 Visit Comments: ATV tracks parallel creek for approximately 400 m. Creek was non-wadeable, channel widths were estimated. Anode pole was broken at this sample site due to a narrow gap (slightly more narrow than width of cataraft) between a boulder and a canyon wall with very fast current flowing around a blind corner. Stream velocity calculated from TVHR readings is 1.44 m/s, although the readings were taken in the fringe flow rather than in the thalweg due to dangerous conditions. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 3.40 DO (mg/L): 13.52 DO (%): 101.60 Conductivity (µS/cm): 152 **pH:** 7.74 Water Color: Glacial, High Turbidit **Turbidity (NTU): 260.00** Thalweg Velocity (m/s)(ft/s): 2.60 8.53 Stream Channel Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched **Catchment Area(sq. km):** 215 **Embeddedness:** Low Channel Dimensions (m): **Bankfull OHW** Wetted Dominant Substrate: Cobble Width 41.3 Subdominant Substrate 1: Boulder 20.5 Thalweg Depth 0.94 0.79 Subdominant Substrate 2: Silt/Clay Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Bluejoint-Herb 0.3 Closed Tall Shrub Birch-Willow Shrub 10 5 - 10 Bluejoint-Herb 0.3 Closed Tall Shrub Birch-Willow Shrub 10 10 - 20 Bluejoint-Herb 0.3 Closed Tall Shrub Birch-Willow Shrub 10 0.3 Closed Tall Shrub Birch-Willow Shrub 20 - 30 Bluejoint-Herb 10 **Key To Fish Sampling Methods** Estimated reach length (m): 3900 Total Electrofishing Time (s): 1266 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count: 28** Fish Measured: 8 Fork Lengths (mm) Min: 87 Max: 181 Mean: 118 Median: 134 Sampling Method (No. of fish): BEF (8) VOB (20) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 79 Max: 79 **Mean:** 79 Median: 79

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: Visual estimate Electrofisher: Smith-Root GPP 2.5 Transparency:



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FSS1118b010429.jpg

FSS1118b010430.jpg

Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/21/2011 9:15 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.37458 -148.87835 Coordinates -148.87375 **/** 62.37193 62.37458 -148.87835 Elevation NED (m)(ft): 907 2976 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Talkeetna Mts B-4 Legal Description (MTRS): S026N003E03 Waterbody Name: East Fork Iron Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM27 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.43 DO (mg/L): 12.25 DO (%): 94.50 Conductivity (µS/cm): 86 pH: 7.41 Water Color: Clear Turbidity (NTU): 2.92 Thalweg Velocity (m/s)(ft/s): 1.05 3.44 **Stream Channel** Stream Gradient (%): 0.5 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 86 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble Width 15.0 8.5 Subdominant Substrate 1: Gravel Thalweg Depth 0.80 0.35 Subdominant Substrate 2: Sand Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 2.2 3 Closed Tall Willow Shrub Closed Tall Willow Shrub 3 0.1 5 - 10 Willow Dwarf Shrub Tundra Closed Tall Willow Shrub 10 - 20 Willow Dwarf Shrub Tundra 0.1 Closed Tall Willow Shrub 3 20 - 30 Willow Dwarf Shrub Tundra 0.1 Closed Low Willow Shrub 0.2 **Kev To Fish Sampling Methods** Estimated reach length (m): 415 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 1030 Fish Measured: 30 Fork Lengths (mm) Min: 100 Max: 220 Median: 160 Mean: 162 Sampling Method (No. of fish): PEF (30) VOG (1000) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 78 Max: 78 **Mean:** 78 Median: 78 Sampling Method (No. of fish): PEF (1) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root LR-24 Water Quality: YSI 556 **Transparency:**



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FSS1118C010596.jpg

Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/21/2011 10:51 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.29027 -148.94952 Coordinates -148.94569 62.28859 62.29068 -148.95028 Elevation NED (m)(ft): 720 2362 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Talkeetna Mts B-4 Legal Description (MTRS): S025N003E05 Waterbody Name: Iron Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM32 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow DO (%): 95.50 Water Temp (C): 5.66 DO (mg/L): 11.97 Conductivity (µS/cm): 65 pH: 7.50 Water Color: Glacial, Low Turbidit Turbidity (NTU): 20.70 Thalweg Velocity (m/s)(ft/s): 1.59 5.22 **Stream Channel** Stream Gradient (%): 1.5 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 168 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble **Width** 40.0 14.3 Subdominant Substrate 1: Boulder Thalweg Depth 1.70 0.65 Subdominant Substrate 2: Cobble Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 2.1 6 0 - 5 Open Tall Willow Shrub Closed Tall Alder-Willow Shrub 3 2.1 5 - 10 Open Tall Willow Shrub Closed Tall Alder-Willow Shrub 2.1 Closed Tall Alder-Willow Shrub 3 10 - 20 Open Tall Willow Shrub 20 - 30 Open Tall Willow Shrub 2.1 Closed Tall Alder-Willow Shrub 3 **Key To Fish Sampling Methods** Estimated reach length (m): 450 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Max: Mean: Median: Total Fish Count: 10 **Fish Measured:** Fork Lengths (mm) Min: Sampling Method (No. of fish): VOG (10) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 65 **Total Fish Count:** 3 Fish Measured: 3 Max: 82 **Mean:** 72 Median: 73 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fork Lengths (mm) Min: 103 Max: 103 **Total Fish Count:** 1 Fish Measured: 1 Mean: 103 Median: 103 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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Appendix L173.–Page 4 of 4.

FSS1118C020601.jpg



Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/21/2011 12:24 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.10902 -149.05755 Coordinates -149.05437 62.10772 62.10931 -149.05971 Elevation NED (m)(ft): 854 2802 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna Mts A-5 Legal Description (MTRS): S023N002E03 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HM37. Unnamed tributary to Sheep River. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.89 DO (mg/L): 11.76 DO (%): 94.20 Conductivity (µS/cm): 37 pH: 6.97 Water Color: Glacial, High Turbidit Turbidity (NTU): 53.40 Thalweg Velocity (m/s)(ft/s): 1.47 4.82 **Stream Channel** Stream Gradient (%): 0.5 **Entrenchment:** Slightly Entrenched Moderate **Catchment Area(sq. km):** 109 **Embeddedness:** Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Gravel Width 22.5 18.8 Subdominant Substrate 1: Cobble Thalweg Depth 1.10 0.48 Subdominant Substrate 2: Sand Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Willow Shrub	0.5	Open Tall Willow Shrub	1.2
5 - 10	Open Low Willow Shrub	0.5	Open Tall Willow Shrub	1.2
10 - 20	Open Low Willow Shrub	0.5	Open Tall Willow Shrub	1.2
20 - 30	Open Low Willow Shrub	0.5	Open Tall Willow Shrub	1.2

Estimated reach length (m): 360

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1118C030605.jpg

FSS1118C030606.jpg



Station Info					
Observers: Jonathan Kirsch, Bob Powers			Date/Ti	ime: 08/21/20	11 1:49 PM
StationLatitudeLongitudeCoordinates62.02947-149.27531	Sample Coordinates	Latitude 62.02935	Longitude -149.27206	/ Latitude 62.02939	Longitude -149.27525
Elevation NED (m)(ft): 618 2028					
Coordinate Determination Method: Non-Different			Datum: W		
USGS Quadrangle: Talkeetna Mts A-5	Legal Descrip	tion (MTRS): S022N0011	E04	
Waterbody Name:					
Anadromous Waters Catalog Number:					
Geographic Comments: HM58. Unnamed tributary	to the Kashwitna	River.			
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 6.34 DO (mg/L): 11.77 DO	O (%): 95.20	Conductivit	y (µS/cm): 28	pH: 6.9	7
Water Color: Clear Turbidity (N	ΓU): 4.80	Thalweg Vel	ocity (m/s)(ft/	/s): 1.68 5.51	
Stream Channel					
Stream Gradient (%): 0.8 Entrenchme	nt: Slightly Ent	trenched			
Catchment Area(sq. km): 79 Embeddedno	ess: Low				
Channel Dimensions (m): Bankfull OHW V	Vetted D	ominant Sul	strate: Cobbl	le	
Width 16.0	6.2 Subdor	ninant Subs	trate 1: Sand		
Thalweg Depth 1.10	0.52 Subdor	ninant Subs	trate 2: Bould	ler	
Rosgen Class: C3 Low gradient, meandering, point-b	ar riffle/pool all	uvial channel	ls with broad	well-defined fl	oodplains
Trongen Chass, Co Don gradient, meandering, point C	, 11110, pool, ull		is inter oroug,		oo opiumo.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	1.8
5 - 10	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	1.8
10 - 20	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	1.8
20 - 30	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	1.8

Estimated reach length (m): 259

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1118C040611.jpg



Station Info					
Observers: Jonathan Kirsch, Bob Powers			Date/T	'ime: 08/21/20	011 2:44 PM
Station Latitude Longitude Coordinates 61.56700 -148.61168	Sample Coordinates	Latitude 61.56754	Longitude -148.60704	Latitude / 61.56700	Longitude -148.61168
Elevation NED (m)(ft): 854 2802					
Coordinate Determination Method: Non-Different			Datum: W		
USGS Quadrangle: Anchorage C-5	Legal Descrip	tion (MTRS): S017N005	E18	
Waterbody Name:					
Anadromous Waters Catalog Number:					
Geographic Comments: HM60. Unnamed tributary	to Friday Creek.				
Visit Comments: Wildlife Comments:					
when comments.					
Water Quality \ Stream Flow					
Water Temp (C): 5.94 DO (mg/L): 11.71 DO	D (%): 94.10	Conductivit	y (µS/cm): 16	58 pH: 7.4	.6
Water Color: Glacial, High Turbidit Turbidity (NT	. ,			/s): 1.36 4.46	
		0	• • • •		
Stream Channel					
Stream Gradient (%): 1.5 Entrenchmen	nt: Moderatley	Entrenched			
Catchment Area(sq. km): 44 Embeddedne	ss: Moderate				
Channel Dimensions (m): Bankfull OHW W	Vetted D	ominant Sub	ostrate: Grave	el	
Width 9.0	6.5 Subdor	ninant Subs	trate 1: Cobb	le	
Thalweg Depth 0.85	0.45 Subdor	ninant Subs	trate 2: Sand		
Rosgen Class: B4 Moderately entrenched, moderate g stable plan and profile. Stable banks.	gradient, riffle dor	ninated chan	nel, with infro	equently space	d pools. Very

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Willow Shrub	2	Closed Low Willow Shrub	1
5 - 10	Closed Tall Willow Shrub	2	Closed Low Willow Shrub	1
10 - 20	Closed Low Willow Shrub	0.6	Closed Low Willow Shrub	1
20 - 30	Closed Low Willow Shrub	0.6	Closed Low Willow Shrub	1

Key To Fish Sampling Methods

Estimated reach length (m): 315

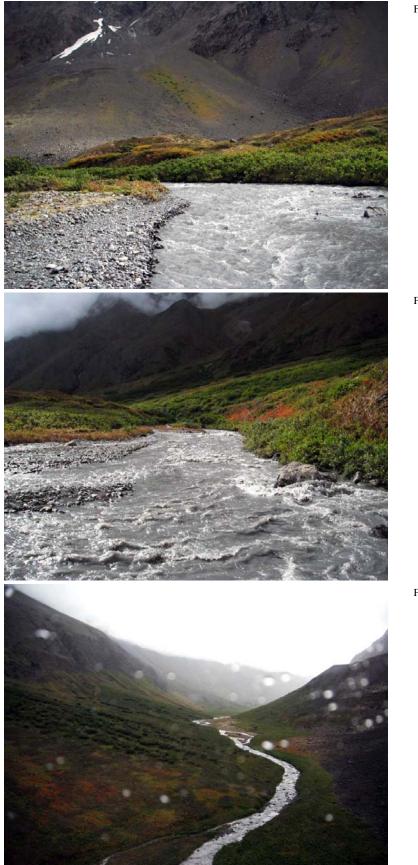
(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1118C050615.jpg

FSS1118C050616.jpg



Station Info

Observers: Jonathan K	irsch, Bob Powers	Sample Coordinate	Latitude s 61.81101	Date/Time: Longitude -149.00016	08/21/2011 3:11 PI
Elevation NED (m)(ft): Coordinate Determinati USGS Quadrangle: And Waterbody Name: Moo Anadromous Waters Ca Geographic Comments:	on Method: Non-Diffe chorage D-6 ose Creek utalog Number:	erential GPS Field Legal Desc	Measurement ription (MTRS	Datum: WGS84): S020N002E24	
Visit Comments: No sar Wildlife Comments:	mpling occurred.				
Water Quality \ Stre	am Flow				
Water Temp (C): Water Color:	DO (mg/L): Turbidity	DO (%): 7 (NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km): Entrench				
Channel Dimensions (n	n): Bankfull OHW	Wetted	Dominant Sul	ostrate:	
Thalweg Rosgen Class:	Width		dominant Subs dominant Subs		
Rosgen Class:	Width 5 Depth	Sub	dominant Subs		
Rosgen Class: Riparian Vegetation Dist. from	Width 5 Depth Communities (View	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	Cano Heigh
Rosgen Class: Riparian Vegetation	Width 5 Depth Communities (View	Sub reck et al. 1992 Canopy	dominant Subs		
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10	Width 5 Depth Communities (View	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Width 5 Depth Communities (View	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width 5 Depth Communities (View Gegetation Type	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Width 5 Depth Communities (View Gegetation Type	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width 5 Depth Communities (View Gegetation Type	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Width 5 Depth Communities (View Gegetation Type	Sub reck et al. 1992 Canopy	dominant Subs	trate 2:	
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplir (NON) None	Width 5 Depth Communities (View Communities (Vie	Sub reck et al. 1992 Canopy	dominant Subs 2)) <u>Right Bank V</u> Life Hi	trate 2:	Heigh
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No.	Width 5 Depth Communities (View Communities (Vie	Sub reck et al. 1992 Canopy Height(m) ge: not applicable	dominant Subs 2)) <u>Right Bank V</u> Life Hi	trate 2: Vegetation Type story: Not Applica	Heigh
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments:	Width 5 Depth Communities (View Communities (Vie	Sub reck et al. 1992 Canopy Height(m) ge: not applicable Fork Lengths (m	dominant Subs 2)) <u>Right Bank V</u> Life Hi	trate 2: Vegetation Type story: Not Applica	Heigh
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments	Width 5 Depth Communities (View Communities (Vie	Sub reck et al. 1992 Canopy Height(m) ge: not applicable Fork Lengths (m Chan	dominant Subs 2)) <u>Right Bank V</u> Life Hi m) Min:	trate 2: Vegetation Type story: Not Applica	Heigh
Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (NON) None Fish Observations Species: no collection eff Total Fish Count: 0 Sampling Method (No. Comments: Instruments Stream Gradient:	Width 5 Depth Communities (View Communities (Vie	Sub reck et al. 1992 Canopy Height(m) ge: not applicable Fork Lengths (m) Chan Chan	dominant Subs 2)) <u>Right Bank V</u> Life Hi m) Min: nel Depths:	trate 2: Vegetation Type story: Not Applica	Heigh

Station Info
Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/22/2011 12:00 PM
StationLatitudeLongitudeSampleLatitudeLongitudeLatitudeLongitudeCoordinates61.78645-148.20603Coordinates61.78645-148.2060361.78771-148.34509
Elevation NED (m)(ft): 324 1063
Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84
USGS Quadrangle: Anchorage D-4 Legal Description (MTRS): S020N007E33
Waterbody Name: Matanuska River
Anadromous Waters Catalog Number: 247-50-10220
Geographic Comments: MM15. Reach ended at clear, right bank side channel mouth.
Visit Comments:
Wildlife Comments: Three goats on bluff at put-in.
Water Quality \ Stream Flow
Water Temp (C): 4.55 DO (mg/L): 11.85 DO (%): 91.80 Conductivity (μS/cm): 106 pH: 7.89 Water Color: Glacial, High Turbidit Turbidity (NTU): 319.00 Thalweg Velocity (m/s)(ft/s): 2.80 9.18
Stream Channel
Stream Gradient (%): 1 Entrenchment: Slightly Entrenched
Catchment Area(sq. km): 2779 Embeddedness: Low
Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Cobble
Width 492.043.0Subdominant Substrate 1: Gravel
Thalweg Depth2.761.50Subdominant Substrate 2: Sand
Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	5	Closed White Spruce Forest	13
5 - 10	Closed Tall Alder-Willow Shrub	5	Closed White Spruce Forest	13
10 - 20	Closed Tall Alder-Willow Shrub	5	Closed White Spruce Forest	13
20 - 30	Closed Tall Alder-Willow Shrub	5	Closed White Spruce Forest	13

Key To Fish Sampling Methods

(BEF) Boat-Mounted Electrofisher

Estimated reach length (m): 8100 **Total Electrofishing Time (s):** 4896

(VOB) Visual Observation, Boat

Fish Observations

Species: salmonid-unspecified Life Stage: juvenile/adult Life History: Unknown						
Total Fish Count: 13	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. o	f fish): VOB (13)					
Comments: Event BB sa	lmonids were approxin	nately 150-200 mm. E	vent FF wer	e probobly D	olly Varden.	
Species: sockeye salmon	Life Sta	age: adult	Life Hi	story: Anad	romous	
Total Fish Count: 33	Fish Measured: 3	Fork Lengths (mm)	Min: 500	Max: 610	Mean: 570	Median: 555
Sampling Method (No. o	Sampling Method (No. of fish): BEF (3) VOB (30) Suspected Spawning: Yes					pawning: Yes
Comments: Color of soc	keye throughout reach	ranged from chrome to	blush to ve	ry red. Socke	ye adults in su	b-6 were all (e
Species: sockeye salmon	Life Sta	age: adult spawning	Life Hi	story: Anad	romous	
Total Fish Count: 101	Fish Measured: 1	Fork Lengths (mm)	Min: 610	Max: 610	Mean: 610	Median: 610
Sampling Method (No. of fish): BEF (1) VOB (100)						
Comments: Event RR, photo 716.						
Species: Dolly Varden	Life Sta	nge: juvenile	Life Hi	story: Unkn	own	
Total Fish Count: 20	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish): VOB (20)						
Comments:						

Life History: Resident Life Stage: juvenile/adult Species: slimy sculpin Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 63 Max: 63 Median: 63 **Mean:** 63 Sampling Method (No. of fish): BEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 88 Fish Measured: 23 Fork Lengths (mm) Min: 98 Max: 283 **Mean:** 144 **Median:** 190 Sampling Method (No. of fish): BEF (23) VOB (65) **Comments:** Species: coho salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2Fork Lengths (mm)Min: 540Max: 540 **Mean: 540 Median:** 540 Sampling Method (No. of fish): BEF (2) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 1 Max: 81 **Total Fish Count:** 1 Fork Lengths (mm) Min: 81 Mean: 81 Median: 81 Sampling Method (No. of fish): BEF (1) **Comments:**

Instruments

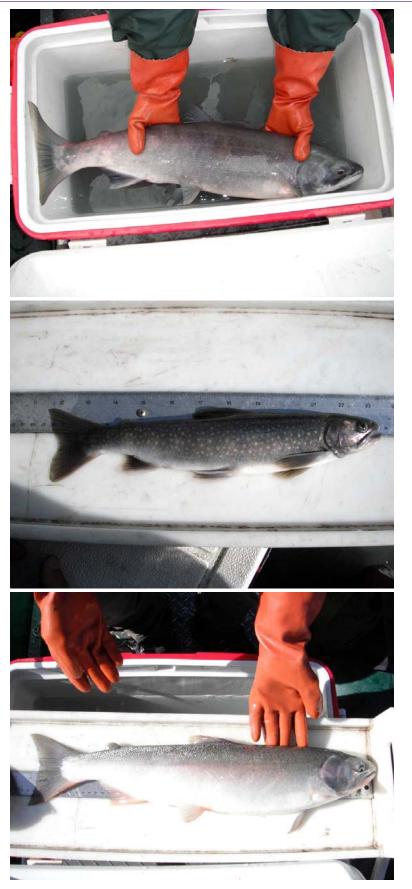
Stream Gradient: handheld abney level	Channel Depths: graduated wading rod		
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder		
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5		
Water Quality: YSI 556	Transparency:		



FSS1119A010701.jpg Looking upstream from habitat transect.

FSS1119A010702.jpg Looking downstream from habitat transect.

FSS1119A010705.jpg Left bank from habitat transect.



FSS1119A010708.jpg Sockeye salmon.

FSS1119A010713.jpg Dolly Varden.

FSS1119A010715.jpg Coho salmon from clear, rightbank side channel mouth at downstream end of reach.

-continued-1138



FSS1119A010718.jpg Sockeye and coho salmon in clear, right-bank side channel mouth at downstream end of reach.

FSS1119A010722.jpg

Looking upstream from the downstream end of the reach (clear side channel mouth on left of photo).

Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/22/2011 5:43 PM Sample Latitude Longitude Coordinates -148.65976 61.74201 Elevation NED (m)(ft): 198 650 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-5 Legal Description (MTRS): S019N004E13 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear, right-bank Matanuska River tributary. Visit Comments: Fly-by only. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 1.5 Catchment Area(sq. km): **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOH) Visual Observation, Helicopter **Fish Observations**

Species: sockeye salmonLife Stage: adult spawningLife History: AnadromousTotal Fish Count: 50Fish Measured:Fork Lengths (mm)Min:Max:Mean:Median:Sampling Method (No. of fish):VOH (50)Comments: See photos 723-724.

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



FSS1119A020723.jpg Sockeye salmon at mouth of side channel.

FSS1119A020724.jpg Sockeye salmon spawning in side channel.

Station Info						
Observers: Raye Ann Ne	eustel, Stormy Haught			Date/Ti	me: 08/22/20	11 9:45 AM
Station Latitude Coordinates 61.73664	Longitude -147.79153	Sample Coordinates	Latitude 61.73664	Longitude -147.79153	Latitude 61.78731	Longitude -147.80632
Elevation NED (m)(ft): 5	46 1791					
Coordinate Determination		ential GPS Field Me	easurement	Datum: WO	GS84	
USGS Quadrangle: Anch	orage C-3	Legal Descrip	tion (MTRS): S019N009E	E15	
Waterbody Name: Glacie	er Creek					
Anadromous Waters Cata	alog Number:					
Geographic Comments:						
Visit Comments: Very fa reading Wildlife Comments:	s were taken in the fringe	~		0	,	0
whulle Collinents.						
Water Quality \ Strea	m Flow					
Water Temp (C): 2.83 Water Color: Glacial, Hig		. ,		y (µS/cm): 159 locity (m/s)(ft/s	-	3
Stream Channel						
Stream Gradient (%): 1 Catchment Area(sq. km):	Entrenchr 129 Embedded	2	Entrenched			
Channel Dimensions (m)	: Bankfull OHW	Wetted D	ominant Sul	bstrate: Cobble	e	
7	Width 49.1	19.2 Subdor	minant Subs	trate 1: Gravel	1	
Thalweg 1	Depth 0.88	0.48 Subdor	minant Subs	trate 2: Silt/Cl	ay	
Rosgen Class: D3 Braided	l channel with longitudir	al and transverse ba	ars. Very wid	le channel with	n eroding bank	s.
	~ /=		-		-	
Riparian Vegetation (Communities (Viero	eck et al. 1992)				
Dist. from Book (m) L & D L M		Canopy Usight(m)				Canopy Height(m)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
0 - 5	Unvegetated		Unvegetated	
5 - 10	Unvegetated		Unvegetated	
10 - 20	Unvegetated		Unvegetated	
20 - 30	Closed Tall Willow Shrub	17	Fireweed	0.3

Key To Fish Sampling Methods

Estimated reach length (m): 6700 Total Electrofishing Time (s): 6605

(BEF) Boat-Mounted Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



FSS1119B010433.jpg

FSS1119B010434.jpg

FSS1119B010435.jpg



FSS1119B010437.jpg

FSS1119B010438.jpg

Station Info				
Observers: Jonathan Kirsch, Bob Powers			Date/Time: 03	8/22/2011 9:31 AM
StationLatitudeLongitudeCoordinates62.20223-149.63863	Sample Coordinates		· · · ·	titudeLongitude.20241-149.63941
Elevation NED (m)(ft): 586 1923	formatical CDS Eigld M	la a gunamant	Determ WCS94	
Coordinate Determination Method: Non-Dif USGS Quadrangle: Talkeetna Mts A-6			Datum: WGS84 S024N002W03	
Waterbody Name: South Fork Montana Creek	- -	Free Contraction of the second		
Anadromous Waters Catalog Number: Geographic Comments: HM63				
Visit Comments:				
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): 6.73DO (mg/L): 11.65Water Color: ClearTurbidit	DO (%): 95.40 ty (NTU): 0.07	Conductivity Thalweg Velo	(µS/cm): 47 j city (m/s)(ft/s): 1.56	pH: 6.43 5 5.12
Stream Channel				
	chment: Slightly E	ntrenched		
	dedness: Low			
Channel Dimensions (m): Bankfull OHV Width 12.2		Dominant Subs ominant Substr		
Thalweg Depth 0.91		ominant Substr		
Rosgen Class: C3 Low gradient, meandering, pe	oint-bar, riffle/pool, a	lluvial channels	with broad, well-de	efined floodplains.
Riparian Vegetation Communities (Vie	ereck et al. 1992))		
Dist. from Bank (m) Left Bonk Vegetation Type	Canopy Height(m)	Dicht Donk W	actation Trues	Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Right Bank Ve		Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub	Height(m) 25	Closed Tall Ald	der Shrub	Height(m) 2.8
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Closed Tall Ald		Height(m) 2.8
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub	Height(m) 25	Closed Tall Ald Open Balsam F Forest	der Shrub	Height(m) 2.8 1wood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub	Height(m) 25 25	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest	der Shrub Poplar (Black Cottor	Height(m) 2.8 nwood) 24 nwood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest	Height(m) 25 25 14	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor	Height(m) 2.8 nwood) 24 nwood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch Forest	Height(m) 25 25 14 14 14 Estimated reach	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor	Height(m) 2.8 nwood) 24 nwood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods	Height(m) 25 25 14 14 14 Estimated reach	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest Iength (m): 285	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor	Height(m) 2.8 nwood) 24 nwood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife State	Height(m) 25 25 14 14 14 Estimated reach (VOG	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest length (m): 285 Ovisual Obser Life Hist	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StaTotal Fish Count: 23Fish Measured: 3	Height(m) 25 25 14 14 14 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest length (m): 285 Ovisual Obser Life Hist	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife State	Height(m) 25 25 14 14 14 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest length (m): 285 Ovisual Obser Life Hist	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count: 23Fish Measured: 3Sampling Method (No. of fish):PEF (3) VOCComments:Species: slimy sculpinLife State	Height(m) 25 25 14 14 14 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (20) age: juvenile/adult	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest Iength (m): 285 Ovisual Obser Life Hist Min: 85	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground ory: Unknown Max: 122 Mean: ory: Resident	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24 1wood) 24 108 Median: 103
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count:23Fish Measured:3Sampling Method (No. of fish):PEF (3) VOCComments:Species: slimy sculpinLife StateTotal Fish Count:7Fish Measured:	Height(m) 25 25 14 14 14 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (20) age: juvenile/adult Fork Lengths (mm	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest Iength (m): 285 Ovisual Obser Life Hist Min: 85	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground ory: Unknown Max: 122 Mean:	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24 1wood) 24 108 Median: 103
Bank (m)Left Bank Vegetation Type0 - 5Closed Tall Alder Shrub5 - 10Closed Tall Alder Shrub10 - 20Closed Spruce-Paper Birch Forest20 - 30Closed Spruce-Paper Birch ForestKey To Fish Sampling Methods(PEF)Backpack ElectrofisherFish ObservationsSpecies: Dolly VardenLife StateTotal Fish Count: 23Fish Measured: 3Sampling Method (No. of fish):PEF (3) VOCComments:Species: slimy sculpinLife State	Height(m) 25 25 14 14 14 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (20) age: juvenile/adult Fork Lengths (mm	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest Iength (m): 285 Ovisual Obser Life Hist Min: 85	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground ory: Unknown Max: 122 Mean: ory: Resident	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24 1wood) 24 108 Median: 103
Bank (m) Left Bank Vegetation Type 0-5 Closed Tall Alder Shrub 5-10 Closed Tall Alder Shrub 10-20 Closed Spruce-Paper Birch Forest 20-30 Closed Spruce-Paper Birch Forest Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Sta Total Fish Count: 23 Fish Measured: 3 Sampling Method (No. of fish): PEF (3) VOC Comments: Species: slimy sculpin Life Sta Total Fish Count: 7 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) VOC Comments:	Height(m) 25 25 14 14 14 Estimated reach (VOG age: juvenile/adult Fork Lengths (mm G (20) age: juvenile/adult Fork Lengths (mm	Closed Tall Ald Open Balsam F Forest Open Balsam F Forest Open Balsam F Forest Iength (m): 285 () Visual Obser Life Hist n) Min: 85	der Shrub Poplar (Black Cottor Poplar (Black Cottor Poplar (Black Cottor vation, Ground ory: Unknown Max: 122 Mean: ory: Resident	Height(m) 2.8 1wood) 24 1wood) 24 1wood) 24 1wood) 24 108 Median: 103

Appendix L181.–Page 2 of 4.

 Species: slimy sculpin
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 2
 Fish Measured:
 2
 Fork Lengths (mm)
 Min:
 70
 Max:
 74
 Mean:
 72
 Median:
 72

 Sampling Method (No. of fish):
 PEF (2)
 Vertice
 Vertice

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



FSS1119C010618.jpg

FSS1119C010619.jpg

FSS1119C010620.jpg

FSS1119C010621.jpg



Station Info

Observers: Jonathan Kirsch,	Bob Powers			Date/Time: 0	08/22/2011 10:56 AM
		Sample Coordinates	Latitude 61.91236	Longitude -149.52512	
Elevation NED (m)(ft): 736 2 Coordinate Determination M USGS Quadrangle: Anchorag Waterbody Name: Little Will Anadromous Waters Catalog Geographic Comments: No 1	lethod: Non-Differen ge D-7 low Creek g Number: landing zone was ident	Legal Descri	ption (MTRS	Datum: WGS84 : S021N001W18 No sampling occurr	ed.
Visit Comments: No habitat of Wildlife Comments:	lata was collected.				
Water Quality \ Stream I	Flow				
Water Temp (C): DO Water Color:) (mg/L): D Turbidity (N	90 (%): NTU):	Conductivity Thalweg Vel	γ (μS/cm): pcity (m/s)(ft/s):	рН:
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km):	Entrenchme Embeddedn				
Channel Dimensions (m): Widt Thalweg Dept		Subdo	Dominant Sub minant Subst minant Subst	rate 1:	
Rosgen Class:		Subu		1410 21	
Riparian Vegetation Con	nmunities (Viereo	ck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegeta</u>		Canopy	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
0 - 5 5 - 10 10 - 20					
20 - 30 Key To Fish Sampling M	[athods				
(NON) None	temous				
Fish Observations Species: no collection effort Total Fish Count: 0 Fish Sampling Method (No. of fish	sh Measured: Fo	not applicable ork Lengths (mm		tory: Not Applicab Max: Mean	
Comments:					
Comments:					
Comments:		Channe	l Depths:		
Comments: Instruments			l Depths: l Widths:		
Comments: Instruments Stream Gradient:			l Widths:		

FSS1119C020622.jpg



Station Info

Observers: Jonathan Kirsch, Bob	Powers Samp	le Latitude		08/22/2011 11:05 AN
		dinates 61.85954	Longitude -149.45580	
Elevation NED (m)(ft): 659 2162 Coordinate Determination Method USGS Quadrangle: Anchorage D- Waterbody Name: Peters Creek	d: Non-Differential GPS		Datum: WGS84	
Anadromous Waters Catalog Nun	nber:			
Geographic Comments: No landing	ng zone was identified on t	arget stream # HM31.		
Visit Comments: No data collected	d.			
Wildlife Comments:				
Water Quality \ Stream Flow	V			
Water Temp (C):DO (mgWater Color:	g/L): DO (%): Turbidity (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%): Catchment Area(sq. km):	Entrenchment: Embeddedness:			
	nkfull OHW Wetted	Dominant Sub		
		Subdominant Subst	rate 1 ·	
Width The large Denth				
Thalweg Depth		Subdominant Subs		
Thalweg Depth Rosgen Class:		Subdominant Subst		
Thalweg Depth Rosgen Class:	unities (Viereck et al.	Subdominant Subst		
Thalweg Depth	Ca	Subdominant Subst	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from	Ca	Subdominant Subst 1992) nopy	rate 2:	Canopy Height(1
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10	Ca	Subdominant Subst 1992) nopy	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20	Ca	Subdominant Subst 1992) nopy	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30	Ca <u>Type</u> Heig	Subdominant Subst 1992) nopy	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Metho	Ca <u>Type</u> Heig	Subdominant Subst 1992) nopy	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30	Ca <u>Type</u> Heig	Subdominant Subst 1992) nopy	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Metho	Ca <u>Type</u> Heig	Subdominant Subst 1992) nopy	rate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) Left Bank Vegetation 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methor (NON) None Fish Observations Species: no collection effort	Car <u>Tvpe</u> Heig ods Life Stage: not appli leasured: Fork Leng	Subdominant Subst 1992) nopy ght(m) <u>Right Bank V</u>	rate 2:	Height(r
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methol (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish M Sampling Method (No. of fish): Comments:	Car <u>Tvpe</u> Heig ods Life Stage: not appli leasured: Fork Leng	Subdominant Subst 1992) nopy ght(m) <u>Right Bank V</u> cable Life His	rate 2: <u> ⁷egetation Type</u> story: Not Applica	Height(r
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Metho (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish M Sampling Method (No. of fish): Comments:	Car <u>Type</u> Heig ods Life Stage: not appli leasured: Fork Leng NON (0)	Subdominant Subst 1992) nopy ght(m) <u>Right Bank V</u> cable Life His	rate 2: <u> ⁷egetation Type</u> story: Not Applica	Height(1
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methol (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish M Sampling Method (No. of fish): Comments: Instruments Stream Gradient:	Ca <u>Type</u> Heig ods Life Stage: not appli leasured: Fork Leng NON (0)	Subdominant Subst 1992) nopy ght(m) <u>Right Bank V</u> cable Life His ths (mm) Min:	rate 2: <u> ⁷egetation Type</u> story: Not Applica	Height(r
Thalweg Depth Rosgen Class: Riparian Vegetation Commu Dist. from Bank (m) <u>Left Bank Vegetation</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Metho (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish M Sampling Method (No. of fish): Comments:	Car <u>Type</u> Heig ods Life Stage: not appli leasured: Fork Leng NON (0)	Subdominant Subst 1992) nopy ght(m) <u>Right Bank V</u> cable Life His ths (mm) Min: Channel Depths:	rate 2: <u> ⁷egetation Type</u> story: Not Applica	Height(r

FSS1119C030623.jpg



Water Quality: YSI 556

Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/22/2011 11:26 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.83539 -149.37911 Coordinates -149.37660 61.83564 61.83557 -149.37976 Elevation NED (m)(ft): 835 2740 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage D-7 Legal Description (MTRS): S020N001W12 Waterbody Name: Purches Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM66 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.21 DO (mg/L): 11.60 DO (%): 93.90 Conductivity (µS/cm): 16 pH: 6.56 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): 0.61 2.00 **Stream Channel** Stream Gradient (%): 0.25 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 17 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Gravel Width 11.5 6.8 Subdominant Substrate 1: Cobble Thalweg Depth 0.94 0.42 Subdominant Substrate 2: Boulder Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) Right Bank Vegetation Type 0 - 5 1 Closed Low Willow Shrub 1 Closed Low Willow Shrub Closed Low Willow Shrub 5 - 10 Closed Low Willow Shrub 1 1 Closed Low Willow Shrub 10 - 20 Closed Low Willow Shrub 1 1 20 - 30 Closed Low Willow Shrub 1 Closed Low Willow Shrub 1 **Kev To Fish Sampling Methods** Estimated reach length (m): 310 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 7 Fish Measured: 1 Fork Lengths (mm) Min: 105 Max: 105 Median: 105 Mean: 105 Sampling Method (No. of fish): PEF (1) VOG (6) **Comments:** Life Stage: juvenile/adult Species: slimy sculpin Life History: Resident Total Fish Count: 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root LR-24

-continued-1153

Transparency:



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FSS1119C040626.jpg

FSS1119C040627.jpg

FSS1119C040628.jpg



Comments:

Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/22/2011 12:25 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.75888 -149.43730 Coordinates -149.43460 61.75957 61.75846 -149.43845 Elevation NED (m)(ft): 682 2238 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage D-7 Legal Description (MTRS): S019N001W03 Waterbody Name: Willow Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM28I mining infrastructure adjacent to the stream. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 6.49 DO (mg/L): 11.63 DO (%): 94.60 Conductivity (µS/cm): 74 pH: 7.69 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): 1.43 4.69 **Stream Channel** Stream Gradient (%): 1.25 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 31 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Boulder Width 11.5 9.2 Subdominant Substrate 1: Cobble Thalweg Depth 0.95 0.41 Subdominant Substrate 2: Gravel Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 4 1.2 Closed Tall Willow Shrub Closed Tall Willow Shrub 4 1.2 5 - 10 Closed Tall Willow Shrub Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 4 1.2 20 - 30 Closed Tall Willow Shrub 4 Closed Tall Willow Shrub 1.2 **Kev To Fish Sampling Methods** Estimated reach length (m): 301 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 2 Fork Lengths (mm) Min: 126 Max: 161 Median: 143 Total Fish Count: 10 Mean: 143 Sampling Method (No. of fish): PEF (2) VOG (8) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 3 Fish Measured: 1 Fork Lengths (mm) Min: 66 Max: 66 Mean: 66 Median: 66 Sampling Method (No. of fish): PEF (1) VOG (2) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Median: 71 **Total Fish Count:** 3 Fish Measured: 3 Fork Lengths (mm) Min: 67 Max: 75 Mean: 71 Sampling Method (No. of fish): PEF (3) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Median: 75 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 **Mean:** 75 Sampling Method (No. of fish): PEF (1)

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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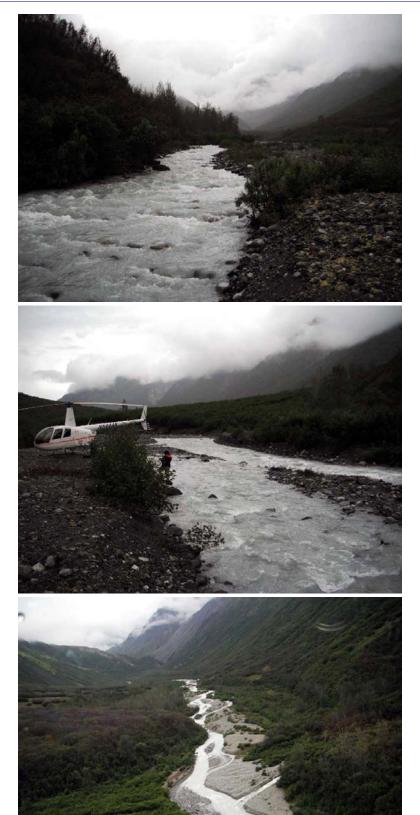
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FSS1119C050633.jpg



Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/22/2011 1:41 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.68143 -148.55629 Coordinates -148.55547 61.67941 61.68235 -148.55646 Elevation NED (m)(ft): 689 2260 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-5 Legal Description (MTRS): S018N005E04 Waterbody Name: Carpenter Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM71 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.08 DO (mg/L): 12.20 DO (%): 95.70 Conductivity (µS/cm): 86 pH: 7.66 Water Color: Glacial, High Turbidit Turbidity (NTU): 80.70 Thalweg Velocity (m/s)(ft/s): 1.65 5.41 **Stream Channel** Stream Gradient (%): 1.2 Slightly Entrenched **Entrenchment:** Moderate **Catchment Area(sq. km):** 52 **Embeddedness:** Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Boulder Width 12.5 8.5 Subdominant Substrate 1: Cobble Thalweg Depth 1.20 0.75 Subdominant Substrate 2: Sand Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 5.5 0 - 5 Open Tall Willow Shrub 1.8 Closed Tall Alder-Willow Shrub 5.5 5 - 10 Open Tall Willow Shrub 1.8 Closed Tall Alder-Willow Shrub 10 - 20 Open Tall Willow Shrub 1.8 Closed Black Cottonwood Forest 15 20 - 30 Open Tall Willow Shrub 1.8 Closed Tall Willow Shrub 5 **Key To Fish Sampling Methods** Estimated reach length (m): 370 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Unknown Max: Mean: Median: **Total Fish Count:** 7 **Fish Measured:** Fork Lengths (mm) Min: Sampling Method (No. of fish): VOG (7) **Comments:** Life History: Unknown Species: Dolly Varden Life Stage: juvenile/adult **Total Fish Count: 32** Fish Measured: 17 Fork Lengths (mm) Min: 118 Max: 235 Mean: 167 **Median:** 176 Sampling Method (No. of fish): PEF (17) VOG (15) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root LR-24 Water Quality: YSI 556 **Transparency:**



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Station Info

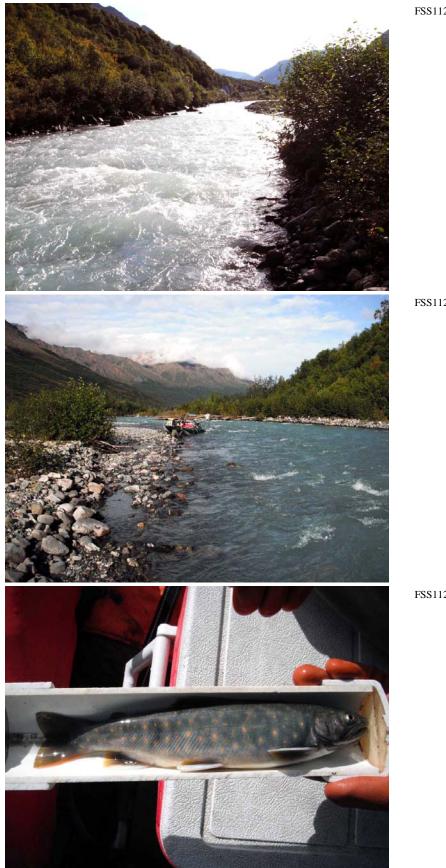
			Data/There 0	0/22/2011	1.5C DM
Observers: Jonathan Kirsch, Bob Pov			Date/Time: 0	8/22/2011	1:50 PM
	Sample Coordinates		gitude .14443		
Elevation NED (m)(ft): 661 2169 Coordinate Determination Method: USGS Quadrangle: Anchorage D-6 Waterbody Name: Little Susitna River Anadromous Waters Catalog Number	Legal Descript	surement Dat ion (MTRS): S02	um: WGS84 20N002E29		
Geographic Comments: No landing ze		m # HM145. No	data were colle	cted.	
Visit Comments: No sampling occurre	d.				
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): DO (mg/L): Water Color:		Conductivity (µS/ halweg Velocity		pH:	
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km):	Entrenchment: Embeddedness:				
Channel Dimensions (m): Bankfu		minant Substrat			
Width Thalweg Depth		inant Substrate 1 inant Substrate 2			
Rosgen Class:	Subuon				
Riparian Vegetation Communit	ies (Viereck et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Typ</u>	Canopy <u>e</u>	ight Bank Vegeta	ntion Type		Canopy Height(m)
0 - 5					
5 - 10					
10 - 20					
10 - 20 20 - 30					
10 - 20					
10 - 20 20 - 30 Key To Fish Sampling Methods (NON) None					
10 - 20 20 - 30 Key To Fish Sampling Methods			Not Applicab : Mean		edian:
10 - 20 20 - 30 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Measu Sampling Method (No. of fish): NOI	ured: Fork Lengths (mm)				edian:
10 - 20 20 - 30 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Measu Sampling Method (No. of fish): NOI Comments:	ured: Fork Lengths (mm)	Min: Max			edian:
10 - 20 20 - 30 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Mease Sampling Method (No. of fish): NON Comments: Instruments	W (0) Fork Lengths (mm)	Min: Max Depths:			edian:
10 - 20 20 - 30 Key To Fish Sampling Methods (NON) None Fish Observations Species: no collection effort Total Fish Count: 0 Fish Measu Sampling Method (No. of fish): NON Comments: Instruments Stream Gradient:	ared: Fork Lengths (mm) N (0) Channel 1	Min: Max Depths: Widths:			edian:

Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/23/2011 8:40 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.29761 -148.99991 Coordinates -148.99991 62.29761 62.30381 -149.04293Elevation NED (m)(ft): 661 2169 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Talkeetna Mts B-4 Legal Description (MTRS): S026N002E36 Waterbody Name: Iron Creek **Anadromous Waters Catalog Number: Geographic Comments:** Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.86 DO (mg/L): 11.47 DO (%): 89.50 Conductivity (µS/cm): 52 **pH:** 7.26 Water Color: Glacial, Low Turbidit Turbidity (NTU): 14.00 Thalweg Velocity (m/s)(ft/s): 2.10 6.89 **Stream Channel** Stream Gradient (%): 1.5 **Entrenchment:** Slightly Entrenched Negligible **Catchment Area(sq. km):** 183 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 16.0 13.0 Subdominant Substrate 1: Boulder Thalweg Depth 1.26 0.70 Subdominant Substrate 2: Gravel Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 2 Closed Tall Alder-Willow Shrub 2 Closed Tall Alder Shrub 2 4 5 - 10 Closed Tall Alder Shrub Closed Paper Birch Forest 10 - 20 Closed Tall Alder Shrub 2 Closed Paper Birch Forest 4 20 - 30 Closed Tall Alder Shrub 2 Closed Paper Birch Forest 4 **Kev To Fish Sampling Methods** Estimated reach length (m): 2600 Total Electrofishing Time (s): 743 (BEF) Boat-Mounted Electrofisher (VOB) Visual Observation, Boat **Fish Observations** Species: Dolly Varden Life Stage: adult Life History: Unknown **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: **Total Fish Count:** 4 Sampling Method (No. of fish): VOB (4) Comments: Event DD Dolly Varden approximately 350mm. Life History: Unknown Species: Dolly Varden Life Stage: juvenile/adult Fork Lengths (mm) Min: 134 Max: 431 Total Fish Count: 30 Fish Measured: 9 Mean: 237 **Median:** 282 Sampling Method (No. of fish): BEF (9) VOB (21) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOB (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Median: Total Fish Count: 10 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOB (10) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:GPS FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

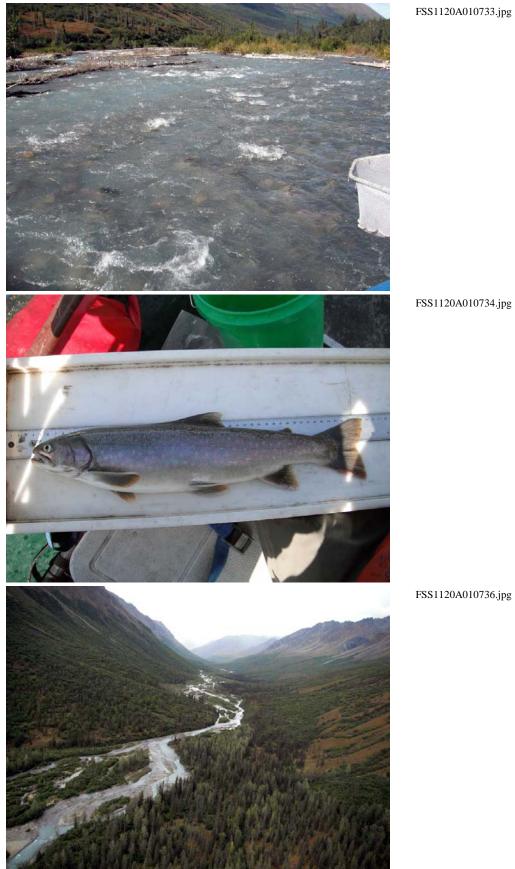
Channel Depths: graduated wading rod Channel Widths: handheld laser rangefinder Electrofisher: Smith-Root GPP 2.5 Transparency:



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-continued-1167

FSS1120A010737.jpg



* *			
Station Info			
Observers: Jonathan Kirsch, Bob Powers		Date/Time: 08/23/2	011 9:34 AM
StationLatitudeLongitudeCoordinates61.81971-147.37338	Sample Coordinates	Latitude Longitude Latitude 61.82095 -147.36887 61.81927	
Elevation NED (m)(ft): 764 2507 Coordinate Determination Method: Non-Diffe USGS Quadrangle: Anchorage D-1 Waterbody Name: East Fork Matanuska River Anadromous Waters Catalog Number: Geographic Comments: HM62		easurement Datum: WGS84 tion (MTRS): S020N011E13	
Visit Comments: Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 5.48 DO (mg/L): 12.01 Water Color: Glacial, Low Turbidit Turbidity		Conductivity (μS/cm): 163 pH: 7. Thalweg Velocity (m/s)(ft/s): 1.56 5.12	
Stream Channel			
Stream Gradient (%):1EntrenchCatchment Area(sq. km):138EmbeddeChannel Dimensions (m):BankfullOHW	edness: Moderate	Entrenched ominant Substrate: Cobble	
Width 12.1 Thalweg Depth 0.99		ninant Substrate 1: Boulder ninant Substrate 2: Sand	
Rosgen Class: B3 Moderately entrenched, moder stable plan and profile. Stable bar	rate gradient, riffle do		ed pools. Very
Riparian Vegetation Communities (View			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	Right Bank Vegetation Type	Canopy Height(m)
0 - 5 Open Tall Alder Shrub		Closed Paper Birch Forest	g()
5 - 10 Open Tall Alder Shrub		Closed Paper Birch Forest	9
10 - 20 Open Tall Alder Shrub	1.8	Closed Paper Birch Forest	14
20 - 30 Closed Tall Alder-Willow Shrub	3 (Closed Paper Birch Forest	14
Key To Fish Sampling Methods	Estimated reach le	ength (m):430	
(PEF) Backpack Electrofisher	(VOG)	Visual Observation, Ground	
Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 31 Fish Measured: 11 Sampling Method (No. of fish): PEF (11) VOC Comments:	-	Life History: Unknown Min: 90 Max: 134 Mean: 105	Median: 112
Species: rainbow troutLife StagTotal Fish Count:5Fish Measured: 2Sampling Method (No. of fish):PEF (2) VOGComments:	-	Life History: Unknown Min: 118 Max: 121 Mean: 119	Median: 119
Species: slimy sculpinLife StagTotal Fish Count:2Fish Measured:Sampling Method (No. of fish):VOG (2)Comments:	ge: juvenile/adult Fork Lengths (mm)	Life History: Resident Min: Max: Mean:	Median:
Species: rainbow troutLife StagTotal Fish Count:2Fish Measured:2Sampling Method (No. of fish):PEF (2)Comments:	ge: juvenile Fork Lengths (mm)	Life History: Unknown Min: 38 Max: 101 Mean: 69	Median: 69

Appendix L189.–Page 2 of 4.

Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 75 Max: 75 **Mean:** 75 Median: 75 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Arctic grayling Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 95 Max: 105 **Mean:** 100 **Median:** 100 Sampling Method (No. of fish): PEF (2) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 2 Fork Lengths (mm) Min: 89 Max: 90 Median: 89 Total Fish Count: 2 **Mean:** 89 Sampling Method (No. of fish): PEF (2) **Comments:**

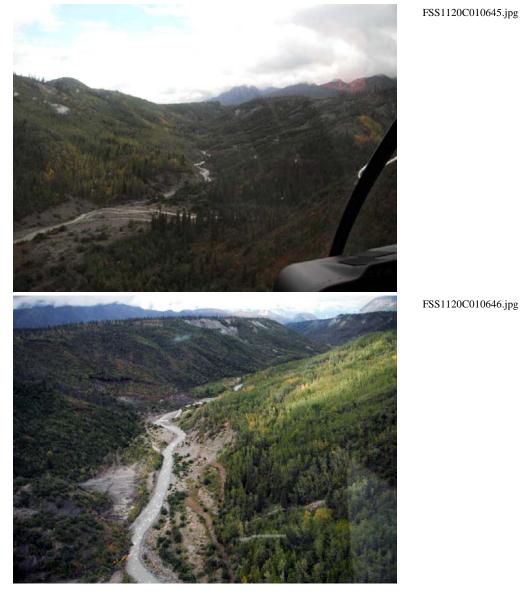
Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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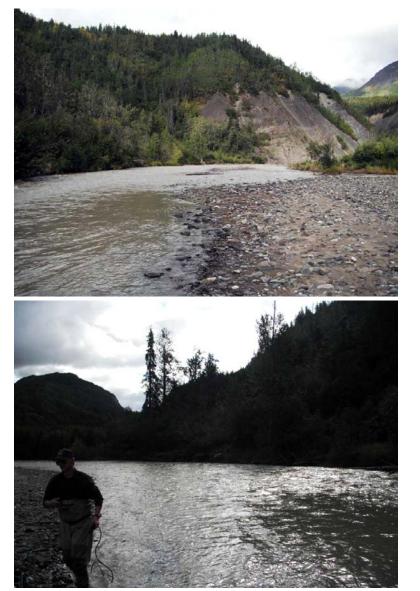
Station Info		
Observers: Jonathan Kirsch, Bob Powers	Date/Time: 08/23/2011 11:10 A	М
StationLatitudeLongitudeCoordinates61.81139-147.71274Elevation NED (m)(ft):5901936Coordinate Determination Method:Non-DiffeUSGS Quadrangle:Anchorage D-2Waterbody Name:Caribou CreekAnadromous Waters Catalog Number:Geographic Comments:HM82, pretty steep carVisit Comments:Wildlife Comments:	Sample Coordinates Latitude 61.81359 Longitude -147.71596 Latitude 61.81139 Longitude -147.7127 erential GPS Field Measurement Legal Description (MTRS): Datum: WGS84 S020N010E19	
Water Quality \ Stream Flow		
Water Temp (C): 6.35DO (mg/L): 12.11Water Color: Glacial, High TurbiditTurbidity	DO (%): 98.40 Conductivity (μS/cm): 370 pH: 8.16 (NTU): 134.00 Thalweg Velocity (m/s)(ft/s): 1.30 4.26	
Stream Channel		
Stream Gradient (%): 0.3 Entrencl	-	
Catchment Area(sq. km): 743 Embedd		
Channel Dimensions (m): Bankfull OHW Width 50.0	Wetted Dominant Substrate: Cobble 14.5 Subdominant Substrate 1: Sand	
Thalweg Depth 2.20	0.80 Subdominant Substrate 2: Gravel	
Rosgen Class: B3 Moderately entrenched, moder stable plan and profile. Stable bar	ate gradient, riffle dominated channel, with infrequently spaced pools. Ve aks.	ery
Riparian Vegetation Communities (Vie	reck et al. 1992)	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	CanopyCanopHeight(m)Right Bank Vegetation TypeHeight(
0-5 Closed Tall Alder-Willow Shrub	8 Closed Tall Alder Shrub 5.5	
5-10 Closed Tall Alder-Willow Shrub	8 Closed Tall Alder Shrub 5.5	
10 - 20 Closed Paper Birch Forest	14Closed Black Cottonwood Forest26	
20 - 30 Closed Paper Birch Forest	14Closed Black Cottonwood Forest26	
Key To Fish Sampling Methods	Estimated reach length (m): 315	
(PEF) Backpack Electrofisher	(VOG) Visual Observation, Ground	
Fish Observations		
Species: Dolly VardenLife StagTotal Fish Count:12Fish Measured: 2Sampling Method (No. of fish):PEF (2) VOGComments:	ge: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 115 Max: 144 Mean: 129 Median: 12 (10)	29
Species: Arctic graylingLife StarTotal Fish Count:30Fish Measured:Sampling Method (No. of fish):VOG (30)Comments:	ge: juvenile/adult Life History: Resident Fork Lengths (mm) Min: Max: Mean: Median:	
Species: slimy sculpinLife StarTotal Fish Count:50Fish Measured:Sampling Method (No. of fish):VOG (50)Comments:	ge: juvenile/adult Life History: Resident Fork Lengths (mm) Min: Max: Mean: Median:	
Species: Arctic graylingLife StarTotal Fish Count:5Fish Measured:5Sampling Method (No. of fish):PEF (5)Comments:	ge: juvenile Life History: Resident Fork Lengths (mm) Min: 100 Max: 159 Mean: 126 Median: 12	29

Species: slimy sculpin Life Stage: adult Life History: Resident **Total Fish Count: 5** Fork Lengths (mm) Min: 72 Max: 110 Mean: 93 Median: 91 Fish Measured: 5 Sampling Method (No. of fish): PEF (5) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 46 Max: 46 **Mean:** 46 Median: 46 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:Orange FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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Station Info					
Observers: Jonathan Kirsch, Bob Powers			Date/T	'ime: 08/23/2	011 12:46 PN
Station Latitude Longitude Coordinates 61.66955 -147.79768	Sample Coordinates	Latitude 61.66920	Longitude -147.79760	Latitude / 61.67076	
Elevation NED (m)(ft): 808 2651					
Coordinate Determination Method: Non-Diff			Datum: W		
USGS Quadrangle: Anchorage C-3	Legal Descrip	tion (MTRS): S018N009	E10	
Waterbody Name: Glacier Creek					
Anadromous Waters Catalog Number:					
Geographic Comments: HM43. There is a glad	cier about a half mile u	pstream of si	te.		
Visit Comments:					
	DO (4/) 02 (0	<u> </u>			14
			y (μS/cm): 16 ocity (m/s)(ft/	-	
Water Quality \ Stream Flow Water Temp (C): 0.45 DO (mg/L): 13.38 Water Color: Glacial, High Turbidit Turbidit				-	
Water Quality \ Stream Flow Water Temp (C): 0.45 DO (mg/L): 13.38 Water Color: Glacial, High Turbidit Turbidit	y (NTU): 248.00			-	
Water Quality \ Stream Flow Water Temp (C): 0.45 DO (mg/L): 13.38 Water Color: Glacial, High Turbidit Turbidit Stream Channel	y (NTU): 248.00	Thalweg Vel		-	
Water Quality \ Stream Flow Water Temp (C): 0.45 DO (mg/L): 13.38 Water Color: Glacial, High Turbidit Stream Channel Stream Gradient (%): 1.3 Entrence Catchment Area(sq. km): 35	y (NTU): 248.00 hment: Moderatley ledness: Moderate	Thalweg Vel		/s): 1.47 4.82	
Water Quality \ Stream Flow Water Temp (C): 0.45 DO (mg/L): 13.38 Water Color: Glacial, High Turbidit Turbidit Stream Channel Stream Gradient (%): 1.3 Entrence	y (NTU): 248.00 hment: Moderatley ledness: Moderate V Wetted D	Thalweg Vel Entrenched ominant Sub	ocity (m/s)(ft	/s): 1.47 4.82	
Water Quality \ Stream Flow Water Temp (C): 0.45 DO (mg/L): 13.38 Water Color: Glacial, High Turbidit Turbidit Stream Channel Stream Gradient (%): 1.3 Entrenc Catchment Area(sq. km): 35 Embedd Channel Dimensions (m): Bankfull OHW	y (NTU): 248.00 hment: Moderatley ledness: Moderate V Wetted D 6.0 Subdon	Thalweg Vel Entrenched ominant Sub ninant Subst	ocity (m/s)(ft ostrate: Cobb	/s): 1.47 4.82 le	

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated		Unvegetated	
5 - 10	Unvegetated		Closed Tall Alder Shrub	4.5
10 - 20	Open Low Alder Shrub	1.4	Closed Tall Alder Shrub	4.5
20 - 30	Open Low Alder Shrub	1.4	Closed Tall Alder Shrub	4.5

Key To Fish Sampling Methods

Estimated reach length (m): 230

(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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Station Info					
Observers: Jonathan Kirsch, Bob Powers			Date/Ti	me: 08/23/20	011 1:56 PM
StationLatitudeLongitudeCoordinates61.70482-148.29855	Sample Coordinates	Latitude 61.70405	Longitude -148.29390	/ Latitude 61.70475	Longitude -148.29957
Elevation NED (m)(ft): 709 2326	omential CDS Field Ma	agunamant	Determe W/	7001	
Coordinate Determination Method: Non-Diff USGS Quadrangle: Anchorage C-4	Legal Descrip		Datum: W0 : S019N006E		
Waterbody Name: Coal Creek					
Anadromous Waters Catalog Number: Geographic Comments: HM38					
Visit Comments: Lost velocity board.					
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 4.17 DO (mg/L): 12.47	DO (%): 95.70	Conductivity	(uS/cm)• 24(pH: 8.0	0
Water Color: Glacial, High Turbidit Turbidit	. ,	Thalweg Velo		-	
Stream Channel					
Stream Gradient (%): 2 Entrenc	-	Entrenched			
Catchment Area(sq. km): 79 Embedd		4 G 1	den den Calibil	_	
Channel Dimensions (m): Bankfull OHW Width 60.0		ominant Subs ninant Substi			
Thalweg Depth 1.20		ninant Substi			
Rosgen Class: D3 Braided channel with longitud	linal and transverse ba	ars. Very wide	e channel with	n eroding bank	3.
Riparian Vegetation Communities (Vie	ereck et al. 1992)				
Dist. from	Canopy				Canopy
Bank (m) <u>Left Bank Vegetation Type</u>	_	Right Bank V	egetation Ty	<u>pe</u>	Height(m)
0 - 5 Closed Tall Alder Shrub		Unvegetated			
5 - 10 Closed Tall Alder Shrub		Unvegetated			
10 - 20 Closed Tall Alder Shrub		Unvegetated	<i>a</i>		
20 - 30 Closed Tall Alder Shrub	6 (Open Tall Ald	er Shrub		5.5
Key To Fish Sampling Methods	Estimated reach le	ength (m): 460)		
(PEF) Backpack Electrofisher	(VOG)	Visual Obser	vation, Grou	nd	
Fish Observations					
	ge: adult		tory: Unknov		
Total Fish Count: 5 Fish Measured: Sampling Method (No. of fish): VOG (5) Comments:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
	ge: juvenile/adult	Life Hist	tory: Unknov	wn	
Total Fish Count:12Fish Measured:12Sampling Method (No. of fish):PEF (12)Comments:	Fork Lengths (mm)	Min: 106	Max: 215	Mean: 189	Median: 160
Species: Dolly Varden Life Sta	ge: juvenile	Life Hist	tory: Unknov	wn	
Total Fish Count:1Fish Measured:1Sampling Method (No. of fish):PEF (1)Comments:	Fork Lengths (mm)	Min: 75	Max: 75	Mean: 75	Median: 75

Instruments

Stream Gradient:handheld abney levelStream Velocity:Orange FloatTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1120C040658.jpg

FSS1120C040659.jpg



Station Info

Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/23/2011 3:40 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.60878 -148.39329 Coordinates -148.39397 61.60818 61.60997 -148.39310 Elevation NED (m)(ft): 667 2188 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-4 Legal Description (MTRS): S018N006E32 Waterbody Name: Metal Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM25 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 2.77 DO (mg/L): 13.12 DO (%): 97.00 Conductivity (µS/cm): 134 **pH:** 6.30 Water Color: Glacial, High Turbidit Turbidity (NTU): 953.00 Thalweg Velocity (m/s)(ft/s): 2.80 9.18 **Stream Channel** Moderatley Entrenched Stream Gradient (%): 2.75 **Entrenchment:** Moderate **Catchment Area(sq. km):** 62 Embeddedness: **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Boulder Width 15.0 6.2 Subdominant Substrate 1: Cobble Thalweg Depth 1.40 0.80 Subdominant Substrate 2: Sand Rosgen Class: B2 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	4.5	Unvegetated	
5 - 10	Closed Tall Alder-Willow Shrub	4.5	Unvegetated	
10 - 20	Closed Tall Alder-Willow Shrub	4.5	Closed Tall Alder-Willow Shrub	6.5
20 - 30	Closed Tall Alder-Willow Shrub	4.5	Closed Tall Alder-Willow Shrub	6.5

Key To Fish Sampling Methods

Estimated reach length (m): 222

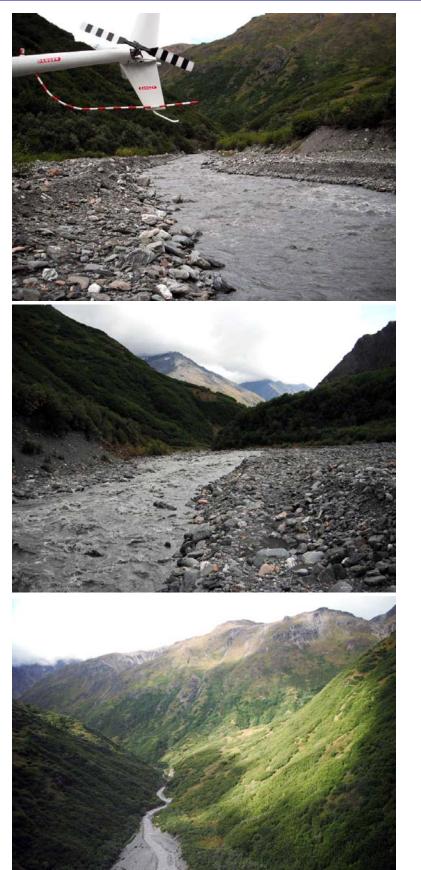
(PEF) Backpack Electrofisher

Fish Observations

No Fish Found

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod		
Stream Velocity: Orange Float	Channel Widths: measuring tape		
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24		
Water Quality: YSI 556	Transparency:		



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FSS1120C050662.jpg

FSS1120C050663.jpg

FSS1120C050664.jpg

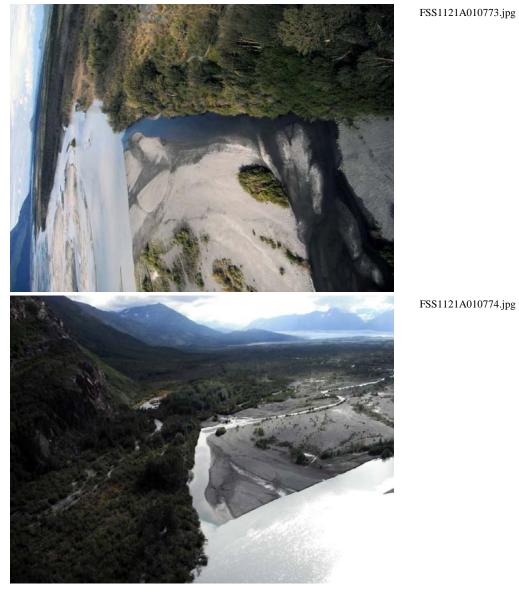


Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/24/2011 11:20 AM Sample Latitude Longitude Coordinates 61.47886 -148.71049Elevation NED (m)(ft): 34 112 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E15 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Mouth of a clear, right-bank Knik River tributary. This stream flows along the edge of the Knik River floodplain in an area dominated by mature-stage cottonwood and alder, which was abandoned by the main channel, but may still be flooded annually. Visit Comments: Visual observations only--no habitat data or fish were collected. A major ATV trail crosses this stream (probably through a sockeye spawning area), and we saw evidence of anglers targeting these salmon. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 28 Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground **Fish Observations** Species: sockeye salmon Life Stage: adult Life History: Anadromous Total Fish Count: 100 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (100) Suspected Spawning: Yes **Comments:** Species: coho salmon Life Stage: adult Life History: Anadromous Fork Lengths (mm) Min: Max: Median: Total Fish Count: 30 **Fish Measured:** Mean: Sampling Method (No. of fish): VOG (30) Suspected Spawning: Yes **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: Turbidity: Electrofisher:** Water Quality: **Transparency:**



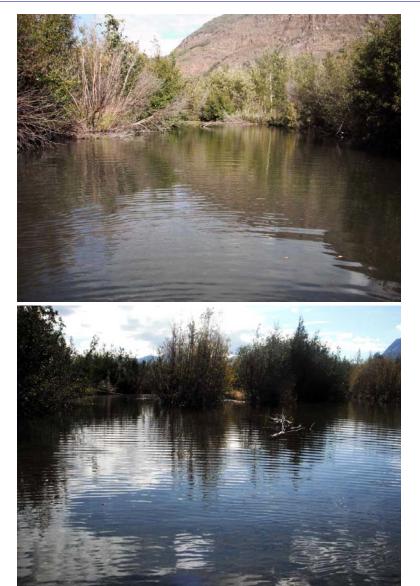
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FSS1121A010772.jpg



FSS1121A010773.jpg

Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/24/2011 11:46 AM Sample Latitude Longitude Coordinates -148.68604 61.46990 Elevation NED (m)(ft): 52 171 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E14 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear, right-bank Knik River side channel. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 30 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: threespine stickleback Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 100 Max: Median: **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOG (100) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths: Electrofisher: Turbidity:** Water Quality: **Transparency:**



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FSS1121A020777.jpg

Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/24/2011 12:30 PM Sample Latitude Longitude Coordinates -148.81443 61.52175 Elevation NED (m)(ft): 28 92 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-5 Legal Description (MTRS): S017N004E31 Waterbody Name: Anadromous Waters Catalog Number: 247-50-10200-2081-3041 Geographic Comments: Left bank Jim Creek tributary. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): Water Temp (C): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 10 **Embeddedness: Catchment Area**(sq. km): Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) <u>Right Bank Vegetation Type</u> Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous Max: Median: Total Fish Count: 11 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): MTR (11) Comments: around 100 mm. Species: Dolly Varden Life Stage: juvenile Life History: Unknown **Total Fish Count:** 3 Fork Lengths (mm) Min: Max: Median: Fish Measured: Mean: Sampling Method (No. of fish): MTR (3) Comments: 80-100 mm Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths: Turbidity: Electrofisher:** Water Quality: **Transparency:**

FSS1121A030809.jpg



Station Info Observers: Joe Buckwalter, Heidi Zimmer Date/Time: 08/24/2011 12:37 PM Sample Latitude Longitude Coordinates 61.53202 -148.84128 Elevation NED (m)(ft): 28 92 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-5 Legal Description (MTRS): S017N003E25 Waterbody Name: Anadromous Waters Catalog Number: 247-50-10200-2081-3041 Geographic Comments: Left bank Jim Creek tributary. Seasonally inundated by Leaf Lake. Visit Comments: Minnow trapping only--no electrofishing or habitat assessment occurred. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Embeddedness: Catchment Area**(sq. km): 4 Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Height(m) Right Bank Vegetation Type Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous Max: Median: **Total Fish Count:** 4 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): MTR (4) Comments: 60-90 mm Species: threespine stickleback Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 3 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean: Sampling Method (No. of fish): MTR (3) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): MTR (1) Comments: Others may have been present, but, as planktivores, were not attracted into the minnow traps. Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:

Water Quality:

Transparency:



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Station Info				
Observers: Joe Buckwalter, Heidi Zimmer			Date/Time: 08/24/	2011 1:39 PM
Station Latitude Longitude Coordinates 61.82932 -149.49916	Sample Coordinates	Latitude 61.82973	Longitude Latitud -149.49645 / 61.8293	0
Elevation NED (m)(ft): 670 2198 Coordinate Determination Method: Non-Diff USGS Quadrangle: Anchorage D-7 Waterbody Name: Purches Creek Anadromous Waters Catalog Number: Geographic Comments: Appears moderately en	Legal Descri	ption (MTRS	Datum: WGS84): S020N001W17	
Visit Comments: Thalweg was too deep to wad reported here. Wildlife Comments:	e, so TVHR was mea	sured along the	e fringe. Actual velocity is	higher than
Water Quality \ Stream Flow				
Water Temp (C): 8.20 DO (mg/L): 10.80	DO (%): 91.70 y (NTU): 1.13		y (μS/cm): 18 pH: 6 ocity (m/s)(ft/s): 1.29 4.2	
Stream Channel				
Stream Gradient (%): 2EntrendCatchment Area(sq. km): 52EmbeddedChannel Dimensions (m):BankfullWidth13.0Thalweg Depth1.43Rosgen Class:C2 Low gradient, meandering, population	dedness: Negligible V Wetted 11.0 Subde 0.75 Subde	e Dominant Sub ominant Subst ominant Subst		l floodplains.
Riparian Vegetation Communities (Vie	ereck et al. 1992)	1		
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank V</u>	Vegetation Type	Canopy Height(m)
0 - 5 Open White Spruce Forest	10	Closed Tall A	lder-Willow Shrub	1.5
5 - 10 Open White Spruce Forest	10	Crowberry Dy	warf Shrub Tundra	0.3
10 - 20 Open White Spruce Forest	10	Mesic Sedge-	Grass Meadow Tundra	0.5
20 - 30 Open White Spruce Forest	10	Mesic Sedge-	Grass Meadow Tundra	0.5
Key To Fish Sampling Methods(PEF)Backpack Electrofisher	Estimated reach	length (m): 26	50	
Fish Observations Species: Dolly Varden Life State Total Fish Count: 9 Fish Measured: 9 Sampling Method (No. of fish): PEF (9)	age: juvenile Fork Lengths (mn		story: Unknown Max: 77 Mean: 46	Median: 55

Species: slimy sculpin Life History: Resident Life Stage: juvenile/adult Median: 61 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 61 Max: 61 **Mean:** 61 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile Life History: Resident Total Fish Count: 1 Fork Lengths (mm) Min: 45 Max: 45 Mean: 45 Median: 45 Fish Measured: 1 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 84 Max: 126 **Total Fish Count: 5** Fish Measured: 5 Mean: 109 **Median:** 105 Sampling Method (No. of fish): PEF (5) **Comments:**

Appendix L198.–Page 2 of 4.

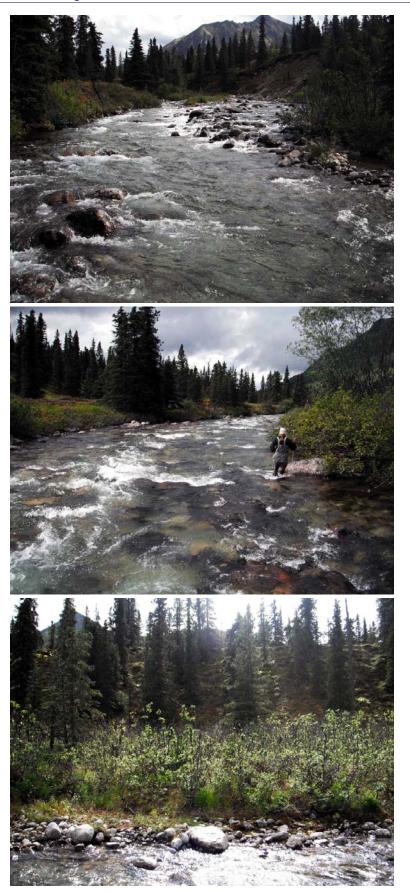
 Species: slimy sculpin
 Life Stage: adult
 Life History: Resident

 Total Fish Count:
 1
 Fish Measured:
 1
 Fork Lengths (mm)
 Min:
 76
 Mean:
 76
 Median:
 76

 Sampling Method (No. of fish):
 PEF (1)
 Comments:
 Vertical Period
 Vertica

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:

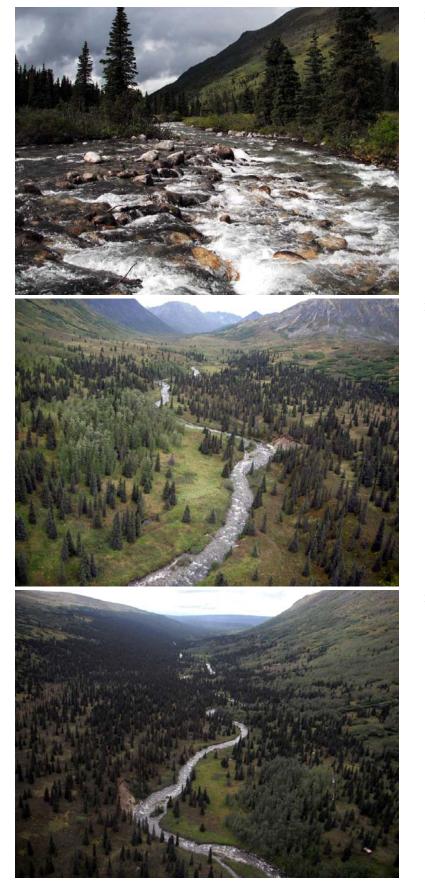


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FSS1121A050780.jpg

FSS1121A050782.jpg



FSS1121A050785.jpg

FSS1121A050786.jpg

Station Info

Turbidity:

Water Quality:

Station Info						
Observers: Joe Buckwa	alter, Heidi Zimmer			Date/Tim	e: 08/24/2	2011 5:08 PM
		Sample	Latitude	Longitude		
Elevation NED (m)(ft): Coordinate Determinati USGS Quadrangle: And Waterbody Name: Anadromous Waters Ca Geographic Comments: Visit Comments: Visua	on Method: Non-Diffe chorage C-5 ntalog Number: 247-50 Left bank Jim Creek tri	Legal Descrip -10200-2081-3041 butary. Site is season	tion (MTRS ally inundate	-	6	
Wildlife Comments:	· · · · · · · · · · · · · · · · · · ·					
Water Quality \ Stre	am Flow					
Water Temp (C): Water Color:	DO (mg/L): Turbidity	DO (%): / (NTU):	Conductivit Thalweg Vel	y (µS/cm): locity (m/s)(ft/s):	рН: :	
Stream Channel						
Stream Gradient (%): Catchment Area(sq. km Channel Dimensions (n Thalweg Rosgen Class:	n): Bankfull OHW Width	edness: 7 Wetted D Subdor	ominant Sul ninant Subs ninant Subs	trate 1:		
Riparian Vegetation	Communities (Vie	reck et al. 1992)				
Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30		Canopy	<u>Right Bank `</u>	Vegetation Type	2	Canopy Height(m)
Key To Fish Samplin	ng Methods					
(VOH) Visual Observation	-					
Fish Observations						
Species: sockeye salmon Total Fish Count: 30 Sampling Method (No. Comments:	Fish Measured:	ge: adult spawning Fork Lengths (mm)		story: Anadrom Max: M	ious Iean:	Median:
Instruments						
Stream Gradient:		Channel	Depths:			
Stream Velocity:		Channel	Widths:			

Electrofisher:

Transparency:



FSS1121A060812.jpg Sockeye salmon spawning.

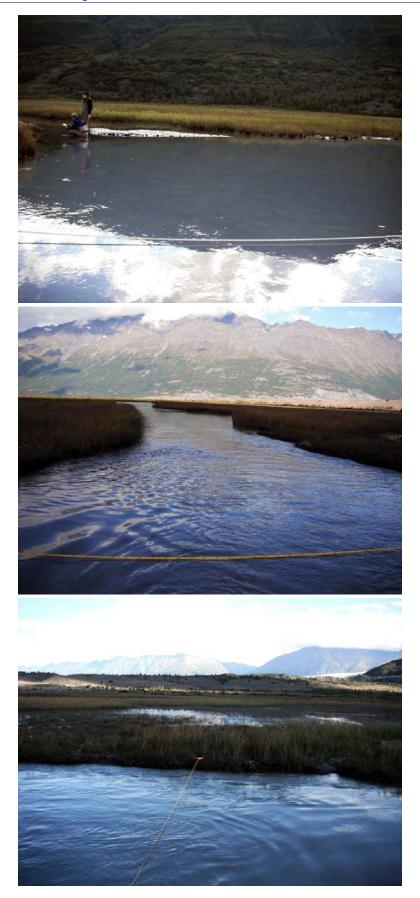
FSS1121A060813.jpg Sockeye salmon spawning.

Station Info Observers: Joe Buckwalter, Heidi Zimmer, Stormy Haught, Raye Ann Neustel Date/Time: 08/24/2011 9:35 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.32294 -148.48040 Coordinates -148.47993 61.32198 61.32294 -148.48040Elevation NED (m)(ft): 106 348 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Anchorage B-4 Legal Description (MTRS): S014N005E12 Waterbody Name: Fourteen Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM131. Habitat transect on Fourteen Creek just downstream of small clear tributary mouth. The reach of Fourteen Creek where the habitat transect was located had a small left-bank side channel. Visit Comments: Raye Ann and Stormy sampled the turbid Fourteen Creek mainstem. Joe and Heidi sampled a clear tributary (water temp 9.7 C, conductivity 160 us/cm, 8.2 DO mg/L, 72.2 DO%, 6.78 pH, turbidity 7.58 NTU). Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 3.52 DO (mg/L): 12.86 DO (%): 96.80 Conductivity (µS/cm): 61 pH: 7.20 Water Color: Glacial, High Turbidit Turbidity (NTU): 85.00 Thalweg Velocity (m/s)(ft/s): 0.60 1.97 **Stream Channel** Stream Gradient (%): 0 **Entrenchment:** Slightly Entrenched Catchment Area(sq. km): 12 **Embeddedness:** Very High **Channel Dimensions (m): Bankfull OHW** Wetted Dominant Substrate: Silt/Clay Width 8.3 7.8 Subdominant Substrate 1: Thalweg Depth 0.90 0.74 Subdominant Substrate 2: Rosgen Class: E5 Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) **Right Bank Vegetation Type** 0 - 5 Fresh Sedge Marsh 0.5 Fresh Sedge Marsh 0.5 5 - 10 Fresh Sedge Marsh 0.5 Fresh Sedge Marsh 0.5 10 - 20 Fresh Sedge Marsh 0.5 Fresh Sedge Marsh 0.5 0.5 0.5 20 - 30 Fresh Sedge Marsh Fresh Sedge Marsh **Key To Fish Sampling Methods** Estimated reach length (m): 140 (PEF) Backpack Electrofisher (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 24 Fish Measured: 16 Fork Lengths (mm) Min: 90 Max: 207 **Mean:** 147 Median: 148 Sampling Method (No. of fish): MTR (3) PEF (15) VOG (6) **Comments:** Species: sockeye salmon Life Stage: adult Life History: Anadromous Total Fish Count: 1 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (1) Comments: In turbid mainstem. Species: sculpin-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count: 5 Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (5) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1121B010454.jpg

FSS1121B010455.jpg Looking down Fourteen Creek from habitat transect.

FSS1121B010456.jpg Right bank.

-continued-1202



FSS1121B010459.jpg Fourteen Creek with Clear trib entering from right.

Station Info Observers: Raye Ann Neustel, Stormy Haught Date/Time: 08/24/2011 11:15 AM Sample Latitude Longitude Latitude Longitude Coordinates -148.65442 61.46628 61.46612 -148.65602 Elevation NED (m)(ft): 45 148 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E24 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Clear, right-bank Knik River tributary. This stream flows along the edge of the Knik River floodplain in an area dominated by mature-stage cottonwood and alder, which was abandoned by the main channel, but may still be flooded annually. Visit Comments: A major ATV trail parallels and crosses this creek multiple times. Electrofished only--No habitat data collected at this site. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 23 Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** Estimated reach length (m): 120 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: threespine stickleback Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 31 Fish Measured: 1 Fork Lengths (mm) Min: 46 Max: 46 **Mean:** 46 Median: 46 Sampling Method (No. of fish): PEF (1) VOG (30) **Comments:** Species: sculpin-unspecified Life Stage: juvenile/adult Life History: Resident **Total Fish Count:** 2 Fork Lengths (mm) Min: Max: Median: **Fish Measured:** Mean: Sampling Method (No. of fish): VOG (2) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 12 Fish Measured: 2 Fork Lengths (mm) Min: 143 Max: 229 **Median:** 186 Mean: 186 Sampling Method (No. of fish): PEF (2) VOG (10) **Comments:**

Appendix L201.–Page 2 of 4.

Life Stage: juvenile Life History: Anadromous Species: coho salmon Total Fish Count: 8 Fish Measured: 3 Fork Lengths (mm) Min: 57 Max: 63 **Mean:** 60 Median: 60 Sampling Method (No. of fish): PEF (3) VOG (5) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 7 Fish Measured: 5 Fork Lengths (mm) Min: 49 Max: 69 **Mean: 59** Median: 59 Sampling Method (No. of fish): PEF (5) VOG (2) **Comments: Species:** threespine stickleback Life Stage: adult Life History: Unknown **Total Fish Count:** 10 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (10) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Fish Measured: 1 Max: 70 **Mean:** 70 Median: 70 **Total Fish Count:** 1 Fork Lengths (mm) Min: 70 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



FSS1121B020462.jpg

FSS1121B020463.jpg

FSS1121B020466.jpg Juvenile sockeye salmon.



FSS1121B020467.jpg

FSS1121B020468.jpg

Station Info Observers: Raye Ann Neustel, Stormy Haught Date/Time: 08/24/2011 2:23 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.85726 -149.46468 Coordinates -149.46252 61.85787 61.85726 -149.46468 Elevation NED (m)(ft): 654 2146 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage D-7 Legal Description (MTRS): S020N001W04 Waterbody Name: Peters Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM31 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 7.26 DO (mg/L): 11.13 DO (%): 92.30 Conductivity (µS/cm): 18 **pH:** 6.93 Water Color: Clear Turbidity (NTU): 3.72 Thalweg Velocity (m/s)(ft/s): 0.90 2.95 **Stream Channel** Moderatley Entrenched Stream Gradient (%): 0.5 **Entrenchment:** Moderate **Catchment Area(sq. km):** 52 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 16.4 16.2 Subdominant Substrate 1: Boulder Thalweg Depth 0.70 0.21 Subdominant Substrate 2: Gravel **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Height(m) Right Bank Vegetation Type Height(m) Bank (m) Left Bank Vegetation Type 2 0 - 5 0.3 Fireweed Closed Tall Alder Shrub 2 0.4 5 - 10 Closed Low Alder-Willow Shrub Closed Tall Alder Shrub 10 - 20 Closed Low Alder-Willow Shrub 0.4 2 Closed Tall Alder Shrub 20-30 Midgrass-Herb 0.3 Midgrass-Herb 0.3 **Key To Fish Sampling Methods** Estimated reach length (m): 198 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 5 Fork Lengths (mm) Min: 60 Max: 113 Median: 86 Total Fish Count: 19 **Mean:** 82 Sampling Method (No. of fish): PEF (5) VOG (14) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Total Fish Count: 21 Fish Measured: 4 Fork Lengths (mm) Min: 25 Max: 90 **Mean: 57** Median: 57 Sampling Method (No. of fish): PEF (4) VOG (17) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: Orange Float Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root GPP 2.5 Water Quality: YSI 556 **Transparency:**



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Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/24/2011 9:18 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.96285 -147.99423 Coordinates -147.99289 61.96469 61.96267 -147.99547 Elevation NED (m)(ft): 991 3251 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage D-3 Legal Description (MTRS): S022N008E28 Waterbody Name: Boulder Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM14 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.78 DO (mg/L): 11.90 DO (%): 92.80 Conductivity (µS/cm): 154 **pH:** 8.14 Water Color: Glacial, Low Turbidit Turbidity (NTU): 7.97 Thalweg Velocity (m/s)(ft/s): 0.96 3.15 **Stream Channel** Stream Gradient (%): 0.75 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 50 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble 8.2 6.1 Width Subdominant Substrate 1: Gravel Thalweg Depth 0.80 0.30 Subdominant Substrate 2: Boulder Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 0.3 Closed Tall Willow Shrub 6 Open Low Willow Shrub 0.3 5 - 10 Closed Tall Willow Shrub 6 Open Low Willow Shrub 10 - 20 Closed Tall Willow Shrub Closed Tall Willow Shrub 6 5.5 20 - 30 Closed Tall Willow Shrub 3 Closed Low Willow Shrub 0.4 **Kev To Fish Sampling Methods** Estimated reach length (m): 330 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: rainbow trout Life Stage: adult Life History: Resident Max: Median: **Total Fish Count:** 3 **Fish Measured:** Fork Lengths (mm) Min: Mean: Sampling Method (No. of fish): VOG (3) **Comments:** Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 221 Max: 265 Total Fish Count: 7 Fish Measured: 7 Mean: 250 Median: 243 Sampling Method (No. of fish): PEF (7) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter Electrofisher: Smith-Root LR-24

Water Quality: YSI 556

Transparency:

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FSS1121C010669.jpg



Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/24/2011 10:39 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 61.88341 -148.16349 Coordinates -148.16087 61.88324 61.88317 -148.16554 Elevation NED (m)(ft): 813 2667 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage D-4 Legal Description (MTRS): S021N007E27 Waterbody Name: East Boulder Creek **Anadromous Waters Catalog Number:** Geographic Comments: HM159 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.21 DO (mg/L): 12.01 DO (%): 94.50 Conductivity (µS/cm): 135 **pH:** 8.05 Water Color: Clear Turbidity (NTU): 0.00 Thalweg Velocity (m/s)(ft/s): 1.00 3.28 **Stream Channel** Stream Gradient (%): 0.75 Slightly Entrenched **Entrenchment: Catchment Area(sq. km):** 50 **Embeddedness:** Low Wetted **Channel Dimensions (m):** Bankfull OHW Dominant Substrate: Cobble 6.8 5.0 Width Subdominant Substrate 1: Gravel Thalweg Depth 0.59 0.27 Subdominant Substrate 2: Boulder Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Height(m) <u>Right Bank Vegetation Type</u> 3 0 - 5Closed Tall Alder-Willow Shrub Unvegetated 18 5 - 10 Closed Spruce-Paper Birch Forest Unvegetated 10 - 20 Closed Spruce-Paper Birch Forest 18 Unvegetated 20 - 30 Closed Spruce-Paper Birch Forest 18 Closed Spruce-Paper Birch Forest 18 **Key To Fish Sampling Methods** Estimated reach length (m): 269 (PEF) Backpack Electrofisher **Fish Observations** Species: rainbow trout Life Stage: juvenile/adult Life History: Unknown Fish Measured: 2 Fork Lengths (mm) Min: 135 Max: 142 Median: 138 **Total Fish Count:** 2 **Mean:** 138 Sampling Method (No. of fish): PEF (2) **Comments:** Species: rainbow trout Life Stage: juvenile/adult Life History: Resident Fork Lengths (mm) Min: 245 Max: 255 **Total Fish Count:** 2 Fish Measured: 2 Mean: 250 **Median: 250** Sampling Method (No. of fish): PEF (2) **Comments:** Instruments Stream Gradient: handheld abney level Channel Depths: graduated wading rod Stream Velocity: transparent velocity head rod Channel Widths: measuring tape Turbidity: LaMotte 2020e turbidimeter

Water Quality: YSI 556

Electrofisher: Smith-Root LR-24 **Transparency:**



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Turbidity:

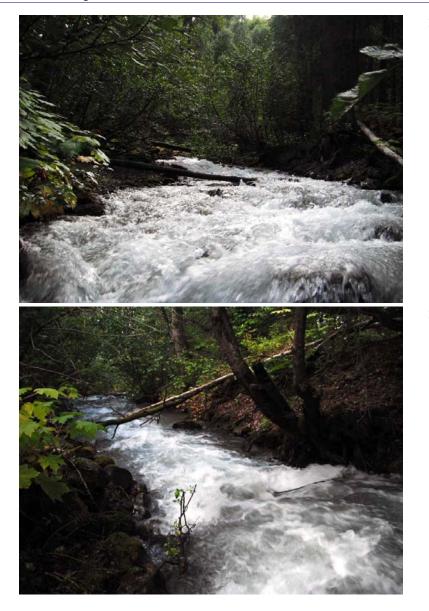
Water Quality:

Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/24/2011 11:40 AM Sample Latitude Longitude Coordinates -148.80788 61.71344 Elevation NED (m)(ft): 191 627 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-5 Legal Description (MTRS): S019N004E30 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Side stream of the Matanuska River. Sample site 16C04 was at the mouth and coho and Chinook salmon were found so we revisited the site and climbed up the river a little ways to sample upstream of where we sampled before. Spot-shocked this stream. Visit Comments: No habitat data was collected. Spot shocked looking for fish presence. Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): Water Temp (C): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 32 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 3 Fork Lengths (mm) Min: 118 Max: 130 Total Fish Count: 3 Mean: 122 Median: 124 Sampling Method (No. of fish): PEF (3) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths:**

-continued-1217

Electrofisher: Smith-Root LR-24

Transparency:



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Sampling Method (No. of fish): VOG (6)

Station Info Observers: Jonathan Kirsch, Bob Powers Date/Time: 08/24/2011 3:27 PM Sample Latitude Longitude Latitude Longitude Coordinates -149.04030 61.67777 61.67299 -149.03728Elevation NED (m)(ft): 127 417 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage C-6 Legal Description (MTRS): S018N002E02 Waterbody Name: Moose Creek Anadromous Waters Catalog Number: 247-50-10220-2085 Geographic Comments: Began spot shocking at mouth and proceeded up stream. No habitat data recorded. Visit Comments: No habitat data collected. Team C chose to sample here after aerial survey revealed favorable habitat. Spot-shocked to confirm salmon presence. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 136 Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 8 Fish Measured: 3 Fork Lengths (mm) Min: 61 Max: 65 Median: 63 Mean: 63 Sampling Method (No. of fish): PEF (3) VOG (5) **Comments:** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 14 Fork Lengths (mm) Min: 56 Median: 60 Fish Measured: 4 Max: 64 **Mean: 59** Sampling Method (No. of fish): PEF (4) VOG (10) **Comments:** Species: chum salmon Life Stage: adult spawning Life History: Anadromous **Total Fish Count:** 6 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean:

 Comments:
 Life Stage: adult spawning
 Life History: Anadromous

 Total Fish Count:
 5
 Fish Measured:
 Fork Lengths (mm)
 Min:
 Max:
 Median:

 Sampling Method (No. of fish):
 VOG (5)
 Suspected Spawning:
 Yes

 Comments:
 Comments:
 Comments:
 Comments:
 Comments:

Suspected Spawning: Yes

Species: sockeye salmon	Life Stage: adult spawning		Life History: Anadromous			
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. o	f fish): VOG (2)				Suspected	Spawning: Yes
Comments:						

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality:	Transparency:

Station Info							
Observers:	Raye Ann Neustel				Date/Time: 09	0/01/2011 8:20) AM
			Sample Coordinates	Latitude 62.42975	Longitude -151.39777		
Coordinate D USGS Quadr Waterbody N Anadromous	D (m)(ft): 422 1385 Determination Method: rangle: Talkeetna B-3 Jame: Lake Creek Waters Catalog Number Comments: Sampled at 1		Legal Descri 0-2053-3170	ption (MTRS)	Datum: WGS84 : S027N011W18		
Visit Comme		ry coming from v e site on 08/17/20	wetlands area 1 011. The entir	nas ATV tracks ety of this strea	nd of Chelatna Lake crossing creek. Pict m was floated by cata	ure 519 was fi	om a
Wildlife Com	ments:						
Water Oual	ity \ Stream Flow						
Water Temp Water Color:	(C): DO (mg/L)): DO Turbidity (NTU	(%): J):	Conductivity Thalweg Velo	(μS/cm): p city (m/s)(ft/s): 1.10	oH: 3.61	
Stream Cha	nnel						
Stream Gradi Catchment A		Entrenchment Embeddedness	8.5				
Channel Din	nensions (m): Bankf Width Thalweg Depth	ull OHW We	Subd	Dominant Subs ominant Subst ominant Subst	rate 1: Silt/Clay		
Rosgen Class	:						
Riparian Ve	egetation Communi	ties (Viereck	et al. 1992))			
Dist. from							
Bank (m) L	eft Bank Vegetation Ty	<u>pe</u>	Canopy Height(m)	<u>Right Bank V</u>	egetation Type		anopy ight(m)
=	e ft Bank Vegetation Ty losed Tall Alder-Willow				egetation Type rch-Balsam Poplar-S	Не	ight(m)
0-5 C		Shrub	Height(m)	Open Paper B		He Spruce Forest	ight(m) 24
0-5 C 5-10 C	losed Tall Alder-Willow	Shrub Shrub	Height(m) 10	Open Paper B Open Paper B	rch-Balsam Poplar-S	He Spruce Forest Spruce Forest	ight(m) 24 24

Key To Fish Sampling Methods

(ANG) Angling	(MTR) Minnow Trap	
(VOG) Visual Observation, Ground		
Fish Observations		

Life Stage: adult spawning Species: sockeye salmon Life History: Anadromous **Total Fish Count:** 144 **Fish Measured:** 3 Fork Lengths (mm) Min: 476 Max: 492 Mean: 484 Median: 484 Sampling Method (No. of fish): ANG (3) VOG (141) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 12 Fork Lengths (mm) Min: 40 Max: 47 **Total Fish Count: 35 Mean:** 43 Median: 43 Sampling Method (No. of fish): MTR (12) VOG (23) **Comments:** Species: sockeye salmon Life Stage: carcass Life History: Anadromous Median: **Total Fish Count:** 1 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (1) Comments: photo # 519

Instruments

Stream Gradient:Stream Velocity:GPS FloatTurbidity:Water Quality:

Channel Depths: Channel Widths: Electrofisher: Transparency:

FSS1122C011476.jpg

Station Info Observers: Raye Ann Neustel Date/Time: 09/02/2011 9:11 AM Sample Latitude Longitude Coordinates 62.36592 -151.29478 Elevation NED (m)(ft): 382 1253 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Talkeetna B-3 Legal Description (MTRS): S026N011W03 Waterbody Name: Lake Creek Anadromous Waters Catalog Number: 247-41-10200-2053-3170 Geographic Comments: Sample site at confluence of Sunflower Creek and Lake Creek. Small unnamed tributary on river left confluencing with Lake Creek approximately 20 m upstream of Sunflower Creek and Lake Creek confluence. Visit Comments: No water quality data collected. This entire creek was sampled by cataraft using minnow traps, angling and visual observation. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 2.10 6.89 Stream Channel Stream Gradient (%): **Entrenchment:** Slightly Entrenched Catchment Area(sq. km): 435 **Embeddedness:** Low Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Gravel Width Subdominant Substrate 1: Cobble **Thalweg Depth** Subdominant Substrate 2: Silt/Clay **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) **Right Bank Vegetation Type** Height(m) 0 - 5 Closed Tall Alder-Willow Shrub 18 Closed Tall Alder-Willow Shrub 22 5 - 10 Closed Tall Alder-Willow Shrub 18 Closed Tall Alder-Willow Shrub 22 22 10 - 20 Closed Tall Alder-Willow Shrub 18 Closed Tall Alder-Willow Shrub 18 Closed Tall Alder-Willow Shrub 22 20 - 30 Closed Tall Alder-Willow Shrub **Key To Fish Sampling Methods** (ANG) Angling (DIP) Dip Net (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations**

Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count: 22** Fish Measured: 22 Fork Lengths (mm) Min: 46 Max: 70 Mean: 55 Median: 58 Sampling Method (No. of fish): MTR (22) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 14 Fish Measured: 14 Fork Lengths (mm) Min: 49 Median: 67 Max: 85 **Mean:** 62 Sampling Method (No. of fish): MTR (14) **Comments:** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 48 Max: 50 **Mean:** 49 Median: 49 Sampling Method (No. of fish): DIP (4) Comments: These sockeye juveniles were observed swimming near minnow trap and were caught by dip net.

Species: sockeye salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 9 Fork Lengths (mm) Min: Max: Median: Fish Measured: Mean: Sampling Method (No. of fish): VOG (9) **Comments:** Species: coho salmon Life Stage: adult Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 609 Max: 611 Mean: 610 **Median:** 610 Sampling Method (No. of fish): ANG (2) **Comments:**

Instruments

Stream Gradient:		C
Stream Velocity:	GPS Float	Cl
Turbidity:		E
Water Quality:		Ti

Channel Depths: Channel Widths: Electrofisher: Transparency:



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FSS1123C011481.jpg

Observers: Raye Ann Neustel Date/Time: 09/03/2011 11:48 AM Sample Latitude Longitude Coordinates 62.25186 -151.16078 Elevation NED (m)(ft): 319 1047 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna B-3 Legal Description (MTRS): S025N010W17 Waterbody Name: Lake Creek Anadromous Waters Catalog Number: 247-41-10200-2053-3170 Geographic Comments: Sample site at confluence of Lake Creek and Home Creek. Visit Comments: This site was sampled with minnow traps, angling and visual observation. Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): Water Temp (C): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 2.50 8.20 **Stream Channel** Stream Gradient (%): **Entrenchment:** Slightly Entrenched 731 Negligible **Catchment Area**(sq. km): **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Gravel Width Subdominant Substrate 1: Cobble Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Height(m) <u>Right Bank Vegetation Type</u> Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (ANG) Angling (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 64 Max: 69 **Mean:** 66 Median: 66 Sampling Method (No. of fish): MTR (2) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 3 Fish Measured: 3 Fork Lengths (mm) Min: 54 Max: 67 **Mean: 58** Median: 60 Sampling Method (No. of fish): MTR (3) **Comments:** Species: rainbow trout Life Stage: juvenile Life History: Resident **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 94 Max: 101 **Mean: 97** Median: 97 Sampling Method (No. of fish): MTR (2) **Comments:** Life History: Anadromous Species: coho salmon Life Stage: adult Fork Lengths (mm) Min: 491 Max: 611 **Total Fish Count:** 3 Fish Measured: 2 Mean: 551 Median: 551 Sampling Method (No. of fish): ANG (2) VOG (1) **Comments:**

Species: sockeye salmonLife Stage: adultLife History: AnadromousTotal Fish Count: 5Fish Measured: 3Fork Lengths (mm)Min: 476Max: 492Mean: 484Median: 484Sampling Method (No. of fish):ANG (3) VOG (2)Comments:Kernel Control Co

Instruments

Stream Gradient: Stream Velocity: GPS Float Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:



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Sample Coordinates	Latitude 62.22231	Date/Time: 09/03/ Longitude -151.10507	2011 1:33 PM
Coordinates		-	
	62.22231	-151.10507	
GPS Field Me	asurement	Datum: WGS84	
		: S025N010W27	
Legui Deserip			
-2053-3170			
	ockeye salmo	on were observed holding.	Spawning
ical.			
• ()	~		
	•	· · ·	7
)•	Thatweg ven	Jerty (III/S)(II/S): 2.40 7.8	1
•••	trenched		
Low			
Subdol	mnant Subst	rate 2:	
et al. 1992)			
Canopy Height(m)	Right Bank V	egetation Type	Canopy Height(m)
lt	Life His	tory: Anadromous	
Lengths (mm)	Min:	Max: Mean:	Median:
		Suspected	Spawning: Yes
Channel	Depths:		
~ -	****		
Channel	Widths:		
Channel Electrof			
	-2053-3170 y of this stream l where adult s leal. %): Slightly En Low ted D Subdon Subdon Subdon Subdon Subdon ft al. 1992) Canopy Height(m) <u>I</u> lt Lengths (mm)	-2053-3170 y of this stream was floated l where adult sockeye salmo- leal. %): Conductivity Thalweg Vele Slightly Entrenched Low ted Dominant Subst Subdominant Subst Subdomin	-2053-3170 y of this stream was floated by cataraft. Beaver complement where adult sockeye salmon were observed holding. (a) (a) (b): Conductivity (µS/cm): pH: (c): Thalweg Velocity (m/s)(ft/s): 2.40 7.8 Slightly Entrenched

Observers: Raye Ann I	Neustel						e: 09/03/2	2011 3:55 PM
			Sample Coordi		Latitude	Longitude		
Elevation NED (m)(ft):	278 912		Coordi	mates	62.16824	-151.05487		
Coordinate Determinati		Non-Diff	erential GPS F	Field Mea	asurement	Datum: WGS	584	
USGS Quadrangle: Tal): S024N010W		
Waterbody Name: Lake			0	•				
Anadromous Waters Ca	talog Number	::						
Geographic Comments:								
Visit Comments: No sa waypo		llected. 7	This entire river	r was flo	ated via cata	raft and this was	s a fish obs	servation
Wildlife Comments:								
Water Quality \ Stre	am Flow							
Water Temp (C):	DO (mg/L):	:	DO (%):	(Conductivit	y (µS/cm):	pH:	
Water Color:	1	Turbidity	y (NTU):	Т	halweg Vel	ocity (m/s)(ft/s)	:	
Stream Channel								
Stream Gradient (%):		Entrenc	hment:					
Catchment Area(sq. km): 832	Embedd	ledness:					
	D. 16	II OHW	Wetted	Do	ominant Sub	ostrate:		
Channel Dimensions (n	i): Bankiu							
``	Width				ninant Subs			
Channel Dimensions (n Thalweş	Width				ninant Subs ninant Subs			
``	Width							
Thalweg	Width g Depth	ies (Vie		Subdom				
Thalweş Rosgen Class:	Width g Depth	ies (Vie		Subdom 1992)				Сапору
Thalweg Rosgen Class: Riparian Vegetation	Width 3 Depth Communit		ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs		2	Canopy Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from	Width 3 Depth Communit		ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u>	Width 3 Depth Communit		ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5	Width 3 Depth Communit		ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10	Width 3 Depth Communit		ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20	Width 3 Depth Communit <u>Gegetation Typ</u>	<u>e</u>	ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30	Width 3 Depth Communit <u>Gegetation Typ</u> ng Methods	<u>e</u>	ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin	Width 3 Depth Communit <u>Gegetation Typ</u> ng Methods	<u>e</u>	ereck et al. 1 Cano	Subdom 1992) opy	ninant Subs	trate 2:	2	
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observations Fish Observations Species: sockeye salmon	Width 3 Depth Communit <u>Gegetation Typ</u> ng Methods	<u>e</u>	ereck et al. 1 Cano	Subdom 1992) opy	hinant Subs Right Bank M	trate 2:		
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observations Fish Observations Species: sockeye salmon Total Fish Count: 2	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh	Subdom 1992) opy ht(m) <u>R</u>	hinant Subst	trate 2: Vegetation Type		
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observation Fish Observations Species: sockeye salmon Total Fish Count: 2 Sampling Method (No.	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh	Subdom 1992) opy ht(m) <u>R</u>	hinant Subst	trate 2: Vegetation Type	ious	Height(m)
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observations Fish Observations Species: sockeye salmon Total Fish Count: 2	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh	Subdom 1992) opy ht(m) <u>R</u>	hinant Subst	trate 2: Vegetation Type	ious	Height(m)
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observation Fish Observations Species: sockeye salmon Total Fish Count: 2 Sampling Method (No. Comments:	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh	Subdom 1992) opy ht(m) <u>R</u>	hinant Subst	trate 2: Vegetation Type	ious	Height(m)
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observation Fish Observations Species: sockeye salmon Total Fish Count: 2 Sampling Method (No. Comments:	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh	Subdom 1992) opy ht(m) <u>R</u>	inant Subst	trate 2: Vegetation Type	ious	Height(m)
Thalwey Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observations Species: sockeye salmon Total Fish Count: 2 Sampling Method (No. Comments: Instruments	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh age: adult Fork Length	Subdom 1992) opy ht(m) <u>R</u>	hinant Subst	trate 2: Vegetation Type	ious	Height(m)
Thalweg Rosgen Class: Riparian Vegetation Dist. from Bank (m) <u>Left Bank V</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Samplin (VOB) Visual Observation Fish Observations Species: sockeye salmon Total Fish Count: 2 Sampling Method (No. Comments: Instruments Stream Gradient:	Width g Depth Communit Gegetation Typ ng Methods on, Boat Fish Measu	<u>e</u> Life Sta ured:	ereck et al. 1 Cano Heigh ge: adult Fork Length	Subdom 1992) opy ht(m) <u>R</u> (mm) Channel 1	Life His Min: Depths: Widths:	trate 2: Vegetation Type	ious	Height(m)

Observers: Raye A	nn Neustel				Date/Time	e: 09/04/20	011 10:34 AM
			Sample Coordinates	Latitude 62.13811	Longitude -150.99935		
Elevation NED (m)(ft): 223 732						
Coordinate Determi	nation Method:	Non-Differential	GPS Field Me	easurement	Datum: WGS	84	
USGS Quadrangle:	Talkeetna A-2		Legal Descrip	otion (MTRS): S024N009W3	80	
Waterbody Name:	Lake Creek						
Anadromous Water	-	r: 247-41-10200	-2053-3170				
Geographic Comme							
Visit Comments: M	linnow traps place o habitat data coll		el habitat with	hyporheic po	ols also connecte	d to this sid	le-channel.
Wildlife Comments:	:						
Water Quality \ S	tream Flow						
Water Temp (C):	DO (mg/L)		. ,	Conductivit		pH:	
Water Color: Clear		Turbidity (NTU):	Thalweg Vel	ocity (m/s)(ft/s):		
Stream Channel							
Stream Gradient (% Catchment Area(sq.		Entrenchment: Embeddedness	0,	trenched			
Channel Dimension	ns (m): Bankfu	ull OHW Wet	tted D	ominant Sul	ostrate: Gravel		
	Width				trate 1: Silt/Clay		
Tha	lweg Depth		Subdo	minant Subs	trate 2:		
Rosgen Class:							
Riparian Vegetat	ion Communi	ties (Viereck e	et al. 1992)				
Dist. from Bank (m) <u>Left Bar</u>	nk Vegetation Ty	<u>pe</u>	Canopy Height(m)	Right Bank '	Vegetation Type		Canopy Height(m)
	nk Vegetation Ty	<u>pe</u>		Right Bank '	Vegetation Type		
Bank (m) Left Ban	nk Vegetation Ty	<u>pe</u>		Right Bank '	Vegetation Type		
Bank (m) <u>Left Bar</u> 0 - 5 5 - 10 10 - 20	nk Vegetation Ty	<u>De</u>		<u>Right Bank '</u>	Vegetation Type		
Bank (m) <u>Left Bar</u> 0 - 5 5 - 10	nk Vegetation Ty	<u>De</u>		Right Bank ^v	Vegetation Type		
Bank (m) <u>Left Bar</u> 0 - 5 5 - 10 10 - 20				Right Bank \	Vegetation Type		
Bank (m) <u>Left Ban</u> 0 - 5 5 - 10 10 - 20 20 - 30	pling Methods		Height(m)		Vegetation Type		
Bank (m) <u>Left Ban</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam	pling Methods		Height(m)				
Bank (m) <u>Left Ban</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap	pling Methods		Height(m) <u>)</u> (VOG)	Visual Obse			
Bank (m) Left Ban 0 - 5 5 5 - 10 10 10 - 20 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap Fish Observation Fish Observation	pling Methods s ^{mon} 42 Fish Meas	5 Life Stage: juv sured: 39 Fork	Height(m) <u>)</u> (VOG) enile	Visual Obse	ervation, Ground		
Bank (m) <u>Left Ban</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap Fish Observation Species: Chinook sal Total Fish Count: Sampling Method (pling Methods s ^{mon} 42 Fish Meas No. of fish): MT	5 Life Stage: juv sured: 39 Fork	Height(m) <u>)</u> (VOG) enile Lengths (mm)	Visual Obse Life Hi Min: 42	ervation, Ground	ous (ean: 51	Height(m)
Bank (m) <u>Left Ban</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap Fish Observation Species: Chinook sal Total Fish Count: Sampling Method (Comments:	pling Methods s mon 42 Fish Meas No. of fish): MT n 22 Fish Meas	S Life Stage: juv sured: 39 Fork TR (39) VOG (3) Life Stage: juv sured: 14 Fork	Height(m) <u>)</u> (VOG) enile Lengths (mm) enile	Visual Obse Life Hi Min: 42 Life Hi	ervation, Ground story: Anadrome Max: 65 M story: Anadrome	ous (ean: 51	Height(m)
Bank (m)Left Ban0 - 55 - 1010 - 2020 - 30Key To Fish Sam(MTR)Minnow TrapFish ObservationsSpecies: Chinook salTotal Fish Count:Sampling Method (Comments:Species: coho salmonTotal Fish Count:Sampling Method (Comments:Comments:Sampling Method (Comments:	pling Methods s mon 42 Fish Meas No. of fish): MT n 22 Fish Meas	S Life Stage: juv sured: 39 Fork TR (39) VOG (3) Life Stage: juv sured: 14 Fork	Height(m) <u>)</u> (VOG) enile Lengths (mm) enile	Visual Obse Life Hi Min: 42 Life Hi	ervation, Ground story: Anadroma Max: 65 M story: Anadroma	ous cean: 51	Height(m) Median: 53
Bank (m) Left Ban 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap Fish Observation Species: Chinook sal Total Fish Count: Sampling Method (Comments: Species: coho salmon Total Fish Count: Sampling Method (pling Methods s mon 42 Fish Meas No. of fish): MT n 22 Fish Meas	S Life Stage: juv sured: 39 Fork TR (39) VOG (3) Life Stage: juv sured: 14 Fork	Height(m) <u>)</u> (VOG) enile Lengths (mm) enile Lengths (mm)	Visual Obse Life Hi Min: 42 Life Hi Min: 40	ervation, Ground story: Anadroma Max: 65 M story: Anadroma	ous cean: 51	Height(m) Median: 53
Bank (m) Left Ban 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap Fish Observation Species: Chinook sal Total Fish Count: Sampling Method (Comments: Species: coho salmon Total Fish Count: Sampling Method (Comments: Simpling Method (Comments: Stream Gradient:	pling Methods s mon 42 Fish Meas No. of fish): MT n 22 Fish Meas	S Life Stage: juv sured: 39 Fork TR (39) VOG (3) Life Stage: juv sured: 14 Fork	Height(m) <u>i</u> (VOG) enile Lengths (mm) enile Lengths (mm) Channel	Visual Obse Life Hi Min: 42 Life Hi Min: 40	ervation, Ground story: Anadroma Max: 65 M story: Anadroma	ous cean: 51	Height(m) Median: 53
Bank (m)Left Ban0 - 55 - 1010 - 2020 - 30Key To Fish Sam(MTR)Minnow TrapFish ObservationSpecies: Chinook salTotal Fish Count:Sampling Method (Comments:Species: coho salmon Total Fish Count:Sampling Method (Comments:InstrumentsStream Gradient:Stream Velocity:	pling Methods s mon 42 Fish Meas No. of fish): MT n 22 Fish Meas	S Life Stage: juv sured: 39 Fork TR (39) VOG (3) Life Stage: juv sured: 14 Fork	Height(m) <u>)</u> (VOG) enile Lengths (mm) enile Lengths (mm) Channel Channel	Visual Obse Life Hi Min: 42 Life Hi Min: 40	ervation, Ground story: Anadroma Max: 65 M story: Anadroma	ous cean: 51	Height(m) Median: 53
Bank (m) Left Ban 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sam (MTR) Minnow Trap Fish Observation Species: Chinook sal Total Fish Count: Sampling Method (Comments: Species: coho salmon Total Fish Count: Sampling Method (Comments: Simpling Method (Comments: Stream Gradient:	pling Methods s mon 42 Fish Meas No. of fish): MT n 22 Fish Meas	S Life Stage: juv sured: 39 Fork TR (39) VOG (3) Life Stage: juv sured: 14 Fork	Height(m) <u>i</u> (VOG) enile Lengths (mm) enile Lengths (mm) Channel	Visual Obse Life Hi Min: 42 Life Hi Min: 40	ervation, Ground story: Anadroma Max: 65 M story: Anadroma	ous cean: 51	Height(m) Median: 53

Observers: Raye Ann Neustel	Date/Time: 09/04/2011 11:50 AM
	Sample Latitude Longitude Coordinates 61.95709 -150.90675
USGS Quadrangle: Tyonek D-3 Waterbody Name: Lake Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: No habitat data collect	 Non-Differential GPS Field Measurement Datum: WGS84 Legal Description (MTRS): S022N009W34 : 247-41-10200-2053-3170 : eted. Waypoint 24C03 suspected spawning sockeye salmon activity observed also, lownriver. Adults holding in side channel habitat.
Wildlife Comments:	
Water Quality \ Stream Flow	
Water Temp (C):DO (mg/L):Water Color: ClearT	DO (%): Conductivity (μS/cm): pH: Furbidity (NTU): Thalweg Velocity (m/s)(ft/s): 2.50 8.20
Stream Channel	
	Entrenchment:Slightly EntrenchedEmbeddedness:Low
Channel Dimensions (m): Bankful Width Thalweg Depth	I OHW Wetted Dominant Substrate: Gravel Subdominant Substrate 1: Cobble Subdominant Substrate 2: Silt/Clay
	~
Rosgen Class:	
	es (Viereck et al. 1992)
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5	Canopy Canopy
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Canopy
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10	Canopy Canopy
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Canopy
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOB) Visual Observation, Boat	Canopy Canopy
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOB) Visual Observation, Boat	Canopy Height(m) <u>Right Bank Vegetation Type</u> Canopy Height(m) Life Stage: adult Life History: Anadromous red: Fork Lengths (mm) Min: Max: Mean: Median:
Riparian Vegetation Communiti Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOB) Visual Observation, Boat Fish Observations Species: sockeye salmon Total Fish Count: 60 Fish Measu Sampling Method (No. of fish): VOE Comments:	Canopy Height(m) <u>Right Bank Vegetation Type</u> Canopy Height(m) Life Stage: adult Life History: Anadromous red: Fork Lengths (mm) Min: Max: Mean: Median:
Riparian Vegetation Communitie Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOB) Visual Observation, Boat Fish Observations Species: sockeye salmon Total Fish Count: 60 Fish Measur Sampling Method (No. of fish): VOE Comments:	Canopy Height(m) <u>Right Bank Vegetation Type</u> Canopy Height(m) Life Stage: adult Life History: Anadromous red: Fork Lengths (mm) Min: Max: Mean: Median:
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOB) Visual Observation, Boat Fish Observations Species: sockeye salmon Total Fish Count: 60 Fish Measu Sampling Method (No. of fish): VOE Comments: Instruments	Canopy Canopy Height(m) Right Bank Vegetation Type Height(m) Life Stage: adult Life History: Anadromous Intervention of the stage red: Fork Lengths (mm) Min: Max: Mean: Median: 6(60) Suspected Spawning: Yes
Riparian Vegetation Communiti Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (VOB) Visual Observation, Boat Fish Observations Species: sockeye salmon Total Fish Count: 60 Fish Measu Sampling Method (No. of fish): VOE Comments: Instruments Stream Gradient:	Canopy Height(m) Right Bank Vegetation Type Canopy Height(m) Life Stage: adult Life History: Anadromous red: Fork Lengths (mm) Min: Max: Mean: Median: Suspected Spawning: C(60) Suspected Spawning: Yes

Observers: Raye Ann Neu	ıstel			Date/Ti	me: 09/04/2011 12:00 PM
		Sample Coordinates	Latitude 61.94425	Longitude -150.91135	
Elevation NED (m)(ft): 45 Coordinate Determination USGS Quadrangle: Tyonel Waterbody Name: Lake Cr Anadromous Waters Catal Geographic Comments: Visit Comments: This entin collected.	Method: Non-Differ k D-3 reek log Number: re river was floated by		ption (MTRS)	Datum: WC S021N009W	V03
Wildlife Comments:					
Water Quality \ Stream	n Flow				
Water Temp (C):IWater Color:	DO (mg/L): Turbidity	DO (%): (NTU):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s	рН: s):
Stream Channel					
Stream Gradient (%): Catchment Area(sq. km):	Entrench 1060 Embedde				
Channel Dimensions (m): W Thalweg De	Bankfull OHW /idth epth	Subdo	Dominant Sub ominant Subst ominant Subst	rate 1:	
Rosgen Class:					
Riparian Vegetation Co	ommunities (Vier	reck et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vege</u> 0 - 5	etation Type	Canopy Height(m)	<u>Right Bank V</u>	egetation Typ	Canopy De Height(m)
5 - 10 10 - 20					
20 - 30					
Key To Fish Sampling	Methods				
(VOB) Visual Observation, I	Boat				
Fish Observations					
Species: sockeye salmon Total Fish Count: 1	Life Stag Fish Measured:	e: adult Fork Lengths (mm		tory: Anadro Max:	mous Mean: Median:
Sampling Method (No. of E Comments:	fish): VOB (1)				Suspected Spawning: Yes
Sampling Method (No. of Comments:	fish): VOB (1)				Suspected Spawning: Yes
Sampling Method (No. of	fish): VOB (1)		l Depths:	:	Suspected Spawning: Yes
Sampling Method (No. of E Comments: Instruments	fish): VOB (1)	Channe	d Depths:		Suspected Spawning: Yes
Sampling Method (No. of the Comments: Instruments Stream Gradient:	fish): VOB (1)	Channe	d Widths:		Suspected Spawning: Yes
Sampling Method (No. of a Comments: Instruments Stream Gradient: Stream Velocity:	fish): VOB (1)	Channe	l Widths: fisher:		Suspected Spawning: Yes

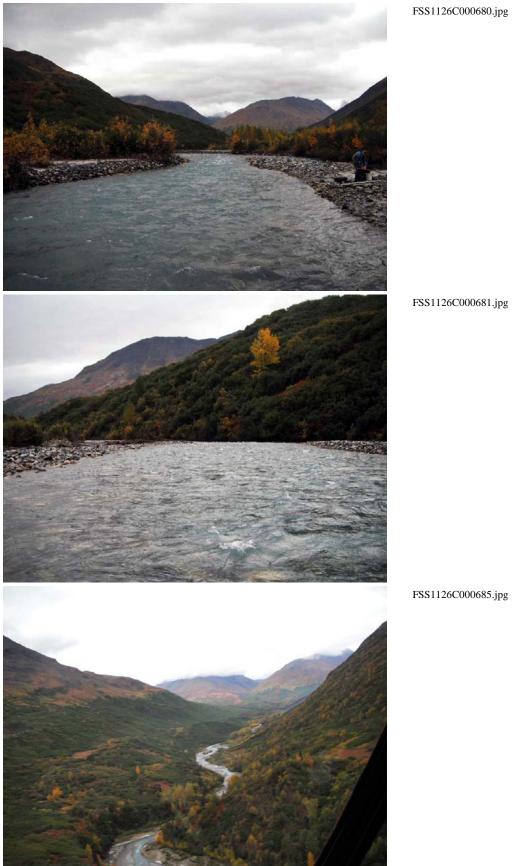
Station Info Observers: Raye Ann Neustel Date/Time: 09/04/2011 8:01 AM Sample Latitude Longitude Coordinates -150.91383 61.93593 Elevation NED (m)(ft): 38 125 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-3 Legal Description (MTRS): S021N009W03 Waterbody Name: Lake Creek Anadromous Waters Catalog Number: 247-41-10200-2053-3170 Geographic Comments: The main channel of Lake Creek that confluences with the Yentna River has changed starting at this site which is approximately 8 km upriver from the mouth and has formed a new channel approximately 4 km north of old main channel. Visit Comments: No water quality data collected. The new main channel of Lake Creek that confluences with the Yentna River has numerous beaver complexes and backwater rearing habitat. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Thalweg Velocity (m/s)(ft/s): Water Color: Clear **Turbidity (NTU): Stream Channel** Stream Gradient (%): **Entrenchment:** Slightly Entrenched 1062 Catchment Area(sq. km): **Embeddedness:** Moderate Channel Dimensions (m): Bankfull OHW Wetted Dominant Substrate: Silt/Clay Width Subdominant Substrate 1: Gravel **Thalweg Depth** Subdominant Substrate 2: Cobble **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (VOG) Visual Observation, Ground **Fish Observations** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 50 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (50) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: Turbidity: Electrofisher:** Water Quality: **Transparency:**

Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/12/2011 10:50 AM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.28225 -152.65063 Coordinates -152.65319 62.28301 62.28086 -152.64774 Elevation NED (m)(ft): 408 1339 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna B-6 Legal Description (MTRS): S025N018W05 Waterbody Name: Kachatna River **Anadromous Waters Catalog Number:** Geographic Comments: HY41 Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.16 DO (mg/L): 11.40 DO (%): 87.50 Conductivity (µS/cm): 161 **pH:** 6.84 Water Color: Glacial, Low Turbidit Turbidity (NTU): 4.78 Thalweg Velocity (m/s)(ft/s): 1.43 4.69 **Stream Channel** Stream Gradient (%): 1.75 Moderatley Entrenched **Entrenchment: Catchment Area(sq. km):** 148 **Embeddedness:** Low Bankfull OHW Wetted **Channel Dimensions (m):** Dominant Substrate: Cobble **Width** 81.0 11.0 Subdominant Substrate 1: Gravel Thalweg Depth 1.44 0.76 Subdominant Substrate 2: Silt/Clay Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 16 0 - 5 Unvegetated Open Tall Alder-Willow Shrub 5-10 Unvegetated Open Tall Alder-Willow Shrub 16 10-20 Unvegetated Open Tall Alder-Willow Shrub 16 20 - 30 Closed Tall Alder-Willow Shrub 18 Closed Tall Alder-Willow Shrub 20 **Kev To Fish Sampling Methods** Estimated reach length (m): 400 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fish Measured: 13 Fork Lengths (mm) Min: 37 Max: 76 Median: 56 **Total Fish Count: 29** Mean: 56 Sampling Method (No. of fish): PEF (13) VOG (16) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 85 **Total Fish Count:** 9 Fish Measured: 9 Max: 98 Mean: 91 Median: 91 Sampling Method (No. of fish): PEF (9) **Comments: Species:** slimy sculpin Life Stage: adult Life History: Resident Median: 77 **Total Fish Count:** 1 Fish Measured: 1 Fork Lengths (mm) Min: 77 Max: 77 **Mean:** 77 Sampling Method (No. of fish): PEF (1) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: 61 Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 61 Max: 61 **Mean:** 61 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1126C000681.jpg

FSS1126C000685.jpg

FSS1126C000686.jpg



Station Info Observers: Raye Ann Neustel Date/Time: 09/05/2011 10:50 AM Sample Latitude Longitude Coordinates -150.91483 61.90602 Elevation NED (m)(ft): 32 105 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek D-3 Legal Description (MTRS): S021N009W15 Waterbody Name: Lake Creek Anadromous Waters Catalog Number: 247-41-10200-2053-3170 Geographic Comments: This sample site is at the confluence of the Yentna River and Lake Creek. Visit Comments: No water quality data collected. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: Clear **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): 1.50 4.92 **Stream Channel** Stream Gradient (%): **Entrenchment:** Slightly Entrenched 1075 Moderate Catchment Area(sq. km): **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Silt/Clay Width Subdominant Substrate 1: Gravel **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class:**

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Black Cottonwood Forest	29	Closed Tall Alder-Willow Shrub	19
5 - 10	Closed Black Cottonwood Forest	29	Closed Tall Alder-Willow Shrub	19
10 - 20	Closed Black Cottonwood Forest	29	Closed Tall Alder-Willow Shrub	19
20 - 30	Closed Black Cottonwood Forest	29	Closed Tall Alder-Willow Shrub	19

Key To Fish Sampling Methods

(VOG) Visual Observation, Ground

Fish Observations

Species: sockeye salmon Total Fish Count: 75 Sampling Method (No. o Comments:	Fish Measured:	age: adult spawning Fork Lengths (mm)	History: Ana Max:	dromous Mean:	Median:
Species: chum salmon Total Fish Count: 250 Sampling Method (No. o Comments:	Fish Measured:	age: adult spawning Fork Lengths (mm)	History: Ana Max:	dromous Mean:	Median:
Species: chum salmon Total Fish Count: 100 Sampling Method (No. o Comments:	Fish Measured:	age: carcass Fork Lengths (mm)	History: Ana Max:	dromous Mean:	Median:
Species: pink salmon Total Fish Count: 500 Sampling Method (No. o Comments:	Fish Measured:	age: adult spawning Fork Lengths (mm)	History: Ana Max:	dromous Mean:	Median:

Species: pink salmon Life Stage: carcass Life History: Anadromous Total Fish Count: 100 Fish Measured: Median: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (100) **Comments:** Species: coho salmon Life Stage: adult Life History: Anadromous Total Fish Count: 30 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (30) **Comments:** Instruments

Stream Gradient: Stream Velocity: GPS Float **Turbidity:** Water Quality:

Channel Depths: Channel Widths: Electrofisher: Transparency:

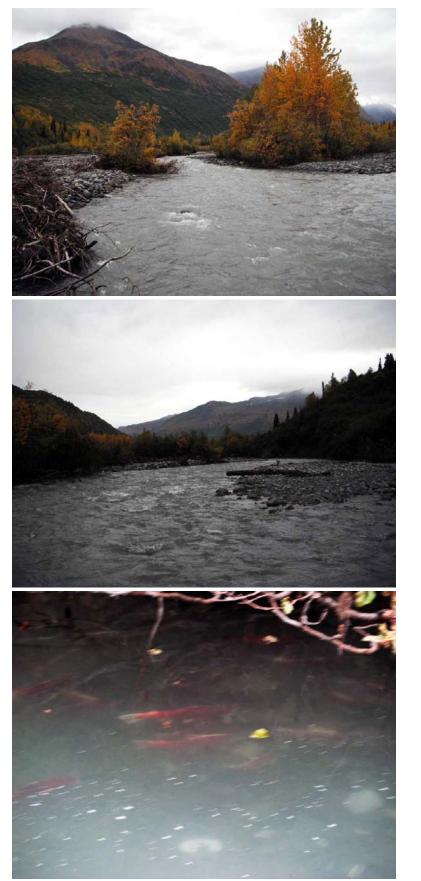
Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/12/2011 1:00 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.28330 -152.58183 Coordinates -152.58579 62.28451 62.28267 -152.58091 Elevation NED (m)(ft): 376 1234 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Talkeetna B-6 Legal Description (MTRS): S025N018W03 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HY76. Sampled downstream of Denali National Park border. Unnamed tributary of Kichatna River flowing out of Denali Park. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 4.87 DO (mg/L): 12.43 DO (%): 97.10 Conductivity (µS/cm): 120 **pH:** 7.29 Water Color: Glacial, High Turbidit Turbidity (NTU): 28.80 Thalweg Velocity (m/s)(ft/s): 1.22 4.00 **Stream Channel** Stream Gradient (%): 1.25 **Entrenchment:** Moderatley Entrenched Catchment Area(sq. km): **Embeddedness:** High 92 **Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Cobble Width 56.0 13.0 Subdominant Substrate 1: Gravel Thalweg Depth 0.90 0.50 Subdominant Substrate 2: Silt/Clay Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 Closed Tall Willow Shrub 16 Unvegetated 5 - 10 Closed Tall Willow Shrub 16 Unvegetated 10 - 20 Closed Tall Willow Shrub 16 Unvegetated 20 - 30 Closed Tall Willow Shrub 16 Unvegetated **Key To Fish Sampling Methods** Estimated reach length (m): 301 (PEF) Backpack Electrofisher (VOG) Visual Observation, Ground **Fish Observations** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fish Measured: 14 Fork Lengths (mm) Min: 98 Max: 374 **Median:** 236 Total Fish Count: 69 Mean: 214 Sampling Method (No. of fish): PEF (14) VOG (55) **Comments:** Species: coho salmon Life History: Anadromous Life Stage: juvenile **Total Fish Count:** 8 Fish Measured: 4 Fork Lengths (mm) Min: 49 Max: 57 **Mean: 53** Median: 53 Sampling Method (No. of fish): PEF (4) VOG (4) **Comments:** Species: slimy sculpin Life Stage: juvenile/adult Life History: Resident Median: Total Fish Count: 18 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Sampling Method (No. of fish): VOG (18) **Comments:** Species: sockeye salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 59 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (59) **Comments:**

Appendix L218.–Page 2 of 4.

Species: coho salmon Life Stage: adult spawning Life History: Anadromous Total Fish Count: 16 Fish Measured: Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): VOG (16) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Total Fish Count: 6 Fish Measured: 6 Fork Lengths (mm) Min: 54 Max: 75 **Mean:** 62 Median: 64 Sampling Method (No. of fish): PEF (6) **Comments:** Species: slimy sculpin Life Stage: adult Life History: Resident Median: 86 Fork Lengths (mm) Min: 82 Max: 91 Total Fish Count: 3 Fish Measured: 3 **Mean:** 87 Sampling Method (No. of fish): PEF (3) **Comments:**

Instruments

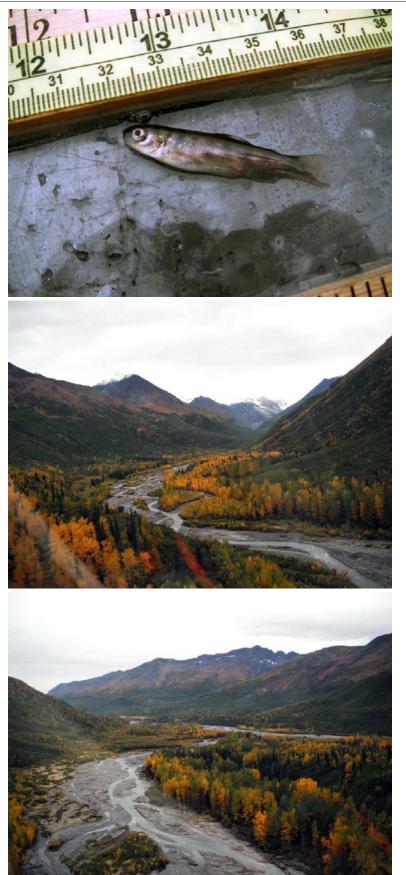
Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1126C020695.jpg

Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/12/2011 4:15 PM Station Latitude Longitude Sample Latitude Longitude Latitude Longitude Coordinates 62.23868 -152.41515 Coordinates -152.41885 62.23833 62.23873 -152.41435 Elevation NED (m)(ft): 291 955 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Ouadrangle: Talkeetna A-5 Legal Description (MTRS): S025N017W22 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: HY121. Unnamed tributary of the Kichatna River. Visit Comments: Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): 5.91 DO (mg/L): 12.29 DO (%): 98.40 Conductivity (µS/cm): 82 **pH:** 7.62 Water Color: Clear Turbidity (NTU): 1.20 Thalweg Velocity (m/s)(ft/s): 1.05 3.44 **Stream Channel** Moderatley Entrenched Stream Gradient (%): 1 **Entrenchment:** Very High **Catchment Area(sq. km):** 53 **Embeddedness: Channel Dimensions (m):** Bankfull OHW Wetted Dominant Substrate: Gravel **Width** 28.0 11.0 Subdominant Substrate 1: Cobble Thalweg Depth 0.95 0.55 Subdominant Substrate 2: Silt/Clay Rosgen Class: B4 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks. **Riparian Vegetation Communities (Viereck et al. 1992)** Dist from Canony Canony

Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	31	Unvegetated	
5 - 10	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	31	Open Tall Willow Shrub	10
10 - 20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	31	Open Tall Willow Shrub	10
20 - 30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	31	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	28

Key To Fish Sampling Methods Estimat

Estimated reach length (m): 280

(PEF) Backpack Electrofisher

Fish Observations

Species: Chinook salmon	Life Sta	age: juvenile	Life H	istory: Anad	romous	
Total Fish Count: 5 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 46	Max: 63	Mean: 55	Median: 54
Species: Dolly Varden	Life Sta	age: juvenile	Life H	istory: Unkn	iown	
Total Fish Count: 4 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 34	Max: 43	Mean: 39	Median: 38
Species: Dolly Varden	Life Sta	age: juvenile/adult	Life H	istory: Unkn	nown	
Total Fish Count: 4 Sampling Method (No. o Comments:		Fork Lengths (mm)	Min: 126	Max: 189	Mean: 166	Median: 157

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1126C030700.jpg



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Sample		Date/Ti	ime: 09/12	2011 4.51 DM
-			mic. 07/12	2011 4:51 PM
Coordinates	Latitude 62.22703	Longitude -152.90688	Latitue 62.224	8
l GPS Field Me	asurement	Datum: W	GS84	
Legal Descript	tion (MTRS)	: S025N020	W25	
of Puntilla Lake	. HY143.			
. ,	•		-	
e .	renched			
etted Do	ominant Sub	strate: Cobbl	le	
0.0 Subdon	ninant Subst	rate 1: Grave	el	
.38 Subdon	ninant Subst	rate 2: Silt/C	lay	
r. riffle/pool. allı	uvial channel	s with broad.	well-define	d floodplains.
	Legal Description of Puntilla Lake (%): 94.00 U): 0.32 T Slightly Ent Sightly Ent Moderate etted Do 0.0 Subdom .38 Subdom	of Puntilla Lake. HY143. (%): 94.00 Conductivity U): 0.32 Thalweg Velo Sightly Entrenched Moderate Consumption of the state of the	Legal Description (MTRS): S025N020 of Puntilla Lake. HY143. (%): 94.00 Conductivity (μS/cm): 26 (J): 0.32 Thalweg Velocity (m/s)(ft : Slightly Entrenched s: Moderate etted Dominant Substrate: Cobb 0.0 Subdominant Substrate 1: Grave .38 Subdominant Substrate 2: Silt/C r, riffle/pool, alluvial channels with broad,	Legal Description (MTRS): S025N020W25 of Puntilla Lake. HY143. (%): 94.00 Conductivity (µS/cm): 261 pH: J): 0.32 Thalweg Velocity (m/s)(ft/s): 0.91 2.9 : Slightly Entrenched s: Moderate etted Dominant Substrate: Cobble 0.0 Subdominant Substrate 1: Gravel .38 Subdominant Substrate 2: Silt/Clay r, riffle/pool, alluvial channels with broad, well-defined

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated		Closed Tall Willow Shrub	12
5 - 10	Unvegetated		Closed Tall Willow Shrub	12
10 - 20	Unvegetated		Closed Tall Willow Shrub	12
20 - 30	Unvegetated		Closed Tall Willow Shrub	12

Estimated reach length (m): 368

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

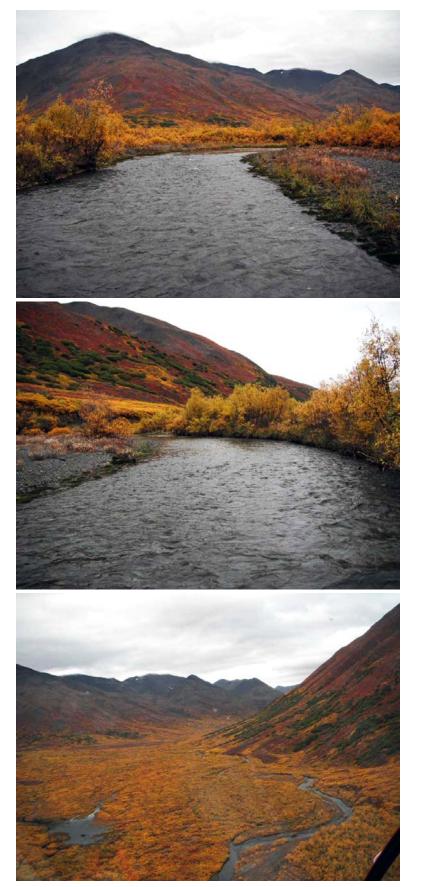
Fish Observations

No Fish Found

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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Appendix L221. Station 1 SS1127C01.	•		
Station Info			
Observers: Jonathan Kirsch, Raye Ann Neuste	el, Doug Hill	Date/Time: 09	9/13/2011 9:51 AM
StationLatitudeLongitudeCoordinates61.37645-150.34211	Sample Coordinates	Latitude Longitude La 61.37559 -150.34455 / 61.	titudeLongitude.37645-150.34211
Elevation NED (m)(ft): 10 33			
Coordinate Determination Method: Non-Diff USGS Quadrangle: Tyonek B-1		easurement Datum: WGS84 ption (MTRS): S015N006W22	
Waterbody Name: Maguire Creek	Legal Deseri	pion (MTK5). 50151000 422	
Anadromous Waters Catalog Number:			
Geographic Comments: HM93			
Visit Comments: Velocity was nearly zero and	much of the stream w	as stagnant.	
Wildlife Comments:			
Water Quality \ Stream Flow			
Water Temp (C): 9.71 DO (mg/L): 7.70	DO (%): 68.50		pH: 5.83
Water Color: Feric Turbidit	y (NTU): 8.69	Thalweg Velocity (m/s)(ft/s): 0.06	5 0.20
Stream Channel			
~ /	chment: Slightly E		
	dedness: Very High		
Channel Dimensions (m): Bankfull OHV Width 5.0		Dominant Substrate: Silt/Clay minant Substrate 1:	
Thalweg Depth 1.25		minant Substrate 1:	
Rosgen Class: E5 Low gradient, meandering rif efficient and stable. High meand		ow width/depth ratio and little depo	osition. Very
Riparian Vegetation Communities (Vie			
Dist. from	Canopy		Canopy
Bank (m) Left Bank Vegetation Type		Right Bank Vegetation Type	Height(m)
0 - 5 Mesic Graminoid Herbaceous	1.5	Mesic Graminoid Herbaceous	1.5
5 - 10 Mesic Graminoid Herbaceous	1.5	Mesic Graminoid Herbaceous	1.5
10 - 20 Mesic Graminoid Herbaceous	1.5	Mesic Graminoid Herbaceous	1.5
20 - 30 Mesic Graminoid Herbaceous	1.5	Mesic Graminoid Herbaceous	1.5
Key To Fish Sampling Methods	Estimated reach	ength (m): 268	
(PEF) Backpack Electrofisher			
Fish Observations			
Species: ninespine stickleback Life Sta	age: juvenile/adult	Life History: Resident	
Total Fish Count: 4 Fish Measured: G I I	Fork Lengths (mm) Min: 43 Max: 52 Mean:	: 47 Median: 47
Sampling Method (No. of fish): PEF (4) Comments:			
	age: juvenile	Life History: Resident	
Total Fish Count: 6 Fish Measured: 6 Sampling Method (No. of fish): PEF (6) Comments:	Fork Lengths (mm	-	: 36 Median: 36
Instruments			
Stream Gradient: handheld abney level	Channe	I Depths: graduated wading rod	
Stream Velocity: transparent velocity head ro		Widths: measuring tape	
Turbidity: LaMotte 2020e turbidimeter	Electro		
	Licell		

Water Quality: YSI 556

Transparency:



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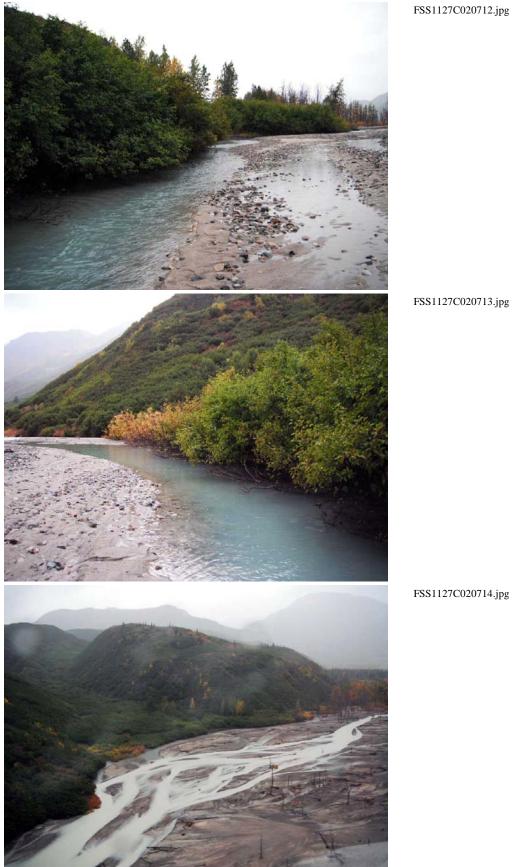


II					
Station Info					
Observers: Jonathan Kirsch, Raye Ann Neustel			Date/Time	e: 09/13/20	11 12:49 PM
StationLatitudeLongitudeCoordinates61.75670-152.01937	Sample Coordinates	Latitude 61.75597	Longitude -152.02131 /	Latitude 61.75670	Longitude -152.01937
Elevation NED (m)(ft): 263 863					
Coordinate Determination Method: Non-Different			Datum: WGS		
USGS Quadrangle: Tyonek D-6 Waterbody Name: Trimble River Anadromous Waters Catalog Number: Geographic Comments: HY100	Legal Descrip	otion (MTKS	5): S019N015W0	8	
Visit Comments: Reach was sampled entirely within only the variables associated with the associated with the main stem Trin	the trib. fed side c	channel and d			
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 3.72DO (mg/L): 11.80DWater Color: Glacial, Low TurbiditTurbidity (N	Ο (%): 89.40 ΓU): 12.30		y (µS/cm): 36 locity (m/s)(ft/s):	pH: 6.3	9
Stream Channel					
Stream Gradient (%): 0.3 Entrenchme	nt: Slightly En	trenched			
Catchment Area(sq. km): 40 Embeddedne	ess: Moderate				
Channel Dimensions (m): Bankfull OHW V			bstrate: Sand		
Width 14.0 Thalweg Depth 1.10		minant Subs minant Subs	trate 1: Cobble		
Rosgen Class: C5 Low gradient, meandering, point-b				ll-defined f	loodplains
Riparian Vegetation Communities (Vierec	-				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy Height(m)	Right Bank '	Vegetation Type		Canopy Height(m)
0-5 Unvegetated	(Closed Tall A	Alder Shrub		18
5-10 Unvegetated	(Closed Tall A	Alder Shrub		18
10 - 20 Unvegetated	(Closed Tall A	Alder Shrub		18
20 - 30 Unvegetated		Closed Tall A	Alder Shrub		18
Key To Fish Sampling Methods E	stimated reach le	ength (m): 18	80		
(PEF) Backpack Electrofisher	(VOG)	Visual Obse	ervation, Ground		
	uvenile/adult rk Lengths (mm))		story: Unknown Max: 199 M	ean: 148	Median: 150
Sampling Method (No. of fish): PEF (9)	uvenile rk Lengths (mm)		story: Unknown Max: 68 M	ean: 60	Median: 60
Comments:					
Instruments					
Instruments	Channel	l Depths: g	raduated wading 1	od	
		_	raduated wading i	od	
Instruments Stream Gradient: handheld abney level		Widths: m		rod	

Water Quality: YSI 556

-continued-

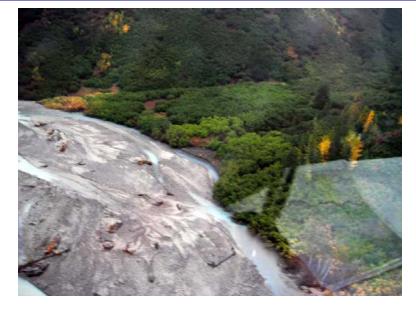
Transparency:



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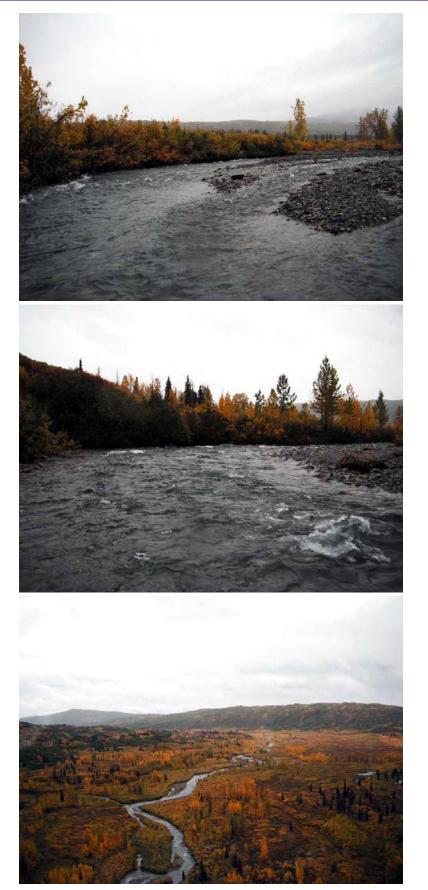


Station Info					
Observers: Jonathan Kirsch, Raye Ann Neustel			Date/T	'ime: 09/13/2	011 2:29 PM
StationLatitudeLongitudeCoordinates61.80046-151.71907	Sample Coordinates	Latitude 61.79909	Longitude -151.72275	Latitude / 61.80067	0
Elevation NED (m)(ft): 423 1388					
Coordinate Determination Method: Non-Different			Datum: W		
USGS Quadrangle: Tyonek D-5 Waterbody Name: Canyon Creek	Legal Descri	ption (MTRS)	: S020N014	W25	
Anadromous Waters Catalog Number: 247-41-102	200-2053-3205-4	067			
Geographic Comments: HY70					
Visit Comments: Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): 5.77DO (mg/L): 11.64DWater Color: ClearTurbidity (N)	Ο (%): 92.90 ΓU): 0.86	Conductivity Thalweg Velo		-	
Stream Channel					
Stream Gradient (%): 1.3EntrenchmeCatchment Area(sq. km): 63Embeddedne	6,	ntrenched			
	Vetted	Dominant Sub	strate: Cobb	le	
Width 22.0		ominant Subst	rate 1: Bould	ler	
8 . 1		ominant Subst			
Rosgen Class: C3 Low gradient, meandering, point-b	oar, riffle/pool, a	lluvial channel	s with broad,	well-defined	floodplains.
Riparian Vegetation Communities (Vierec	k et al. 1992)				
I 8	n ee un 1772)				
Dist. from	Canopy				Canopy
Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Canopy	<u>Right Bank V</u>		<u>ype</u>	Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 Unvegetated	Canopy Height(m)	<u>Right Bank V</u> Closed Tall W	illow Shrub	<u>vpe</u>	Height(m)
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Closed Tall Willow Shrub	Canopy Height(m) 19	<u>Right Bank V</u> Closed Tall W Closed Tall W	illow Shrub illow Shrub	vpe	Height(m) 19 19
Dist. from Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Closed Tall Willow Shrub10 - 20Closed Tall Willow Shrub	Canopy Height(m) 19 19	Right Bank V Closed Tall W Closed Tall W Closed Tall W	7illow Shrub 7illow Shrub 7illow Shrub	<u>vpe</u>	Height(m) 19 19 19
Dist. from Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Fireweed	Canopy Height(m) 19	<u>Right Bank V</u> Closed Tall W Closed Tall W	7illow Shrub 7illow Shrub 7illow Shrub	<u>vpe</u>	Height(m) 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Fireweed	Canopy Height(m) 19 19 0.4 stimated reach	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W	7illow Shrub 7illow Shrub 7illow Shrub 7illow Shrub 0		Height(m) 19 19 19
Dist. from Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Fireweed	Canopy Height(m) 19 19 0.4 stimated reach	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W	7illow Shrub 7illow Shrub 7illow Shrub 7illow Shrub 0		Height(m) 19 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Fireweed	Canopy Height(m) 19 19 0.4 stimated reach	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W	7illow Shrub 7illow Shrub 7illow Shrub 7illow Shrub 0		Height(m) 19 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Fireweed Key To Fish Sampling Methods E (PEF) Backpack Electrofisher	Canopy Height(m) 19 0.4 stimated reach (VOG uvenile	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Iength (m): 33) Visual Obse Life His	7illow Shrub 7illow Shrub 7illow Shrub 7illow Shrub 0	ind	Height(m) 19 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Fireweed Key To Fish Sampling Methods E (PEF) Backpack Electrofisher E Fish Observations Species: Chinook salmon	Canopy Height(m) 19 19 0.4 stimated reach (VOG uvenile rk Lengths (mm	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Iength (m): 33) Visual Obse Life His	7illow Shrub 7illow Shrub 7illow Shrub 0 rvation, Grou	und	Height(m) 19 19 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Fireweed Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life Stage: j Total Fish Count: 25 Fish Measured: 8 For Sampling Method (No. of fish): PEF (8) VOG (17)	Canopy Height(m) 19 19 0.4 stimated reach (VOG uvenile rk Lengths (mm)	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Iength (m): 33) Visual Obse Life His) Min: 53	7illow Shrub 7illow Shrub 7illow Shrub 0 rvation, Grou	omous Mean: 56	Height(m) 19 19 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Closed Tall Willow Shrub 10 - 20 Closed Tall Willow Shrub 20 - 30 Fireweed Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life Stage: j Total Fish Count: 25 Fish Measured: 8 For Sampling Method (No. of fish): PEF (8) VOG (17) Comments:	Canopy Height(m) 19 19 0.4 stimated reach (VOG uvenile rk Lengths (mm) uvenile rk Lengths (mm	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Iength (m): 33) Visual Obse Life His) Min: 53	Villow Shrub Villow Shrub Villow Shrub O rvation, Grou story: Anadro Max: 61	omous Mean: 56	Height(m) 19 19 19 19
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Fireweed Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life Stage: j Total Fish Count: 25 Fish Measured: 8 For Sampling Method (No. of fish): PEF (8) VOG (17 Comments: Species: coho salmon Life Stage: j Total Fish Count: 22 Fish Measured: 11 For Sampling Method (No. of fish): PEF (11) VOG (1 Sampling Method (No. of fish): PEF (11) VOG (1	Canopy Height(m) 19 19 0.4 stimated reach (VOG uvenile rk Lengths (mm) uvenile rk Lengths (mm 1)	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Iength (m): 33) Visual Obse Life His) Min: 53	 /illow Shrub /illow Shrub /illow Shrub 0 rvation, Grou story: Anadre Max: 61 	omous Mean: 56 omous Mean: 50	Height(m) 19 19 19 19 19 Median: 57
Dist. from Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Closed Tall Willow Shrub 10-20 Closed Tall Willow Shrub 20-30 Fireweed Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Chinook salmon Life Stage: j Total Fish Count: 25 Fish Measured: 8 For Sampling Method (No. of fish): PEF (8) VOG (17) Comments: Species: coho salmon Life Stage: j Total Fish Count: 22 Total Fish Count: 22 Fish Measured: 11 For Sampling Method (No. of fish): PEF (11) VOG (1 Comments: Species: Dolly Varden Life Stage: j 11	Canopy Height(m) 19 19 0.4 stimated reach (VOG uvenile rk Lengths (mm 1) uvenile rk Lengths (mm 1)	Right Bank V Closed Tall W Closed Tall W Closed Tall W Closed Tall W Closed Tall W Iength (m): 33) Visual Obse Life His) Min: 53 Life His) Min: 42	 7illow Shrub 7illow Shrub 7illow Shrub 7illow Shrub 0 rvation, Grou rtory: Anadra Max: 61 story: Anadra Max: 58 	omous Mean: 56 omous Mean: 50	Height(m) 19 19 19 19 19 19 Median: 57

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



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FSS1127C030719.jpg

FSS1127C030720.jpg



Station Info

Observers: Jonathan Kirsch, Raye Ann Neustel			Date/T	`ime: 09/13/20	111 5·33 PM
observersi Johanni Krisen, Raye Anni Reaser	Sample Coordinates	Latitude 61.78528	Longitude -151.78989	/ Latitude	Longitude -151.78473
USGS Quadrangle: Tyonek D-5 Waterbody Name: Canyon Creek Anadromous Waters Catalog Number: Geographic Comments: Visit Comments: No habitat data collected as this si actual transect site 27C03.	tial GPS Field Me Legal Descrip	asurement tion (MTRS	Datum: W): S020N014	'GS84 W34	
Widlife Comments:					
Water Quality \ Stream FlowWater Temp (C):DO (mg/L):DWater Color:Turbidity (N		Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft	рН: /s):	
Stream Channel					
Stream Gradient (%): Entrenchme Catchment Area(sq. km): 21 Embeddedn Channel Dimensions (m): Bankfull OHW W Width Thalweg Depth Rosgen Class:	ess: Wetted D Subdor	ominant Suk ninant Subs ninant Subs	trate 1:		
Riparian Vegetation Communities (Vierec	k et al. 1992)				
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m) <u>I</u>	Right Bank V	Vegetation Ty	<u>vDe</u>	Canopy Height(m)
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy			<u>vpe</u>	
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Canopy Height(m) <u>1</u> Estimated reach le	ength (m): 32			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage:	Canopy Height(m) <u>1</u> Setimated reach le (VOG) juvenile rk Lengths (mm) 7)	ength (m): 32 Visual Obse Life His Min:	0 ervation, Grou story: Unkno Max:	ınd own Mean:	
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 29 Fish Measured: Fo Sampling Method (No. of fish): PEF (12) VOG (1 Comments: The Dolly Varden captured at this site of Species: Dolly Varden Life Stage:	Canopy Height(m) <u>1</u> Estimated reach la (VOG) juvenile rk Lengths (mm) 7) were not measured juvenile/adult rk Lengths (mm) 5)	ength (m): 32 Visual Obse Life His Min: I, but rather io Life His Min:	0 story: Unkno Max: dentifyed and story: Unkno Max:	und Dwn Mean: released. Dwn Mean:	Height(m)
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 29 Fish Measured: Fo Sampling Method (No. of fish): PEF (12) VOG (1 Comments: The Dolly Varden Life Stage: Total Fish Count: 70 Fish Measured: Fo Sampling Method (No. of fish): PEF (25) VOG (4	Canopy Height(m) <u>1</u> Estimated reach la (VOG) juvenile rk Lengths (mm) 7) were not measured juvenile/adult rk Lengths (mm) 5)	ength (m): 32 Visual Obse Life His Min: I, but rather io Life His Min:	0 story: Unkno Max: dentifyed and story: Unkno Max:	und Dwn Mean: released. Dwn Mean:	Height(m) Median:
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: 1 Total Fish Count: 29 Fish Measured: Fo Sampling Method (No. of fish): PEF (12) VOG (1 Comments: The Dolly Varden captured at this site of Species: Dolly Varden Life Stage: Total Fish Count: 70 Fish Measured: Fo Sampling Method (No. of fish): PEF (25) VOG (4 Comments: The Dolly Varden captured at this site of Sampling Method (No. of fish): PEF (25) VOG (4	Canopy Height(m) <u>1</u> Estimated reach la (VOG) juvenile rk Lengths (mm) 7) were not measured juvenile/adult rk Lengths (mm) 5)	ength (m): 32 Visual Obse Life His Min: I, but rather is Life His Min: I, but rather is	0 story: Unkno Max: dentifyed and story: Unkno Max:	und Dwn Mean: released. Dwn Mean:	Height(m) Median:
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods Fish Observations Species: Dolly Varden Life Stage: Total Fish Count: 29 Fish Measured: Fo Sampling Method (No. of fish): PEF (12) VOG (1 Comments: The Dolly Varden captured at this site of Species: Dolly Varden Life Stage: Total Fish Count: 70 Fish Measured: Fo Sampling Method (No. of fish): PEF (25) VOG (4 Comments: The Dolly Varden captured at this site of Sampling Method (No. of fish): PEF (25) VOG (4 Comments: The Dolly Varden captured at this site of Sampling Method (No. of fish): PEF (25) VOG (4 Comments: The Dolly Varden captured at this site of	Canopy Height(m)] Cestimated reach le (VOG) juvenile rk Lengths (mm) 7) were not measured juvenile/adult rk Lengths (mm) 5) were not measured	ength (m): 32 Visual Obse Life His Min: I, but rather id Life His Min: I, but rather id Depths:	0 story: Unkno Max: dentifyed and story: Unkno Max:	und Dwn Mean: released. Dwn Mean:	Height(m) Median:
Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods E (PEF) Backpack Electrofisher Fish Observations Species: Dolly Varden Life Stage: 1 Total Fish Count: 29 Fish Measured: Fo Sampling Method (No. of fish): PEF (12) VOG (1 Comments: The Dolly Varden captured at this site of Species: Dolly Varden Life Stage: 1 Total Fish Count: 70 Fish Measured: Fo Sampling Method (No. of fish): PEF (25) VOG (4 Comments: The Dolly Varden captured at this site of Sampling Method (No. of fish): PEF (25) VOG (4 Comments: The Dolly Varden captured at this site of	Canopy Height(m) <u>1</u> Setimated reach le (VOG) juvenile rk Lengths (mm) 7) were not measured juvenile/adult rk Lengths (mm) 5) were not measured Shannel	ength (m): 32 Visual Obse Life His Min: I, but rather in Life His Min: I, but rather in Depths: Widths:	0 story: Unkno Max: dentifyed and story: Unkno Max:	und Dwn Mean: released. Dwn Mean:	Height(m) Median:

FSS1127C040722.jpg



Station In	fo				
	Jonathan Kirsch, Raye Ann Neustel			Date/Time: 09/13/2011	3.13 PM
	•	~ -			
Station	Latitude Longitude	Sample	Latitude	8 /	Longitude
Coordinat	01.00700 101.00702	Coordinates	61.68734	-151.53946 / 61.68774	-151.53726
	NED (m)(ft): 250 820		-		
	e Determination Method: Non-Differen			Datum: WGS84	
-	drangle: Tyonek C-5	Legal Descri	ption (MTRS)	: S019N013W36	
	Name: Friday Creek				
	us Waters Catalog Number:				
Geographi	c Comments: HY104. Waterfall upriver approximately 10 m below	••			ry
Visit Comr				•	
Wildlife Co					
whante Co	Juments:				
Water Qu	ality \ Stream Flow				
Water Ten	np (C): 7.60 DO (mg/L): 11.85 D	O (%): 99.10	Conductivity	μS/cm): 19 pH: 6.46	
Water Col		TU): 1.73	Thalweg Velo	ocity (m/s)(ft/s): 1.40 4.59	
	•			• • • •	
Stream Cl	nannel				
Stream Gr	adient (%): 1 Entrenchme	ent: Slightly E	ntrenched		
Catchment	Area(sq. km): 62 Embeddedn	ess: Low			
Channel I	Dimensions (m): Bankfull OHW	Wetted	Dominant Sub	strate: Cobble	
0	Width 20.0			rate 1: Boulder	
	Thalweg Depth 1.20		ominant Subst		
	8 1				1.1.*
Rosgen Cla	ass: C3 Low gradient, meandering, point-l	bar, riffie/pool, a	liuviai channei	s with broad, well-defined flo	paplains.
Riparian '	Vegetation Communities (Vierec	k et al. 1992))		
Dist. from		Canopy			Canopy
	Left Bank Vegetation Type	Height(m)	Right Bank V	egetation Type	Height(m)
0 - 5	Closed White Spruce-Paper Birch-Balsar Poplar (Black Cottonwood Forest)	-	Closed White	Spruce-Paper Birch-Balsam Cottonwood Forest)	38
	-	25	-		20
5 - 10	Closed White Spruce-Paper Birch-Balsar	n 35	Closed White	Spruce-Paper Birch-Balsam	38

5-10	Poplar (Black Cottonwood Forest)	55	Poplar (Black Cottonwood Forest)	50
10 - 20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	30
20 - 30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	30

Key To Fish Sampling Methods

Estimated reach length (m): 160

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

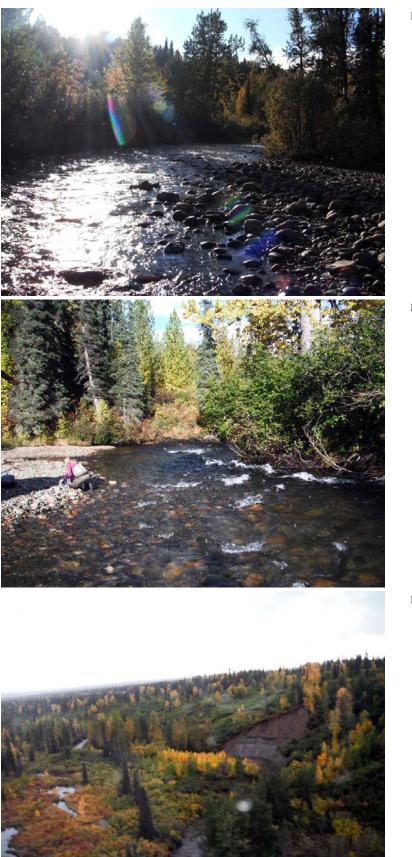
Fish Observations

Species: Chinook salmon Life Stage: juvenile Life History: Anadromous Total Fish Count: 11 Fish Measured: 8 Fork Lengths (mm) Min: 55 Max: 80 **Mean:** 61 Median: 67 Sampling Method (No. of fish): PEF (8) VOG (3) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous **Mean:** 45 **Total Fish Count:** 3 Fish Measured: 2 Fork Lengths (mm) Min: 41 Max: 49 Median: 45 Sampling Method (No. of fish): PEF (2) VOG (1) **Comments:**

Instruments

Stream Gradient:handheld abney levelStream Velocity:transparent velocity head rodTurbidity:LaMotte 2020e turbidimeterWater Quality:YSI 556

Channel Depths: graduated wading rod Channel Widths: measuring tape Electrofisher: Smith-Root LR-24 Transparency:



FSS1127C050724.jpg

FSS1127C050725.jpg

FSS1127C050727.jpg



FSS1127C050760.jpg

Water Quality:

Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/13/2011 2:06 PM Sample Latitude Longitude Latitude Longitude Coordinates -151.53772 61.68820 61.68774 -151.53726 Elevation NED (m)(ft): 254 833 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Tyonek C-5 Legal Description (MTRS): S019N013W36 Waterbody Name: Anadromous Waters Catalog Number: 247-41-10200-2053-3205-4053-5046-6020 Geographic Comments: This tributary of Friday Creek was approximately 10 m downstream from 27C05 transect site. Visit Comments: No habitat data collected at this site. Sample site 27C05 is located about 10 m upstream from the confluence of ths stream. Spot shocked for fish presence only. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): **Embeddedness:** 11 Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** Estimated reach length (m):81 (PEF) Backpack Electrofisher **Fish Observations** Species: Chinook salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 4 Fish Measured: 4 Fork Lengths (mm) Min: 55 Max: 80 Median: 67 Mean: 63 Sampling Method (No. of fish): PEF (4) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Fish Measured: 2 Fork Lengths (mm) Min: 41 Median: 45 **Total Fish Count:** 2 Max: 49 **Mean:** 45 Sampling Method (No. of fish): PEF (2) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths: Turbidity:** Electrofisher: Smith-Root LR-24

Transparency:

Station Info

Observers: Jonathan Kirsch, Raye Ann Neustel Elevation NED (m)(ft): 312 1024 Coordinate Determination Method: Non-Differenti USGS Quadrangle: Tyonek C-5	Sample Coordinates	Latitude 61.69237	Longitude -151.57397	09/13/2011 5:44 PM
Coordinate Determination Method: Non-Differenti		0110/201	101107037	
Waterbody Name: Friday Creek Anadromous Waters Catalog Number: Geographic Comments: Waterfalls.			Datum: WGS84): S019N013W35	ļ
Visit Comments: Fly-by only. This site represents a Wildlife Comments:	waterfall fish ba	rrier.		
Water Quality \ Stream Flow				
Water Temp (C):DO (mg/L):DOWater Color:Turbidity (NT) (%): [U):	Conductivity Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%):EntrenchmenCatchment Area(sq. km):Embeddednes				
Channel Dimensions (m): Bankfull OHW W		Dominant Sub		
Width Thalweg Depth		ominant Subst ominant Subst		
Rosgen Class:				
Riparian Vegetation Communities (Viereck	x et al. 1992)			
Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
10 - 20 20 - 30				
Key To Fish Sampling Methods				
(NON) None				
Fish Observations				
Species: no collection effortLife Stage: noTotal Fish Count:0Fish Measured:FordSampling Method (No. of fish):NON (0)Comments:	ot applicable k Lengths (mm		story: Not Applica Max: Mea	
Instruments				
Stream Gradient:	Channe	el Depths:		
Stream Velocity:	Channe	el Widths:		
Turbidity:	Electro	fisher:		

Appendix L220Station 1551120C01.				
Station Info				
Observers: Jonathan Kirsch, Raye Ann Neustel			Date/Time: 09/1	4/2011 12:01 PM
	Sample Coordinates	Latitude 61.50695	Longitude / Latit -148.99816 / 61.50	
Elevation NED (m)(ft): 115 377				
Coordinate Determination Method: Non-Diffe			Datum: WGS84	
USGS Quadrangle: Anchorage C-6	Legal Descrip	otion (MTRS): S016N003E06	
Waterbody Name: Anadromous Waters Catalog Number:				
Geographic Comments: Unnamed Creek flows t of confluence with Knil		r E. Knik Riv	er Road approximately 4	400 m upstream
Visit Comments: No habitat data collected. ATV Culvert approximately 400 m u to juvenile fish passage.				
Wildlife Comments:				
Water Quality \ Stream Flow				
Water Temp (C): DO (mg/L):	DO (%):	Conductivit	y (µS/cm): pH	:
Water Color: Turbidity	(NTU):	Thalweg Vel	ocity (m/s)(ft/s):	
Stream Channel				
Stream Gradient (%):EntrenchCatchment Area(sq. km):10Embedded				
Channel Dimensions (m): Bankfull OHW Width		Dominant Sub minant Subs		
Thalweg Depth	Subdo	minant Subs	trate 2:	
Thalweg Depth Rosgen Class:		minant Subs	trate 2:	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vier Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	reck et al. 1992) Canopy		trate 2: Vegetation Type	Canopy Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vier Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	reck et al. 1992) Canopy Height(m)	Right Bank V	Vegetation Type	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vier Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	reck et al. 1992) Canopy Height(m) Estimated reach l	Right Bank V ength (m): 29	Vegetation Type	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vier Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	reck et al. 1992) Canopy Height(m) Estimated reach l	Right Bank V	Vegetation Type	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vier Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	reck et al. 1992) Canopy Height(m) Estimated reach l	Right Bank V ength (m): 29	Vegetation Type	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (View Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations	reck et al. 1992) Canopy Height(m) Estimated reach I (MTR) ge: juvenile Fork Lengths (mm)	Right Bank V ength (m): 29) Minnow Tra Life Hit	Vegetation Type	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vien Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 19 Fish Measured: 10 Sampling Method (No. of fish): MTR (9) PEF Comments: Species: coho salmon Life Stag	reck et al. 1992) Canopy Height(m) Estimated reach I (MTR) ge: juvenile Fork Lengths (mm) (10) ge: juvenile Fork Lengths (mm)	Right Bank V ength (m): 29) Minnow Tra Life Hia) Min: 32 Life Hia	Vegetation Type 98 ap story: Anadromous	Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vien Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 19 Fish Measured: 10 Sampling Method (No. of fish): MTR (9) PEF Comments: Species: coho salmon Life Stag Total Fish Count: 13 Fish Measured: 5 Sampling Method (No. of fish): MTR (8) PEF	reck et al. 1992) Canopy Height(m) Estimated reach I (MTR) ge: juvenile Fork Lengths (mm) (10) ge: juvenile Fork Lengths (mm)	Right Bank V ength (m): 29) Minnow Tra Life Hia) Min: 32 Life Hia	Vegetation Type 98 ap story: Anadromous Max: 84 Mean: 53 story: Anadromous	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vien Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 19 Fish Measured: 10 Sampling Method (No. of fish): MTR (9) PEF Comments: Species: coho salmon Life Stag Total Fish Count: 13 Fish Measured: 5 Sampling Method (No. of fish): MTR (8) PEF Comments: Species: coho salmon Life Stag Total Fish Count: 13 Fish Measured: 5 Sampling Method (No. of fish): MTR (8) PEF Comments:	reck et al. 1992) Canopy Height(m) Estimated reach I (MTR) ge: juvenile Fork Lengths (mm) (10) ge: juvenile Fork Lengths (mm) (5)	Right Bank V ength (m): 29) Minnow Tra Life Hia) Min: 32 Life Hia	Vegetation Type 98 ap story: Anadromous Max: 84 Mean: 53 story: Anadromous	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vien Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 19 Fish Measured: 10 Sampling Method (No. of fish): MTR (9) PEF Comments: Species: coho salmon Life Stag Total Fish Count: 13 Fish Measured: 5 Sampling Method (No. of fish): MTR (8) PEF Comments: Instruments	reck et al. 1992) Canopy Height(m) Estimated reach I (MTR) ge: juvenile Fork Lengths (mm) (10) ge: juvenile Fork Lengths (mm) (5)	Right Bank V ength (m): 29) Minnow Tra Life Hia) Min: 32 Life Hia) Min: 52	Vegetation Type 98 ap story: Anadromous Max: 84 Mean: 53 story: Anadromous	Height(m
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Vien Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (PEF) Backpack Electrofisher Fish Observations Species: sockeye salmon Life Stag Total Fish Count: 19 Fish Measured: 10 Sampling Method (No. of fish): MTR (9) PEF Comments: Species: coho salmon Life Stag Total Fish Count: 13 Fish Measured: Species: coho salmon Life Stag Total Fish Count: Total Fish Count: 13 Species: coho salmon Life Stag Total Fish Count: Total Fish Count: 13 Fish Measured: 5 Sampling Method (No. of fish): MTR (8) PEF Comments: Instruments Stream Gradient: Stream Gradient:	reck et al. 1992) Canopy Height(m) Estimated reach I (MTR) ge: juvenile Fork Lengths (mm) (10) ge: juvenile Fork Lengths (mm) (5)	Right Bank V ength (m): 29) Minnow Tra Life Hia) Min: 32 Life Hia) Min: 52	Vegetation Type 98 ap story: Anadromous Max: 84 Mean: 53 story: Anadromous	Height(m

Station Info					
Observers: Jonathan Kirsch, Raye Ann Neustel			Date/	Time: 09/14/2	2011 12:01 PM
· · · · · · · · · · · · · · · · · · ·	Sample	Latitude	Longitude		
	Coordinates	61.50379	-148.9673	5 / 61.5059	4 -148.96949
Elevation NED (m)(ft): 42 138			D		
Coordinate Determination Method: Non-Differe USGS Quadrangle: Anchorage C-6	ntial GPS Field Me Legal Descrip		Datum: V \$016N00		
Waterbody Name:	Legai Descrip		. 50101(00	5205	
Anadromous Waters Catalog Number:					
Geographic Comments: This unnamed stream flow confluence with Knik Riv		area and throu	igh a culvert	approximately	400 m above
Visit Comments: This site was generated to suppor canoe.	t AWC data in Kni	k River drain	age. Access	was by road a	nd inflatable
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C): DO (mg/L):	DO (%):	Conductivity	y (µS/cm):	pH:	
Water Color: Turbidity (N	NTU):	Thalweg Velo	ocity (m/s)(f	ît/s):	
Stream Channel					
Stream Gradient (%): Entrenchm	ent:				
Catchment Area(sq. km): 4 Embedded	ness:				
Channel Dimensions (m): Bankfull OHW	Wetted D	ominant Sub	strate:		
Width	Subdor	minant Subst	rate 1:		
Thalweg Depth	Subdor	minant Subst	rate 2:		
		innant Subst			
Rosgen Class:					
Rosgen Class: Riparian Vegetation Communities (Viere					
	ck et al. 1992)				Сапору
Riparian Vegetation Communities (Viere				<u>`vpe</u>	Canopy Height(m)
Riparian Vegetation Communities (Viere Dist. from	ck et al. 1992) Canopy			<u>`vpe</u>	
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10	ck et al. 1992) Canopy			<u>`vpe</u>	
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20	ck et al. 1992) Canopy			<u>`ype</u>	Canopy Height(m)
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	ck et al. 1992) Canopy			<u>`vpe</u>	
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	ck et al. 1992) Canopy			<u>`vpe</u>	
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	ck et al. 1992) Canopy			<u>`vpe</u>	
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	ck et al. 1992) Canopy			<u>`уре</u>	
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap	ck et al. 1992) Canopy Height(m) <u>1</u>	Right Bank V			
Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations	ck et al. 1992) Canopy Height(m) <u>1</u>	Right Bank V	Vegetation 1		
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: 18 Fish Method (No. of fish): MTR (18)	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm)	Life His Min: 60	Vegetation T story: Anad Max: 106	romous Mean: 100	Height(m)
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: 18 Sampling Method (No. of fish): MTR (18) Comments: All coho salmon caught at this site we	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with	Life His Min: 60	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year.	Height(m
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Sampling Method (No. of fish): MTR (18) Comments: All coho salmon caught at this site we Species: threespine stickleback Life Stage:	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult	Life His Min: 60	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m Median: 83 Coho were ca
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: Species: threespine stickleback Life Stage: Total Fish Count: 4 Fish Measured: Fish Count: 4 Fish Measured: Fish Count: 4 District	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with	Life His Min: 60	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year.	Height(m)
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Sampling Method (No. of fish): MTR (18) Comments: All coho salmon caught at this site we Species: threespine stickleback Life Stage:	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult	Life His Min: 60	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m) Median: 83 Coho were ca
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Sampling Method (No. of fish): MTR (4) Comments:	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult	Life His Min: 60	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m) Median: 83 Coho were ca
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Sampling Method (No. of fish): MTR (4) Comments: Instruments	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult ork Lengths (mm)	Life His Min: 60 the exception Life His Min:	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m) Median: 83 Coho were ca
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Sampling Method (No. of fish): MTR (4) Comments: Instruments Stream Gradient:	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult ork Lengths (mm) Channel	Life His Min: 60 the exception Life His Min: Depths:	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m) Median: 83 Coho were ca
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Sampling Method (No. of fish): MTR (4) Comments: Instruments Stream Gradient: Stream Velocity:	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult ork Lengths (mm) Channel Channel	Right Bank V Life His Min: 60 a the exception Life His Min:	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m) Median: 83 Coho were ca
Riparian Vegetation Communities (Viere Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: coho salmon Life Stage: Total Fish Count: 18 Fish Measured: Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Species: threespine stickleback Life Stage: Total Fish Count: 4 Sampling Method (No. of fish): MTR (4) Comments: Instruments Stream Gradient:	ck et al. 1992) Canopy Height(m) <u>1</u> : juvenile ork Lengths (mm) re second year with : juvenile/adult ork Lengths (mm) Channel	Life His Min: 60 the exception Life His Min: Depths: Widths: isher:	Story: Anad Max: 106 n of one you	romous Mean: 100 ing of the year. iown	Height(m) Median: 83 Coho were ca



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Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/14/2011 12:41 PM Sample Latitude Longitude Latitude Longitude Coordinates -148.92853 61.49554 61.49554 -148.92853 Elevation NED (m)(ft): 54 177 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-6 Legal Description (MTRS): S016N003E09 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Unnamed lake approximately 200 m from East Knik River Road with a small stream outlet to Knik River. Visit Comments: No habitat data collected. This site was generated to support AWC data in Knik River drainage, access was by East Knik River Road. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel Stream Gradient (%): Entrenchment:** Catchment Area(sq. km): 0.5 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations** Species: threespine stickleback Life Stage: juvenile/adult Life History: Unknown **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Total Fish Count: 51 Mean: Sampling Method (No. of fish): MTR (51) **Comments:** Instruments **Stream Gradient: Channel Depths: Channel Widths:** Stream Velocity: **Turbidity: Electrofisher:** Water Quality: **Transparency:**

Water Quality:

Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/14/2011 1:14 PM Sample Latitude Longitude Latitude Longitude Coordinates -148.90285 / 61.48813 61.48984 -148.90302 Elevation NED (m)(ft): 55 180 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-6 Legal Description (MTRS): S016N003E10 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: This unnamed stream flows through a culvert under East Knik River Road. Visit Comments: No habitat data collected. This stream was sampled via East Knik River Road, using minnow traps. Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): Water Temp (C): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Catchment Area(sq. km): 0.2 **Embeddedness:** Channel Dimensions (m): Bankfull OHW Wetted **Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Height(m) Right Bank Vegetation Type Height(m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap **Fish Observations** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Max: 82 Median: 60 **Total Fish Count:** 6 Fish Measured: 6 Fork Lengths (mm) Min: 38 **Mean: 56** Sampling Method (No. of fish): MTR (6) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Fork Lengths (mm) Min: 83 Max: 108 **Total Fish Count:** 7 Fish Measured: 7 **Mean: 95** Median: 95 Sampling Method (No. of fish): MTR (7) **Comments:** Instruments **Stream Gradient: Channel Depths:** Stream Velocity: **Channel Widths: Turbidity: Electrofisher:**

Station Info

Observers: Jonathan Kirsch, Raye Ann Neustel			Date/Tim	e• 09/14/20	11 1:46 PM
observers. Johannan Kirsen, Kaye Ann Neuster	Sample	Latitude	Longitude		Longitude
	Coordinates	61.46914	-148.86883		-148.86922
Elevation NED (m)(ft): 47 154 Coordinate Determination Method: Non-Different USGS Quadrangle: Anchorage B-5 Waterbody Name: Anadromous Waters Catalog Number: Geographic Comments: Unnamed tributary to Kre	Legal Descri		Datum: WGS): S016N003E2		
Visit Comments: ATV tracks in river and parallel	to river. This site s	sampled via E	ast Knik River R	load using m	innow traps.
Wildlife Comments:					
Water Quality \ Stream Flow					
Water Temp (C):DO (mg/L):Water Color:Turbidity (DO (%): (NTU):	Conductivit Thalweg Vel	y (µS/cm): ocity (m/s)(ft/s):	pH:	
Stream Channel					
Stream Gradient (%):EntrenchrCatchment Area(sq. km):1Embedded					
Channel Dimensions (m): Bankfull OHW		Dominant Sub			
Width	Subdo	minant Subst	rate 1:		
Thalweg Depth		minant Subs	rate 2:		
			rate 2:		
Thalweg Depth	Subdo		rate 2:		
Thalweg Depth Rosgen Class:	Subdo eck et al. 1992) Canopy	ominant Subs	rate 2: Vegetation Type	2	Canopy Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viere Dist. from	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u>	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viere Dist. from Bank (m) <u>Left Bank Vegetation Type</u> 0 - 5 5 - 10 10 - 20 20 - 30	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods	Subdo eck et al. 1992) Canopy	ominant Subs		2	
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: Dolly Varden Life Stage	Subdo eck et al. 1992) Canopy	minant Subst	Vegetation Type		
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 4 Fish Measured: 4 Sampling Method (No. of fish): MTR (4) Comments: Comments:	Subdo eck et al. 1992) Canopy Height(m)	minant Subst	/egetation Type	1	Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Ife Stage Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 4 Fish Measured: 4 I Sampling Method (No. of fish): MTR (4) Comments:	Subdo eck et al. 1992) Canopy Height(m) e: juvenile/adult Fork Lengths (mm	minant Subst	/egetation Type	1	Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 - 5 5 - 10 10 - 20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 4 Fish Measured: 4 1 Sampling Method (No. of fish): MTR (4) Comments: Instruments Instruments Instruments	Subdo eck et al. 1992) Canopy Height(m) e: juvenile/adult Fork Lengths (mm	Minant Subst	/egetation Type	1	Height(m)
Thalweg Depth Rosgen Class: Riparian Vegetation Communities (Viero Dist. from Bank (m) Left Bank Vegetation Type 0 Dist. from Bank (m) Left Bank Vegetation Type 0 0 - 5 5 - 10 10 -20 20 - 30 Key To Fish Sampling Methods (MTR) Minnow Trap Fish Observations Species: Dolly Varden Life Stage Total Fish Count: 4 Fish Measured: 4 4 Sampling Method (No. of fish): MTR (4) Comments: Instruments Stream Gradient: Stream Gradient:	Subdo eck et al. 1992) Canopy Height(m) e: juvenile/adult Fork Lengths (mm	Minant Subst Right Bank V Life His Min: 84	/egetation Type	1	Height(m)

Comments:

Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/14/2011 2:10 PM Sample Latitude Longitude Latitude Longitude Coordinates -148.85933 61.46192 61.46358 -148.86073 Elevation NED (m)(ft): 45 148 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N003E23 Waterbody Name: **Anadromous Waters Catalog Number:** Geographic Comments: Unnamed tributary to Knik River. Gradient above top most man-made barrier to fish passage (waypoint "topbar") 14%; gradient through section with man-made barriers to fish passage (6 in all) is 7%, and below bottom most man-made barrier to fish passage (waypoint "botombar") gradient 7% Visit Comments: Site accessed by road. This stream flows through a culvert approximately 500 m above confluence with Knik River. There is an active campground on river left near our sampling site with ATV trail running through and down the creek. Starting above culvert approximately 300 m, there is a series of 6 man-made barriers to fish passage--see photos 746-753 and waypoints "topbar" and "botombar". Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment: Embeddedness:** Catchment Area(sq. km): 8 Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: Thalweg Depth Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) <u>Right Bank Vegetation Type</u> Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: coho salmon Life Stage: adult spawning Life History: Anadromous Fork Lengths (mm) Min: Max: Median: Total Fish Count: 14 **Fish Measured:** Mean: Sampling Method (No. of fish): VOG (14) Suspected Spawning: Yes **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Fork Lengths (mm) Min: 55 Median: 57 **Total Fish Count:** 13 Fish Measured: 6 Max: 59 Mean: 57 Sampling Method (No. of fish): MTR (6) VOG (7) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 66 Fish Measured: 1 Fork Lengths (mm) Min: 112 Max: 112 Mean: 112 **Median:** 112 Sampling Method (No. of fish): MTR (1) VOG (65)

-continued-1275

Instruments

Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:



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FSS1128C060743.jpg

FSS1128C060754.jpg

FSS1128C060755.jpg



Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/14/2011 2:28 PM Sample Latitude Longitude Latitude Longitude Coordinates -148.84026 61.45689 61.45661 -148.84134 Elevation NED (m)(ft): 25 82 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N003E24 Waterbody Name: Anadromous Waters Catalog Number: 247-50-10200-2126 Geographic Comments: Sample site is in wetlands habitat next to culvert running under East Knik River Road. Visit Comments: Two minnow traps used to sample in wetlands area next to East Knik River Road. One below the road and one above. No water quality data collected. Wildlife Comments: Water Quality \ Stream Flow DO (mg/L): Water Temp (C): DO (%): Conductivity (µS/cm): pH: Water Color: Humic **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** Slightly Entrenched **Embeddedness:** Catchment Area(sq. km): 5 High Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: sockeye salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 41 Max: 48 Median: 44 Mean: 44 Sampling Method (No. of fish): MTR (2) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous **Total Fish Count: 68** Fish Measured: 18 Fork Lengths (mm) Min: 41 Median: 68 Max: 95 **Mean:** 68 Sampling Method (No. of fish): MTR (18) VOG (50) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown **Total Fish Count:** 6 **Fish Measured:** Fork Lengths (mm) Min: Max: Median: Mean:

Sampling Method (No. of fish): VOG (6)

Comments:

Instruments

Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Transparency:

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FSS1128C070733.jpg

Station Info Observers: Jonathan Kirsch, Raye Ann Neustel Date/Time: 09/14/2011 3:45 PM Sample Latitude Longitude Latitude Longitude Coordinates -148.81521 61.43869 61.44125 -148.80115 Elevation NED (m)(ft): 65 213 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-5 Legal Description (MTRS): S016N004E31 Waterbody Name: Hunter Creek Anadromous Waters Catalog Number: 247-50-10200-2140 Geographic Comments: This glaciated creek flows into a wetlands/backwater complex area before confluence with Knik River. Visit Comments: This site was generated to support AWC data in Knik River drainage. No habitat data collected. Wildlife Comments: Water Quality \ Stream Flow Water Temp (C): DO (mg/L): DO (%): Conductivity (µS/cm): pH: Water Color: **Turbidity (NTU):** Thalweg Velocity (m/s)(ft/s): **Stream Channel** Stream Gradient (%): **Entrenchment:** 180 **Embeddedness: Catchment Area**(sq. km): Bankfull OHW Wetted **Channel Dimensions (m): Dominant Substrate:** Width Subdominant Substrate 1: **Thalweg Depth** Subdominant Substrate 2: **Rosgen Class: Riparian Vegetation Communities (Viereck et al. 1992)** Dist. from Canopy Canopy Bank (m) Left Bank Vegetation Type Height(m) Right Bank Vegetation Type Height(m) 0 - 5 5 - 10 10 - 20 20 - 30 **Key To Fish Sampling Methods** Estimated reach length (m): 995 (PEF) Backpack Electrofisher (MTR) Minnow Trap (VOG) Visual Observation, Ground **Fish Observations** Species: coho salmon Life History: Anadromous Life Stage: adult spawning **Total Fish Count:** 4 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median: Sampling Method (No. of fish): PEF (4) **Comments:** Species: Dolly Varden Life Stage: juvenile/adult Life History: Unknown Total Fish Count: 57 Fish Measured: 8 Fork Lengths (mm) Min: 85 Max: 119 Median: 102 Mean: 100 Sampling Method (No. of fish): PEF (8) VOG (49) **Comments:** Species: sculpin-unspecified Life Stage: adult Life History: Resident Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 95 Max: 95 Median: 95 **Mean: 95** Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown

Total Fish Count: 3 Fish Measured: 3 Fork Lengths (mm) Min: 49 Max: 67 Mean: 60 Median: 58 Sampling Method (No. of fish): PEF (3) Comments:

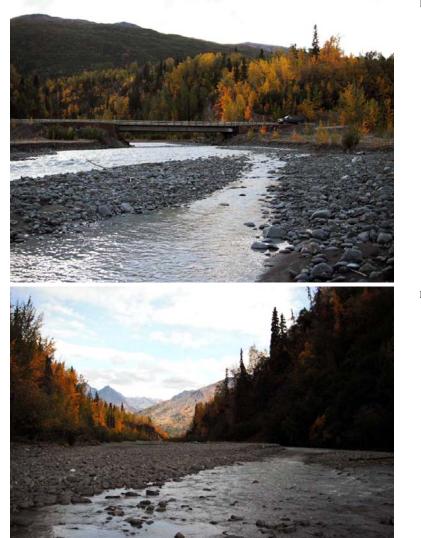
 Species: Dolly Varden
 Life Stage: juvenile/adult
 Life History: Anadromous

 Total Fish Count:
 2
 Fish Measured:
 2
 Fork Lengths (mm)
 Min:
 334
 Max:
 391
 Mean:
 362

 Sampling Method (No. of Fish):
 PEF (2)
 Vertice
 Vertice

Instruments

Stream Gradient: Stream Velocity: Turbidity: Water Quality: Channel Depths: Channel Widths: Electrofisher: Smith-Root LR-24 Transparency:



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Station Info

Observers: Jonathan Kirs	sch, Raye Ann Neustel			Date/Time:	09/14/2011 4:20 AM
		Sample Coordinates	Latitude 61.56450	Longitude -149.04299	
Elevation NED (m)(ft): 44 Coordinate Determination USGS Quadrangle: Anche Waterbody Name: Anadromous Waters Cata Geographic Comments: 7 Visit Comments: No habi	n Method: Non-Differention orage C-6 alog Number: 247-50-1020 This is slack water (ditch) b	ial GPS Field M Legal Descri 00-2071-3023 eside Old Glenr e. This site was	easurement ption (MTRS) Highway app	Datum: WGS84 : S017N002E14 roximately 5 km so	outh of Palmer.
Wildlife Comments:		•			
Water Quality \ Stream	m Flow				
Water Temp (C): Water Color:	DO (mg/L): DO Turbidity (NT) (%): TU):	Conductivity Thalweg Velo	y (µS/cm): pcity (m/s)(ft/s):	рН:
Stream Channel Stream Gradient (%): Catchment Area(sq. km): Channel Dimensions (m): V Thalweg I Rosgen Class:	: Bankfull OHW W Vidth	ss: Vetted I Subdo	Dominant Sub ominant Subst ominant Subst	rate 1:	
Riparian Vegetation C	Communities (Viereck	x et al. 1992)			
Dist. from Bank (m) <u>Left Bank Veg</u> 0 - 5 5 - 10	getation Type	Canopy Height(m)	<u>Right Bank V</u>	egetation Type	Canopy Height(m)
10 - 20 20 - 30					
Key To Fish Sampling (VOG) Visual Observation,	-				

Fish Observations

Species: sockeye salmon	Life Sta	age: adult spawning	Life	e History: Ana	dromous	
Total Fish Count: 75	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of	f fish): VOG (75)					
Comments:						

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:

Station Info

Observers: Jonathan Kirsch, Joe Buckwalter, Raye Ann Neustel

Sample Latitude Longitude Latitude Longitude Coordinates 61.48642 -149.10618 61.48875 -149.09755 Elevation NED (m)(ft): 54 177 Coordinate Determination Method: Non-Differential GPS Field Measurement Datum: WGS84 USGS Quadrangle: Anchorage B-6 Legal Description (MTRS): S016N002E09 **Anadromous Waters Catalog Number:** Geographic Comments: This creek flows under a bridge on Old Glenn Highway. Short section of stream beginning approximately 50 m above bridge has been channelized.

Date/Time: 09/19/2011 4:30 PM

Visit Comments: This site was generated to support AWC data in Knik River drainage. Not all habitat data was collected. Electrofishing was not used to consistently sample entire reach length due to presence of adult spawning SCO. Though conductivity was not measured, electrofisher setting indicate it is fairly high. Uppermost salmon caught during electrofishing event documented with waypoint "29C01SAM". "29C01U" is waypoint at uppermost waterfall that is a significant barrier to fish passage at certain flows. "29C01ROAD" is waypoint at East Knik River Road bridge.

Wildlife Comments:

Water Quality \ Stream Flow

Waterbody Name: Goat Creek

Water Temp (C): Water Color: Clear	DO (mg/L): Tur	DO (%): bidity (NTU):	Conductivity (µS/cm): Thalweg Velocity (m/s)(ft/s):	рН:
Stream Channel				
Stream Gradient (%): 2	Ent	renchment: Mod	leratley Entrenched	
Catchment Area(sq. km):	40 Em	beddedness: Low	,	
Channel Dimensions (m)	: Bankfull (OHW Wetted	Dominant Substrate: Cobble	
V	Vidth		Subdominant Substrate 1: Gravel	
Thalweg I	Depth		Subdominant Substrate 2: Boulder	
Rosgen Class:				

Riparian Vegetation Communities (Viereck et al. 1992)

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Black Cottonwood Forest	35	Closed Black Cottonwood Forest	30
5 - 10	Closed Black Cottonwood Forest	35	Closed Black Cottonwood Forest	30
10 - 20	Closed Black Cottonwood Forest	35	Closed Black Cottonwood Forest	30
20 - 30	Closed Black Cottonwood Forest	35	Closed Black Cottonwood Forest	30

Key To Fish Sampling Methods

Estimated reach length (m): 660

(PEF) Backpack Electrofic (VOG) Visual Observation		(MTR)	Minnow	Ггар		
Fish Observations Species: coho salmon Total Fish Count: 3 Sampling Method (No. o Comments:	Fish Measured:	age: adult spawning Fork Lengths (mm)		History: Ana Max:	dromous Mean:	Median:
Species: Chinook salmon	Life Sta	age: carcass	Life l	History: Ana	dromous	
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. o	f fish): VOG (1)					
Comments:						

Appendix L237.–Page 2 of 2.

Life Stage: juvenile/adult Species: Dolly Varden Life History: Unknown Total Fish Count: 26 Fish Measured: 8 Fork Lengths (mm) Min: 120 Max: 340 Mean: 171 Median: 230 Sampling Method (No. of fish): MTR (1) PEF (7) VOG (18) **Comments:** Species: coho salmon Life Stage: smolt Life History: Anadromous Total Fish Count: 1 Fish Measured: 1 Fork Lengths (mm) Min: 120 Max: 120 **Mean:** 120 **Median:** 120 Sampling Method (No. of fish): PEF (1) **Comments:** Life Stage: juvenile Life History: Anadromous Species: Chinook salmon **Total Fish Count:** 2 Fish Measured: 2 Fork Lengths (mm) Min: 57 **Max:** 80 **Mean:** 68 Median: 68 Sampling Method (No. of fish): MTR (1) PEF (1) **Comments:** Species: coho salmon Life Stage: juvenile Life History: Anadromous Fork Lengths (mm) Min: 62 Mean: 62 **Total Fish Count:** 1 Fish Measured: 1 Max: 62 Median: 62 Sampling Method (No. of fish): PEF (1) **Comments:** Species: Dolly Varden Life Stage: juvenile Life History: Unknown Fork Lengths (mm) Min: 43 **Total Fish Count:** 6 Fish Measured: 6 Max: 77 Mean: 53 Median: 60 Sampling Method (No. of fish): MTR (3) PEF (3) **Comments:** Life History: Resident Species: slimy sculpin Life Stage: adult Fork Lengths (mm) Min: 100 Max: 100 **Median:** 100 Total Fish Count: 1 Fish Measured: 1 **Mean:** 100 Sampling Method (No. of fish): PEF (1) **Comments:**

Instruments

Stream Gradient: Channel Depths: Channel Widths: Stream Velocity: **Turbidity:** Electrofisher: Smith-Root LR-24 Water Quality: **Transparency:**

Station Info

Station In	10									
Observers:	Raye Ann Ne	ustel					Date/	Fime:	10/15/20	11 2:14 PM
					ample oordinates	Latitude 61.44225			Latitude 61.45410	Longitude -148.77542
Elevation N	NED (m)(ft): 30) 98								
USGS Qua Waterbody Anadromo	Determination drangle: Ancho Name: Hunter us Waters Cata c Comments: F	orage B-5 r Creek l log Numbe	r: 247-50	Lo -10200-2	e gal Descr 140	iption (MTR	Datum: V S): S016N004	4E29		omplex
				•			•	0		•
Visit Com	within c. represen salmon c	ed (photo 9) lose proxim ts the third caught using	56) to samp ity to this s pool that is g a seine ne	ple site or site, inclu s connecte et. We ob	n Hunter C iding beave ed to a sma oserved adu	reek delta (95 er ponds, sprin Ill river chann	5,792). Seven ngbrooks. 61. el with approx ected spawnin	ral div 44345 ximate	erse habita 5, -148.771 ely 30 juve	ats sampled 39 nile sockeye
Wildlife Co	omments:									
Water Qu	ality \ Streaı	n Flow								
Water Tem Water Colo	ıp (C): or: Glacial, Higl	DO (mg/L) h Turbidit		DO (% (NTU):	,		ity (µS/cm): elocity (m/s)(f	t/s):	pH:	
Stream Cl	nannel									
Stream Gra	adient (%):		Entrenc	hment:	Slightly E	Intrenched				
Catchment	Area(sq. km):	197	Embedd							
Channel D	imensions (m):		all OHW	Wette			ibstrate: Grav			
	v Thalweg D	Vidth Denth					strate 1: Cobl strate 2: Silt/			
Rosgen Cla	-	- cpui			Subu	ommune Sub	Strate 21 Sha	eruj		
	Vegetation C	Communi	ties (Vie	reck et	al. 1992)				
Dist. from Bank (m)	<u>Left Bank Veg</u>	getation Ty	<u>pe</u>		Canopy Height(m)	<u>Right Bank</u>	Vegetation T	<u>vpe</u>		Canopy Height(m)
0 - 5	Unvegetated					Unvegetated	l			
5 - 10	Unvegetated					Unvegetated	l			
10 - 20	Closed Tall Ale	der-Willow	Shrub		5	Unvegetated	l			
20 - 30	Unvegetated					Unvegetated	l			
Key To Fi	sh Sampling	Methods	5							
(SEI) Sein					(VOC	3) Visual Ob	servation, Gro	und		
Fish Obse	rvations									
Total Fish	ckeye salmon Count: 32 Method (No. of S:		sured: 2			Life H n) Min: 502	listory: Anad Max: 511	Me	an: 506	Median: 506 awning: Yes
	Count: 20 Method (No. of	Fish Meas fish): VC	sured:	ge: adult Fork Le	engths (mr		l istory: Anad Max:	romou Me		Median:
Sampling	ho salmon Count: 50 Method (No. of s: photo 951 &		sured:	ge: adult Fork Le	engths (mr		l istory: Anad Max:	Me	an:	Median: awning: Yes

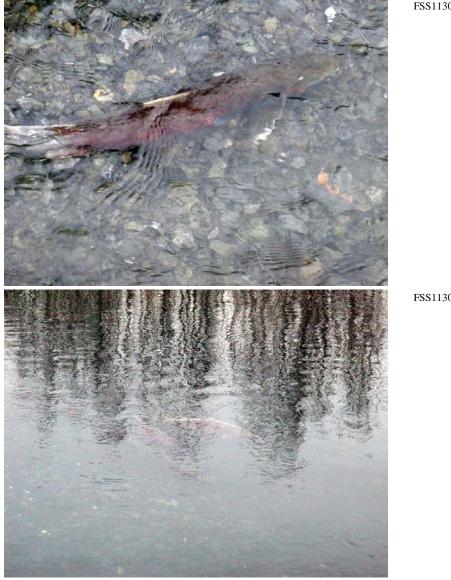
 Species: sockeye salmon
 Life Stage: juvenile
 Life History: Anadromous

 Total Fish Count:
 16
 Fish Measured: 9
 Fork Lengths (mm)
 Min: 42
 Max: 46
 Mean: 43
 Median: 44

 Sampling Method (No. of fish):
 SEI (9) VOG (7)
 Comments:
 Keine State State

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



FSS1130E010951.jpg

FSS1130E010954.jpg

FSS1130E010955.jpg



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FSS1130E010958.jpg

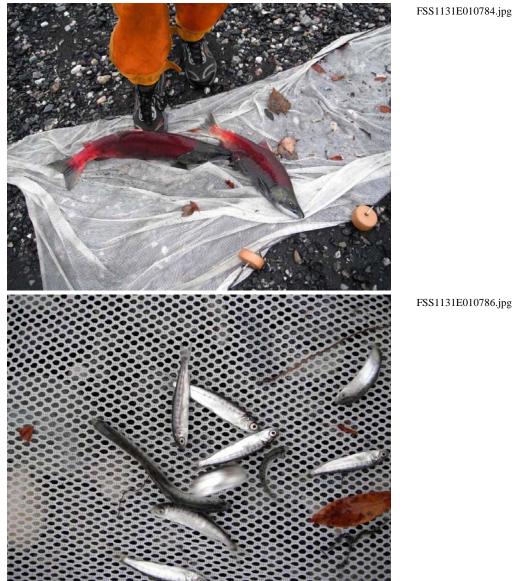
Station Info

Observers: Raye Ann Neustel						
			Date/1	lime:	10/16/20	011 2:35 PM
	Sample Coordinates	Latitude 61.45478	Longitude -148.70688		atitude 1.46728	Longitude -148.70637
Elevation NED (m)(ft): 33 108						
Coordinate Determination Method: Non-Differential	l GPS Field Me	easurement	Datum: W	VGS84		
	Legal Descrip	tion (MTRS): S016N004	4E27		
Waterbody Name: Knik River						
Anadromous Waters Catalog Number: 247-50-10200		T :11 :	J_4_ J L:		V:L. D.:.	
Geographic Comments: Springbrook in Knik River ac flows.	tive braid plair	i. Likely inun	dated by mai	nstem	KIIK KIV	er at nign
Visit Comments: Sample site was accessed via East Kn across Knik River floodplain to hypo ATV tracks through pools of rearing	rheic and side-	channel habit				
Wildlife Comments: Large number of birds of prey. O containing adult and juvenile sale		ote. Brown be	ar tracks surr	oundin	g clear v	vater pools
Water Quality \ Stream Flow						
Water Temp (C): DO (mg/L): DO (Conductivit			pH:	
Water Color: Clear Turbidity (NTU)	J):	Thalweg Vel	ocity (m/s)(f	t/s):		
Stream Channel				_		_
Stream Gradient (%):Entrenchment:Catchment Area(sq. km):0.5Embeddedness	0 5	trenched				
······································			atrata Car	-1		
Channel Dimensions (m): Bankfull OHW We Width		ominant Sub minant Subs				
Thalweg Depth		minant Subs				
Rosgen Class:	54640			July		
Riparian Vegetation Communities (Viereck o	et al. 1992)					
						G
Dist. from	Canopy Height(m)		7 4 4 • 7 0	1		Canopy Height(m)
Bank (m) <u>Left Bank Vegetation Type</u>	Height(m)	Right Bank V	egetation T	<u>ype</u>		Canopy Height(m)
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated	Height(m)	Unvegetated	egetation T	<u>ype</u>		
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated	Height(m)	Unvegetated Unvegetated	Vegetation T	<u>ype</u>		
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated	Height(m)	Unvegetated	Vegetation T	<u>vpe</u>		
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated	Height(m)	Unvegetated Unvegetated	Vegetation T	ype		
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated10 - 20Unvegetated	Height(m)	Unvegetated Unvegetated Unvegetated	Vegetation T	<u>ype</u>		
Bank (m)Left Bank Vegetation Type0 - 5Unvegetated5 - 10Unvegetated10 - 20Unvegetated20 - 30Unvegetated	Height(m)	Unvegetated Unvegetated Unvegetated				
Bank (m)Left Bank Vegetation Type0-5Unvegetated5-10Unvegetated10-20Unvegetated20-30UnvegetatedKey To Fish Sampling Methods(SEI) Seine	Height(m)	Unvegetated Unvegetated Unvegetated Unvegetated				
Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu	Height(m)	Unvegetated Unvegetated Unvegetated Unvegetated Visual Obse	rvation, Gro	und		Height(m)
Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured:	Height(m)	Unvegetated Unvegetated Unvegetated Unvegetated Visual Obse	rvation, Gro	und romous Mea	n:	Height(m)
Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured: Fork Sampling Method (No. of fish): VOG (40)	Height(m) (VOG) alt Lengths (mm)	Unvegetated Unvegetated Unvegetated Unvegetated Visual Obse Life His Min:	rvation, Grou story: Anada Max:	und romous Mea i Susp	n:	Height(m)
Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured: Fork Sampling Method (No. of fish): VOG (40) Comments: Seining was attempted to catch coho, pool	Height(m) (VOG) ult Lengths (mm)	Unvegetated Unvegetated Unvegetated Visual Obse Life His Min: and wide, fish	rvation, Gro story: Anada Max:	und romous Mea r Susp r net.	n: ected Sp	Height(m)
Bank (m) Left Bank Vegetation Type 0 - 5 Unvegetated 5 - 10 Unvegetated 10 - 20 Unvegetated 20 - 30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured: Fork Sampling Method (No. of fish): VOG (40)	Height(m) (VOG) alt Lengths (mm) I was too deep venile	Unvegetated Unvegetated Unvegetated Visual Obse Life His Min: and wide, fish	rvation, Grou story: Anada Max:	und romous Mea r Susp r net.	n: ected Sp	Height(m)
Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured: Fork Sampling Method (No. of fish): VOG (40) Comments: Seining was attempted to catch coho, pool Species: sockeye salmon Life Stage: juv Total Fish Count: 22 Fish Measured: 6 Fork Sampling Method (No. of fish): SEI (6) VOG (16) SEI (6) VOG (16) SEI (6) VOG (16)	Height(m) (VOG) ult Lengths (mm) I was too deep renile Lengths (mm)	Unvegetated Unvegetated Unvegetated Unvegetated Visual Obse Life His Min: and wide, fish Life His Min: 41	rvation, Gro story: Anada Max: swam under story: Anada	und Mear Susp r net. romous Mear	n: ected Sp n: 45	Height(m) Median: pawning: Yes
Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured: Fork Sampling Method (No. of fish): VOG (40) Comments: Seining was attempted to catch coho, pool Species: sockeye salmon Life Stage: juw Total Fish Count: 22 Fish Measured: 6 Fork Sampling Method (No. of fish): SEI (6) VOG (16) Comments: Species: sockeye salmon Life Stage: adu Total Fish Count: 22 Fish Measured: 6 Fork Sampling Method (No. of fish): SEI (6) VOG (16) Comments: Species: sockeye salmon Life Stage: adu Total Fish Count: 205 Goundary Species: Sockeye salmon Life Stage: Sockeye Total Fish Count: 205 Fish Measured: 5 Fork	Height(m) (VOG) ult Lengths (mm) I was too deep renile Lengths (mm)	Unvegetated Unvegetated Unvegetated Unvegetated Visual Obse Life His Min: and wide, fish Life His Min: 41	rvation, Grou story: Anada Max: swam under story: Anada Max: 49	und Mean Susp r net. romous Mean romous Mean	n: ected Sp n: 45 n: 497	Height(m) Median: pawning: Yes Median: 45 Median: 495
Bank (m) Left Bank Vegetation Type 0-5 Unvegetated 5-10 Unvegetated 10-20 Unvegetated 20-30 Unvegetated Key To Fish Sampling Methods (SEI) Seine Fish Observations Species: coho salmon Life Stage: adu Total Fish Count: 40 Fish Measured: Fork Sampling Method (No. of fish): VOG (40) Comments: Seining was attempted to catch coho, pool Species: sockeye salmon Life Stage: juw Total Fish Count: 22 Fish Measured: 6 Fork Sampling Method (No. of fish): SEI (6) VOG (16) Comments: Seining Method (No. of fish): SEI (6) VOG (16) Comments: Species: sockeye salmon Life Stage: adu	Height(m) (VOG) alt Lengths (mm) I was too deep renile Lengths (mm) alt	Unvegetated Unvegetated Unvegetated Unvegetated Visual Obse Life His Min: and wide, fish Life His Min: 41	rvation, Grou story: Anada Max: swam under story: Anada Max: 49	und Mean Susp r net. romous Mean romous Mean	n: ected Sp n: 45 n: 497	Height(m) Median: pawning: Yes Median: 45

Species: chum salmon	Life Stage: adult		Life History: Anadromous				
Total Fish Count: 30	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. o	of fish): VOG (30)				Suspected	l Spawning: A	Yes
Comments: Most chum	salmon observed were	dead and at bottom of c	lear pool	s.			

Instruments

Channel Depths:
Channel Widths:
Electrofisher:
Transparency:



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