

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

by

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Alaska Department of Fish and Game

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Symbols and Abbreviations

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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	all standard mathematical signs, symbols and abbreviations	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H _A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	<i>e</i>
hectare	ha			catch per unit effort	CPUE
kilogram	kg			coefficient of variation	CV
kilometer	km	at	@	common test statistics	(F, t, χ^2 , etc.)
liter	L			confidence interval	CI
meter	m			correlation coefficient	
milliliter	mL	compass directions:		(multiple)	R
millimeter	mm	east	E	correlation coefficient (simple)	r
Weights and measures (English)		north	N	covariance	cov
		south	S	degree (angular)	°
		west	W	degrees of freedom	df
		copyright	©	expected value	<i>E</i>
		corporate suffixes:		greater than	>
		Company	Co.	greater than or equal to	≥
		Corporation	Corp.	harvest per unit effort	HPUE
		Incorporated	Inc.	less than	<
		Limited	Ltd.	less than or equal to	≤
		District of Columbia	D.C.	logarithm (natural)	ln
et alii (and others)	et al.	logarithm (base 10)	log		
et cetera (and so forth)	etc.	logarithm (specify base)	log ₂ , etc.		
Time and temperature		exempli gratia		minute (angular)	'
		(for example)	e.g.	not significant	NS
		Federal Information Code	FIC	null hypothesis	H ₀
		id est (that is)	i.e.	percent	%
		latitude or longitude	lat or long	probability	P
		monetary symbols		probability of a type I error	
		(U.S.)	\$, ¢	(rejection of the null hypothesis when true)	α
		months (tables and figures): first three letters	Jan,...,Dec	probability of a type II error	
		registered trademark	®	(acceptance of the null hypothesis when false)	β
		trademark	™	second (angular)	"
United States		standard deviation	SD		
(adjective)	U.S.	standard error	SE		
United States of America (noun)	USA	variance			
horsepower	hp	U.S.C.	United States Code	population sample	Var var
hydrogen ion activity (negative log of)	pH	U.S. state	use two-letter abbreviations (e.g., AK, WA)		
parts per million	ppm				
parts per thousand	ppt, ‰				
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**

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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:

Table 1.–Completed AFFI Projects since 2002.

HUC	Name	Year	HUC	Name	Year
19020402	Matanuska	2011	19030404	Holitzna River	2009
19020501	Upper Susitna River	2003, 2011	19030405	Stony River	2007
19020502	Chulitna River	2003, 2011	19030501	Aniak	2009
19020503	Talkeetna River	2003, 2011	19040301	MF-NF Chandalar Rivers	2010
19020504	Yentna River	2003, 2011	19040404	Ramparts	2004
19020505	Lower Susitna River	2003, 2011	19040507	Tanana Flats	2004
19020601	Redoubt-Trading Bays	2002	19040508	Nenana River	2004
19030301	Upper Nushagak River	2003, 2005, 2006	19040511	Lower Tanana River	2004
19030302	Mulchatna River	2003, 2005, 2006	19040601	Upper Koyukuk River	2010
19030303	Lower Nushagak River	2003, 2005, 2006	19040602	South Fork Koyukuk River	2010
19030402	Farewell Lake	2007	19040701	Tozitna River	2004
19030403	Takotna River	2007	19040801	Anvik River	2008
			19040802	Upper Innoko River	2008
			19040803	Lower Innoko River	2008
			19040804	Anvik to Pilot Station	2008
			19050102	Unalakleet	2009
			19050103	Norton Bay	2004
			19050105	Imuruk Basin	2004
			19050201	Shishmaref	2004
			19050202	Goodhope-Spafarief Bay	2004
			19050203	Buckland River	2004

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 <http://gis.sf.adfg.state.ak.us/FlexMaps/fishresourcemonitor.html>, 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 km^2), Jim (123 km^2), and Cottonwood (63 km^2) 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 km^2) and Gull Lake (2.3 km^2).

We excluded 187 km^2 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 $< 600 \text{ m}$ 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 $>50 \text{ km}^2$ 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 km^2 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 Subbasin drains some of the highest Alaska Range peaks and ridges, due to 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 $\geq 200 \text{ km}^2$ 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 $1\text{--}1.5 \text{ km}^2$ in area, are the largest lakes in the Chulitna River subbasin.

Sixty-nine percent (4,625 km²) 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. Chulitna (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 ≥ 200 km² 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 (≥ 2 km²) 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 $\geq 200 \text{ km}^2$ 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 km^2) at the head of Lake Creek; Shell (6.1 km^2) and Hewitt lakes (2.6 km^2) near Skwentna, and; Hiline Lake (2.1 km^2) in the Talachulitna River drainage.

Twenty-seven percent ($4,317 \text{ km}^2$) 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 km^2); Figure Eight (7.2 km^2); Flat Horn (5.7 km^2); Red Shirt (4.7 km^2); Trapper (4.7 km^2); unnamed (near Figure Eight, 3.2 km^2); Nancy (3.1 km^2), and; Alexander (3.0 km^2) lakes.

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

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

HUC	Name	Area ^a		Elevation (m)		Glaciated area ^d		Lake/pond area ^d	
		km ²	km ² < 600 m ^b	Max ^c	Mean ^b	km ²	% of HUC	km ²	% of 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

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

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

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

^d Source: National Hydrography Dataset for Alaska. Available at <http://nhd.usgs.gov/> [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.

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

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

^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.

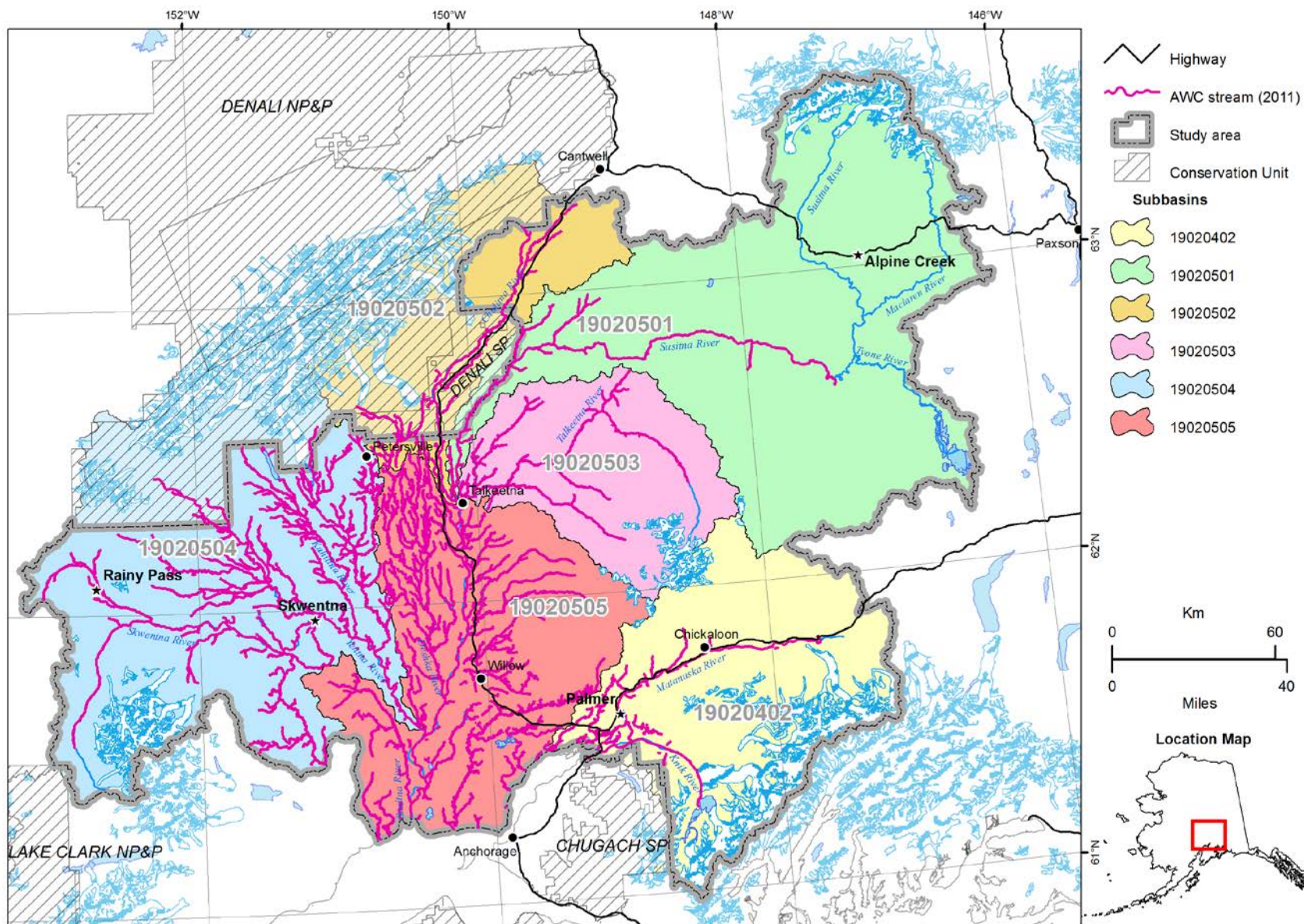


Figure 1.—Study area map.

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 I1).

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:

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

$$L_t = \text{ambient conductivity at } t$$

$$L_{25} = \text{conductivity at } 25^{\circ}\text{C (value displayed on U-10)}$$

$$t = \text{water temperature at time of measurement (}^{\circ}\text{C)}$$

- 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				
Project Code and Station ID	-	text	-	5-digit alphanumeric—see Waypoints and Visits heading in text.
Station location	consumer-grade GPS unit (e.g. Garmin GPSmap 60CSx or 76S)	decimal degrees: latitude (DD.DDDDD); longitude (-DDD.DDDDD)	0.00001 degrees	
Upper end of reach				
Lower end of reach				
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
pH	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 and bankfull [BF, 2011]/OHW [2003])	30-m fiberglass tape	m	0.1 m	In wadeable channels < 30 m wide
	laser range finder (Bushnell Yardage Pro)	m	1 m	In nonwadeable channels, or where width > 30 m
Thalweg depth (wetted and BF [2011]/OHW [2003])	handheld sonar (HawkEye Digital Sonar) and clinometer (to find the BF level)	m	0.1 m	For nonwadeable channels
	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 ÷ 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	-	

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Table 4.–Page 3 of 4.

Variable name	Equipment	Units/Domain	Precision	Comment
Streamflow (continued)				
Thalweg velocity (not measured in 2003)	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
	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 communities				
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	A	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.

-continued-

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	-	integer--no. 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 (km^2) 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 ($100\text{--}500 \text{ km}^2$) and Large ($> 500 \text{ km}^2$) 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:

$$\hat{p}_{s,i} = \frac{n_{s,i}}{n_i} \quad (1)$$

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:

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

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:

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

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 <http://www.adfg.alaska.gov/index.cfm?adfg=ffinventory.interactive>, 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).

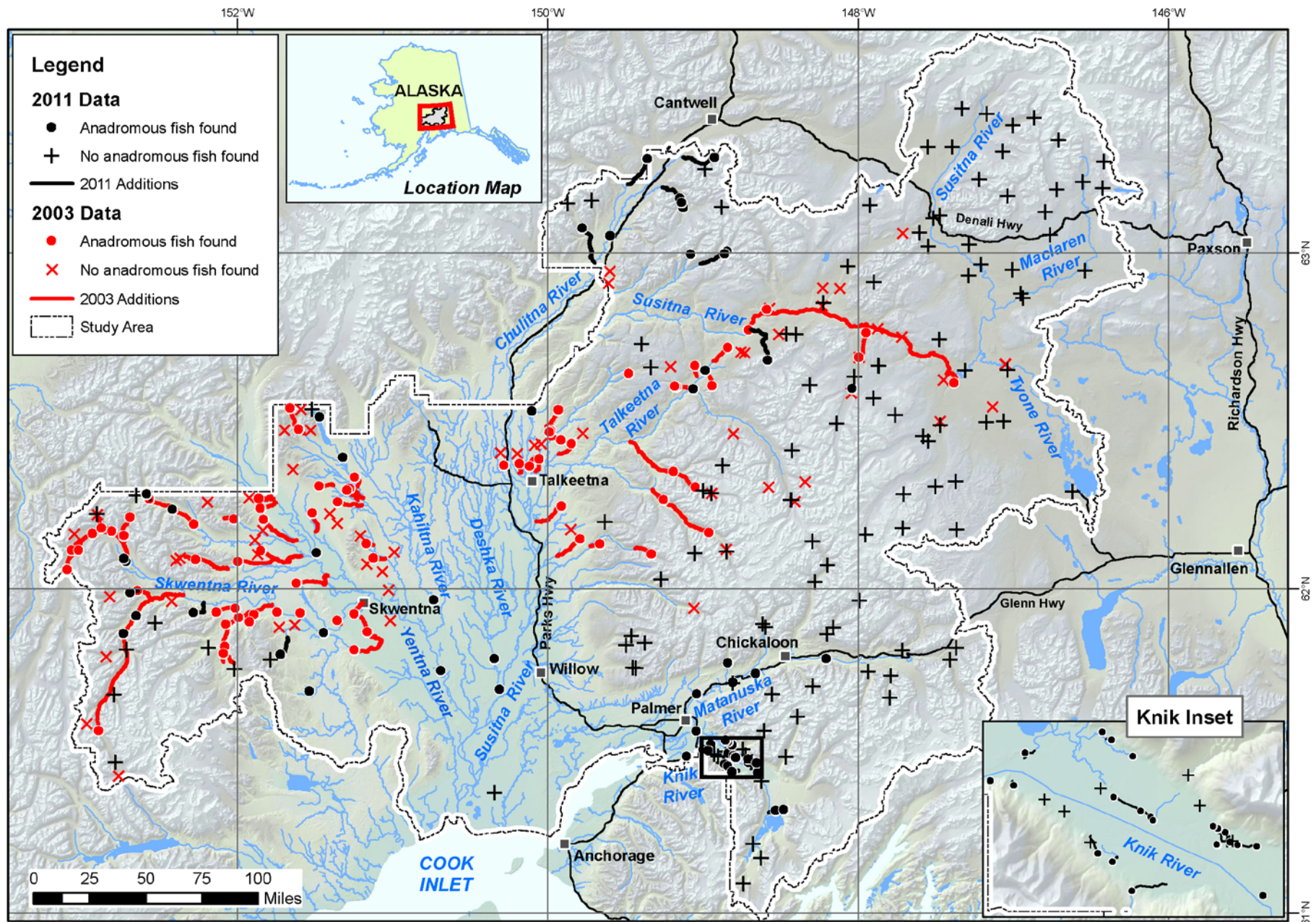


Figure 2.—Map of new or extended AWC water bodies resulting from ADF&G inventories in 2003 and 2011.

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 FSS1117A02 “Hotel Rocks” on the Chickaloon River, and 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 (≤ 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 $<10.84^{\circ}\text{C}$, *stream gradient* was $>0.25\%$, or *conductivity* was $>81\ \mu\text{S/cm}$. 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* $>1.8\ \text{m/s}$, or *conductivity* $>106\ \mu\text{S/cm}$. 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* $>101\ \mu\text{S/cm}$. 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. Also, Dolly Varden tended not 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, 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 compared to where they were not 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, visual observations, dip net; Appendix D15). We found Dolly Varden widely dispersed 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 *Arctic grayling* and not 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).

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

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

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).

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.

Reach ID	Subreaches Sampled	SR^a	Subreach when SR first observed	TSR_{H-T}^b	TSR_{H-T} minus SR
FSS1101a01	15	3	8	3.01	0.01
FSS1101B01	12	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	11	11.27	3.27
FSS1103A01	15	4	10	4.17	0.17
FSS1103B01	16	5	11	5.01	0.01
FSS1103D01	10	5	4	6.16	1.16
FSS1104A01	8	5	4	5.14	0.14
FSS1104B01	13	2	3	2.00	0.00
FSS1104D01	12	3	11	3.80	0.80
FSS1105A01	12	4	5	4.01	0.01
FSS1105B01	13	2	1	2.04	0.04
FSS1106A01	6	5	1	5.05	0.05
FSS1106b01	17	5	11	5.70	0.70
FSS1106D01	7	7	1	7.25	0.25
FSS1107A01	5	5	4	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

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 ≤ 300 km², 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 km², 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).

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.

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

^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*).

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.

Source data ^a	Estimated # of undetected species	Stopping after 80 stream widths		Stopping after 100 stream widths		Stopping after 120 stream widths		Stopping after 140 stream widths	
		%	cumulative %	%	cumulative %	%	cumulative %	%	cumulative %
Reaches where 90+ stream widths (9+ subreaches) were sampled (n=54)	0	24.1%	24.1%						
	1	24.1%	48.1%						
	2	38.9%	87.0%						
	3	9.3%	96.3%						
	4	0.0%	96.3%						
	5+	3.7%	100.0%						
Reaches where 110+ stream widths (11+ subreaches) were sampled (n=42)	0	26.2%	26.2%	35.7%	35.7%				
	1	9.5%	35.7%	21.4%	57.1%				
	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 widths (13+ subreaches) were sampled (n=26)	0	23.1%	23.1%	38.5%	38.5%	38.5%	38.5%		
	1	7.7%	30.8%	11.5%	50.0%	34.6%	73.1%		
	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 widths (15+ subreaches) were sampled (n=18)	0	11.1%	11.1%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
	1	11.1%	22.2%	11.1%	44.4%	38.9%	72.2%	38.9%	72.2%
	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%

^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.

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.

Minimum number of subreaches sampled	Estimated # of undetected species	Stop after no new species in last 4 subreaches		Stop after no new species in last 6 subreaches	
		%	cumulative %	%	cumulative %
6	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%
	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%
		<i>n</i> =57		<i>n</i> =46	
8	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%
	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%
		<i>n</i> =49		<i>n</i> =43	
10	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%
	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%
		<i>n</i> =39		<i>n</i> =34	
12	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%
	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%
		<i>n</i> =27		<i>n</i> =25	

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*).

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.

Minimum number of subreaches sampled	Estimated # of undetected species	Stop after no new species in last 4 subreaches		Stop after no new species in last 6 subreaches	
		%	cumulative %	%	cumulative %
6	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%
	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%
		n=55		n=39	
8	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%
	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	
10	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%
	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%
		n=35		n=25	
12	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%
	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%
		n=23		n=16	

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 (Curry et al. 2009); 5) electrofishing equipment is compact and portable; and 6) 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 $\leq 300 \text{ km}^2$, we have no similar recommendation for streams draining $>300 \text{ km}^2$ other than to suggest the minimum exceeds 14 wetted widths. Similarly, when considering adaptive stopping rules, we have no good recommendations for reaches draining $>300 \text{ km}^2$.

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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REFERENCES CITED

- ADCCED (Alaska Department of Commerce, Community and Economic Development). 2009. Office of Fisheries Development FAQs. <http://www.commerce.state.ak.us/oed/seafood/seafoodfaqs.htm> (Accessed March 2009).
- Agresti, A. 1990. Categorical Data Analysis. John Wiley & Sons. New York, NY.
- Armantrout, N. B., compiler. 1998. Glossary of aquatic habitat inventory terminology. American Fisheries Society, Bethesda, Maryland.
- Bain, M. B. 1999. Substrate. Pages 95–103 [In] M. B. Bain and N. J. Stevenson, editors. Aquatic habitat assessment: common methods. American Fisheries Society, Bethesda, Maryland.
- Barbour, M. T., J. Gerritsen, D. D. Snyder, and J. B. Stribling. 1999. Rapid bioassessment protocols for use in streams and wadeable rivers: periphyton, benthic macroinvertebrates and fish, 2nd edition. U. S. Environmental Protection Agency, Office of Water, EPA Report No. 841-B-99-002, Washington, DC.
- Bonar, S. A., W. A. Hubert, and D. W. Willis, editors. 2009. Standard methods for sampling North American freshwater fishes. American Fisheries Society, Bethesda, Maryland.
- Brown, J., O. J. Ferrians, Jr., J. A. Heginbottom, and E. S. Melnikov. 1998 (revised 2001). Circum-arctic map of permafrost and ground ice conditions. National Snow and Ice Data Center/World Data Center for Glaciology, Boulder, CO. <http://nsidc.org/data/ggd318.html>.
- Buckwalter, J. D., J. M. Kirsch, and D. J. Reed. 2010. Fish inventory and anadromous cataloging in the lower Yukon River drainage, 2008. Alaska Department of Fish and Game, Fishery Data Series No. 10-76, Anchorage. <http://www.adfg.alaska.gov/FedAidPDFs/FDS10-76.pdf>.
- Buckwalter, J. D., J. M. Kirsch, and D. J. Reed. 2012. Fish inventory and anadromous cataloging in the upper Koyukuk River and Chandalar River basins, 2010. Alaska Department of Fish and Game, Fishery Data Series No. 12-22, Anchorage. <http://www.adfg.alaska.gov/FedAidPDFs/FDS12-22.pdf>.
- Cochran, W. G. 1977. Sampling techniques. Third Edition. John Wiley & Sons, New York.
- Conover, W. J. 1980. Practical nonparametric statistics, 2nd ed. New York, John Wiley and Sons.
- Cummins, K. W. 1962. An evaluation of some techniques for the collection and analysis of benthic samples with special emphasis on lotic waters. American Midland Naturalist 67:477-504.
- Curran, J. H., M. L. McTeague, S. E. Burrell, and C. E. Zimmerman. 2011. Distribution, persistence, and hydrologic characteristics of salmon spawning habitats in clearwater side channels of the Matanuska River, Southcentral Alaska. U.S. Geological Survey, Scientific Investigations Report 2011–5102, Reston, Virginia. <http://pubs.usgs.gov/sir/2011/5102/>.
- Curry, R. A., R. M. Hughes, M. E. McMaster, and D. J. Zafft. 2009. Coldwater fish in rivers. Pages 139–158 [In] S. A. Bonar, W. A. Hubert, and D. W. Willis, editors. Standard methods for sampling North American freshwater fishes. American Fisheries Society, Bethesda, Maryland.
- Efron, B. and R. J. Tibshirani. 1993. An introduction to the bootstrap. Chapman and Hall, New York.
- Flotemersch, J. E., and K. A. Blocksom. 2005. Electrofishing in boatable rivers: does sampling design affect bioassessment metrics? Environmental Monitoring and Assessment 102:263-283.
- Havens, A. C. 1988. Evaluation of enhancement efforts for sport fisheries for rainbow trout and Arctic char in Big Lake, Alaska, 1987. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Data Series No. 63, Juneau, Alaska. <http://www.adfg.alaska.gov/FedAidPDFs/fds-063.pdf>.
- HDR Alaska Inc. (HDR). 2011. Susitna-Watana Hydroelectric Project, railbelt large hydro: Aquatic resources data gap analysis (*draft*). July 20, 2011, Anchorage, Alaska. Prepared for the Alaska Energy Authority, Anchorage, Alaska.

REFERENCES CITED (Continued)

- Hendricks, M. L., C. H. Hocutt, and J. R. Stauffer, Jr. 1980. Monitoring of fish in lotic habitats. Pages 205–231 [In] C. H. Hocutt and J. R. Stauffer, Jr., editors. Biological monitoring of fish. D.C. Heath, Lexington, Massachusetts.
- Hughes, R. M., P. R. Kaufmann, A. T. Herlihy, S. S. Intelmann, S. C. Corbett, M. C. Arbogast, and R. C. Hjort. 2002. Electrofishing distance needed to estimate fish species richness in raftable Oregon rivers. *North American Journal of Fisheries Management* 22: 1229–1240.
- Jorgenson, T., K. Yoshikawa, M. Kanevskiy, and Y. Shur. 2008. Climate: mean annual air temperature map (back side of Permafrost Characteristics of Alaska map). University of Alaska Fairbanks, Institute of Northern Engineering, Fairbanks, Alaska. http://www.prism.oregonstate.edu/state_products/ak_maps.phtml.
- Kirsch, J. M., J. D. Buckwalter, and D. J. Reed. 2011. Fish inventory and anadromous cataloging in eastern Norton Sound drainages, 2009. Alaska Department of Fish and Game, Fishery Data Series No. 11-53, Anchorage. <http://www.adfg.alaska.gov/FedAidPDFs/FDS11-53.pdf>.
- Kirsch, J. M., J. D. Buckwalter, and D. J. Reed. *In prep.* Fish inventory and anadromous cataloging in the Kuskokwim River drainage, 2007 and 2009. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.
- Kocovsky, P. M., C. Gowan, K. D. Fausch, and S. C. Riley. 1997. Spinal injury rates in three wild trout populations in Colorado after eight years of backpack electrofishing. *North American Journal of Fisheries Management* 17:308–313.
- Manley, B. F. J. 1997. Randomization, bootstrap, and Monte Carlo methods in biology, 2nd edition. Chapman & Hall/CRC, New York, New York.
- Maret, T. R., and D. S. Ott. 2003. An assessment of fish assemblages and minimum sampling effort required to determine biotic integrity of large rivers in southern Idaho, 2002. U.S. Geological Survey, Water Resources Investigations Report 03-4274, Boise, Idaho.
- McPhail, J. D. and C. C. Lindsey. 1970. Freshwater fishes of Northwestern Canada and Alaska. Fisheries Research Board of Canada, Bulletin 173, Ottawa.
- Martinez, P. J., and A. L. Kolz. 2009. Evaluating the power output of the Smith-Root GPP 5.0 electrofisher to promote electrofishing fleet standardization. *North American Journal of Fisheries Management* 29:270–575.
- McCormick, F. H., and R. M. Hughes. 2000. Aquatic vertebrates. Pages 10-1–10-14 [In] Lazorchak, J.M., B. H. Hill, D. K. Averill, D. V. Peck, and D. J. Klemm, editors. Environmental Monitoring and Assessment Program-Surface Waters: field operations and methods for measuring the ecological condition of non-wadeable rivers and streams. U.S. Environmental Protection Agency, Cincinnati, Ohio. <http://www.epa.gov/emap/html/pubs/docs/groupdocs/surfwatr/field/nonws1.html>.
- McPhail, J. D. and C. C. Lindsey. 1970. Freshwater fishes of Northwestern Canada and Alaska. Fisheries Research Board of Canada, Bulletin 173, Ottawa.
- Mecklenburg, C. W., T. A. Mecklenburg, and L. K. Thorsteinson. 2002. Fishes of Alaska. American Fisheries Society, Bethesda, Maryland.
- Morrow, J. E. 1980. The freshwater fishes of Alaska. Alaska Northwest Publishing Company, Anchorage, Alaska.
- Novotny, D. W., and G. R. Priegel. 1974. Electrofishing boats. Improved designs and operational guidelines to increase the effectiveness of boom shockers. Wisconsin Department of Natural Resources, Technical Bulletin 73, Madison.
- Nowacki, G., P. Spencer, M. Fleming, T. Brock, and T. Jorgenson. Ecoregions of Alaska: 2001. U.S. Geological Survey Open-File Report 02-297 (map).
- Patton, T. M., W. A. Hubert, F. J. Rahel, and K. G. Gerow. 2000. Effort needed to estimate species richness in small streams on the Great Plains in Wyoming. *North American Journal of Fisheries Management* 20:394–398.

REFERENCES CITED (Continued)

- Platts, W. S., W. F. Megahan, and G. W. Minshall. 1983. Methods for evaluating stream, riparian, and biotic conditions. U.S. Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-138, Ogden, Utah. http://www.fs.fed.us/rm/pubs_int/int_gtr138.pdf.
- PRISM Climate Group (PRISM). 2000. Mean annual precipitation, Alaska – Yukon. Oregon State University, Spatial Climate Analysis Service, Corvallis, Oregon. http://www.prism.oregonstate.edu/state_products/ak_maps.phtml (map created February 2000, accessed May 2012).
- R Core Team (2012). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org/>.
- Reynolds, J. B. 1996. Electrofishing. Pages 221-253 in Murphy, B. R., and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- Reynolds, L., A. T. Herlihy, P. R. Kaufman, S. V. Gregory, and R. M. Hughes. 2003. Electrofishing effort requirements for assessing species richness and biotic integrity in Western Oregon Streams. North American Journal of Fisheries Management 23:450-461.
- Rich, C. F. and J. D. Buckwalter. 2003. Southcentral Alaska 2002 anadromous fish and habitat survey. Alaska Department of Fish and Game, Habitat and Restoration Division, Technical Report No. 03-01, Anchorage, Alaska.
- Rosgen, D. L. 1994. A classification of natural rivers. Catena 22:169-199.
- Simon, T. P. and R. E. Sanders. 1999. Applying an index of biotic integrity based on great river fish communities: considerations in sampling and interpretation. Pages 475–505 [In] T. P. Simon, editor. Assessing sustainability and biological integrity of water resources using fish communities. CRC Press, Boca Raton, Florida.
- Temple, G. M., and T. N. Pearsons. 2007. Electrofishing: backpack and drift boat. Pages 95–132 [In] D. H. Johnson, B. M. Shrier, J. S. O'Neal, J. A. Knutzen, X. Augerot, T. A. O'Neil, and T. N. Pearsons. Salmonid field protocols handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland.
- Viereck, L. A., C. T. Dyrness, A. R. Batten, and K. J. Wenzlick. 1992. The Alaska vegetation classification. U.S. Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-286, Portland, Oregon.
- Wahrhaftig, C. 1965. Physiographic divisions of Alaska. U.S. Geological Survey Professional Paper 482, Washington D.C. <http://pubs.usgs.gov/pp/0482/report.pdf>.
- Wentworth, C. K. 1922. A scale of grade and class for elastic sediments. Journal of Geology 30:377-392.
- Wiedmer, M., D. R. Montgomery, A. R. Gillespie, and H. Greenberg. 2010. Late Quaternary megafloods from Glacial Lake Atna, Southcentral Alaska, U.S.A. Quaternary Research 73: 413–424.

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 fish-collection 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 (pps)	Duty cycle (%)	
	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 and dip net. In fast water, the net should remain several meters downstream of 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.

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 $<300\ \mu\text{S}/\text{cm}$, set the Range dial to High. If ambient conductivity is $>300\ \mu\text{S}/\text{cm}$, 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 ($>300\ \mu\text{S}/\text{cm}$), 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.

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

Ambient conductivity ($\mu\text{S}/\text{cm}$)	Target voltage		Ambient conductivity ($\mu\text{S}/\text{cm}$)	Target voltage	
	pulsed DC ^a	Smooth DC		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			

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 = 100 $\mu\text{S}/\text{cm}$.

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)

1. Anesthetize collected fish with CO₂:
 - a. Add 2 buffered CO₂ 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 CO₂ dosage in the field can be difficult, because, by the time the fish have responded to the sedation, the concentration of CO₂ 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 ≤ 250 mm) or board (FL ≥ 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. Species unknown: up to 5 (from each site) individual fish of each species and life stage that cannot be confidently identified in the field;
 - b. UAF Museum: requested voucher specimens (see UAF instructions);
 - c. Juvenile coho salmon: up to 5 from each site;
 - d. Optionally-anadromous fishes for otolith study: 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 CO₂) 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 (Cataract 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).
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APPENDIX B. LOOKUP TABLES

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

Descriptions of fish life-stage classes.

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.

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

Species	Life stage		
	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 classes.

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.

Appendix B3.–Fish-passage barrier classes.

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.–Page 2 of 2.

Code	Name	Description
GWG	Geologically Fixed, Waterfall/High Gradient	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 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 on sufficient upstream and downstream sampling, to be blocked by a culvert 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 on sufficient upstream and downstream sampling, to be blocked by debris placed or deposited in the stream as the direct result of human activities but where that material was not intentionally placed to impound, filter, or divert 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 on 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.
HOT	Human, Other	Where the upstream movements of a given species appear, based on 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 an 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.

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-

Embeddedness classes.

Code	Level of 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 species codes.

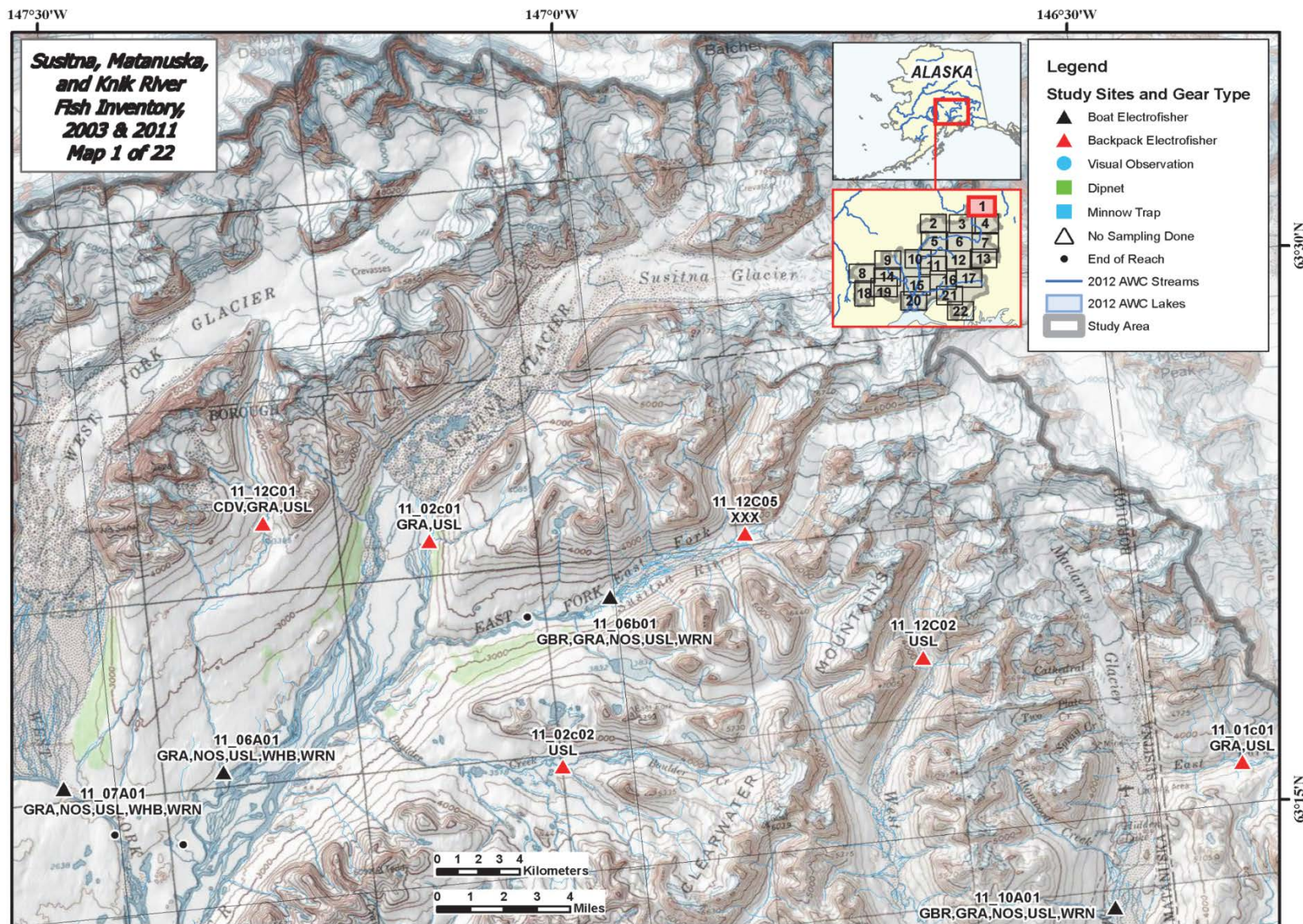
Code	Common name	Scientific name
ACI	sturgeon-unspecified	<i>Acipenser</i> sp.
ATG	green sturgeon	<i>Acipenser medirostris</i>
ATW	white sturgeon	<i>Acipenser transmontanus</i>
CAC	Arctic char	<i>Salvelinus alpinus</i>
CBT	brook trout	<i>Salvelinus fontinalis</i>
CDV	Dolly Varden	<i>Salvelinus malma</i>
CHR	char-unspecified	<i>Salvelinus</i> sp.
CLK	lake trout	<i>Salvelinus namaycush</i>
DAL	Alaska blackfish	<i>Dallia pectoralis</i>
ERC	trout-perch	<i>Percopsis omiscomaycus</i>
FAR	Arctic flounder	<i>Pleuronectes glacialis</i>
FLN	righteye flounders-unspecified	Pleuronectidae
FST	starry flounder	<i>Platichthys stellatus</i>
GAD	cod-unspecified	Gadidae
GAR	Arctic cod	<i>Boreogadus saida</i>
GBR	burbot	<i>Lota lota</i>
GPA	Pacific cod	<i>Gadus macrocephalus</i>
GRA	Arctic grayling	<i>Thymallus arcticus</i>
GSA	saffron cod	<i>Eleginus gracilis</i>
HAM	American shad	<i>Alosa sapidissima</i>
HER	herrings-unspecified	Clupeidae
HPA	Pacific herring	<i>Clupea pallasii</i>
IDA	salmonid, unspecified	Salmonidae
KNS	ninespine stickleback	<i>Pungitius pungitius</i>
KSB	stickleback-unspecified	Gasterosteidae
KTS	threespine stickleback	<i>Gasterosteus aculeatus</i>
LAC	Arctic-Alaskan brook lamprey paired species	<i>L. camtschatica</i> / <i>L. alaskense</i>
LAK	Alaskan brook lamprey	<i>Lampetra alaskense</i>
LAR	Arctic lamprey	<i>Lampetra camtschatica</i>
LMO	Atlantic salmon	<i>Salmo salar</i>
LMP	lamprey-unspecified	<i>Lampetra</i> sp.
LPC	Pacific lamprey	<i>Lampetra tridentata</i>
LRV	American river lamprey	<i>Lampetra ayresii</i>
LWB	western brook lamprey	<i>Lampetra richardsoni</i>
MIN	lake chub	<i>Couesius plumbeus</i>
NOS	longnose sucker	<i>Catostomus catostomus</i>
OEU	eulachon	<i>Thaleichthys pacificus</i>
OLS	longfin smelt	<i>Spirinchus thaleichthys</i>
OPS	pond smelt	<i>Hypomesus olidus</i>
ORM	rainbow smelt	<i>Osmerus mordax</i>
OSM	smelt-unspecified	Osmeridae
OSS	surf smelt	<i>Hypomesus pretiosus</i>
PIK	northern pike	<i>Esox lucius</i>
SAM	Pacific salmon-unspecified	semelparous <i>Oncorhynchus</i> sp.
SCK	Chinook salmon	<i>Oncorhynchus tshawytscha</i>
SCM	chum salmon	<i>Oncorhynchus keta</i>

Code	Common name	Scientific name
SCO	coho salmon	<i>Oncorhynchus kisutch</i>
SPI	pink salmon	<i>Oncorhynchus gorbuscha</i>
SSE	sockeye salmon	<i>Oncorhynchus nerka</i>
TCT	cutthroat trout	<i>Oncorhynchus clarkii</i>
TRB	rainbow trout	<i>Oncorhynchus mykiss</i>
TRT	trout-unspecified	iteroparous <i>Oncorhynchus</i> sp.
UCR	coastrange sculpin	<i>Cottus aleuticus</i>
UFH	fourhorn sculpin	<i>Myoxocephalus quadricornis</i>
ULP	sculpin-unspecified	Cottidae
UPR	prickly sculpin	<i>Cottus asper</i>
UPS	Pacific staghorn sculpin	<i>Leptocottus armatus</i>
USH	sharpnose sculpin	<i>Clinocottus acuticeps</i>
USL	slimy sculpin	<i>Cottus cognatus</i>
WAK	Alaska whitefish	<i>Coregonus nelsonii</i>
WAR	Arctic cisco	<i>Coregonus autumnalis</i>
WBC	Bering cisco	<i>Coregonus laurettae</i>
WBD	broad whitefish	<i>Coregonus nasus</i>
WHB	humpback whitefish	<i>Coregonus pidschian</i>
WHC	humpback whitefish complex	<i>C. clupeaformis</i> / <i>C. nelsonii</i> / <i>C. pidschian</i>
WHF	whitefish-unspecified	Coregoninae
WIN	inconnu (sheefish)	<i>Stenodus leucichthys</i>
WLC	least cisco	<i>Coregonus sardinella</i>
WLK	lake whitefish	<i>Coregonus clupeaformis</i>
WPG	pygmy whitefish	<i>Prosopium coulteri</i>
WRN	round whitefish	<i>Prosopium cylindraceum</i>
YMA	shiner perch	<i>Cymatogaster aggregata</i>
YYP	yellow perch	<i>Perca flavescens</i>
QQQ	other species not listed	-
VVV	no collection effort	-
XXX	no fish collected or observed	-
ZZZ	general fish observation, no species information	-

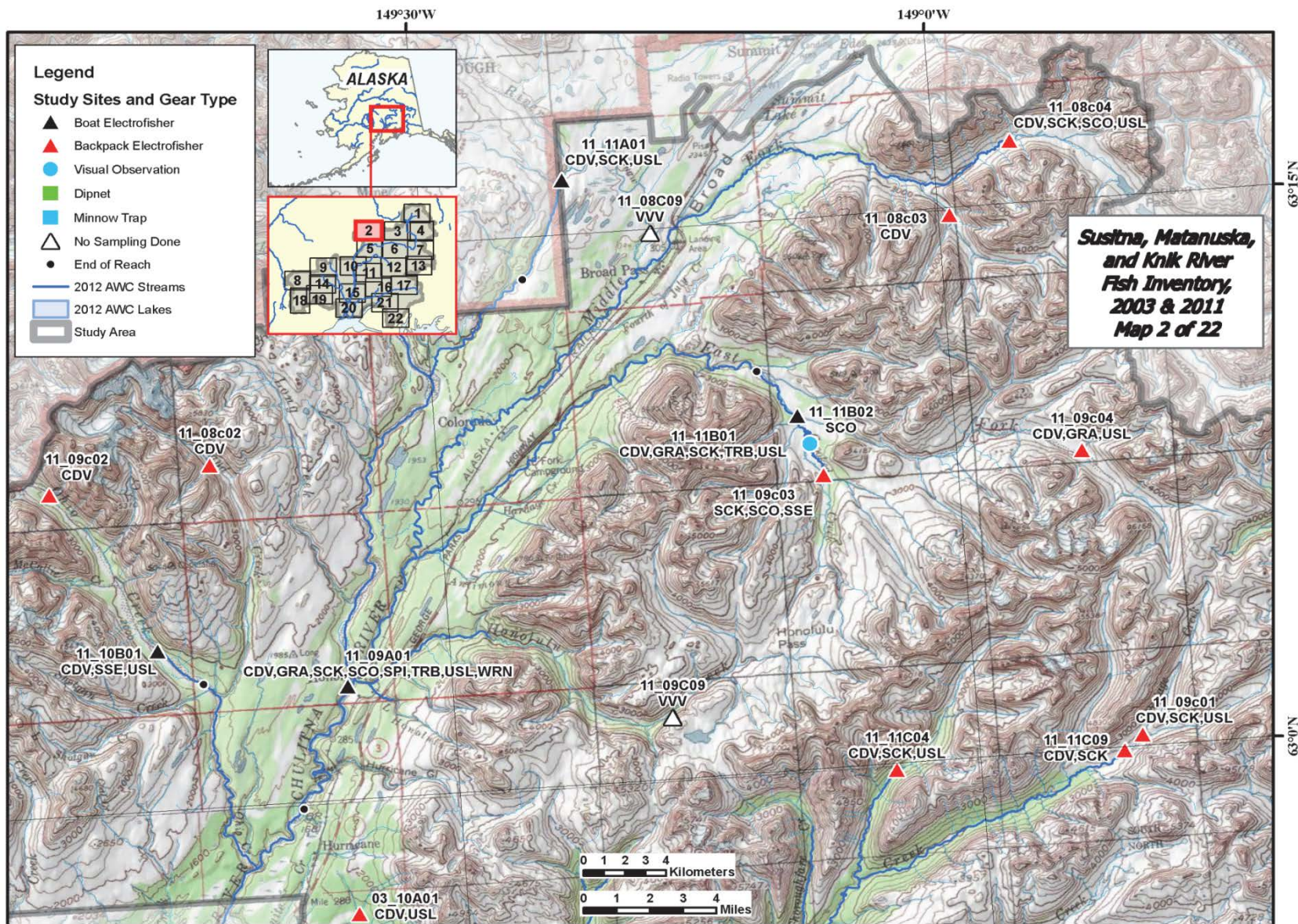
Appendix B6.–Vegetation disturbance classes.

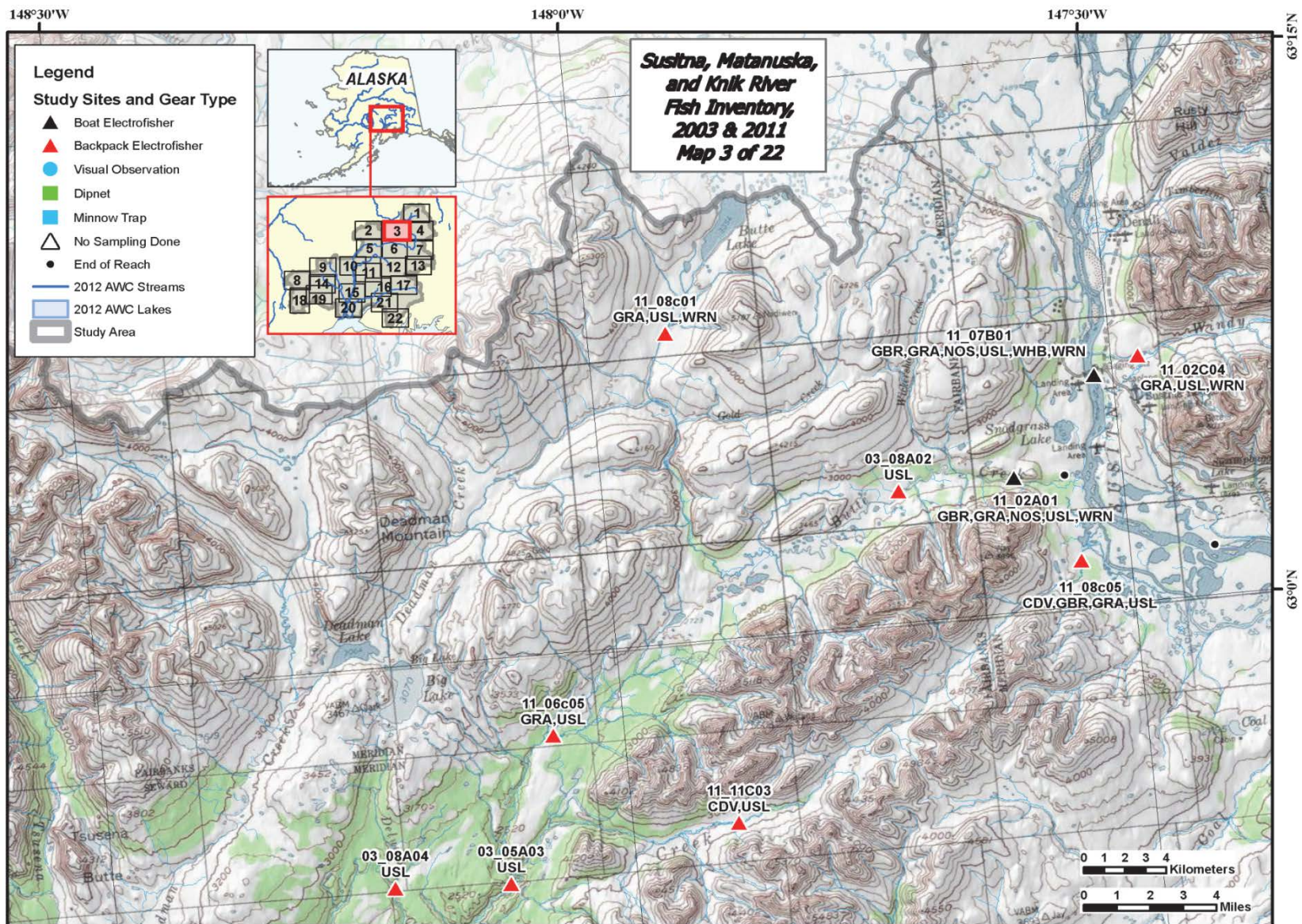
Code	Description
A	Anthropogenic Disturbance
AA	Unique
AA1	Timber Harvest
AA1a	0-1 year post-harvest
AA1b	1-5 year post-harvest
AA1c	10-20 year post-harvest
AA1d	20+ year post-harvest
AA2	Construction
AA2a	0-1 year post-construction
AA2b	1-5 year post-construction
AA2c	10-20 year post-construction
AA2d	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
N	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

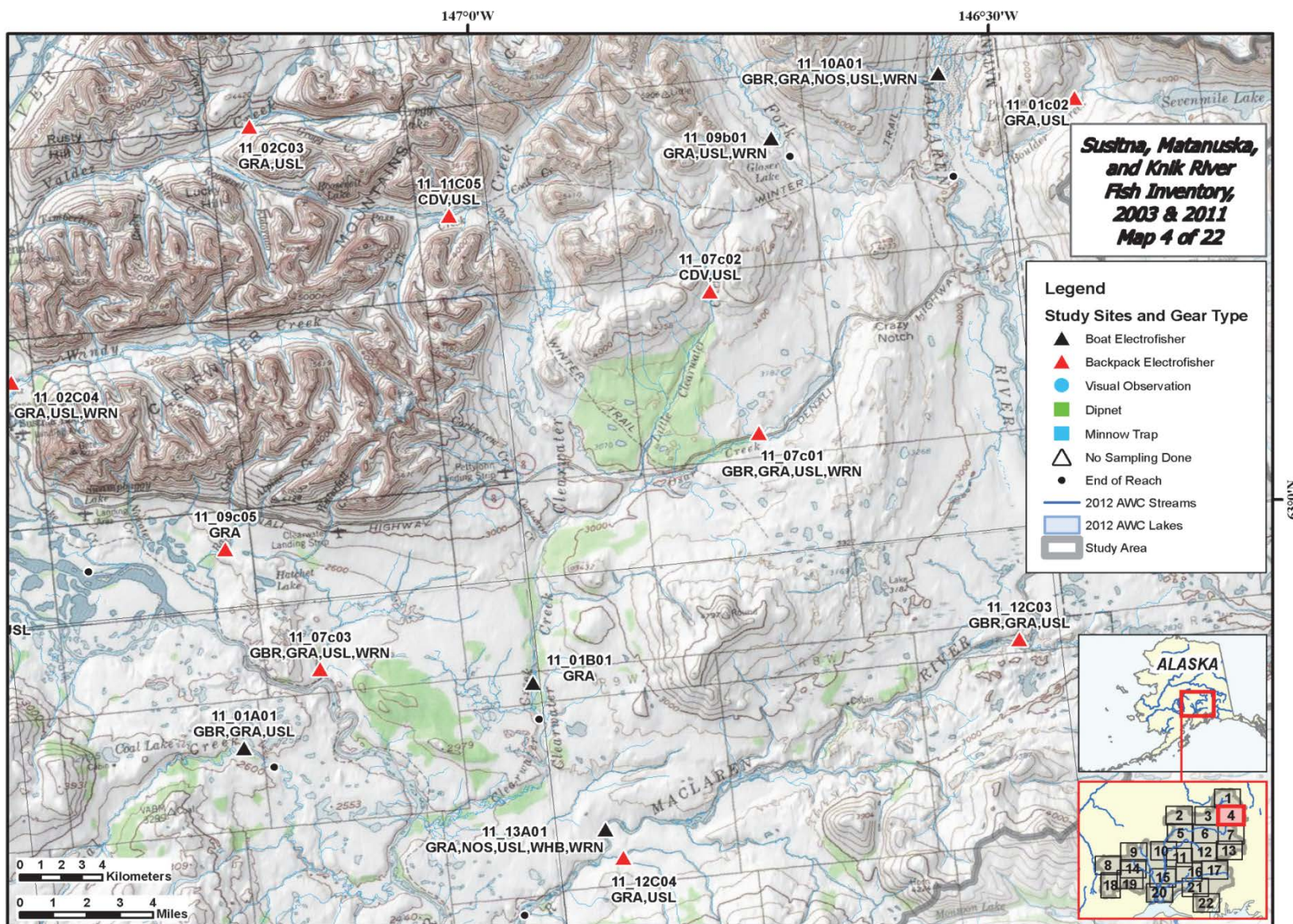
APPENDIX C. STUDY-SITE MAPS

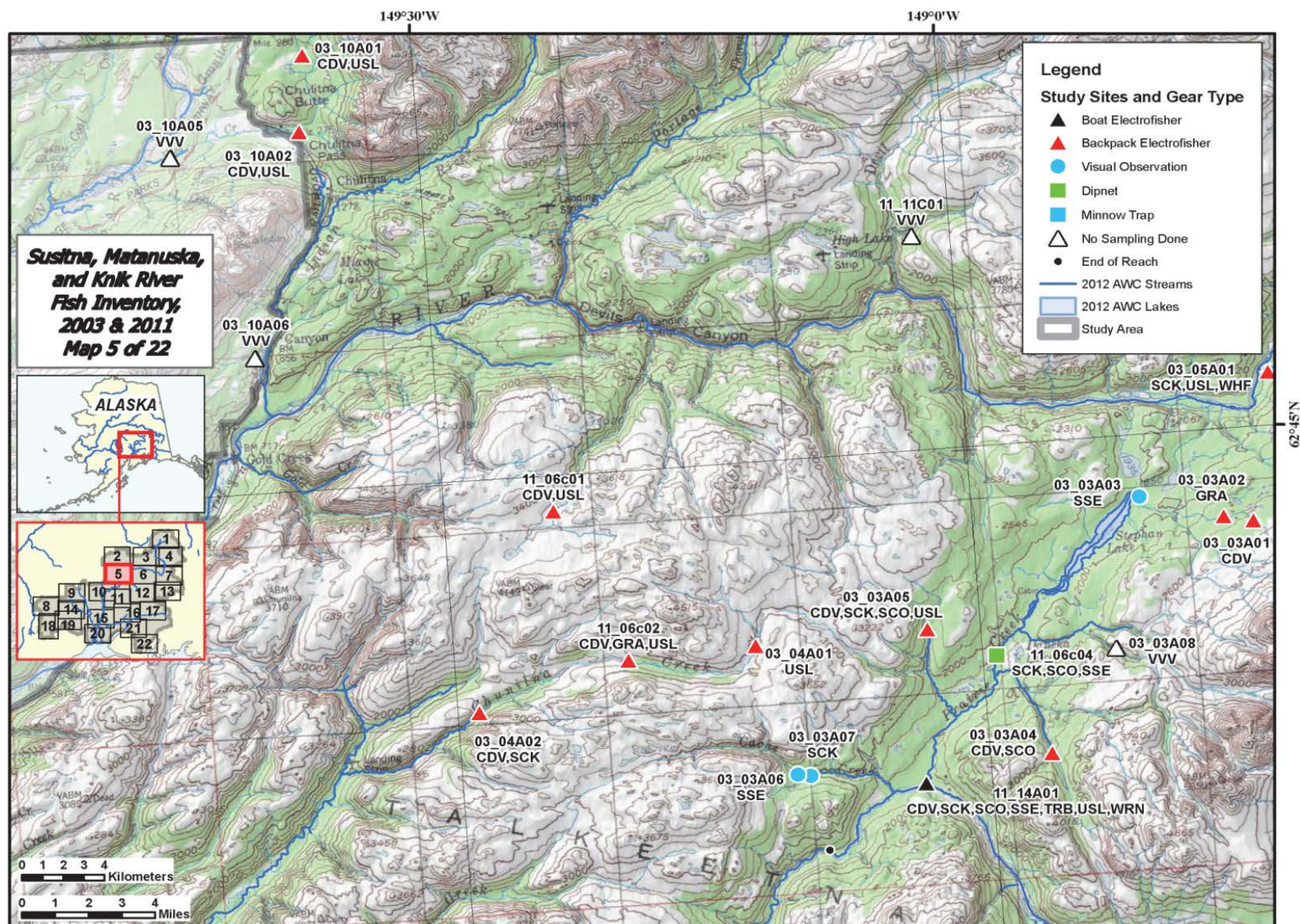


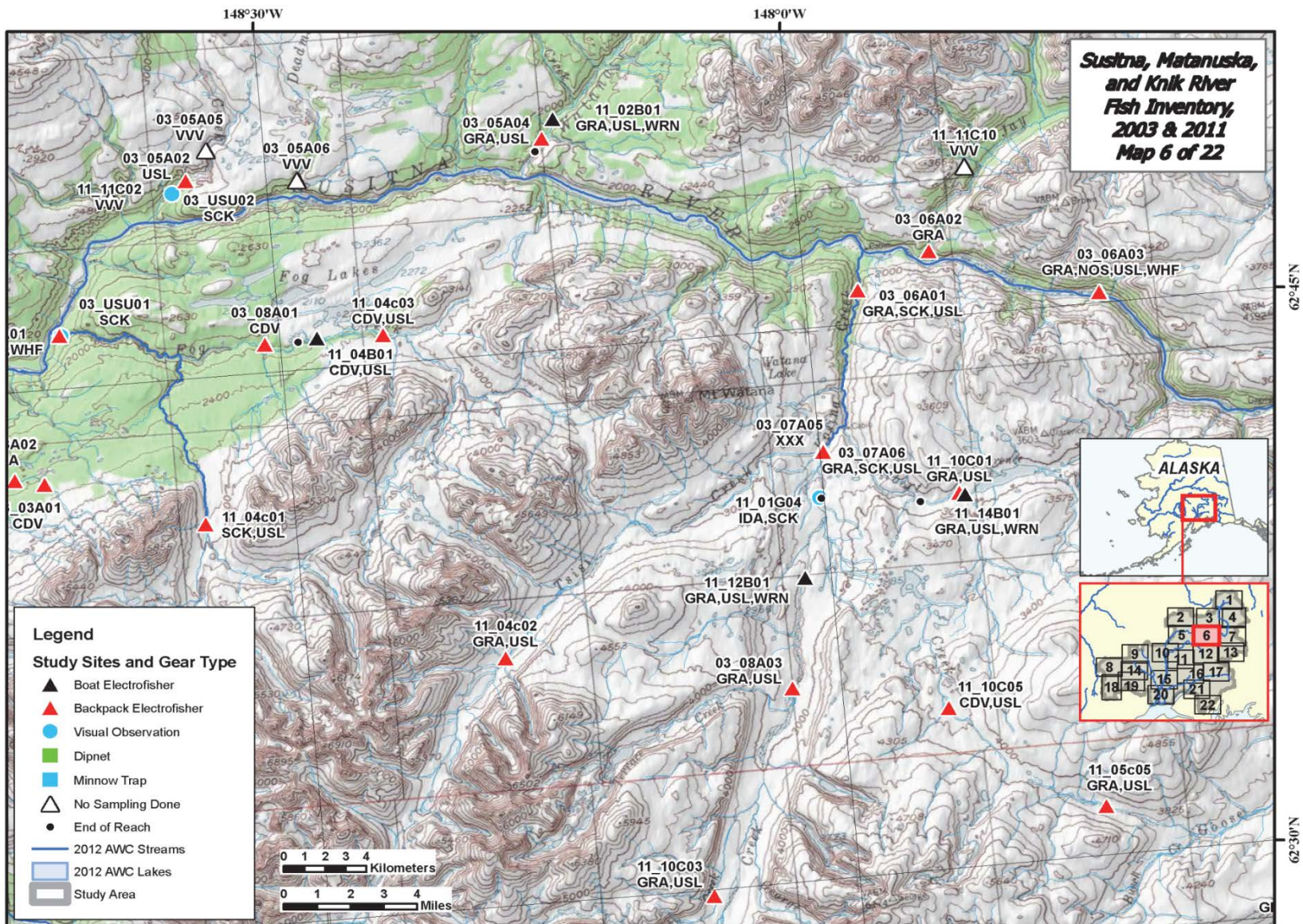
Appendix C1.—Study site maps.

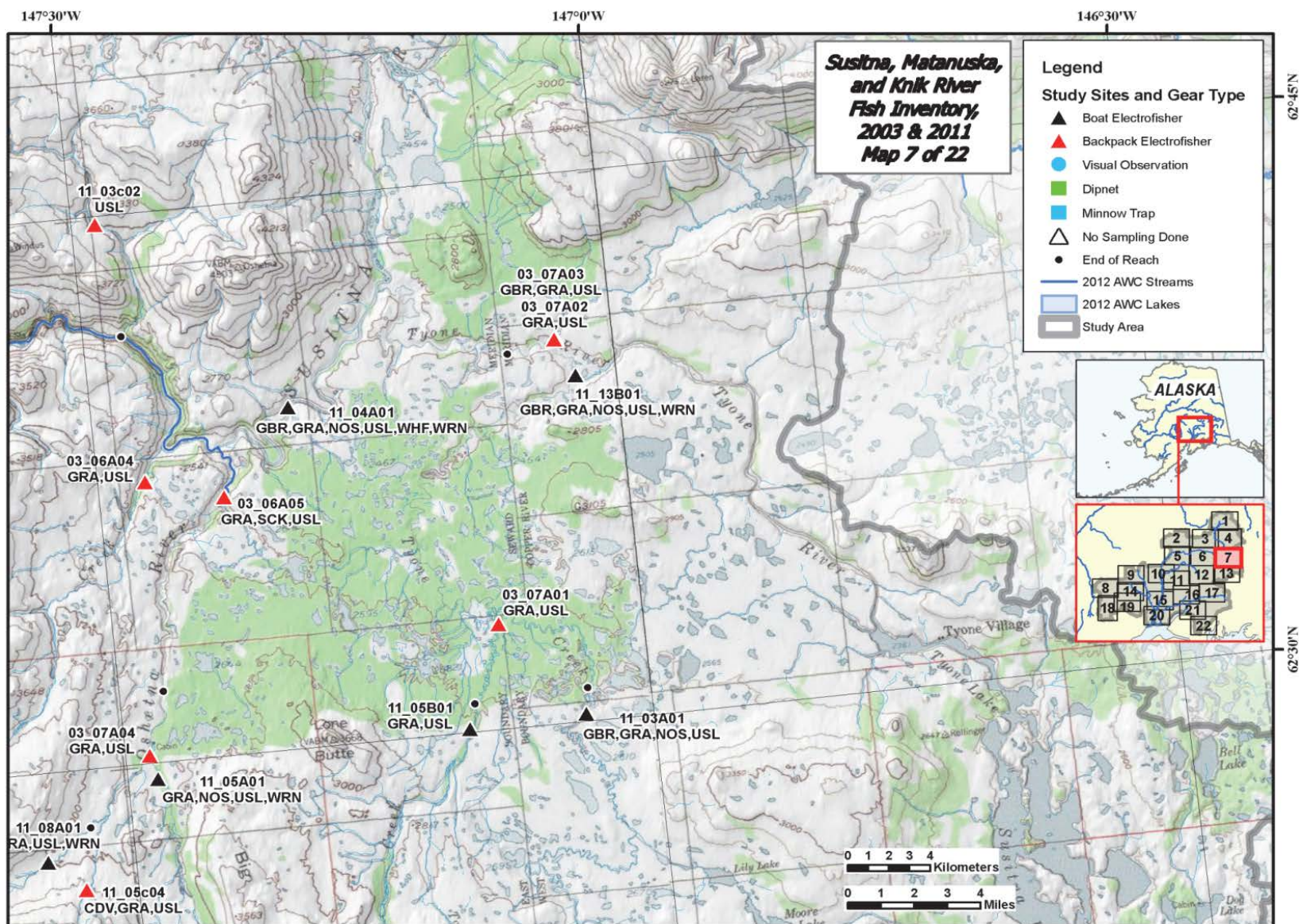


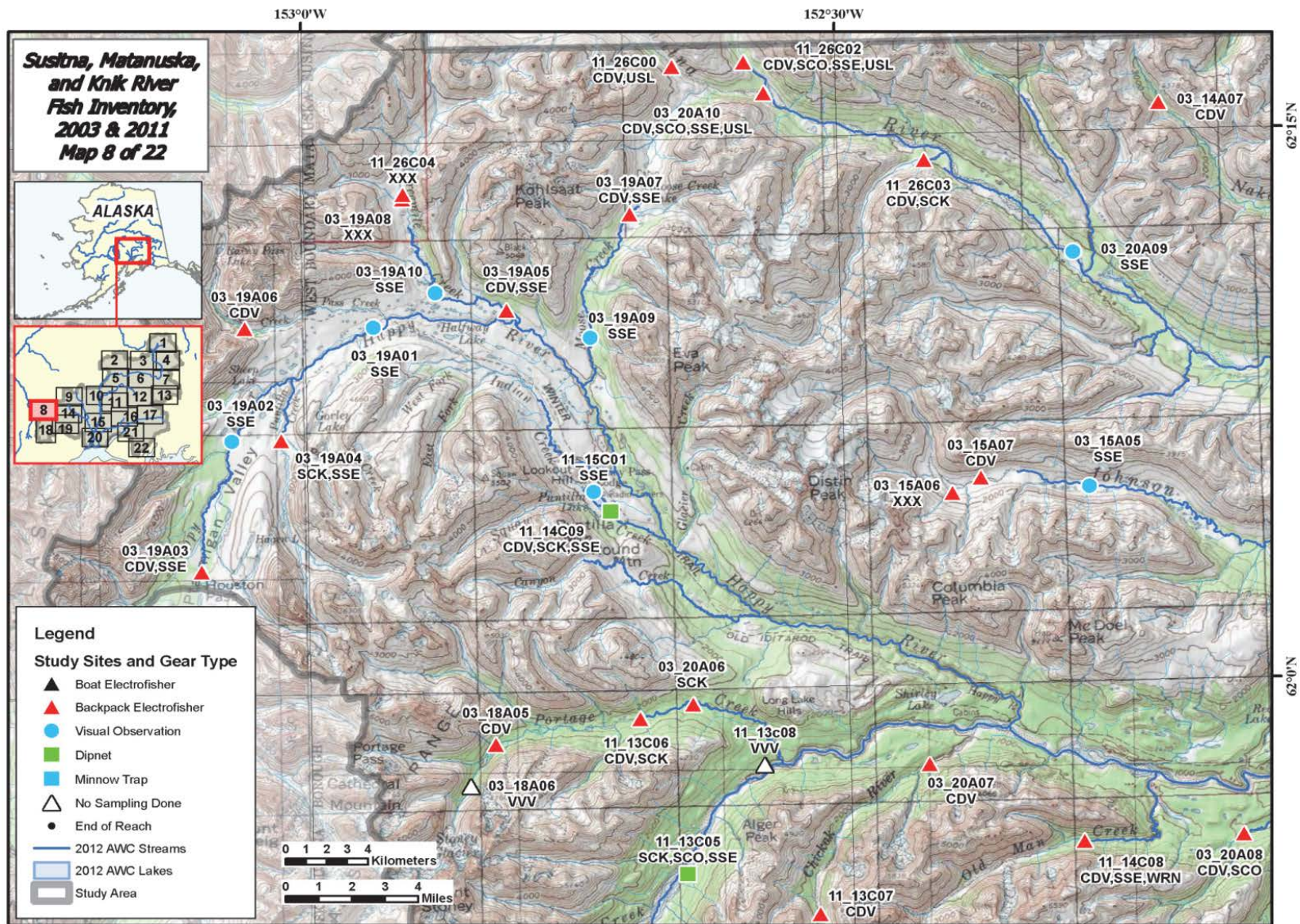


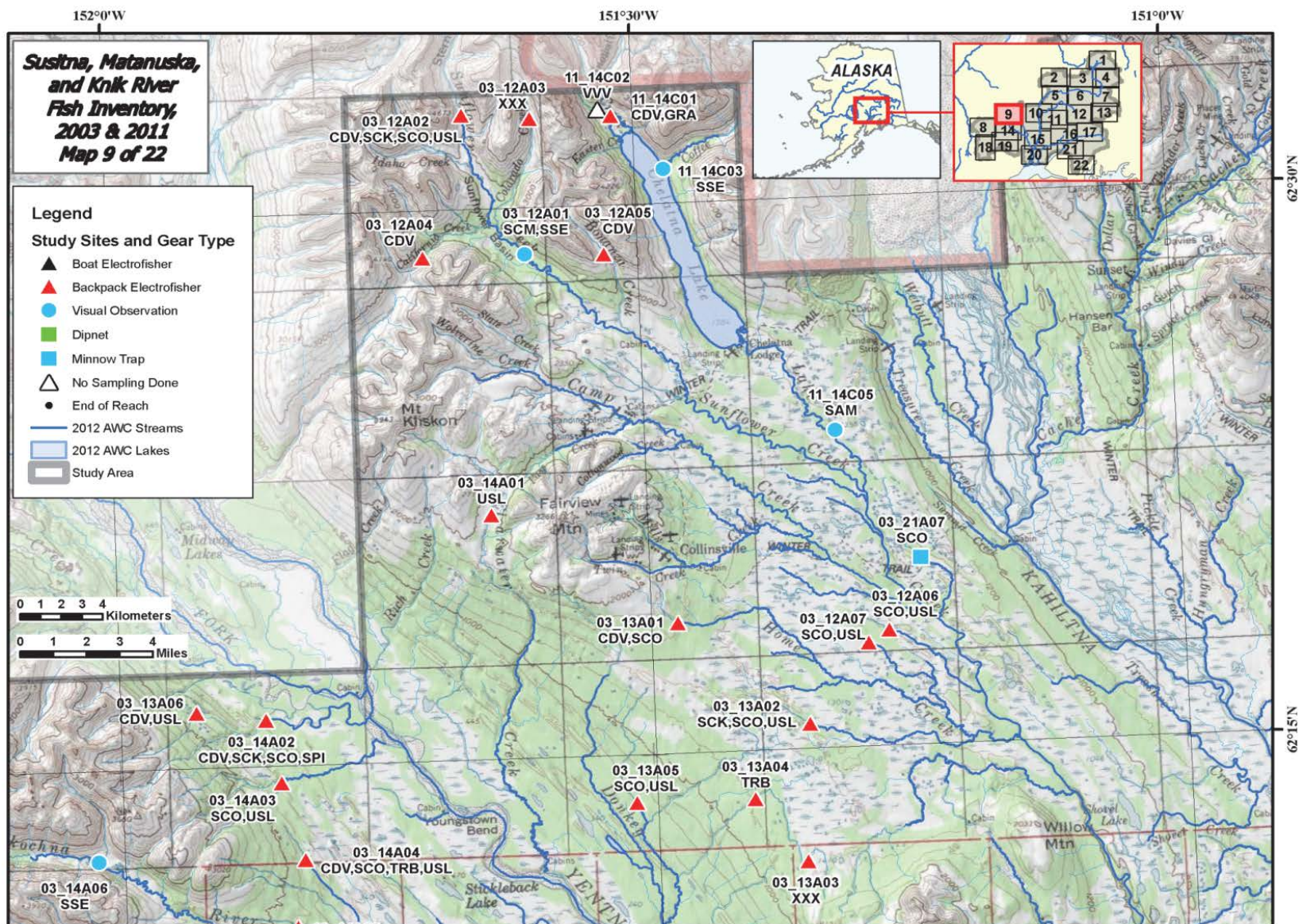


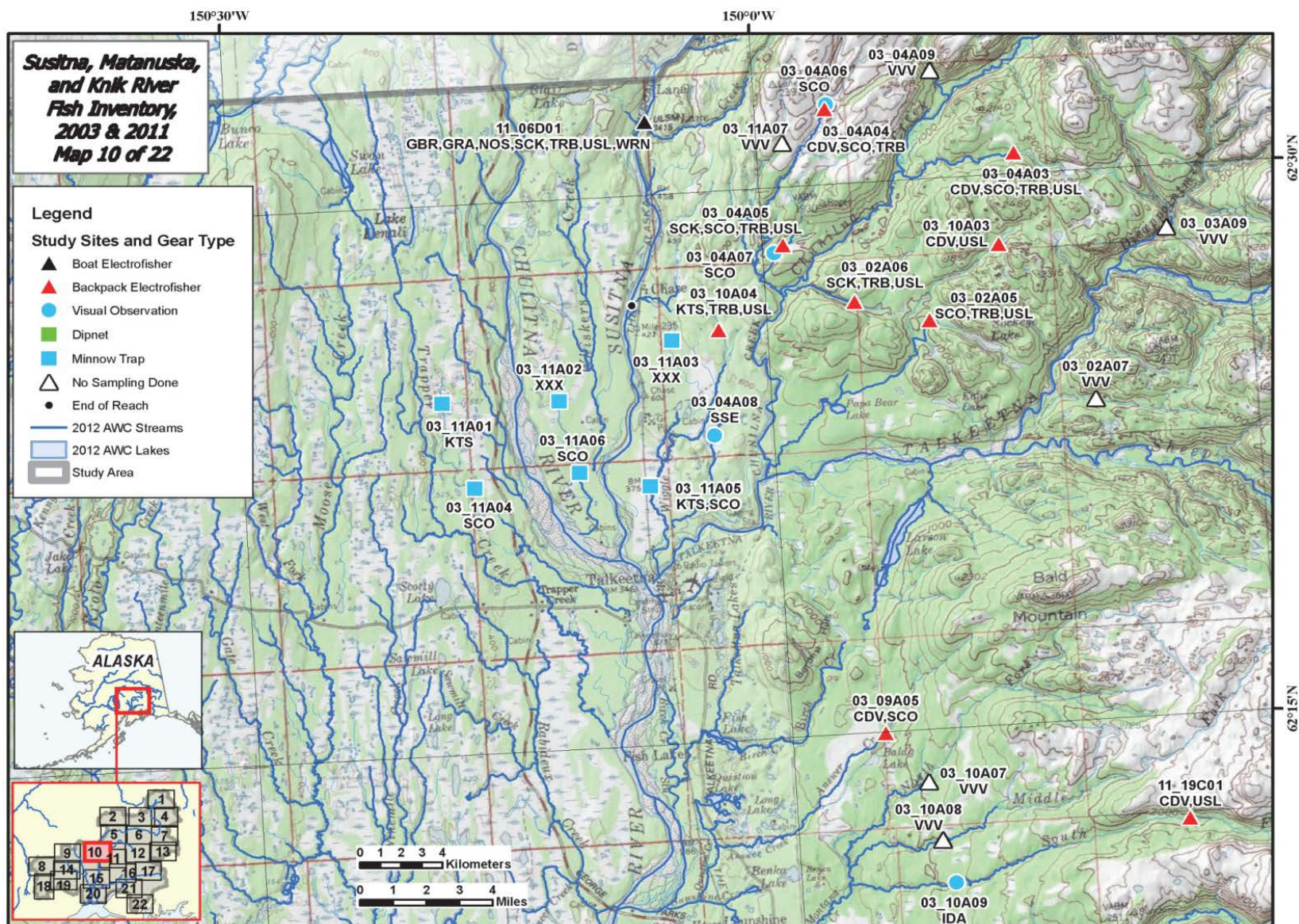




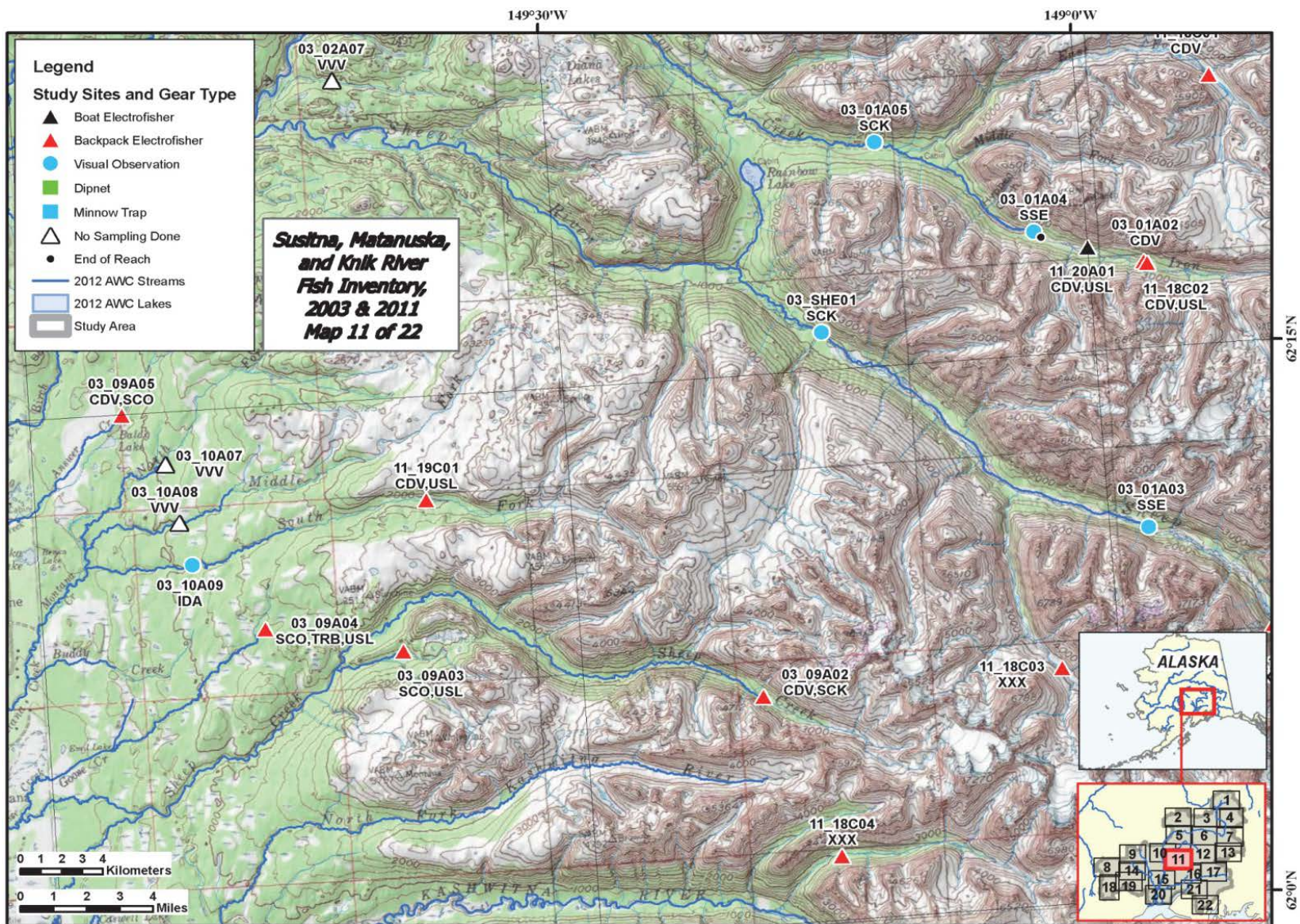




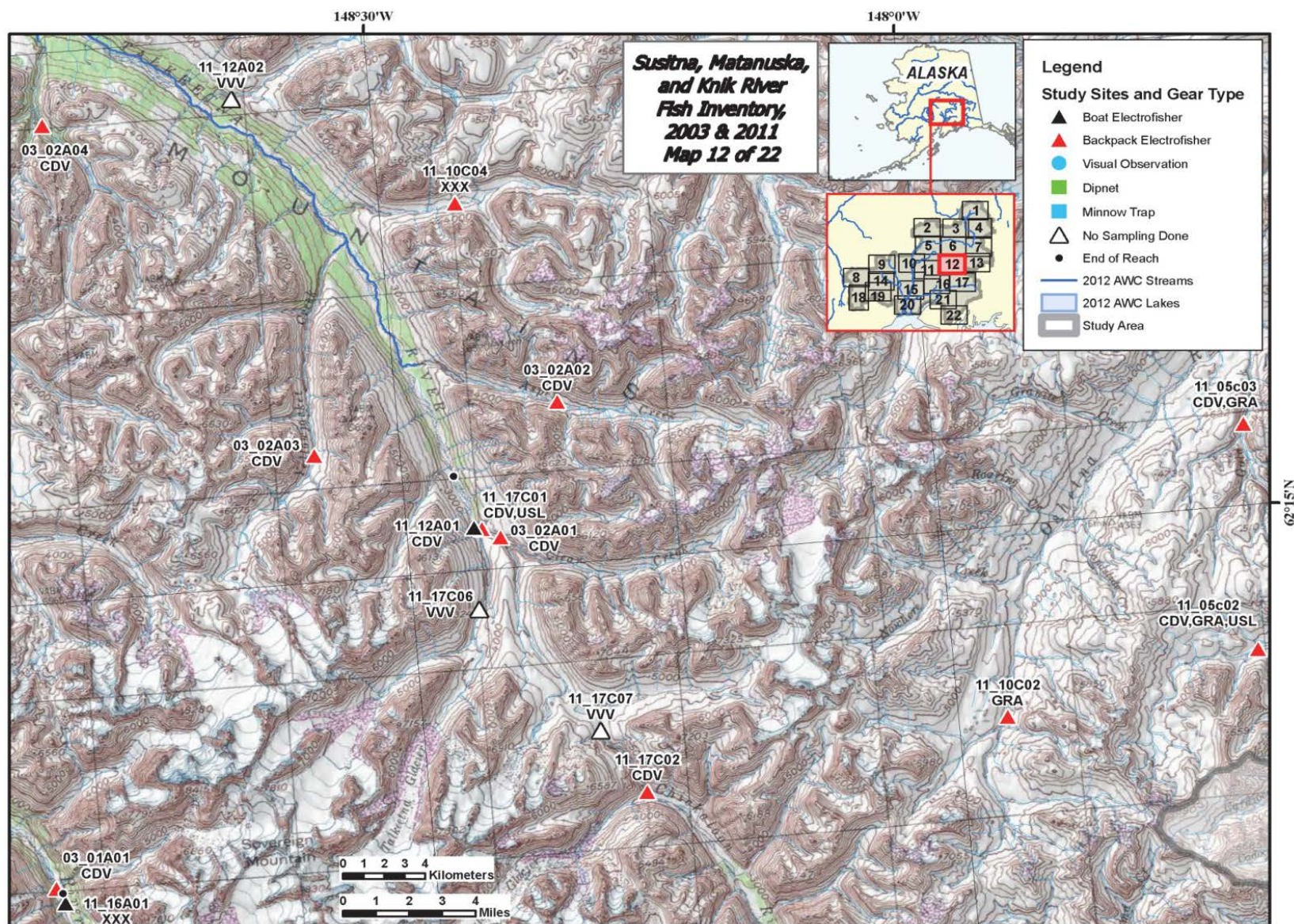


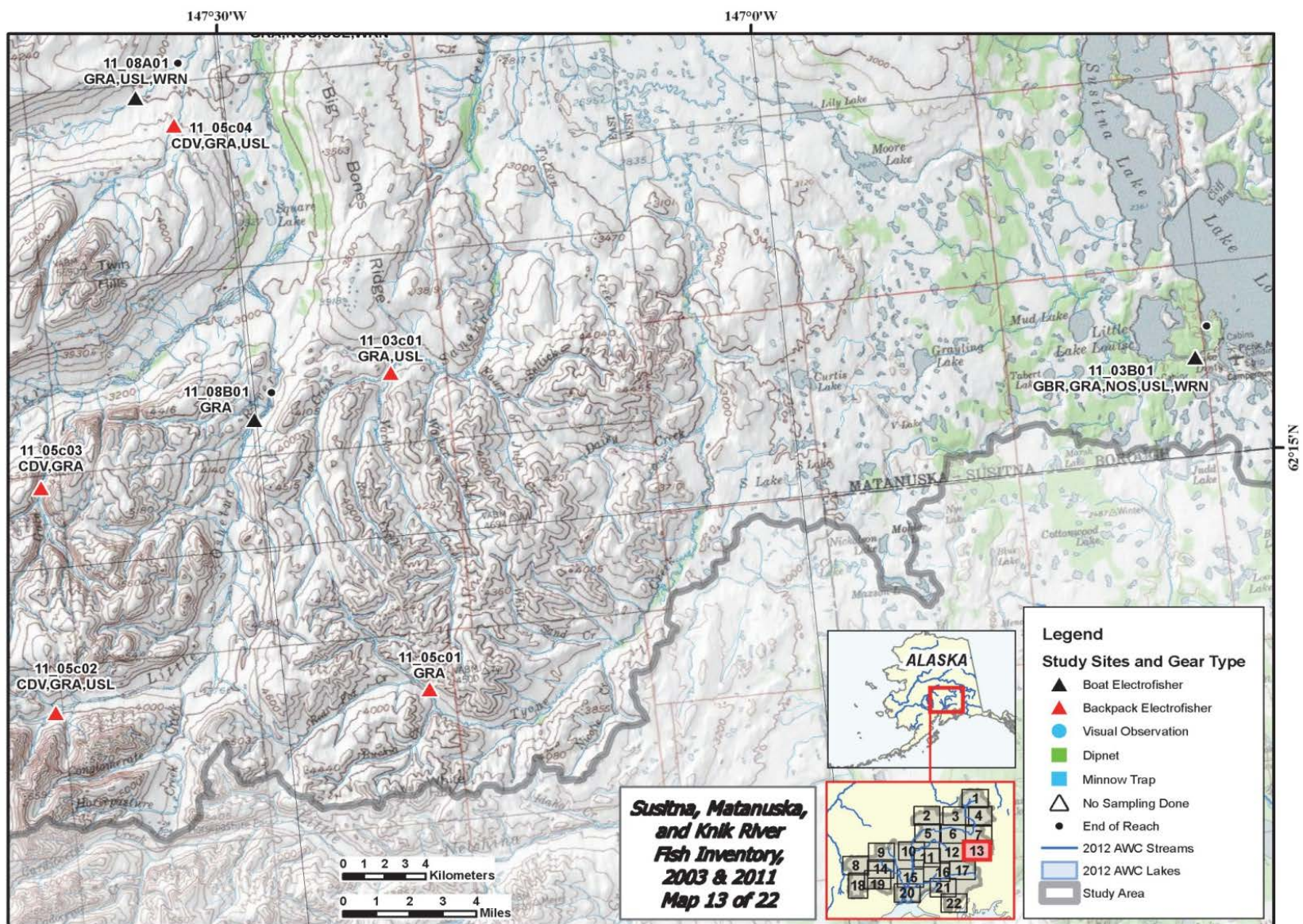


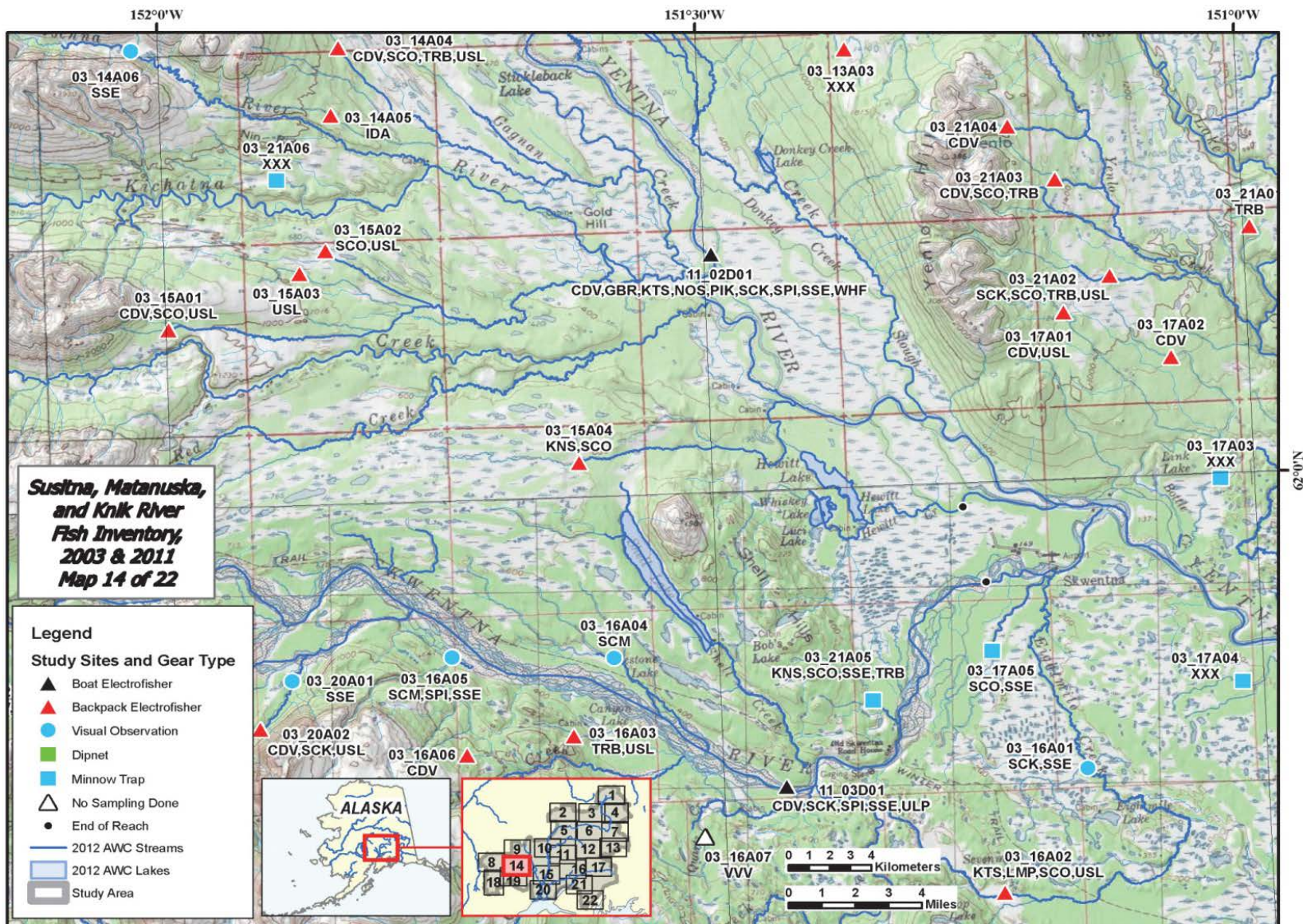
Appendix C1.–Page 10 of 23.

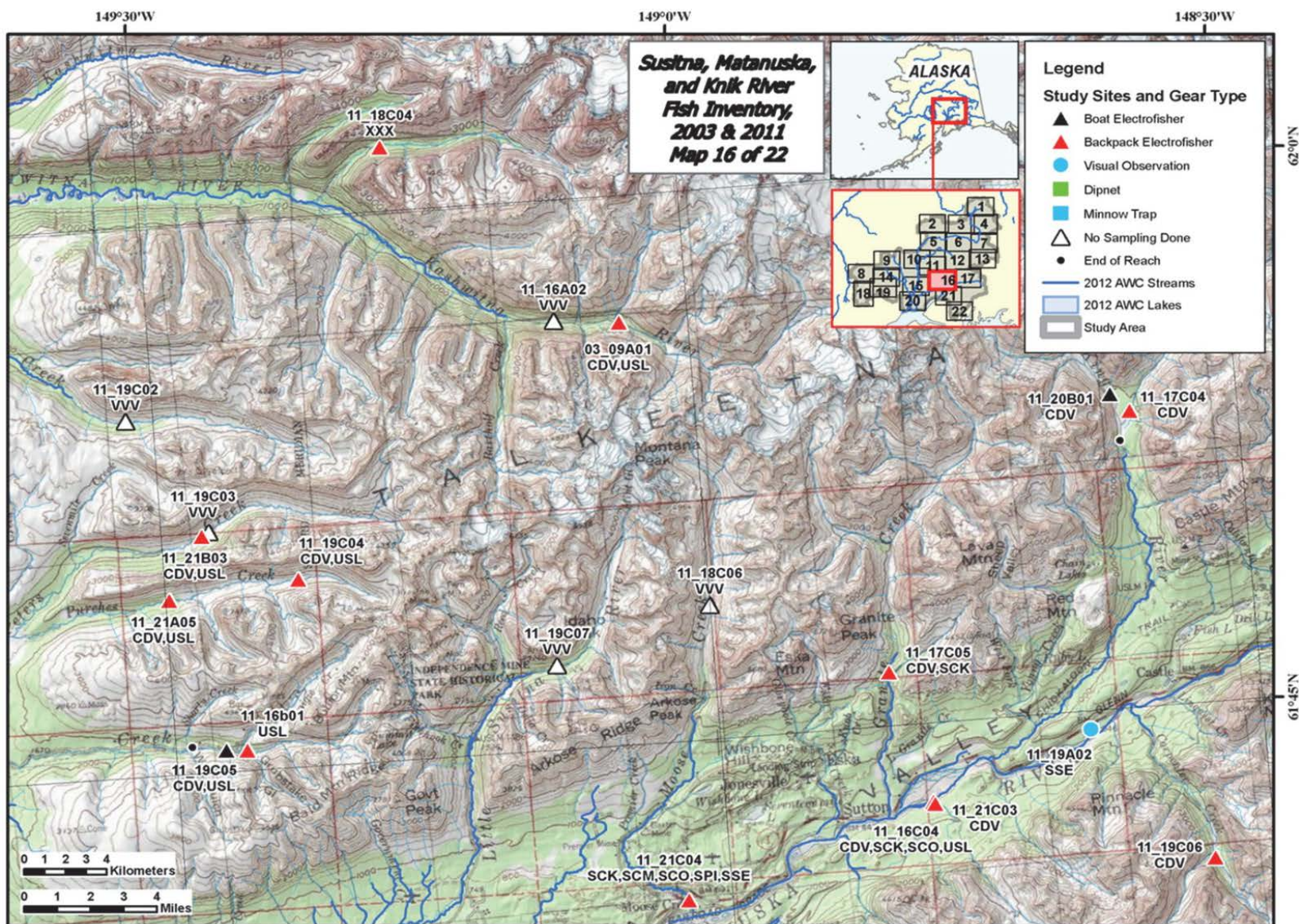


Appendix C1.—Page 11 of 23.

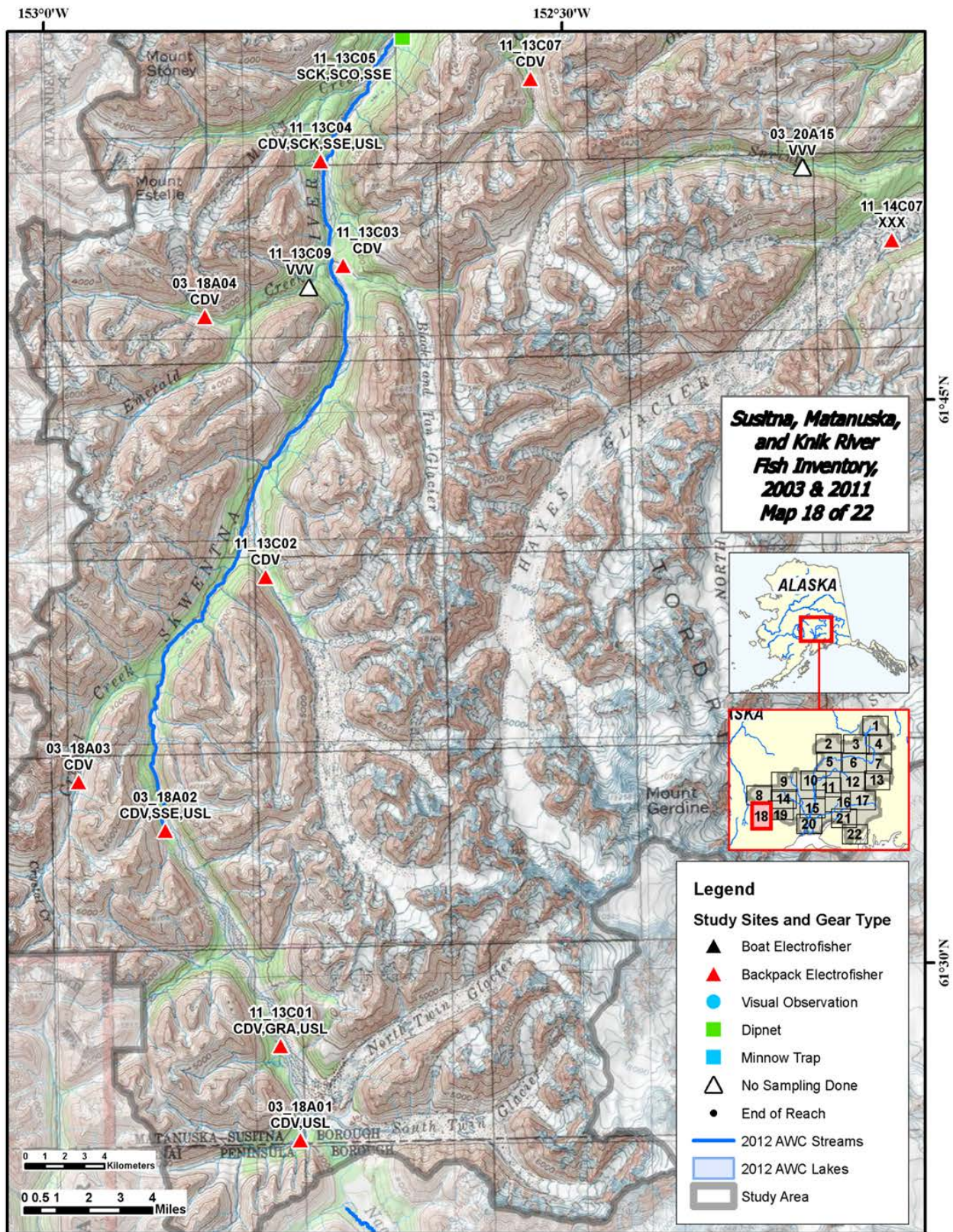




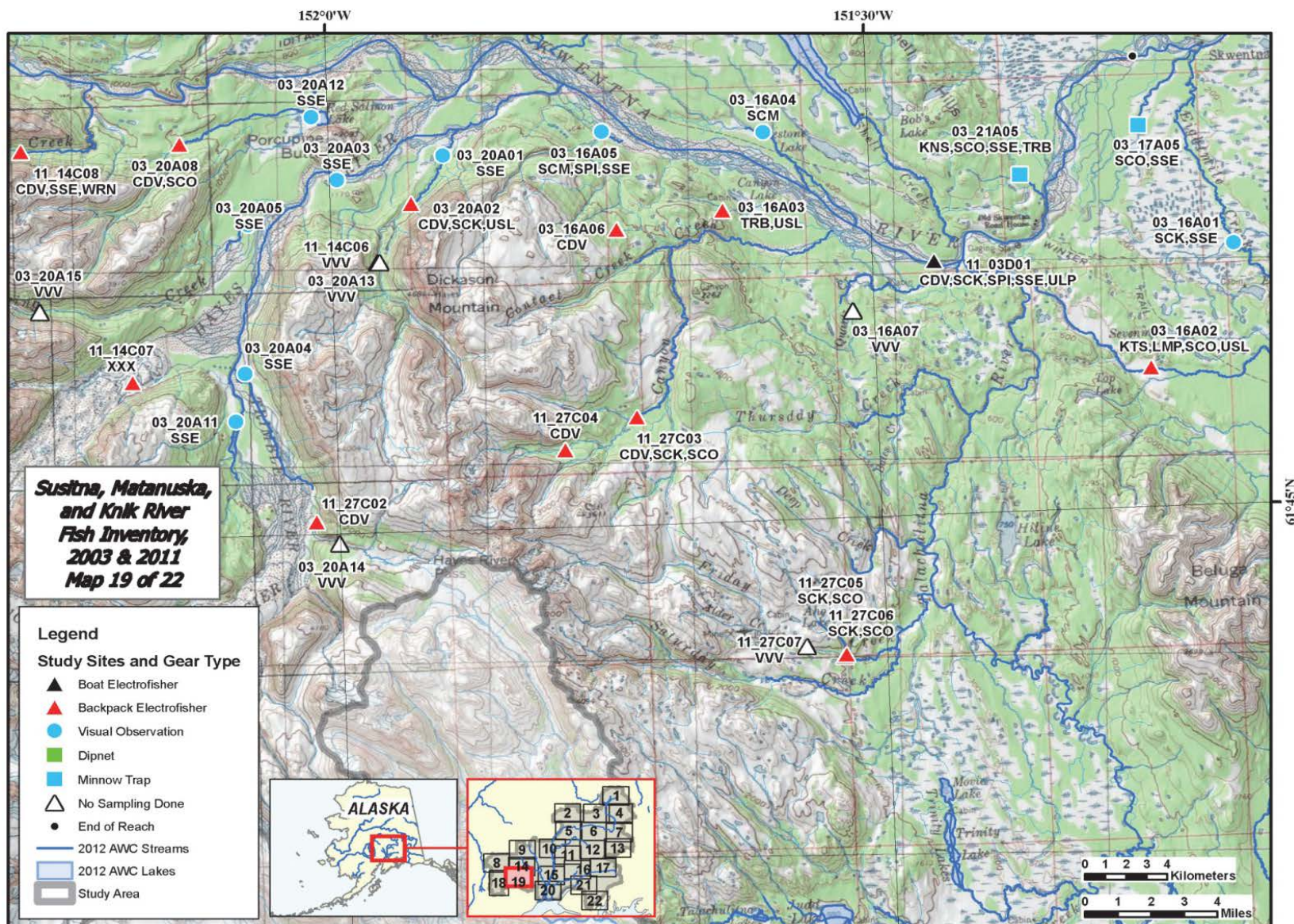


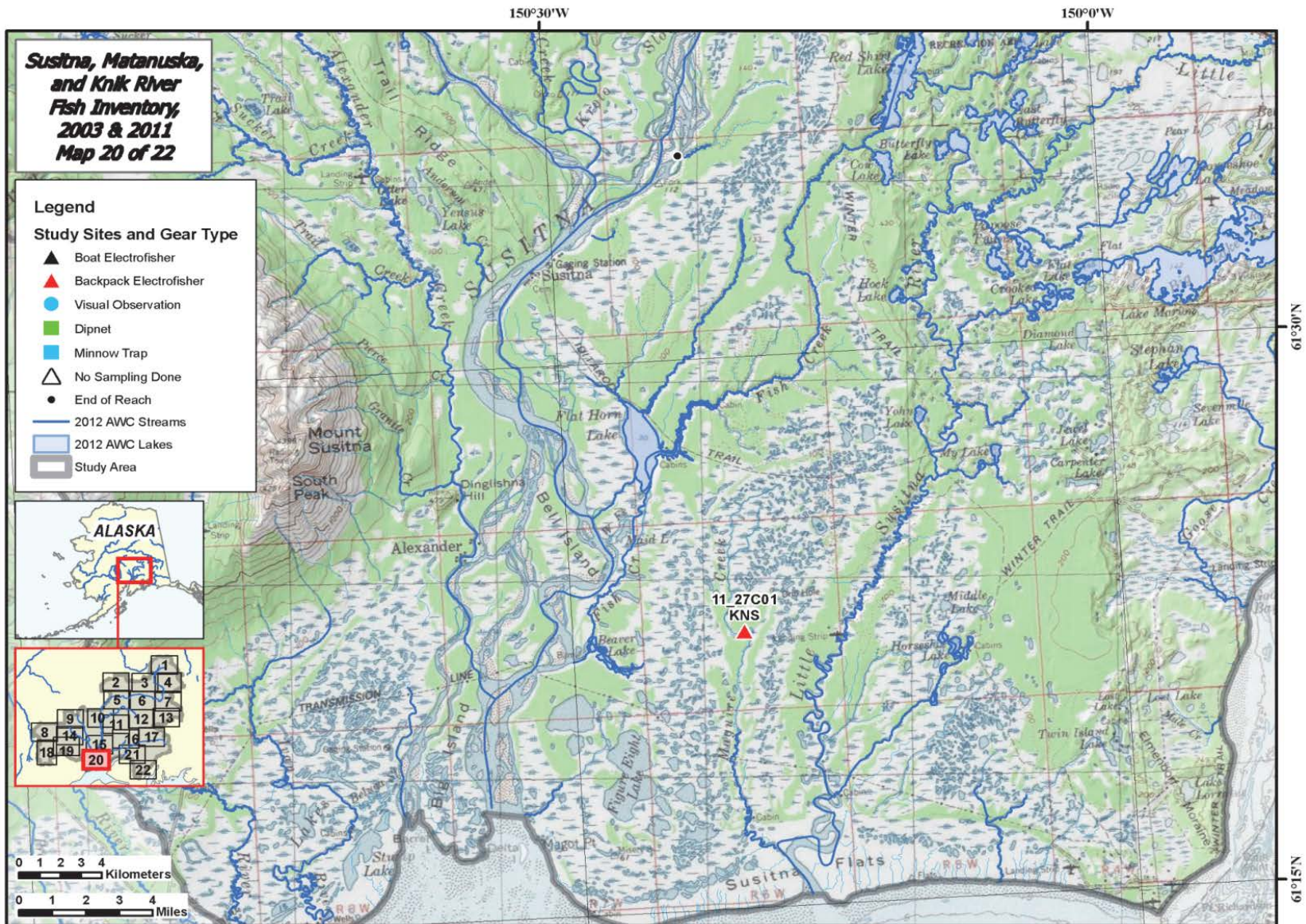


Appendix C1.—Page 16 of 23.

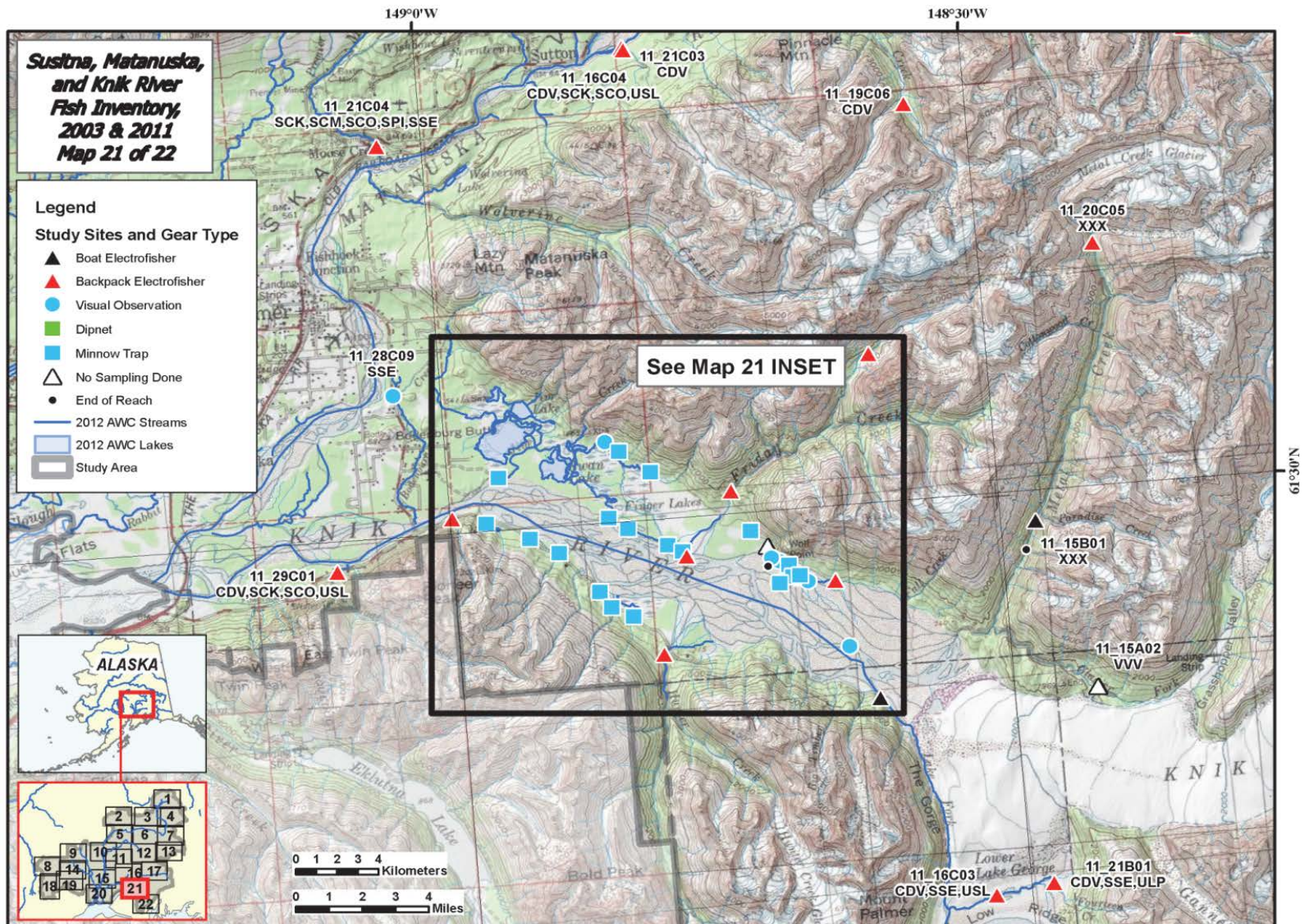


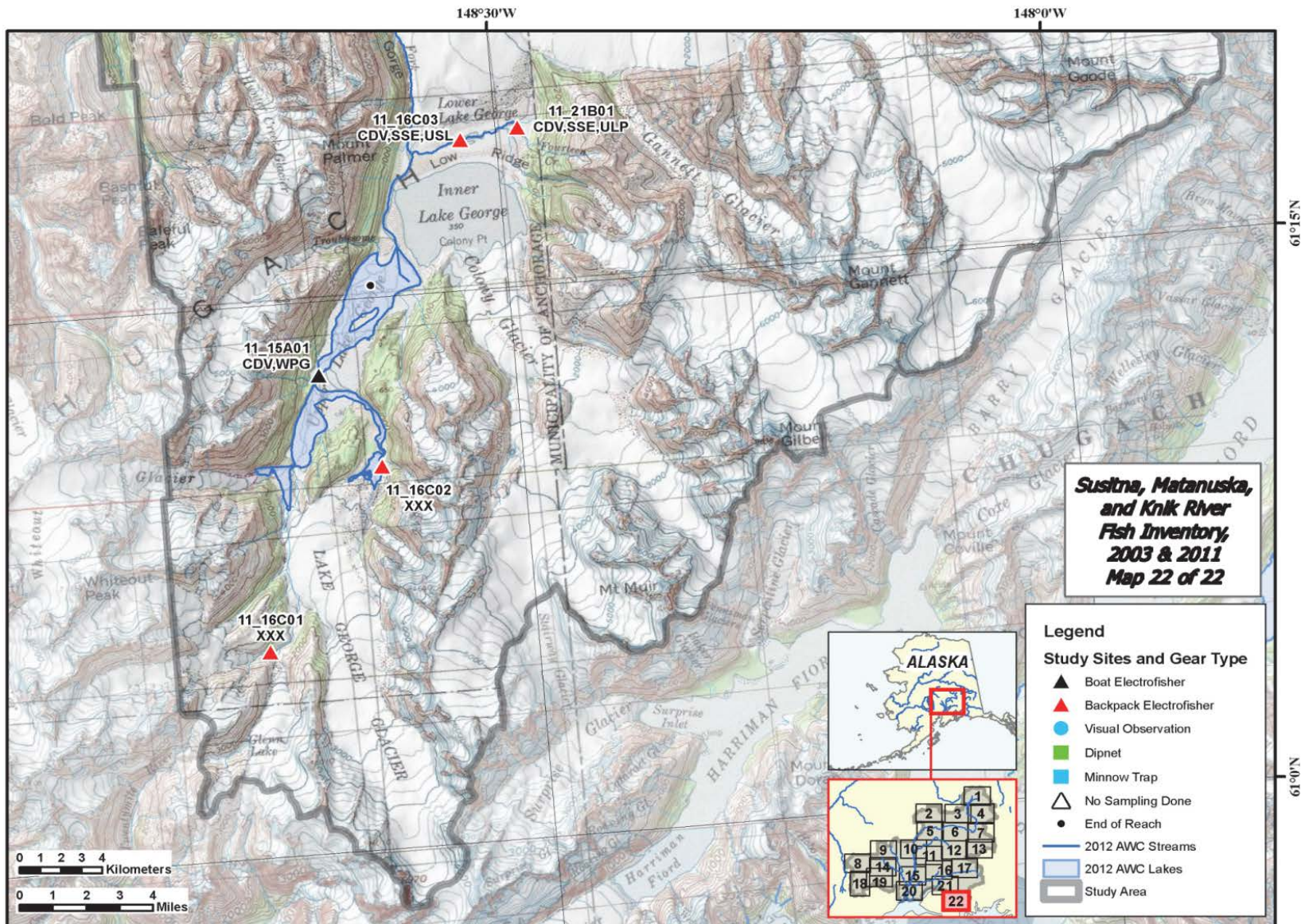
Appendix C1.—Page 18 of 23.



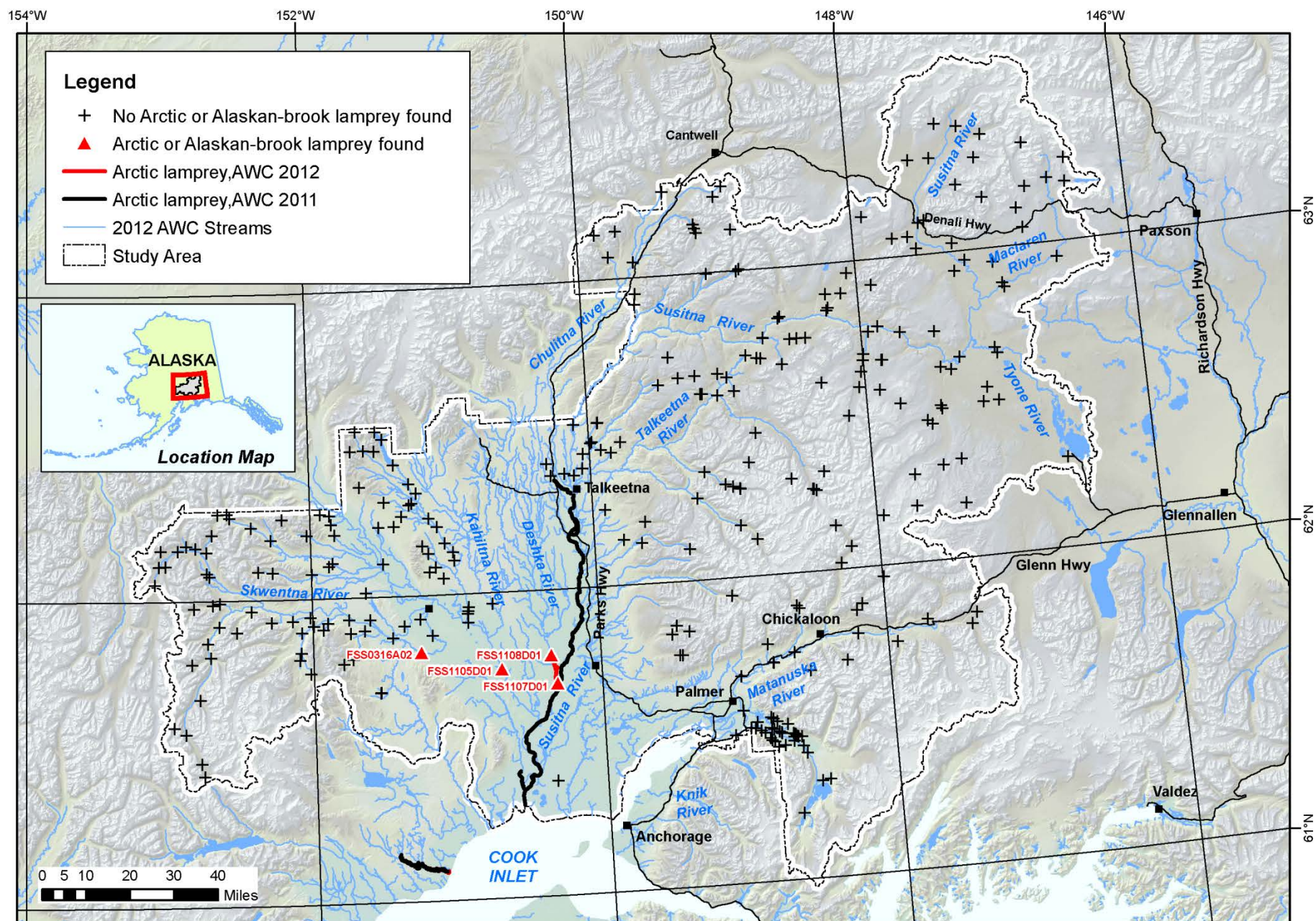


Appendix C1.—Page 20 of 23.

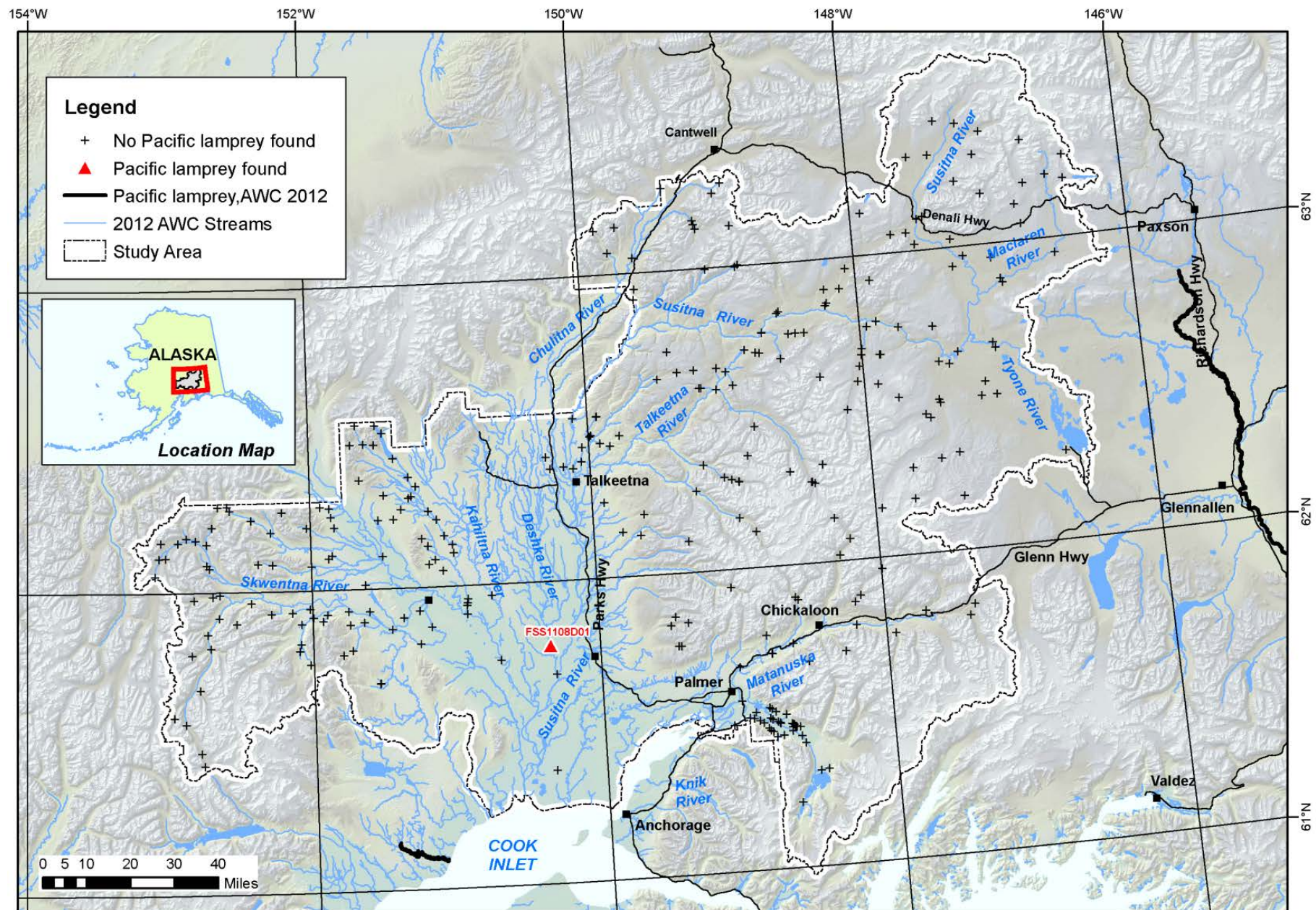




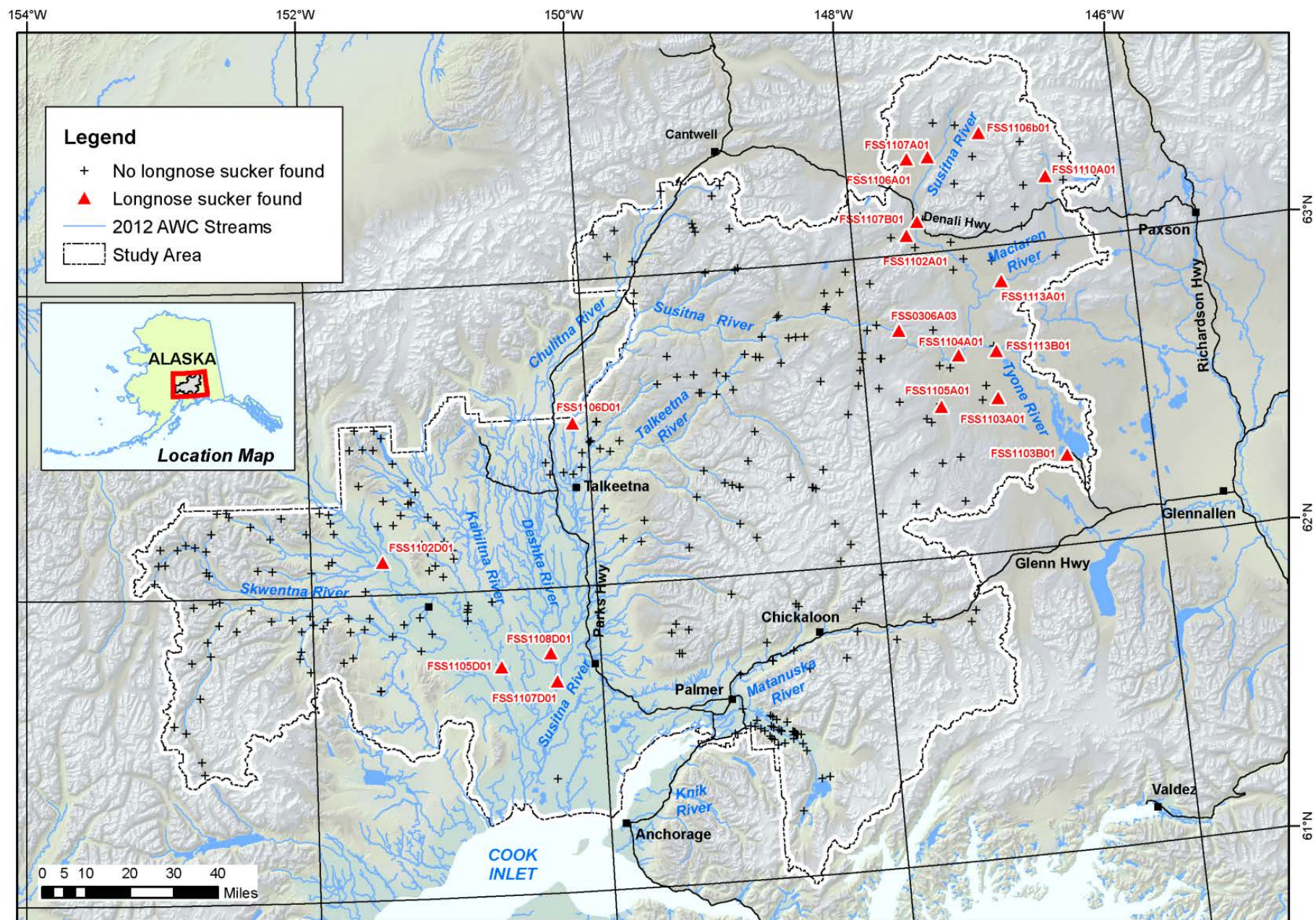
APPENDIX D. SPECIES-OCCURRENCE MAPS



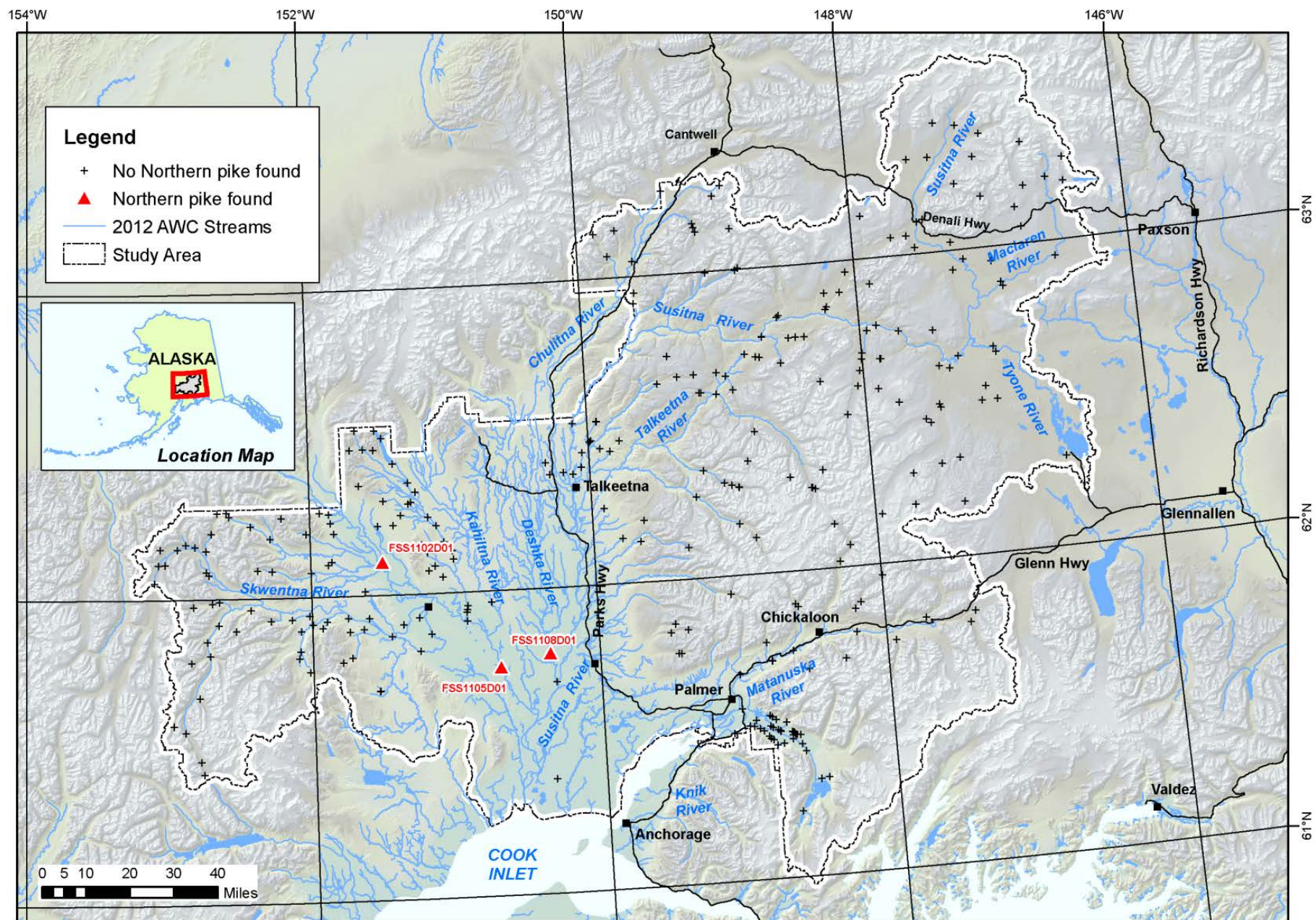
Appendix D1.—Arctic or Alaskan-brook lamprey occurrence.



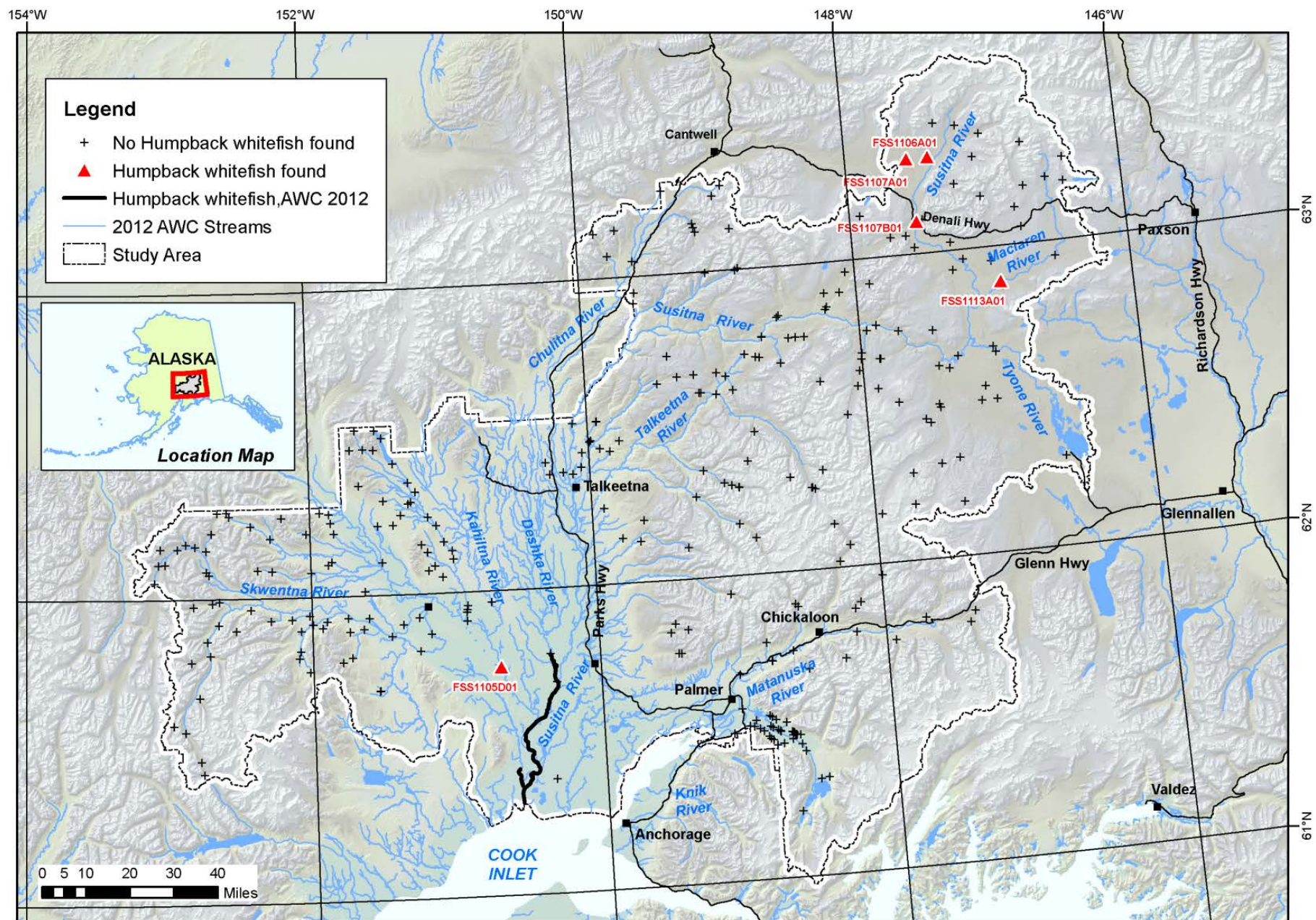
Appendix D2.—Pacific lamprey occurrence.



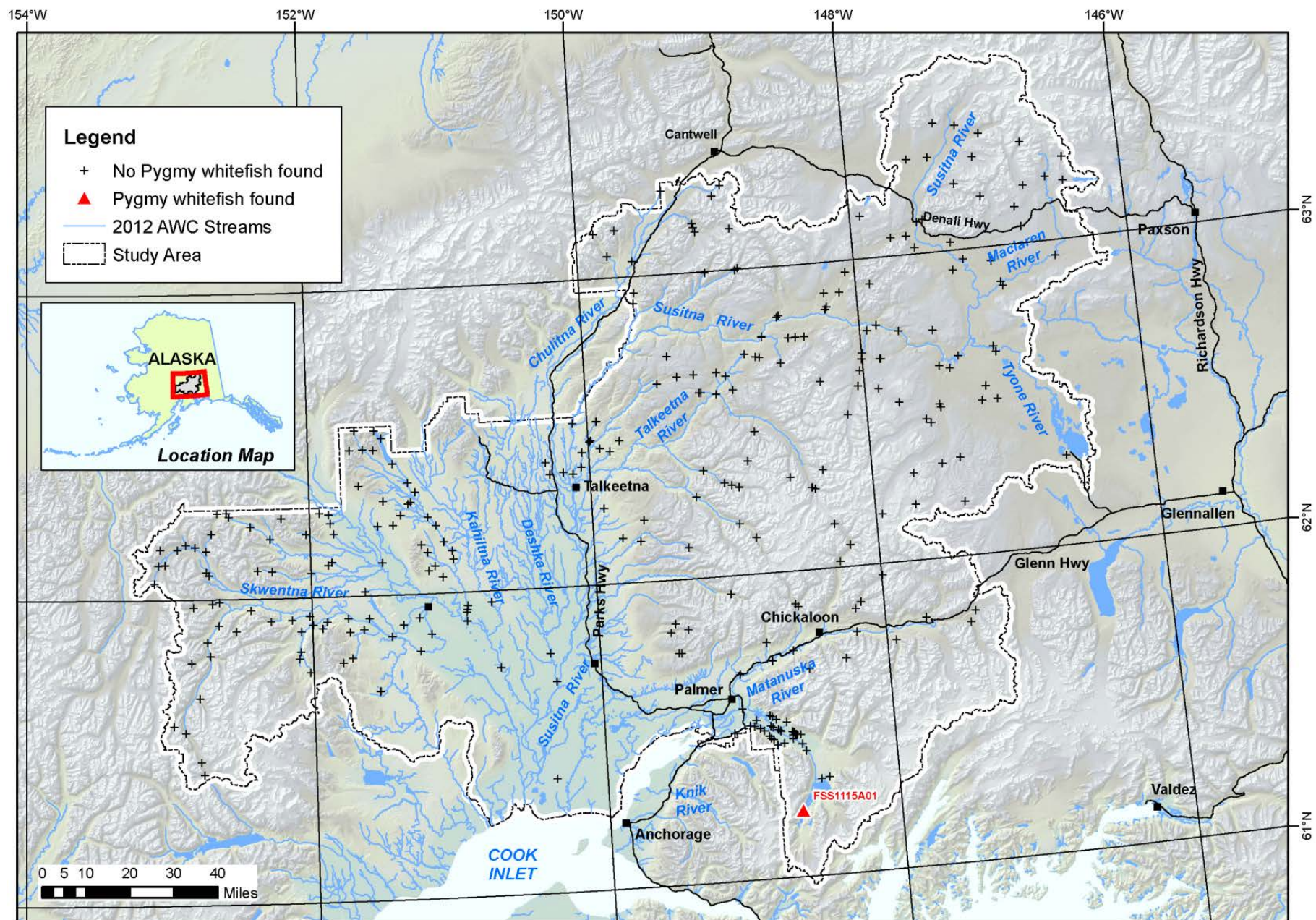
Appendix D3.—Longnose sucker occurrence.



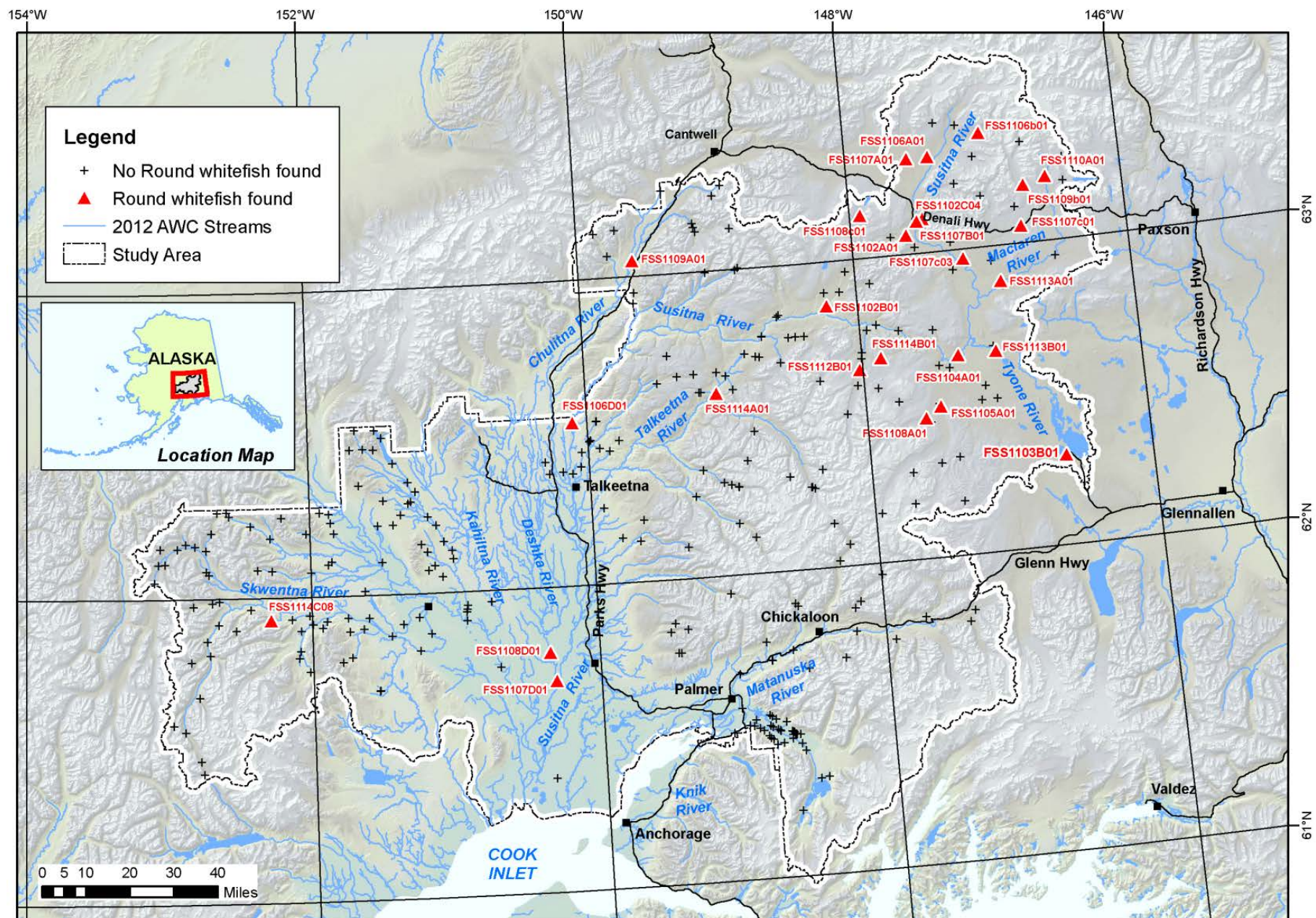
Appendix D4.—Northern pike occurrence.



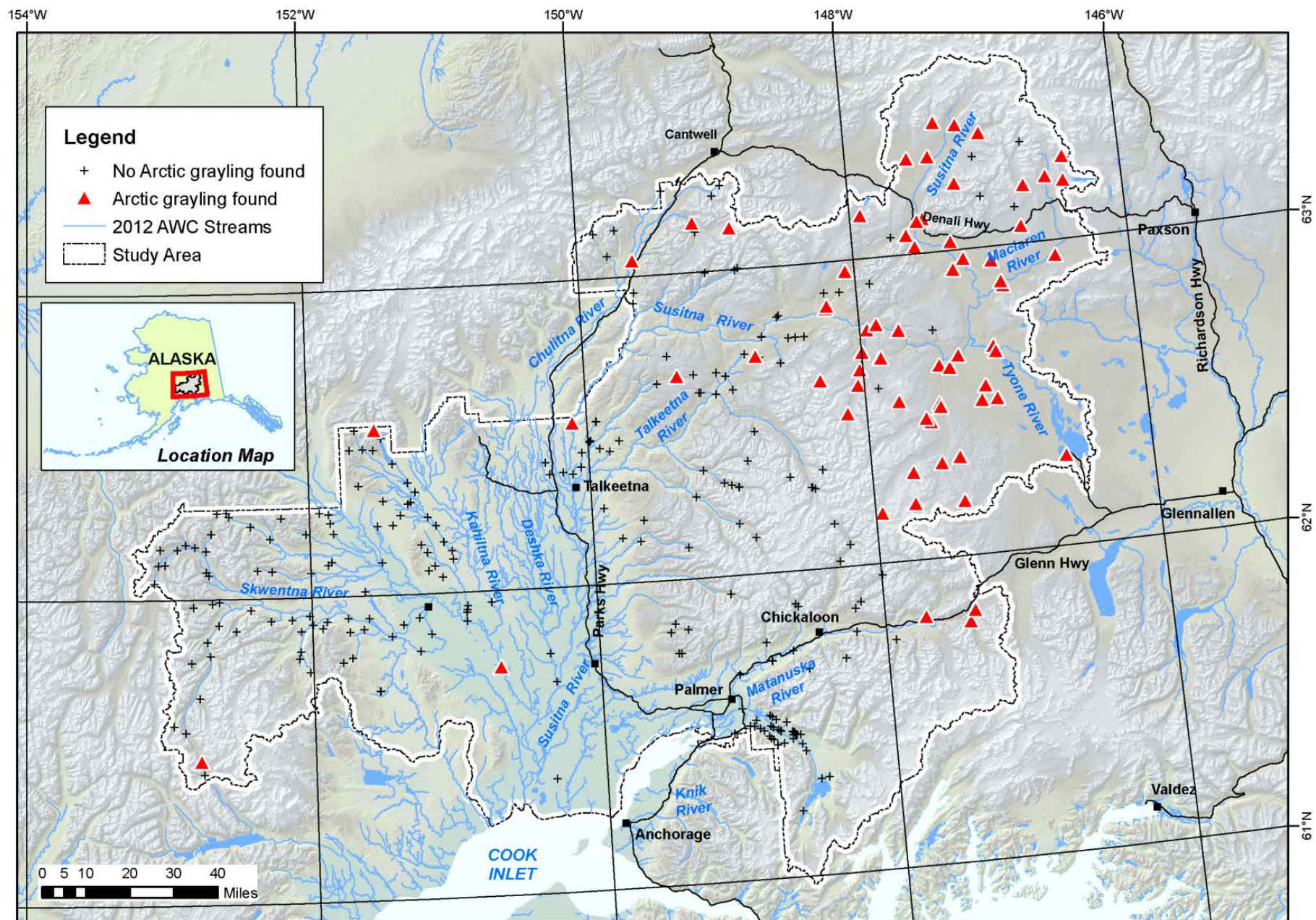
Appendix D5.—Humpback whitefish occurrence.



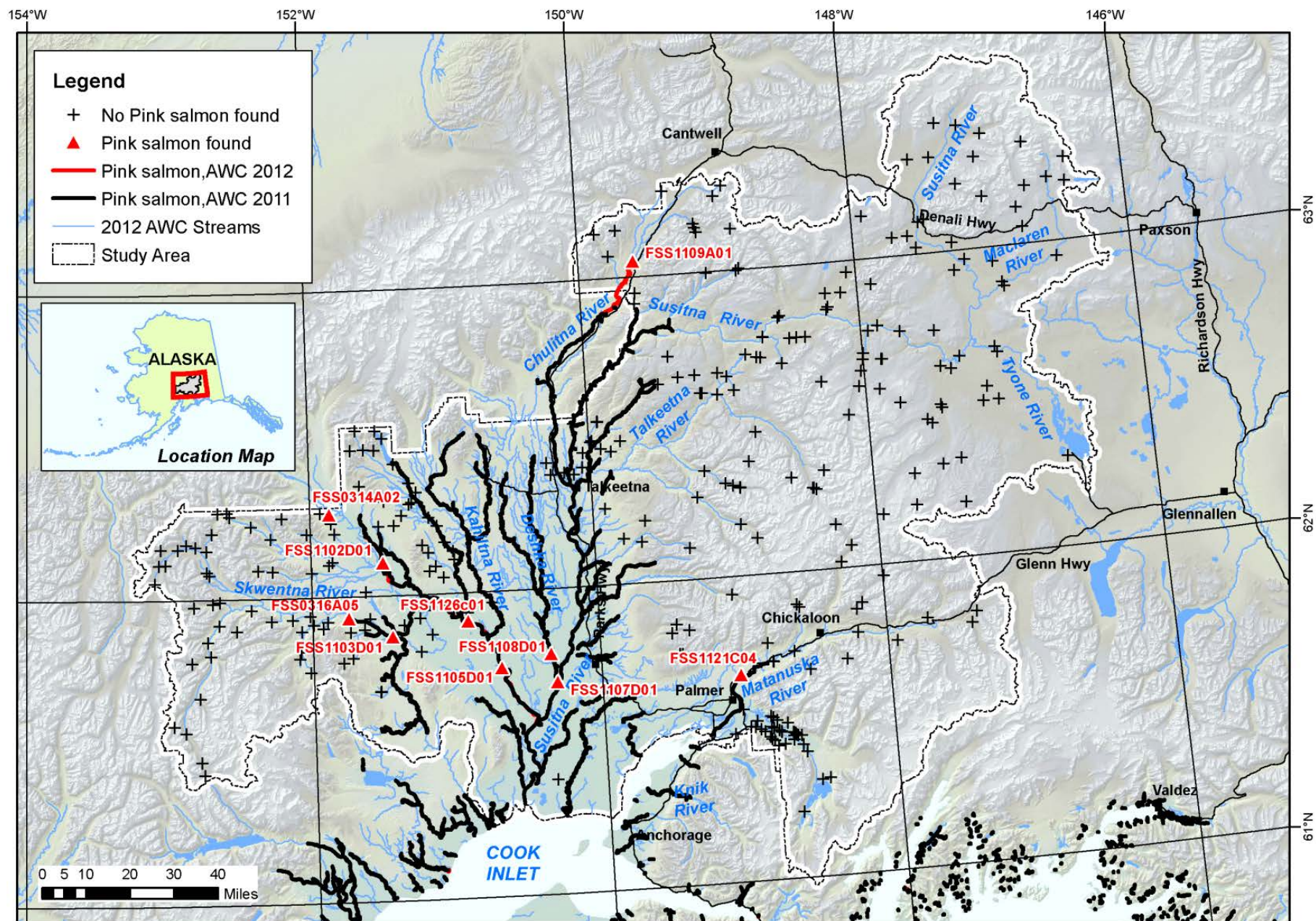
Appendix D6.—Pygmy whitefish occurrence.



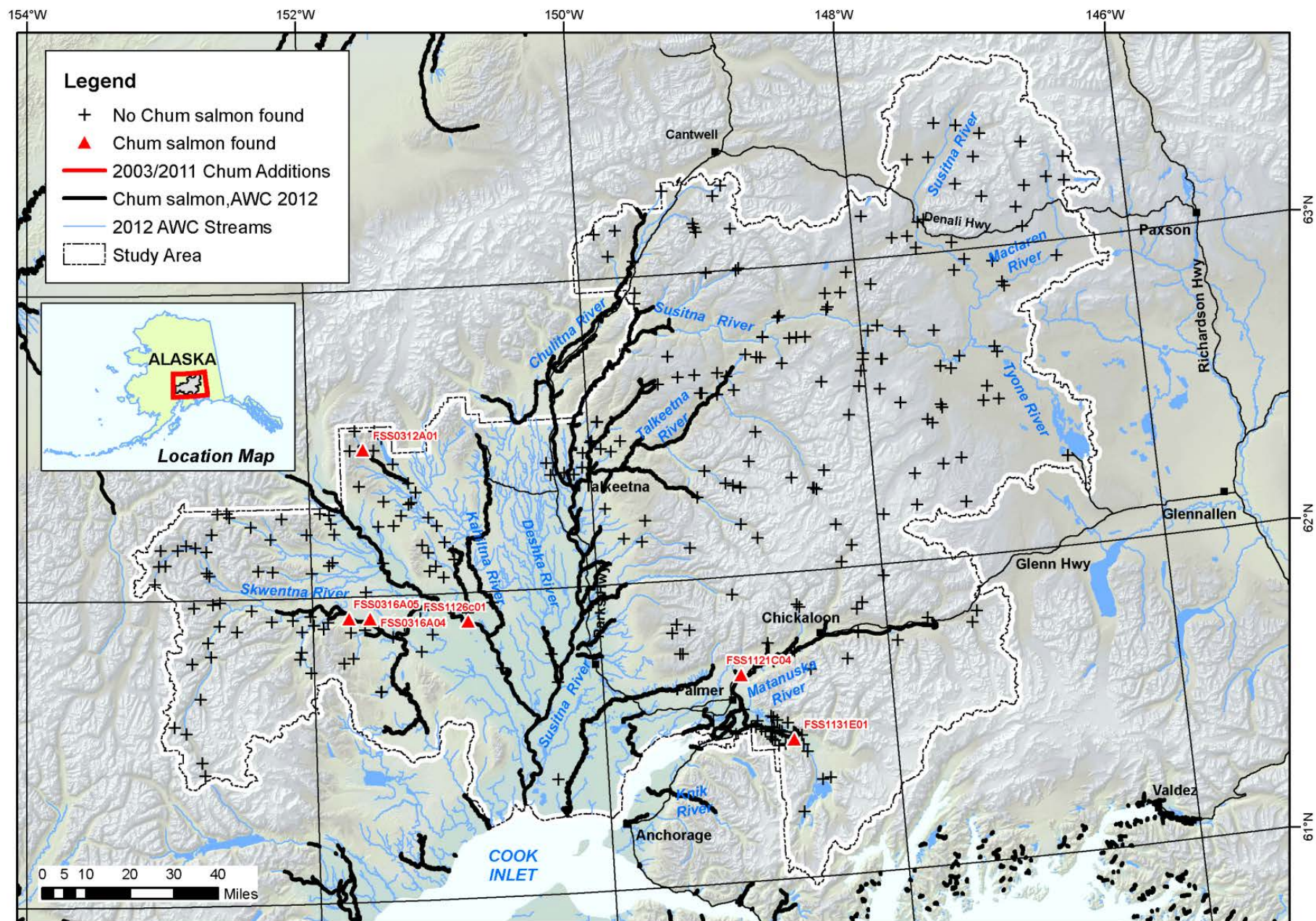
Appendix D7.—Round whitefish occurrence.



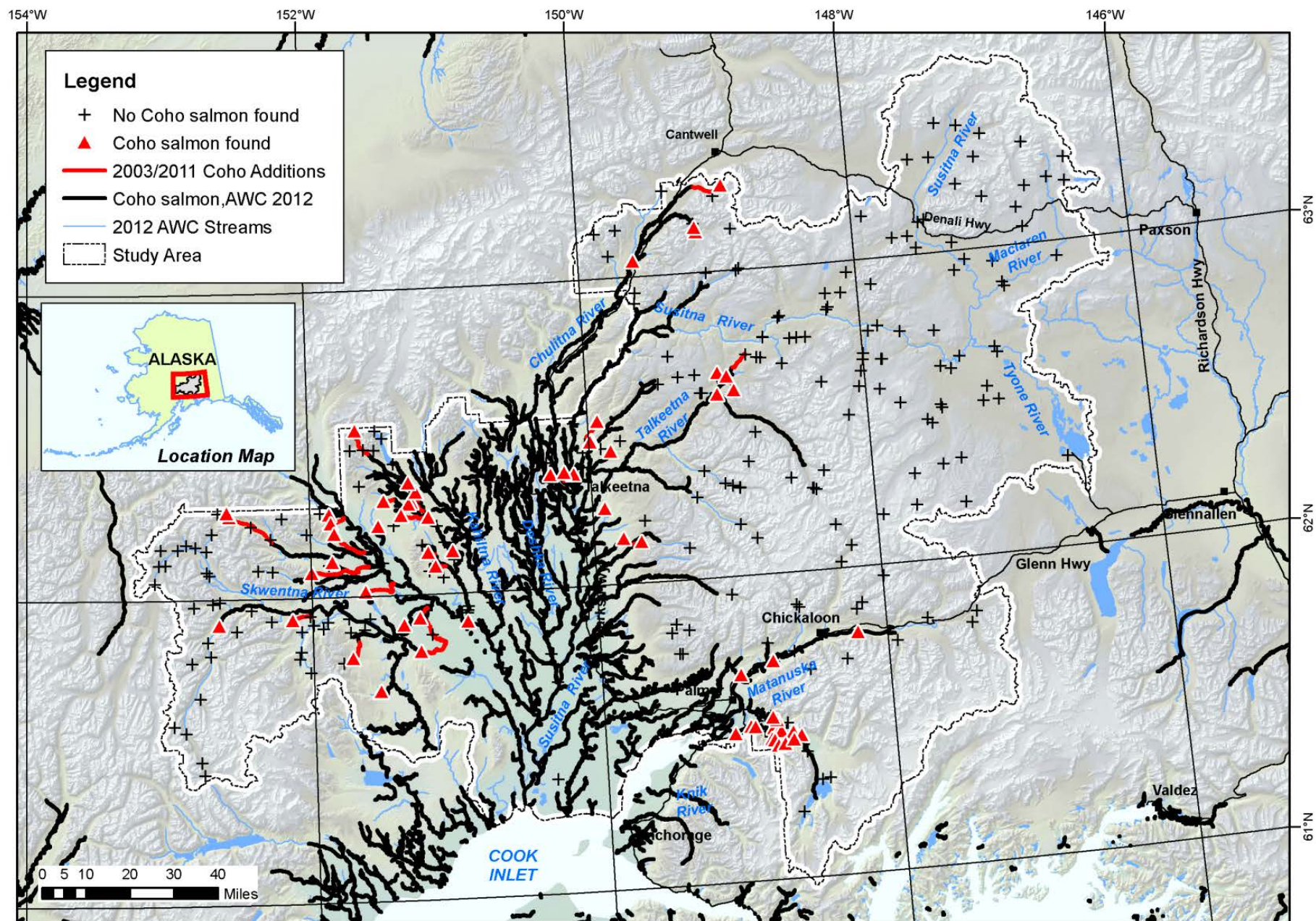
Appendix D8.—Arctic grayling occurrence.



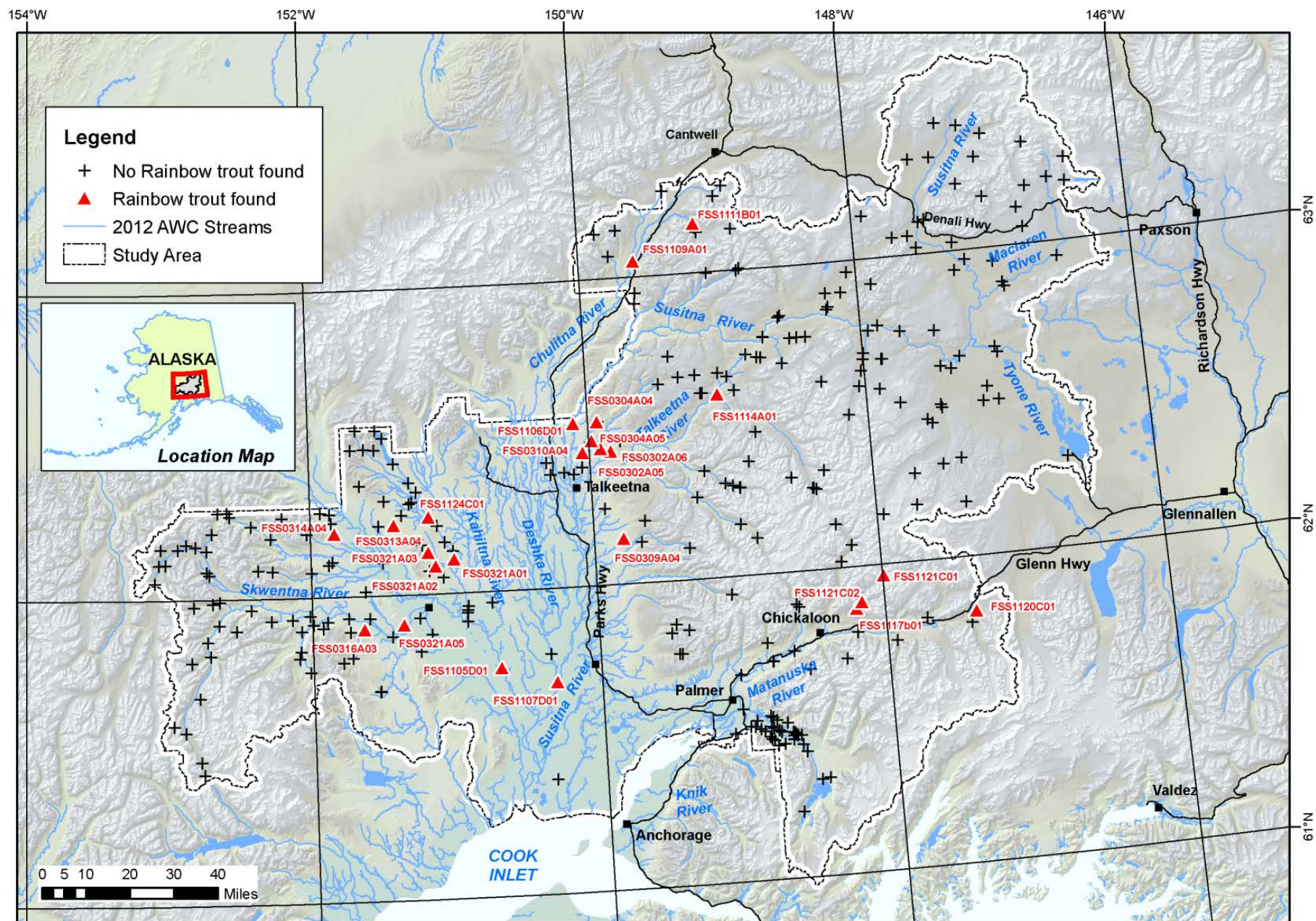
Appendix D9.—Pink salmon occurrence.



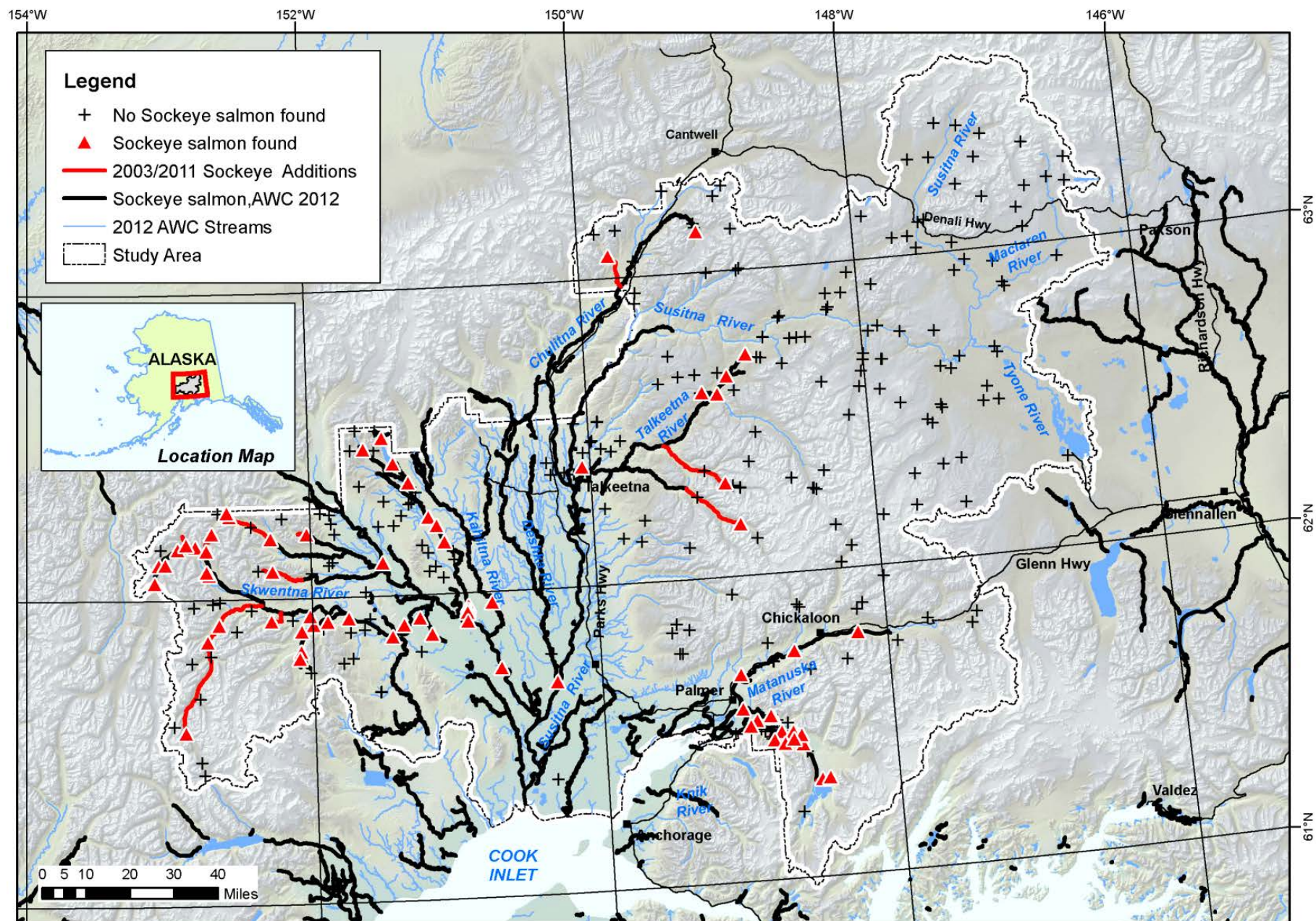
Appendix D10.—Chum salmon occurrence.



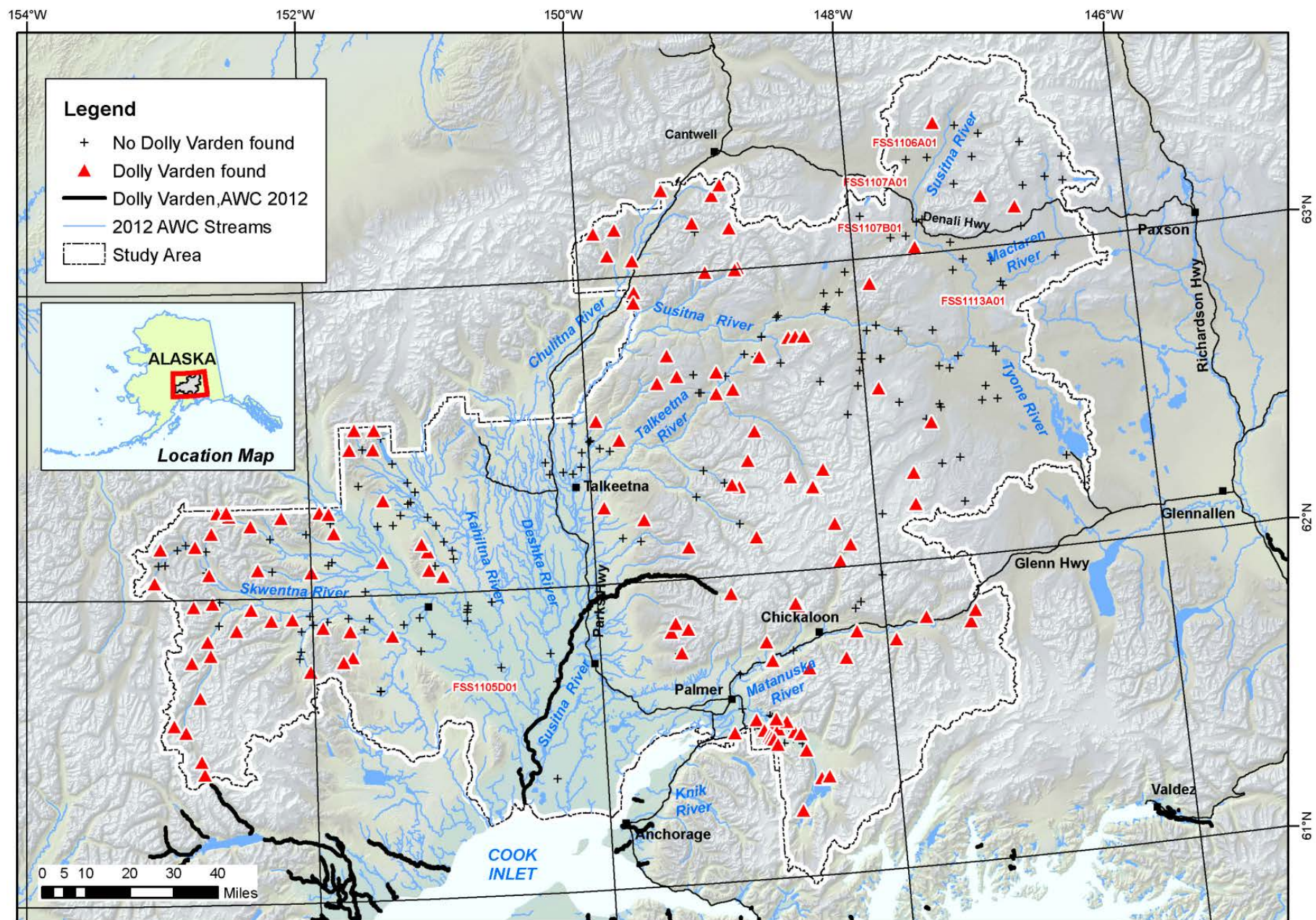
Appendix D11.—Coho salmon occurrence.



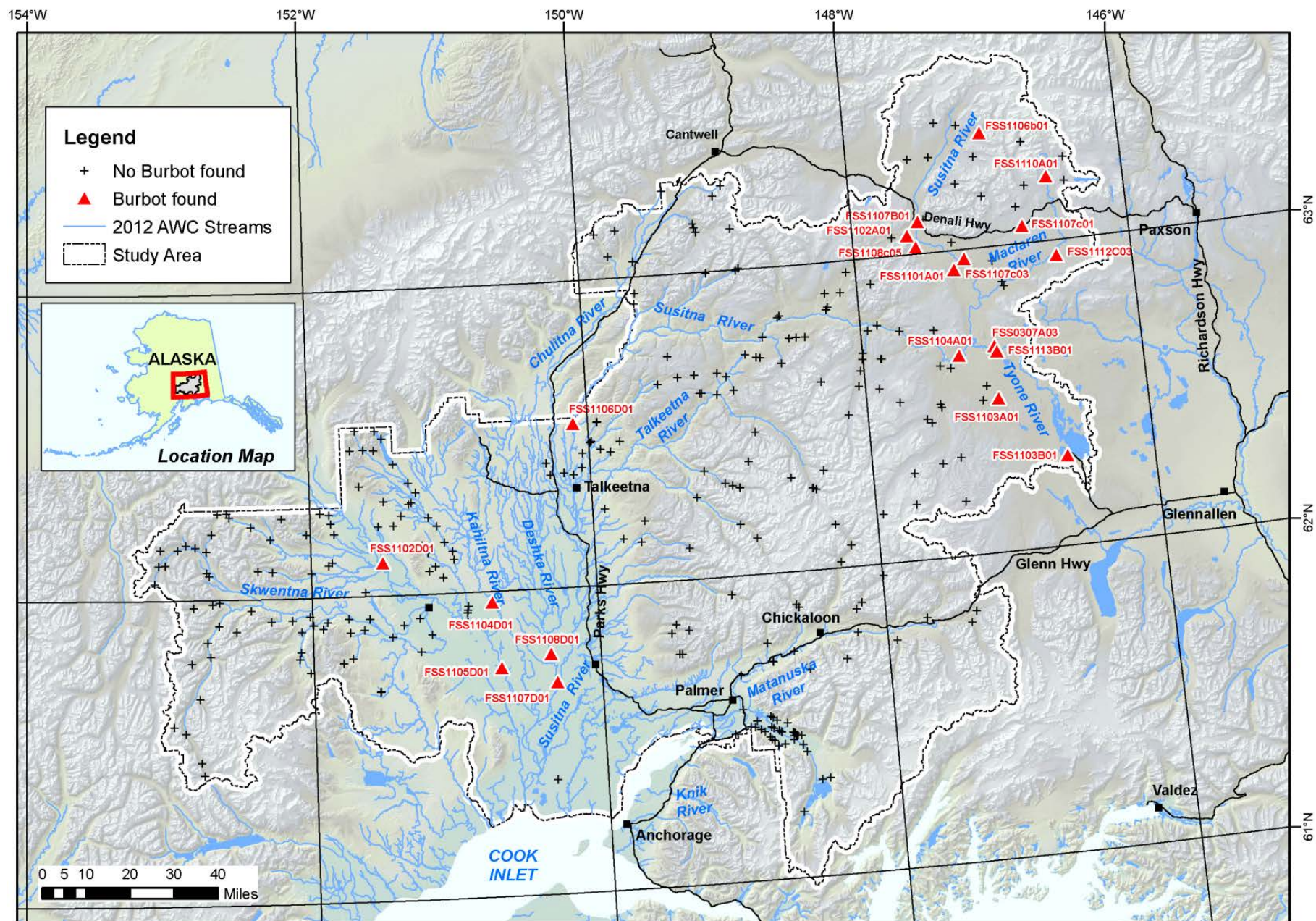
Appendix D12.—Rainbow trout occurrence.



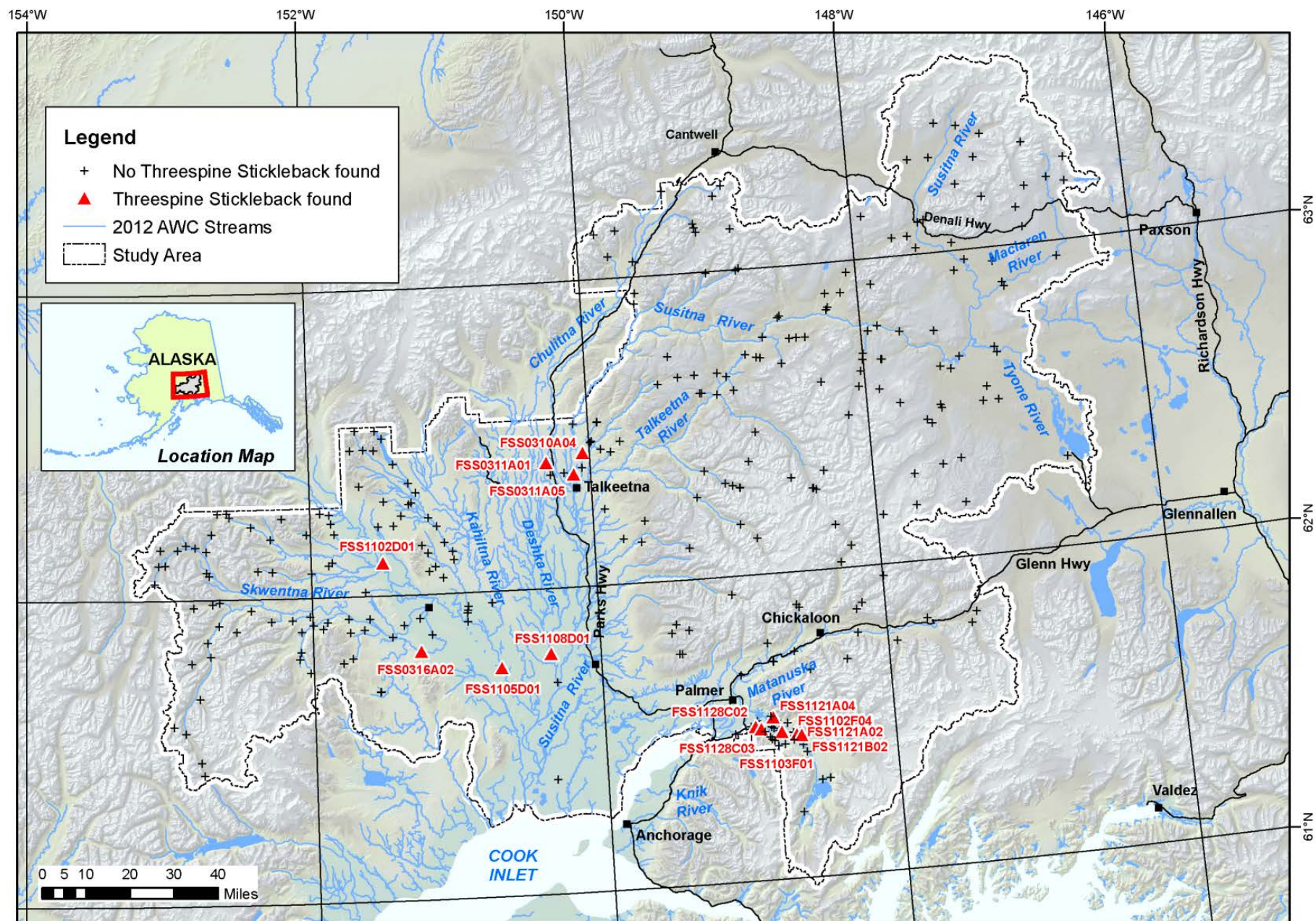
Appendix D13.—Sockeye salmon occurrence.



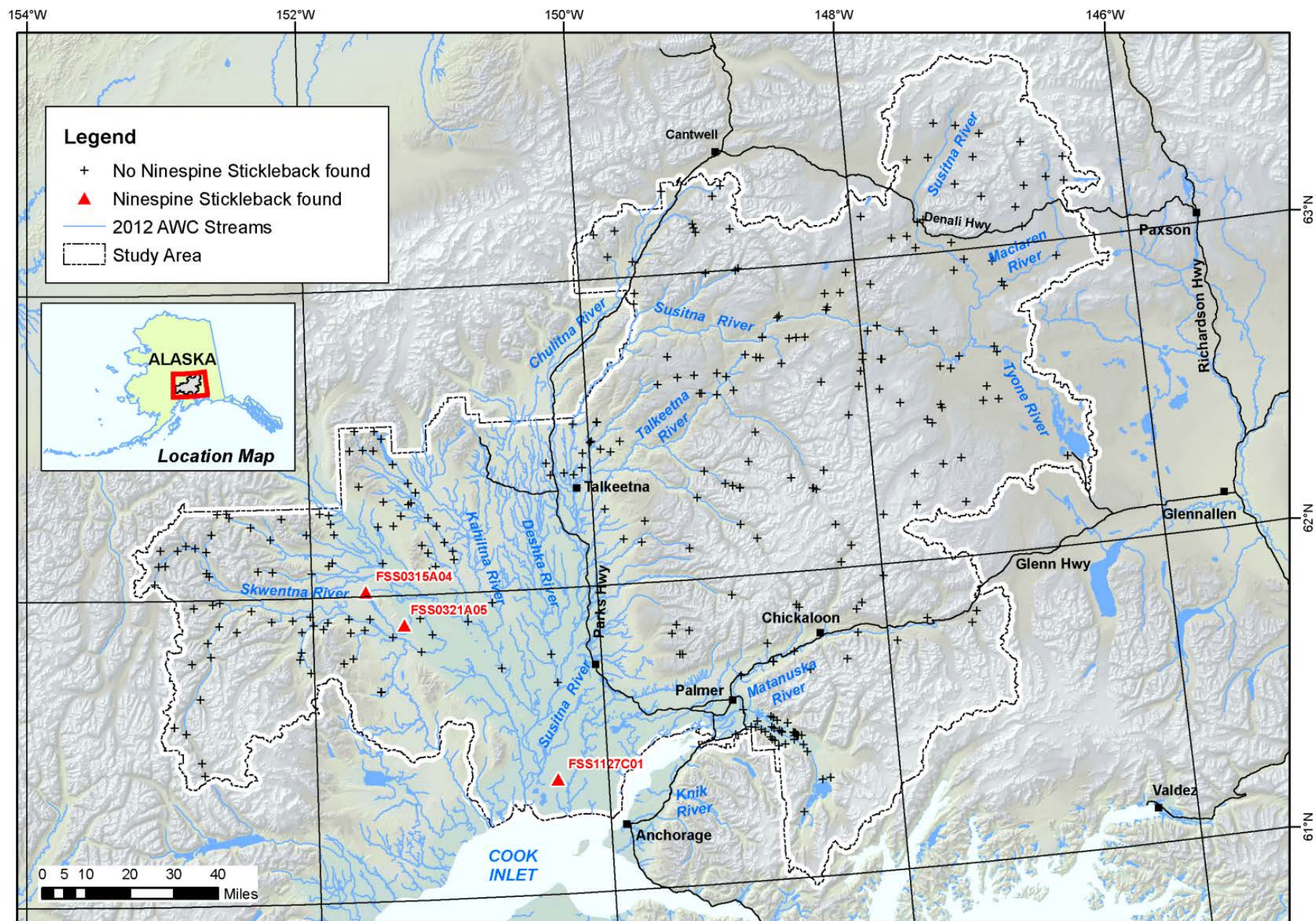
Appendix D15.—Dolly Varden occurrence.



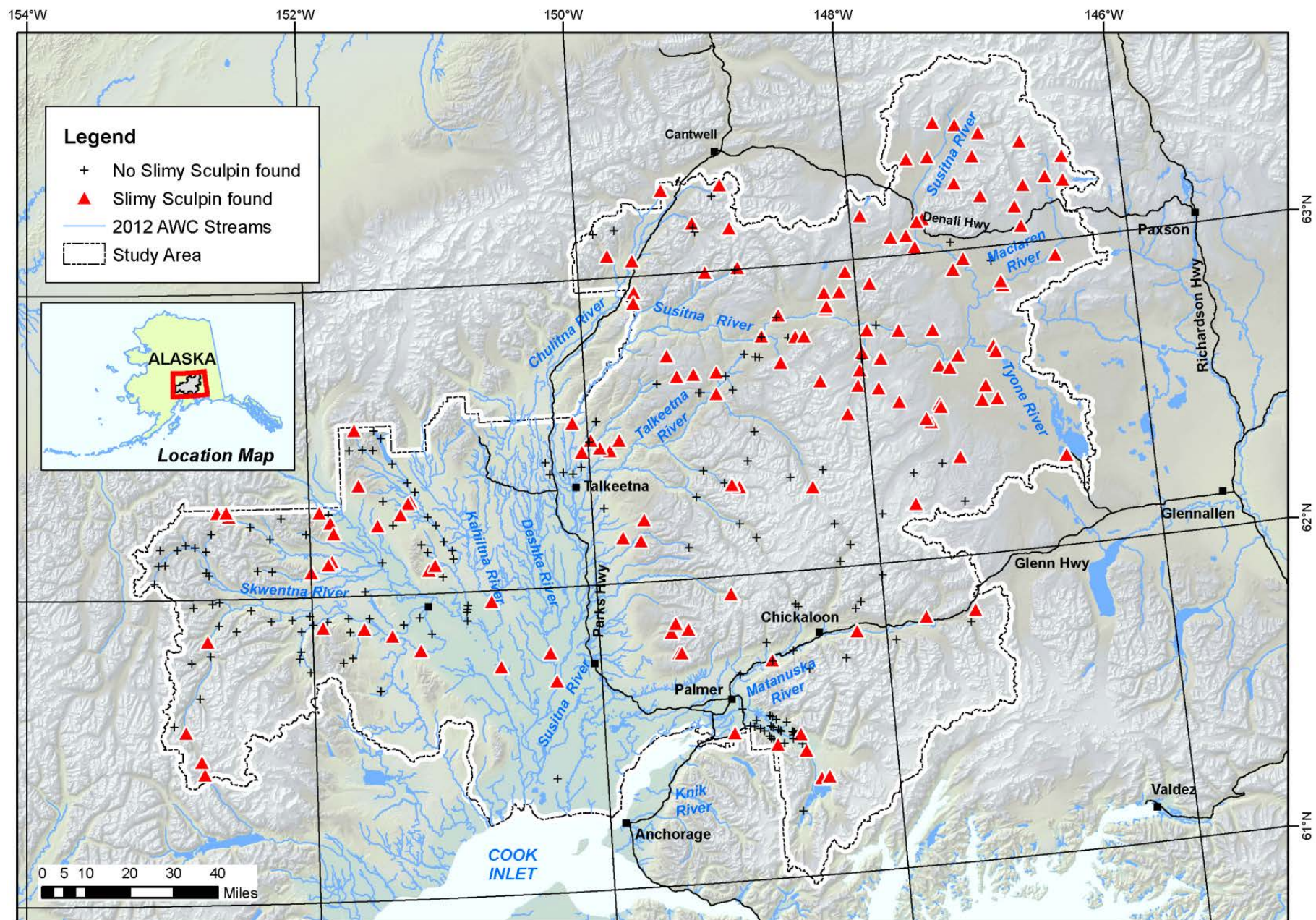
Appendix D16.—Burbot occurrence.



Appendix D17.—Threespine stickleback occurrence.



Appendix D18.—Ninespine stickleback occurrence.



Appendix D19.—Slimy sculpin occurrence.

**APPENDIX E. SUMMARIES OF ANADROMOUS WATERS
CATALOG NOMINATIONS**

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

AWC nom. no.	Station ID (FSS03...)	AWC stream code (247-41-10200...)	Quad	New/Extend waterbody?	New species/ activity ^a	Backup species/ activity ^a
04-022	04A08	-2370-3023	Talkeetna B-1	N	-	Sp
04-023	11A05	-2370-3015	Talkeetna B-1	N	-	COr
04-024	05A01	-2969	Talkeetna Mts D-4	N	Kr	Kp
04-025	USU02	N/A	Talkeetna Mts D-4	Y ^b	Kp	
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	Y	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	Y	COr	
04-048	15A02	-2053-3229-4009-5011	Talkeetna A-4	Y	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	Y	COr	
04-053	14A02	-2053-3249-4103	Talkeetna B-4	Y	Kr, COr, Pp	
04-054	13A05	-2053-3220-4030-5040- 6405	Talkeetna A-4	Y	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	

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Appendix E1.–Page 2 of 2.

AWC nom. no.	Station ID (FSS03...)	AWC stream code (247-41-10200...)	Quad	New/Extend waterbody?	New species/ activity ^a	Backup species/ activity ^a
04-058	12A06	-2053-3170-4047	Talkeetna B-3	Y	COr	
04-059	12A02 12A01	-2053-3170-4067	Talkeetna B-4	Y	COr, Kr, CHp, Ss	
04-060	11A06	-2381-3004	Talkeetna B-1	Y	COr	
04-061	11A04	-2361	Talkeetna B-1	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 04A05	-2370-3041-4049-5056	Talkeetna Mts B-6	Y	COrp, Krp	
04-069	04A06 04A04	-2370-3041-4049	Talkeetna Mts C-6	Y	COPr	
04-070	04A03	-2370-3041-4080	Talkeetna Mts C-6	N	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 01A05	-2370-3180	Talkeetna Mts B-5	Y	Sp, Kp	
04-079	01A03 SHE01	-2370-3090	Talkeetna Mts A-4	Y	Sp, Kp	
04-080	20A05	-2053-3205-4089-5130	Tyonek D-6	Y	Ss	
04-081	19A07	-2053-3205-4112-5054	Talkeetna A-6	N	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.

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

AWC nom. no.	Station ID (FSS11...)	AWC stream code (247...)	Quad	New/ Extend waterbody?	New species/ activity ^a	Backup species/ activity ^a
11-484	01F01	-50-10200-2081	Anchorage C-6	N	Sr	
11-485	01G04	-41-10200-2810	Talkeetna Mts C-3	Y	Kp	
11-486	02D01	-41-10200-2053	Talkeetna A-3	N	Sp	Kpr, Pp
11-487	02F03	-50-10200-2121	Anchorage B-5	Y	COr, Kr	
	02F02					
	02F01					
11-488	02F07	-50-10200-2155-3004	Anchorage B-5	Y	Ss	
	02F06					
11-489	03D01	-41-10200-2053-3205	Tyonek D-4	N		Kp, Pp, Sp
11-490	03F04	-50-10200	Anchorage B-5	N	Sr	Ss
	03F06					
11-491	03F05	-50-10200	Anchorage B-5	N		Ss
11-492	04D01	-41-10200-2053-3150	Tyonek D-2	N		Kp, Sp
11-493	06D01	-41-10200	Talkeetna C-1	N	Kr	Kp
11-494	08D01	-41-10200-2081	Tyonek D-1	N	ALpr, PCp	Kpr, Pp
11-495	09A01	-41-10200-2381	Healy A-6	N	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	N	Krs	COp, Sp
11-498	15A01	-50-10200-2160	Anchorage A-5	N	<i>AWC correction: remove Upper Lake George</i>	
11-499	19A01	-50-10220	Anchorage D-4	N		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	N	Kr	
11-569	21C04	-50-10220-2085	Anchorage C-6	N	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	Tyonek D-5	Y	Kr, COr	
11-573	27C05	-41-10200-2053-3205-4053-5046	Tyonek C-5	Y	Kr, COr	
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	

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Appendix E2.–Page 2 of 2.

AWC nom. no.	Station ID (FSS11...)	AWC stream code (247...)	Quad	New/ Extend waterbody?	New species/ activity	Backup species/ activity
11-581	14C03	-41-10200-2053-3170-4088	Talkeetna C-3	N		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	N		Ksr, COOr, Sp
11-584	08C04	-41-10200-2381	Healy B-4	Y	Kr, COOr	
11-585	09C01	-41-10200-2585	Healy A-4	Y	Kr	
	11C09					
11-586	09C03	-41-10200-2381-3260-4100	Healy A-5	Y	Kr, COOr	
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, COOr, 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	N	Sr, Kr	Kp, Ss
11-593	15C01	-41-10200-2053-3205-4112-5045-0010	Talkeetna A-6	N		Ss
11-623	28C07	-50-10200-2126	Anchorage B-5	Y	Sr, COOr	
11-700	19A02	-50-10220-2139	Anchorage C-5	Y	Ss	
11-701	21A03	-50-10200-2081-3041	Anchorage C-5	N	COOr, Srs	
	21A04					
	21A06					
11-702	21B01	-50-10200-2160-3051	Anchorage B-4	Y	Sp	
	16C03					
11-703	21B02	-50-10200-2155	Anchorage B-5	Y	COOr, Srs	
	02F04					
	03F03					
	21A01					
11-709	07D01	-41-10200	Tyonek C-1	N		Sp, Pp
11-710	05D01	-41-10200-2053	Tyonek C-2	N	Sp	Pp
11-711	03F01	-50-10200	Anchorage B-5	N	Sr	

^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**

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

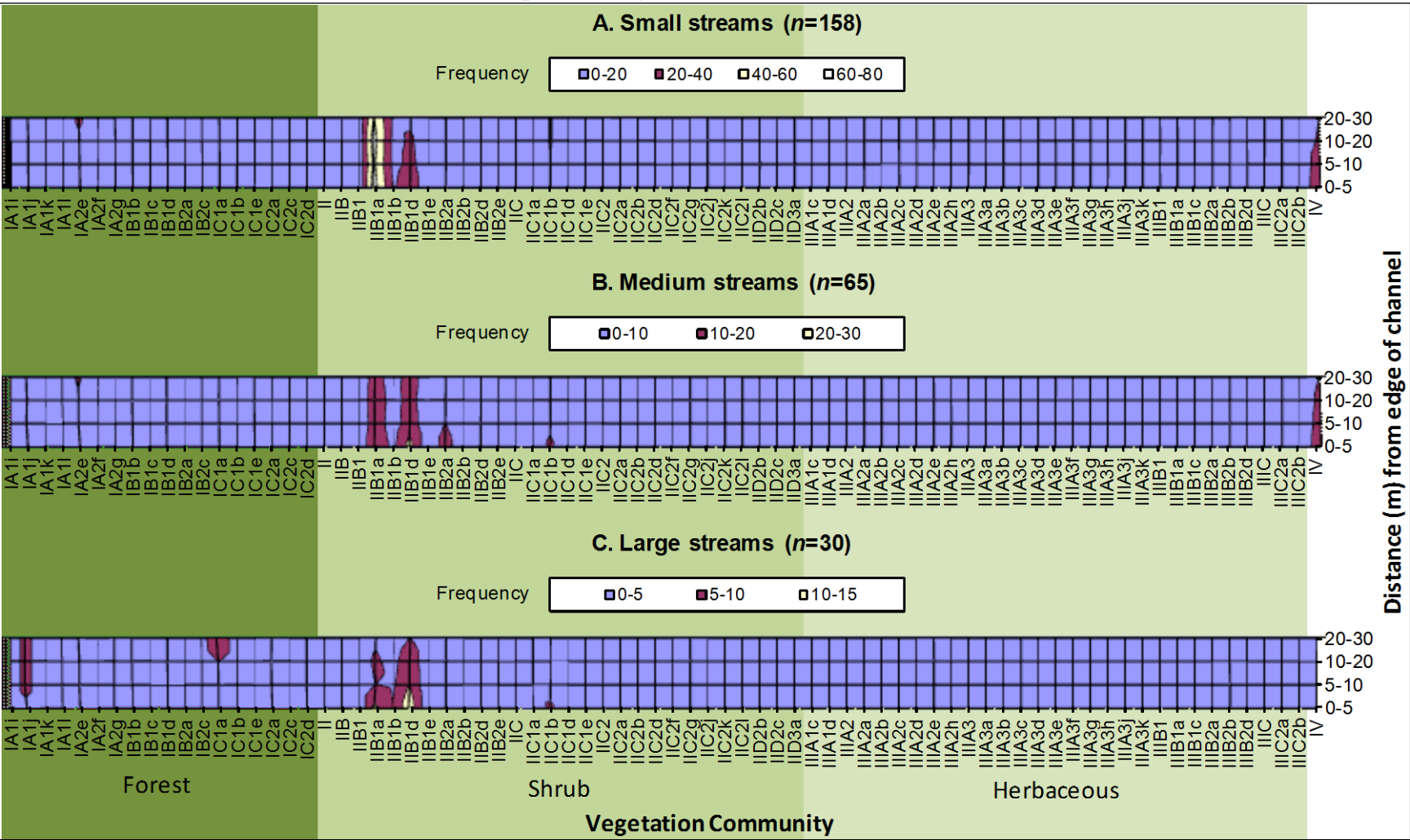
Scientific name	Common name	Life stage	Stream size			Total (n=242)
			Small (n=152)	Medium (n=63)	Large (n=27)	
<i>Lampetra camtschatica</i>	Arctic lamprey	juvenile	0	0	1	1
		juvenile/adult	0	0	1	1
		adult	0	0	1	1
<i>Lampetra tridentata</i>	Pacific lamprey	adult	0	0	1	1
<i>Lampetra</i> sp.	lamprey-unspecified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

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Scientific name	Common name	Life stage	Stream size			Total (n=242)
			Small (n=152)	Medium (n=63)	Large (n=27)	
<i>Salvelinus malma</i>	Dolly Varden	Juvenile	59	18	2	79
		juvenile/adult	65	27	7	99
		adult	20	7	2	29
<i>Lota lota</i>	burbot	juvenile	3	4	9	16
		juvenile/adult	0	4	5	9
		adult	0	0	1	1
<i>Gasterosteus aculeatus</i>	threespine stickleback	juvenile	1	0	2	3
		juvenile/adult	4	0	1	5
		adult	1	0	2	3
<i>Pungitius pungitius</i>	ninespine stickleback	juvenile	1	0	0	1
		juvenile/adult	1	0	0	1
		adult	1	0	0	1
<i>Cottus cognatus</i>	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

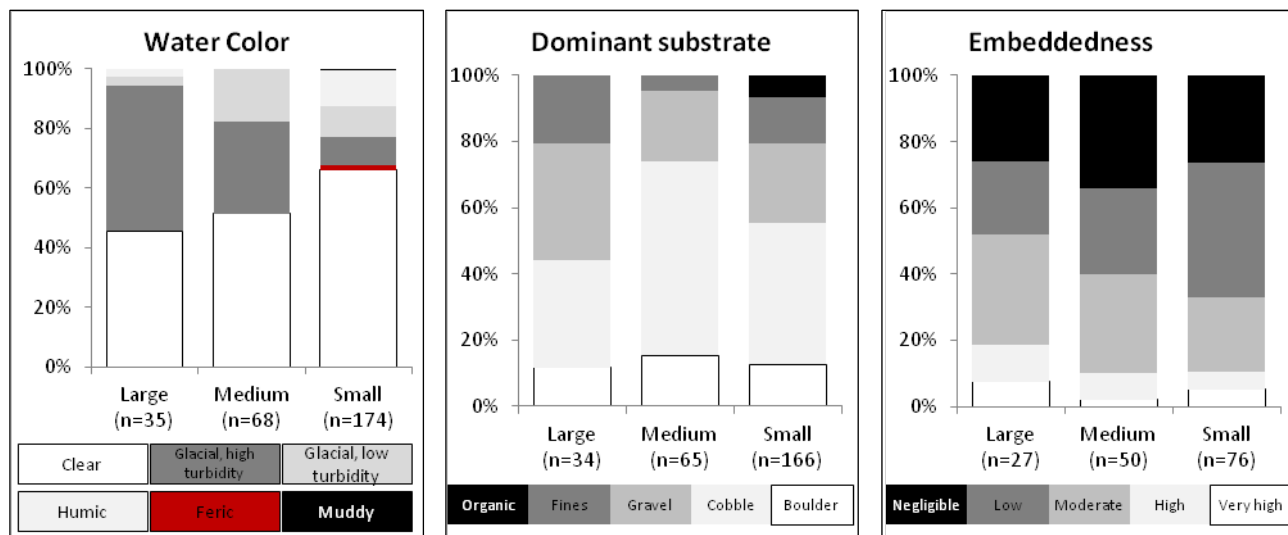
APPENDIX G. GRAPHICAL SUMMARIES OF FISH AND HABITAT VARIABLES

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

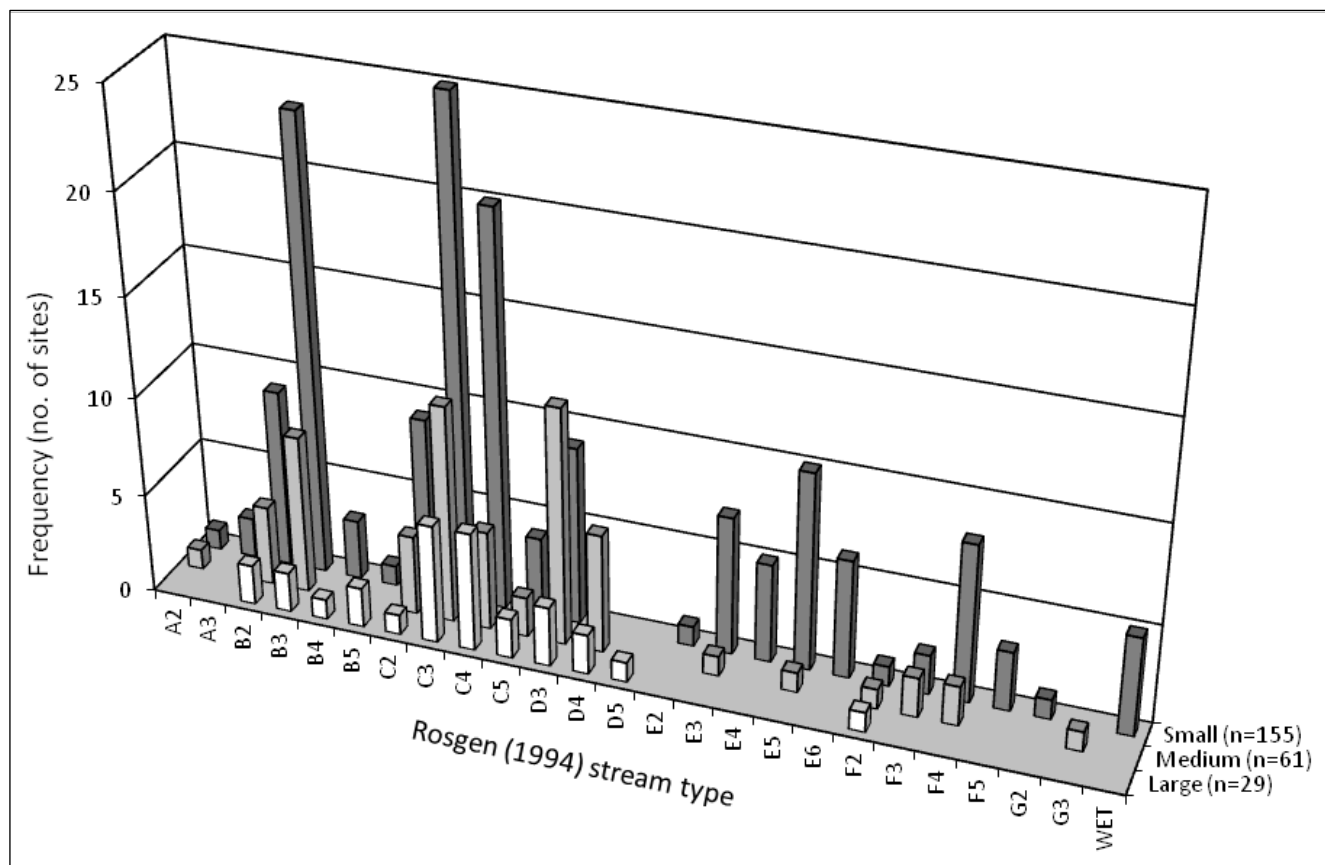


Note: Level-IV vegetation communities (Viereck et al. 1992) we observed are shown along the x-axis. Along the y-axis, vegetation communities are grouped into 4 zones according to their distance (m) from the edge of the stream channel. The count of each vegetation community type is represented by shading.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

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



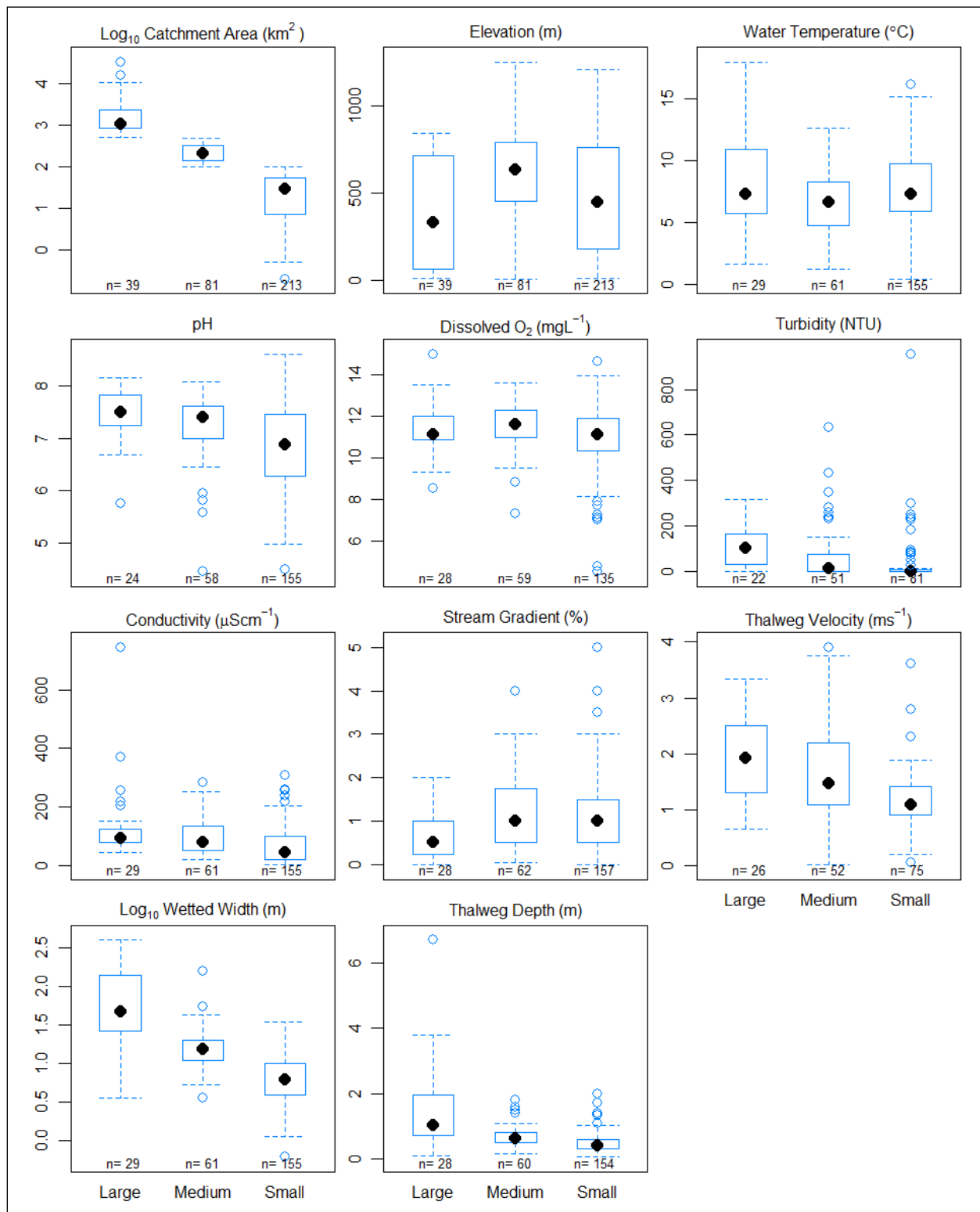
Note: Variables grouped along the x-axis by stream size.



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).

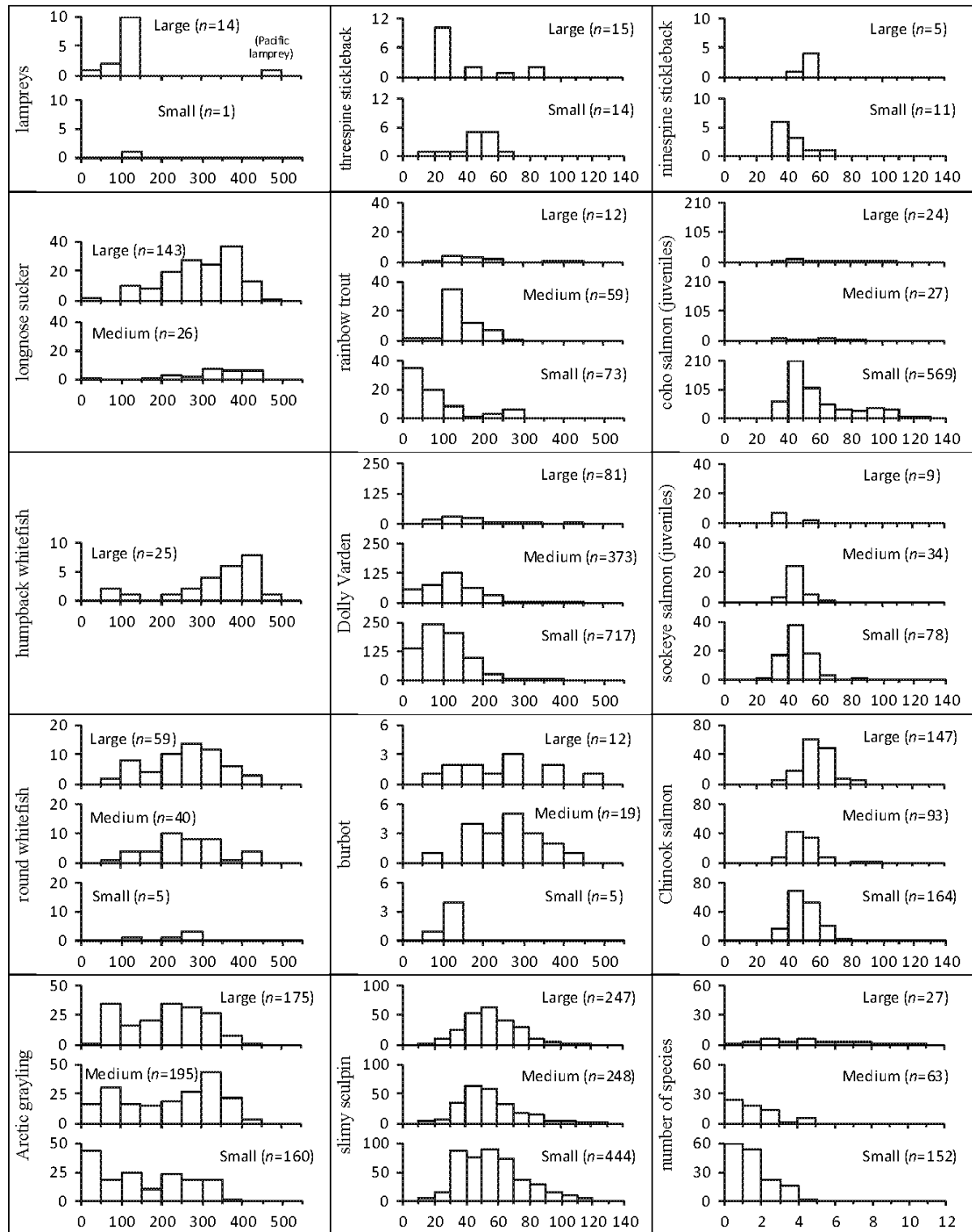
Appendix G2.–Box plots of selected numeric habitat variable distributions, grouped by stream size.



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

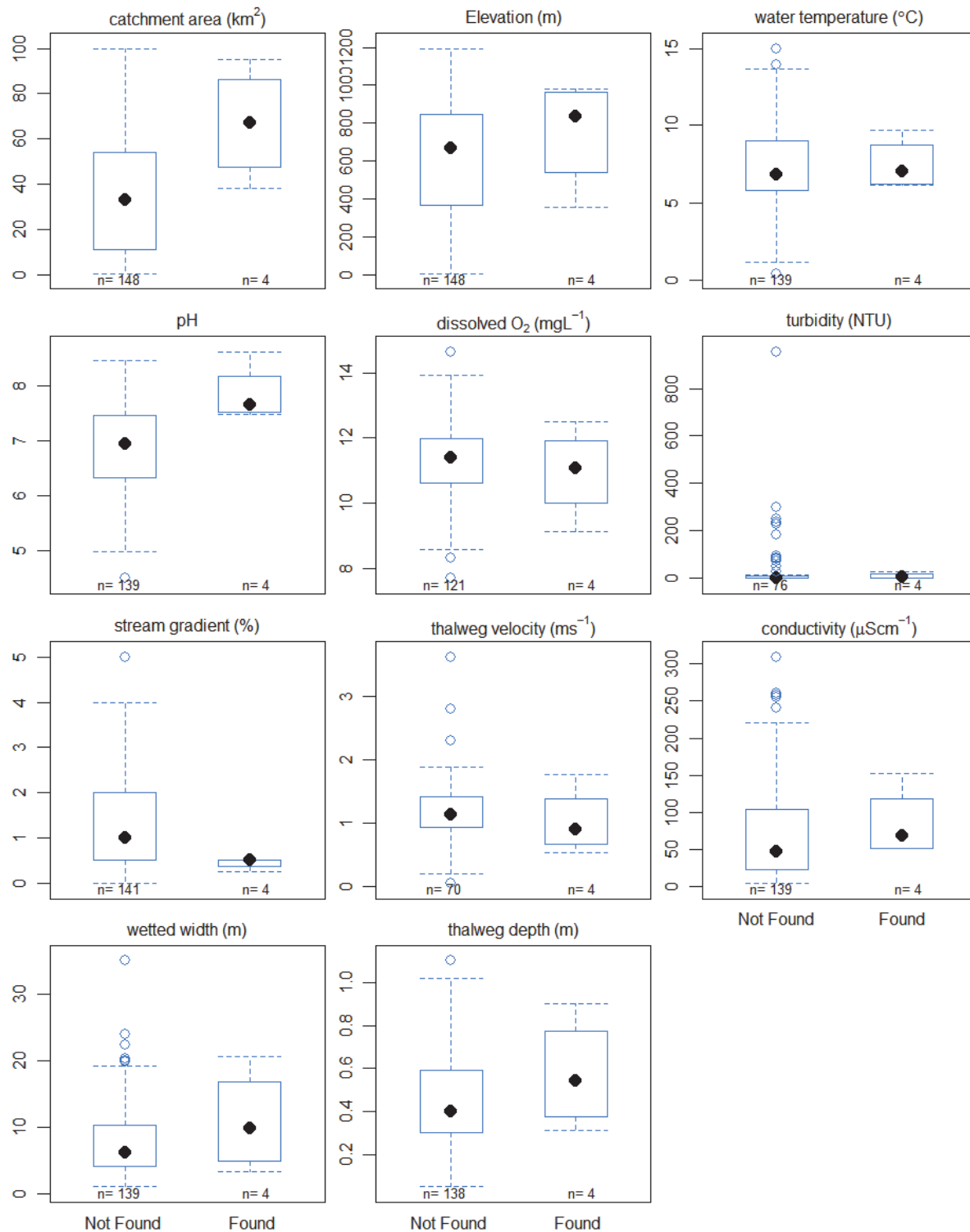
Appendix G3.—Frequency histograms of fork lengths of measured fish, and the number of species found per site, grouped by stream size.



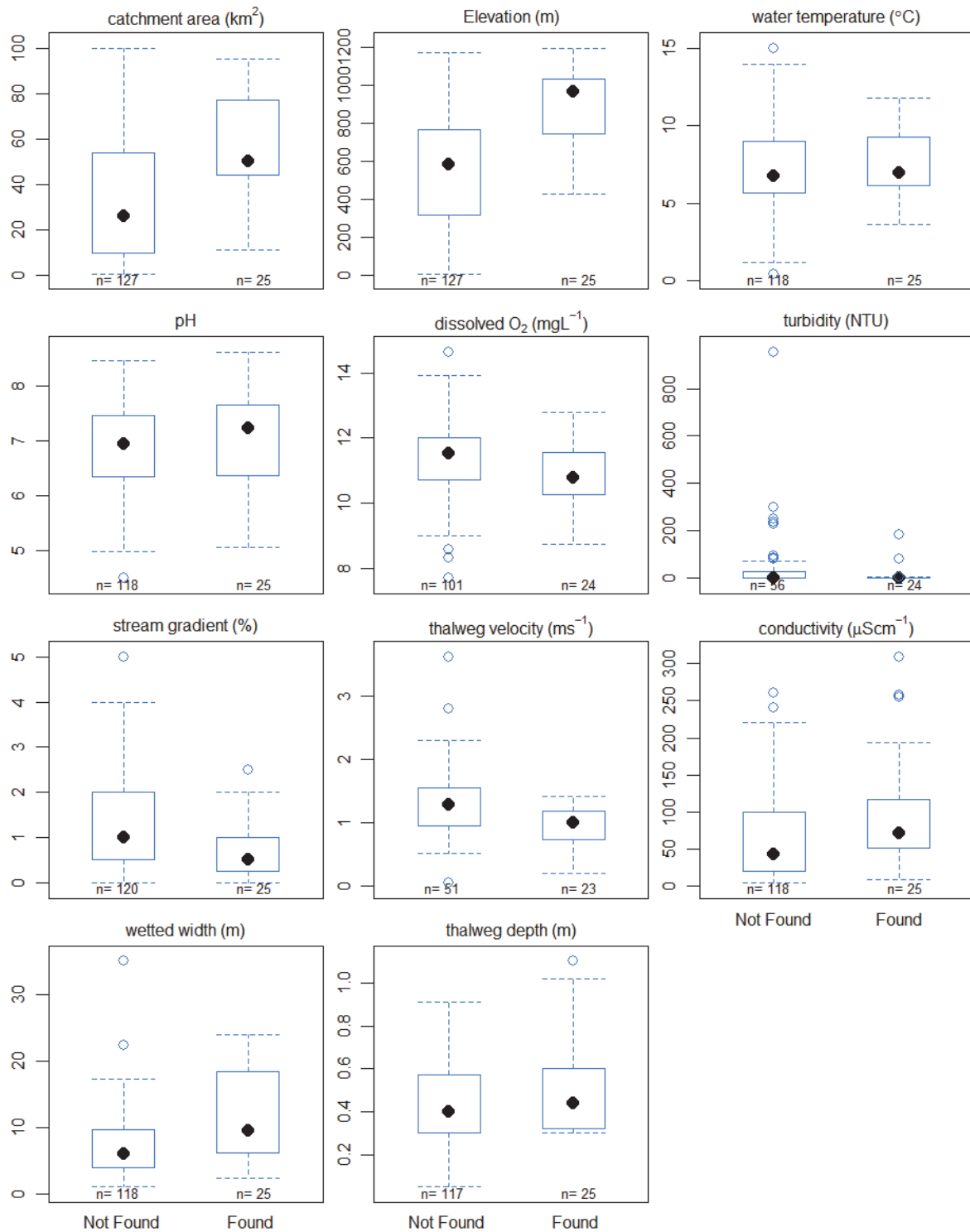
Note: x-axis shows fish fork length (mm); y-axis shows frequency (number of fish measured). Stream-size categories are based on drainage area (km²) upstream of each site (i.e., catchment area): Small streams, ≤ 100 km²; Medium streams, 100–500 km²; Large streams, >500 km². Individual fish lengths from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

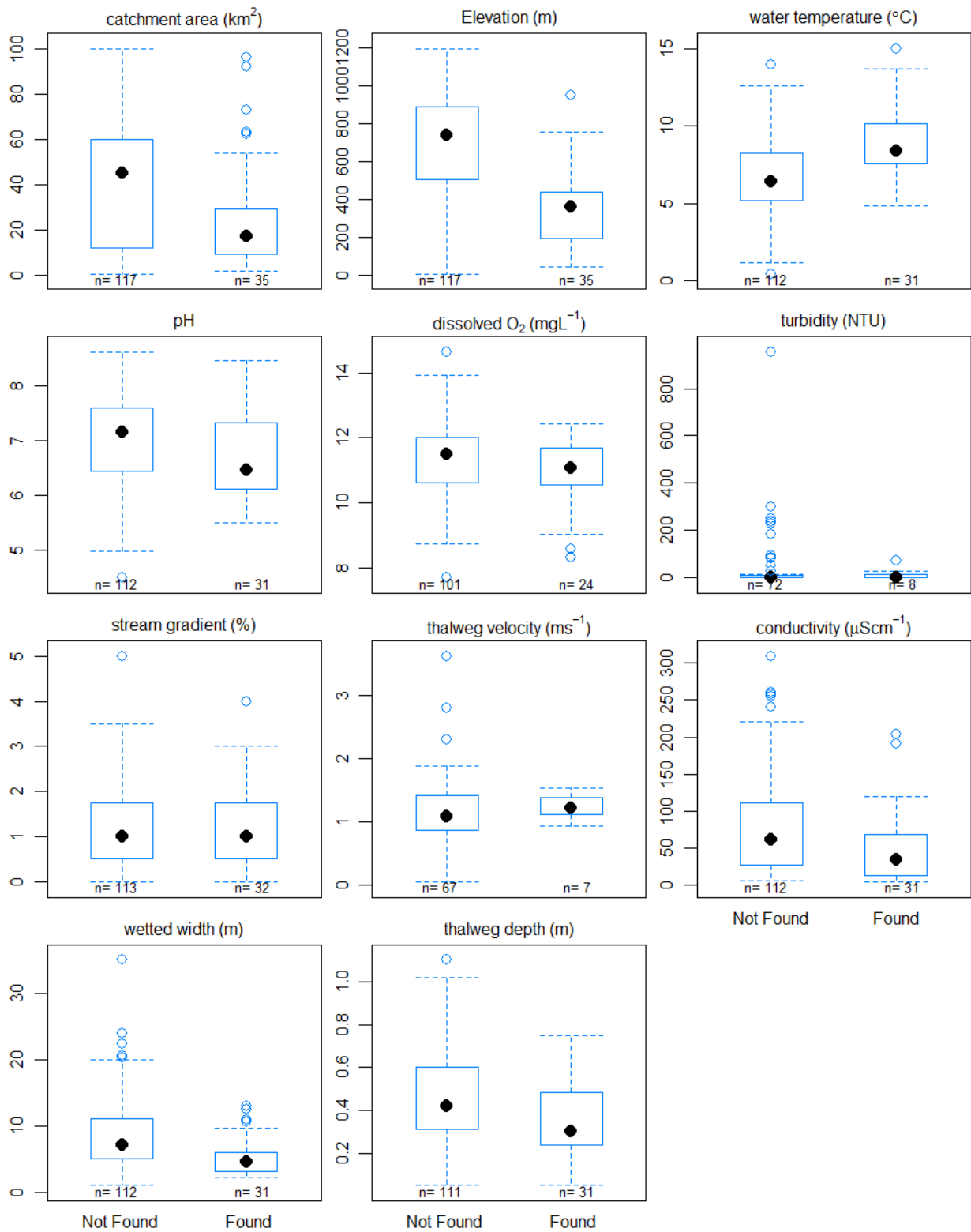
round whitefish - Small Streams (<100 km²)



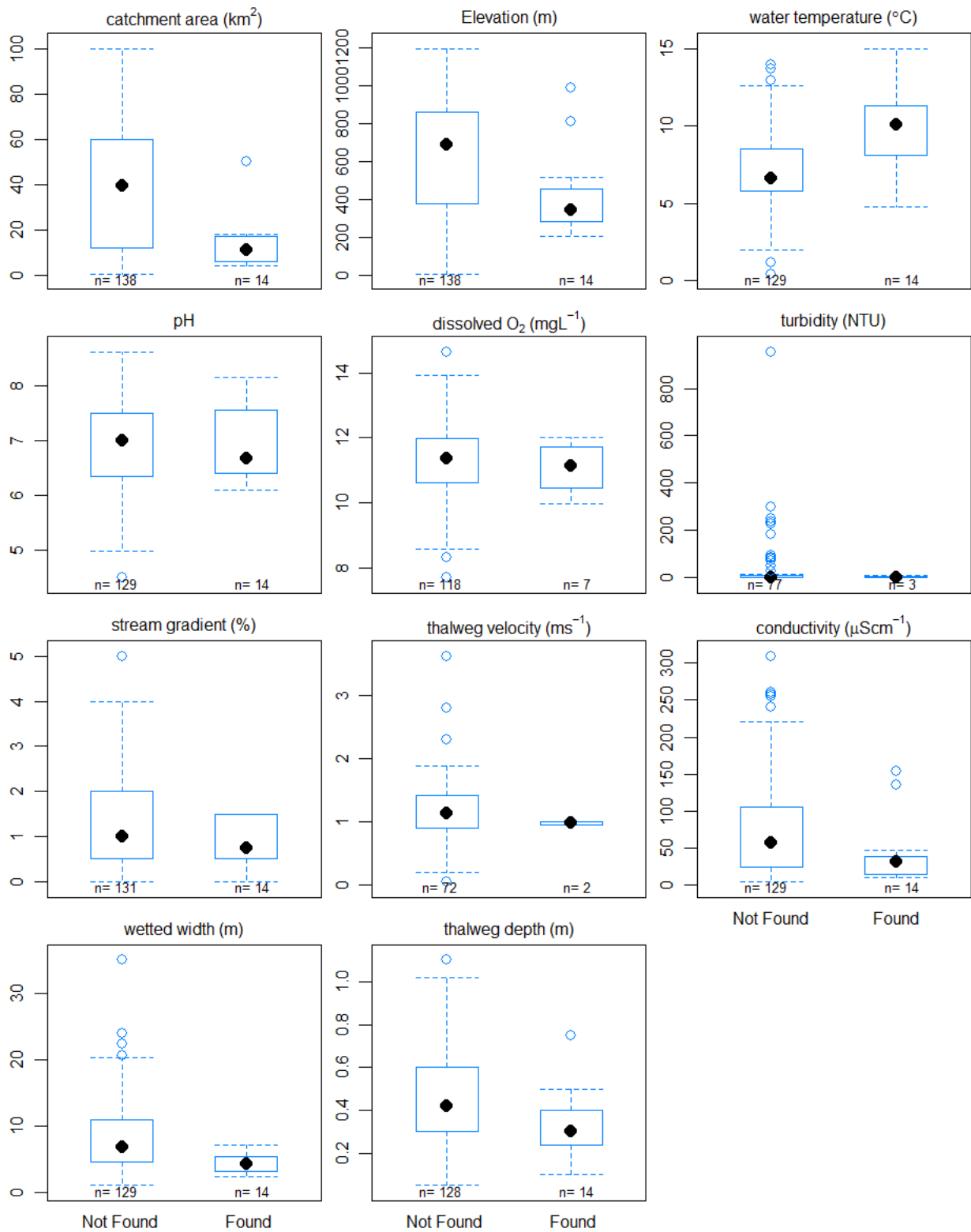
Arctic grayling - Small Streams (<100 km²)



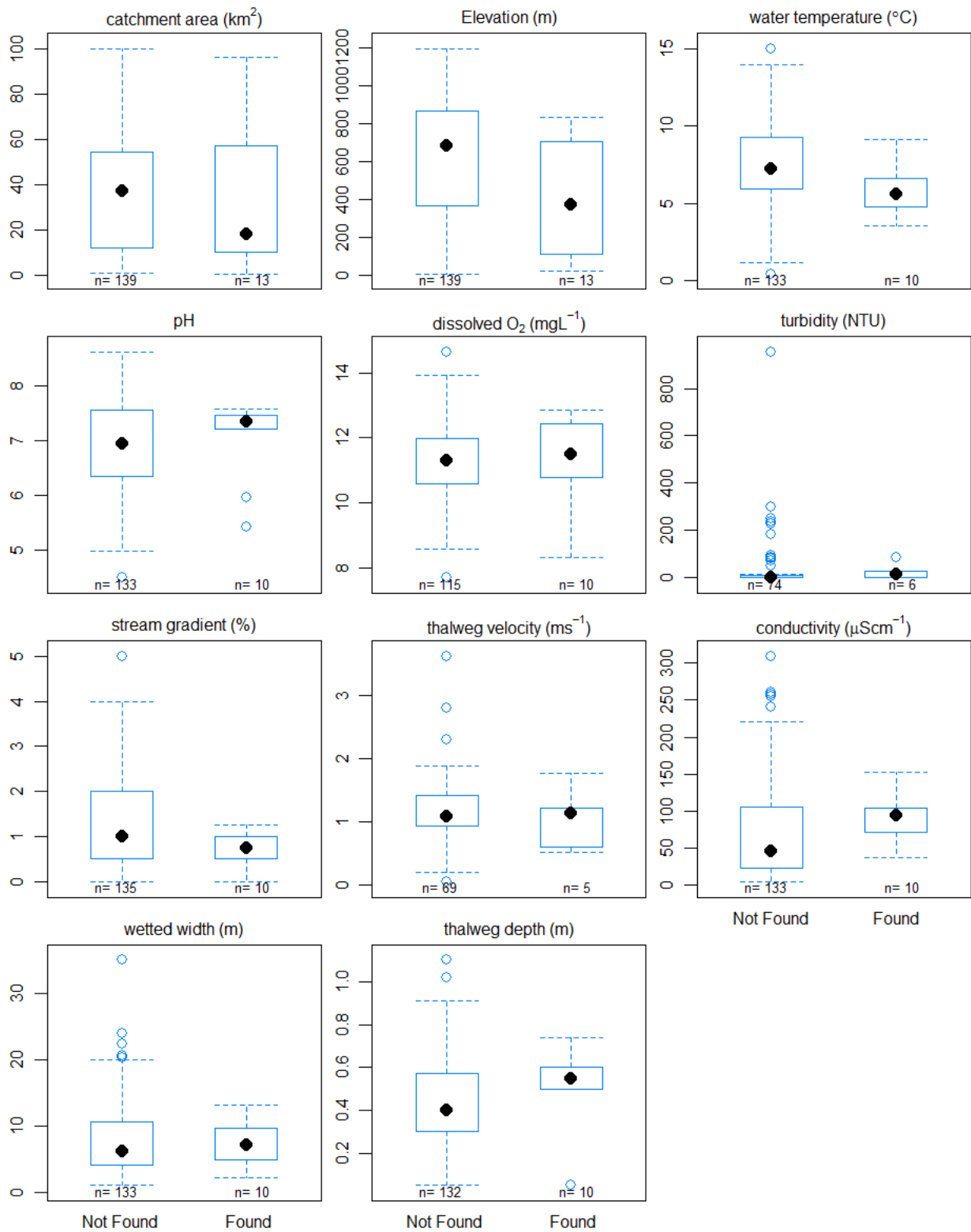
coho salmon - Small Streams (<100 km²)



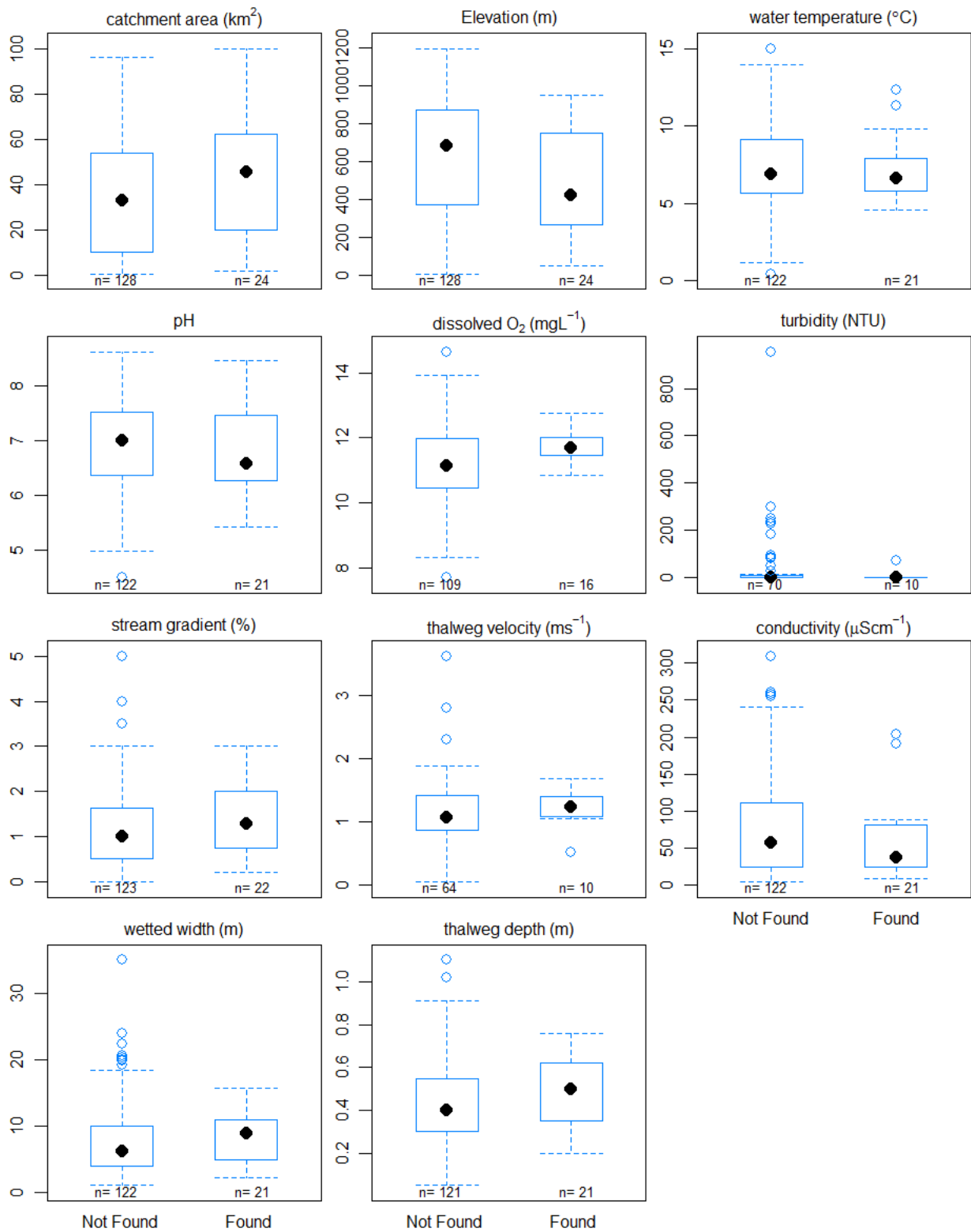
rainbow trout - Small Streams (<100 km²)



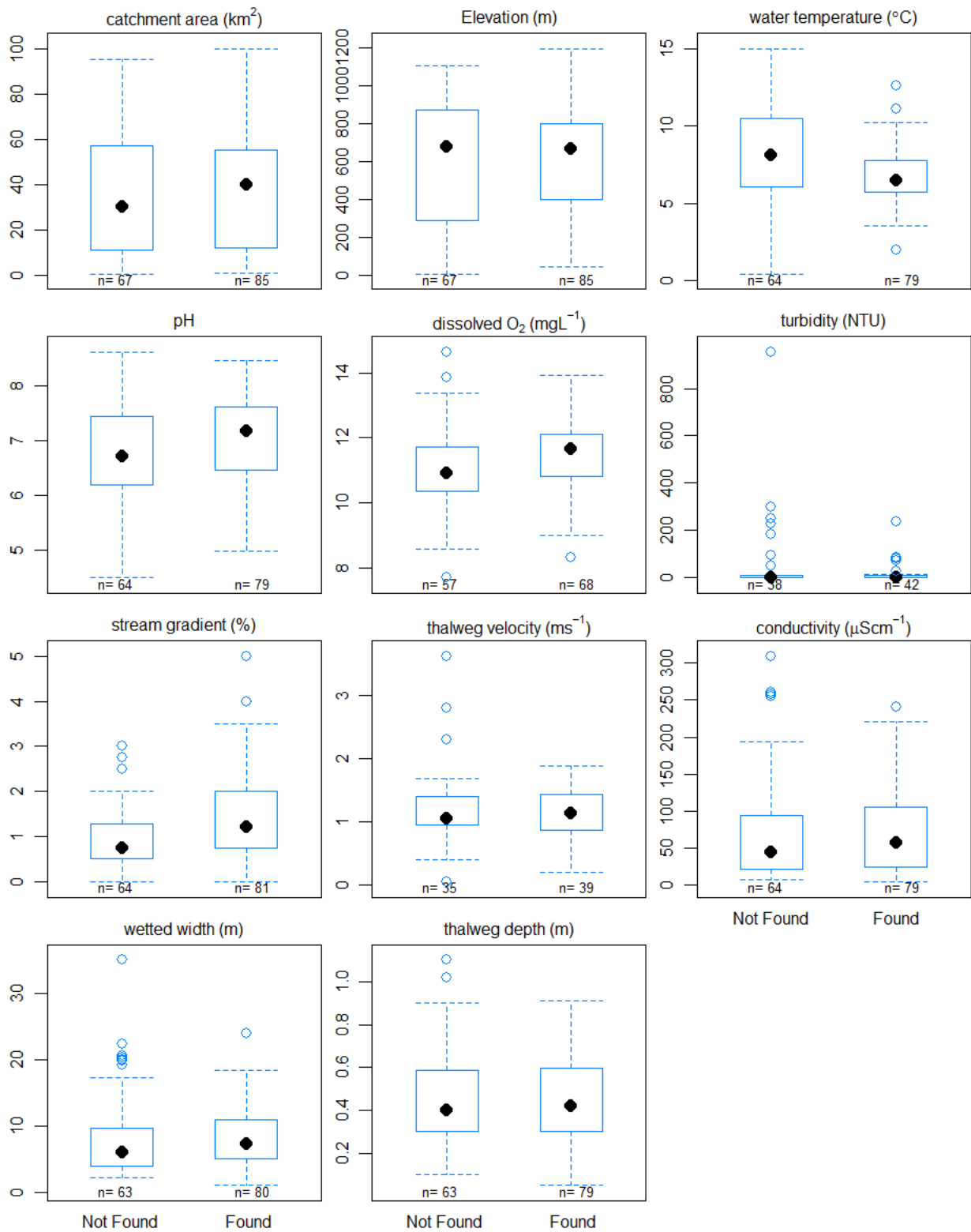
sockeye salmon - Small Streams (<100 km²)



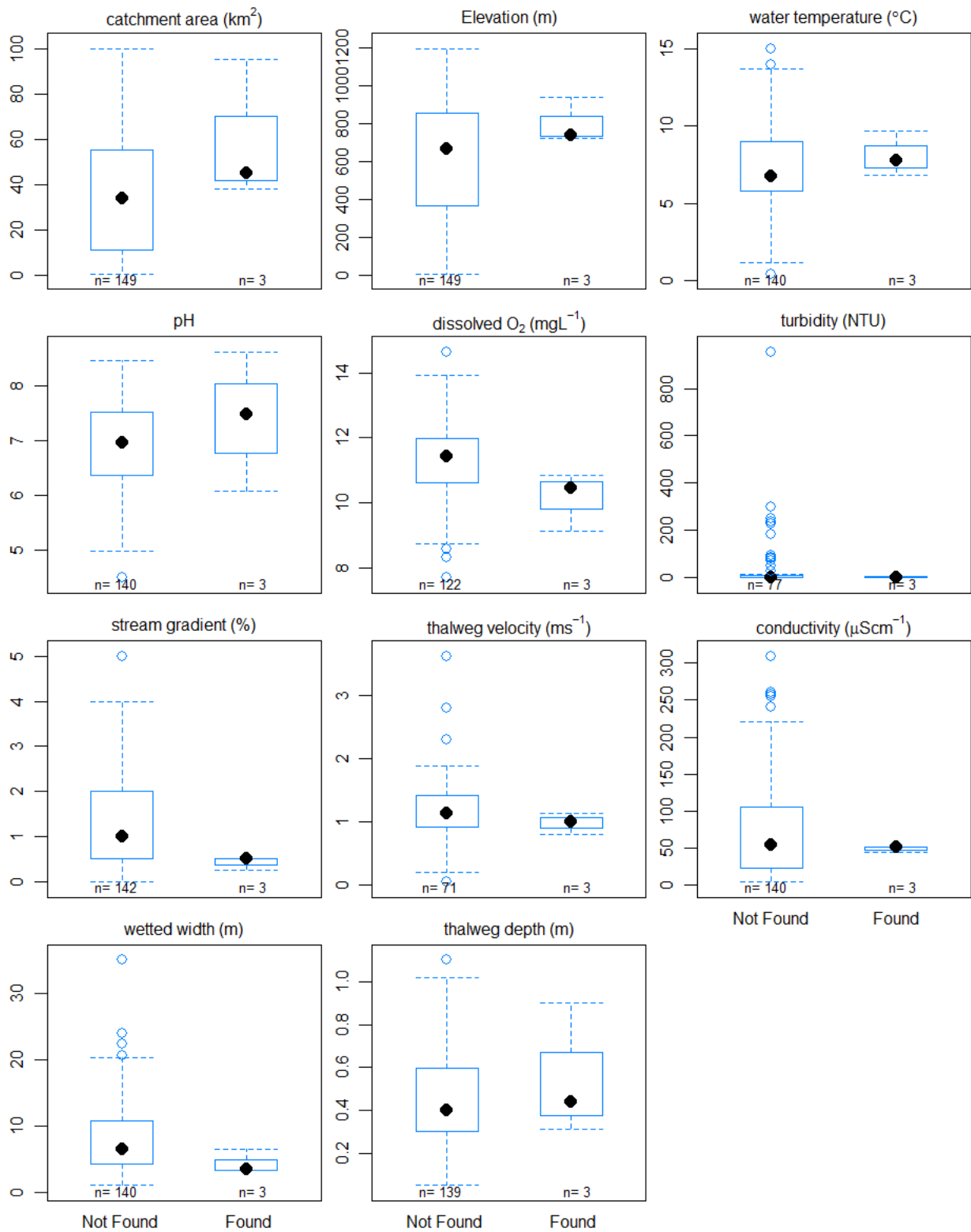
Chinook salmon - Small Streams (<100 km²)



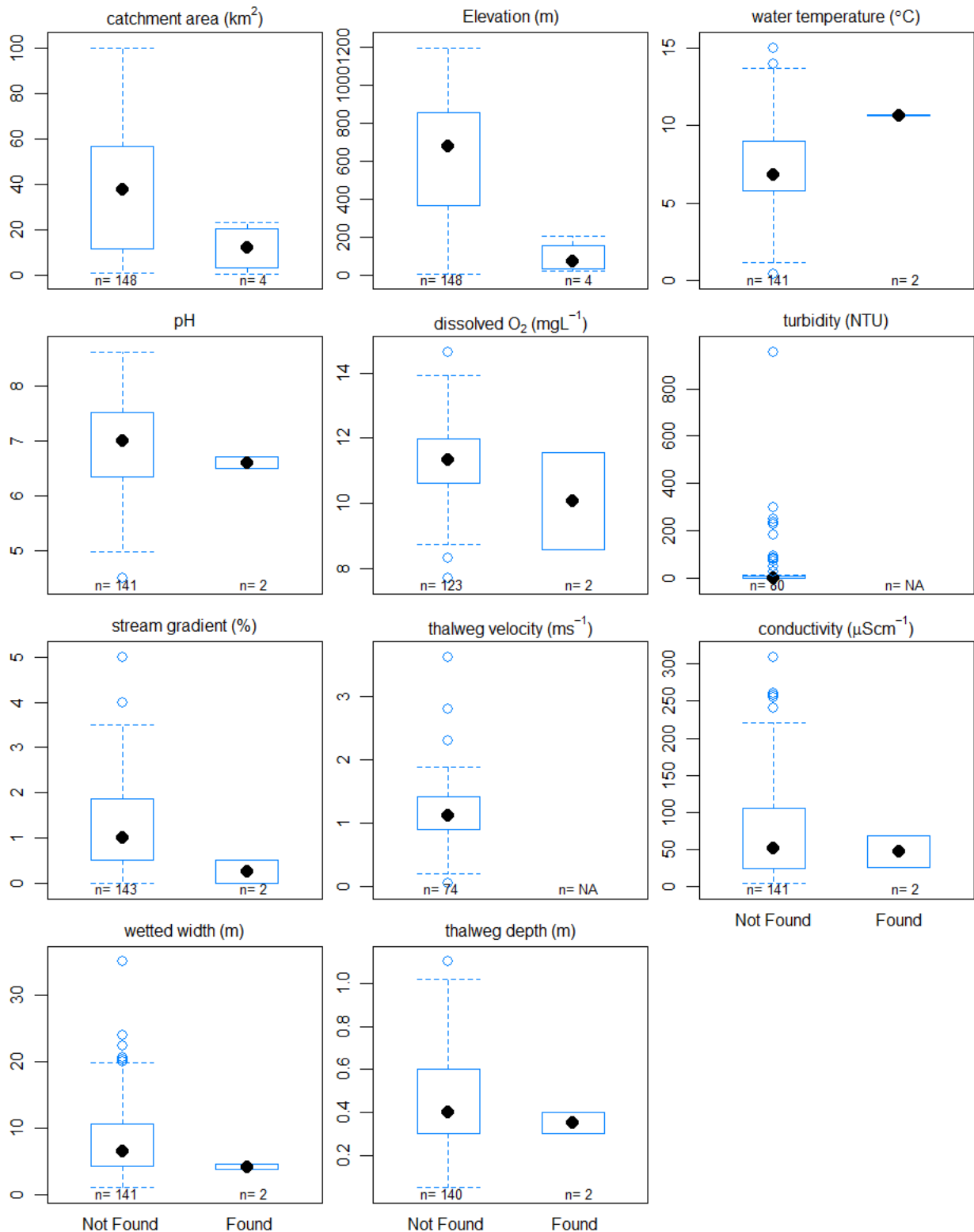
Dolly Varden - Small Streams (<100 km²)



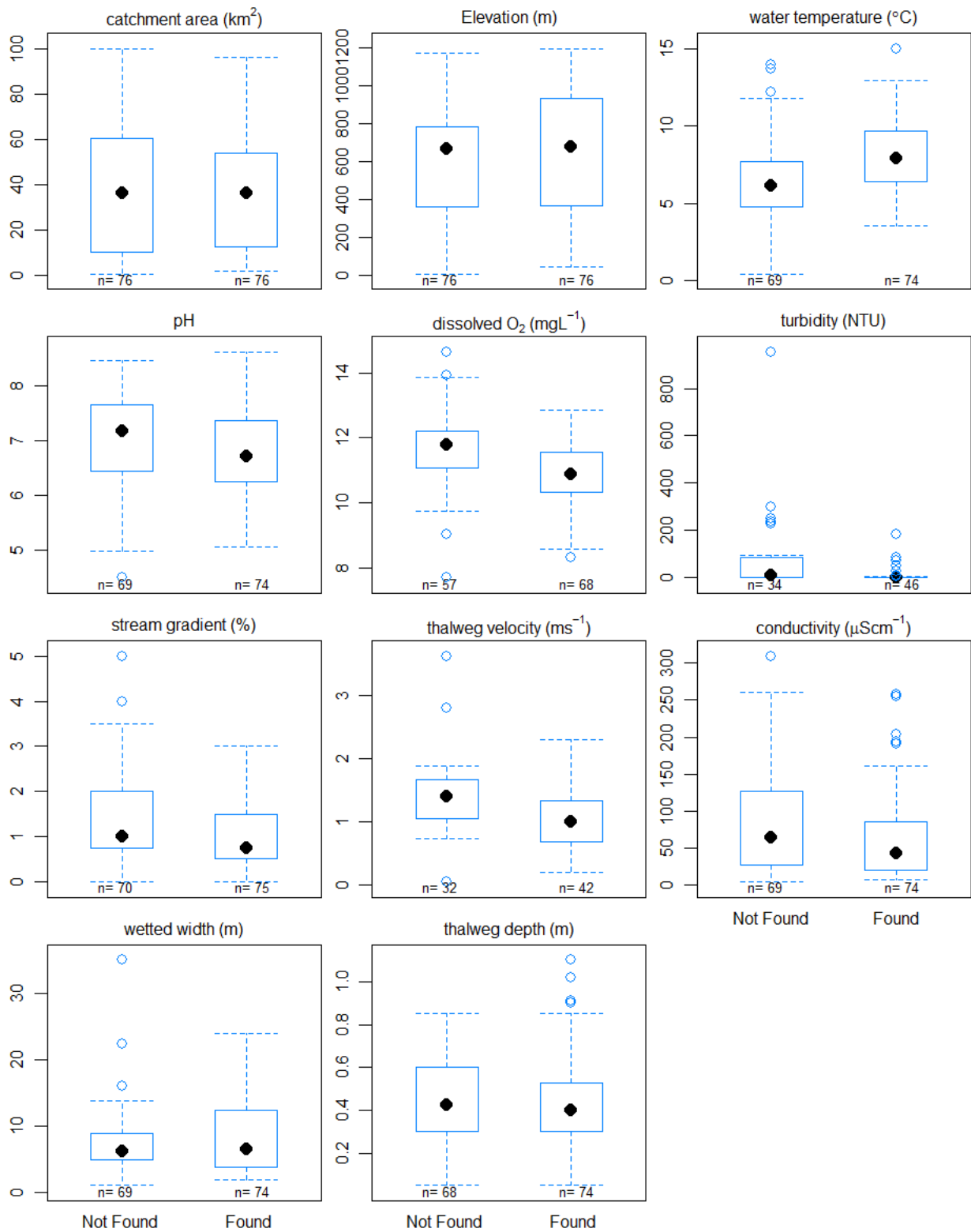
burbot - Small Streams (<100 km²)



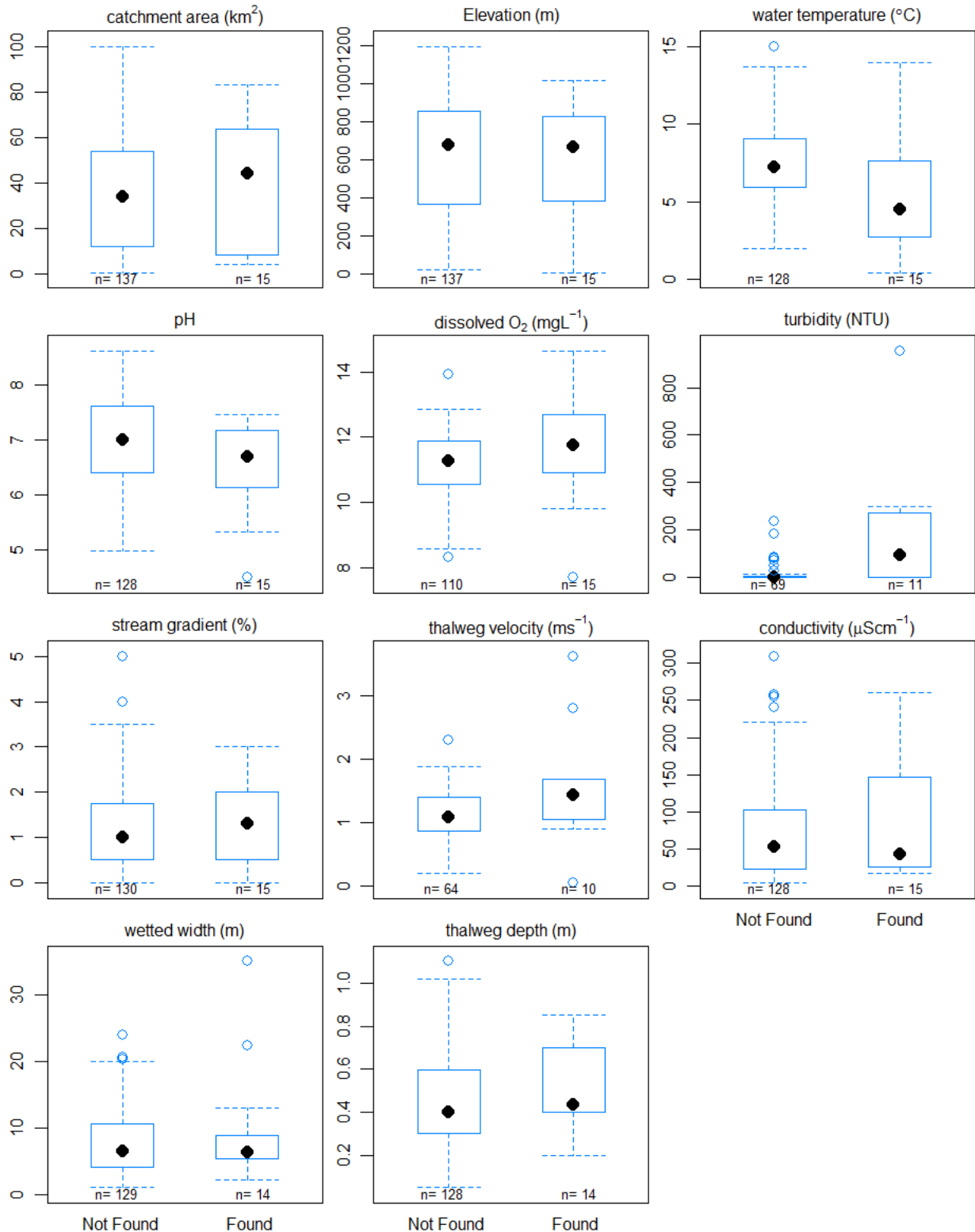
threespine stickleback - Small Streams (<100 km²)



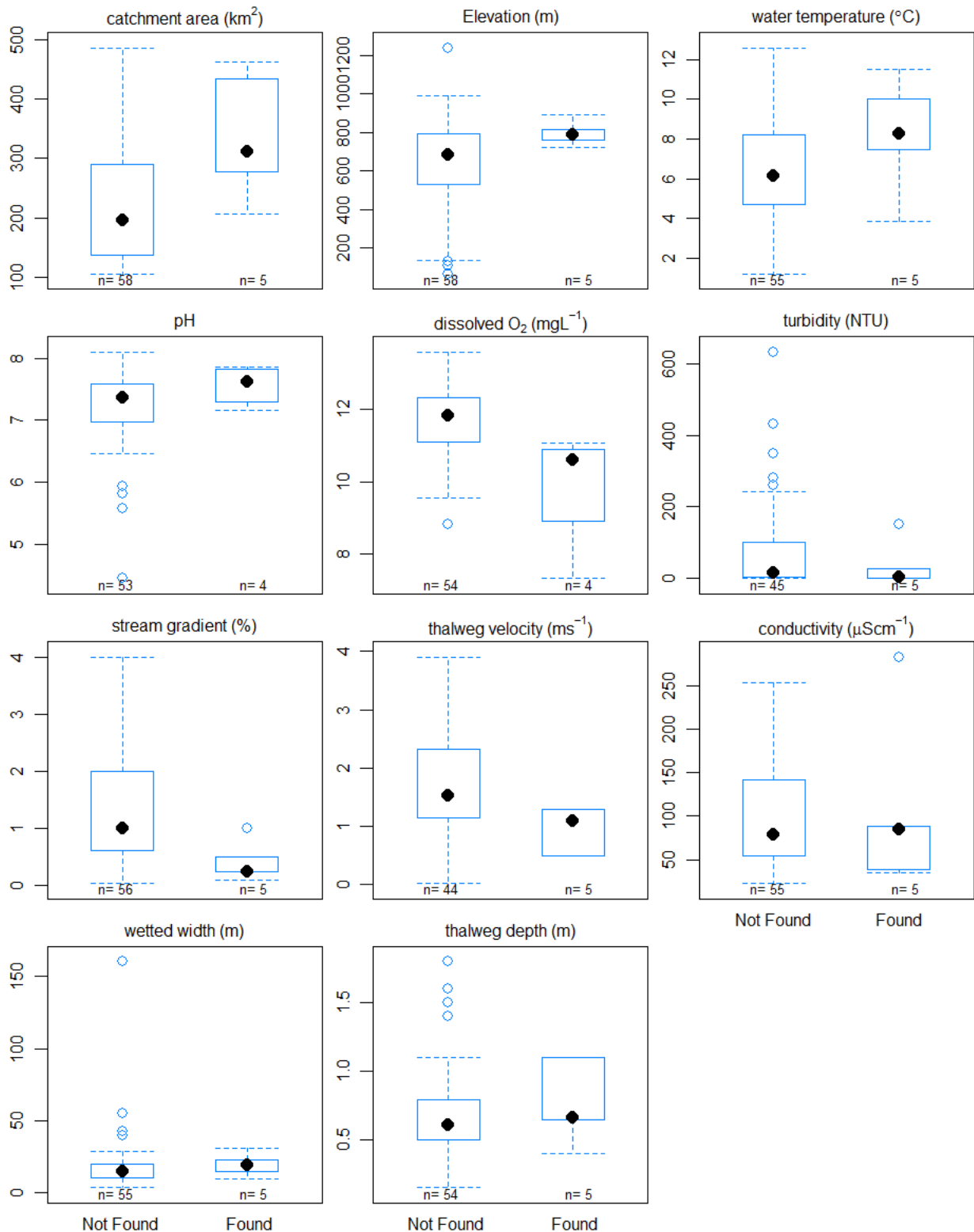
slimy sculpin - Small Streams (<100 km²)



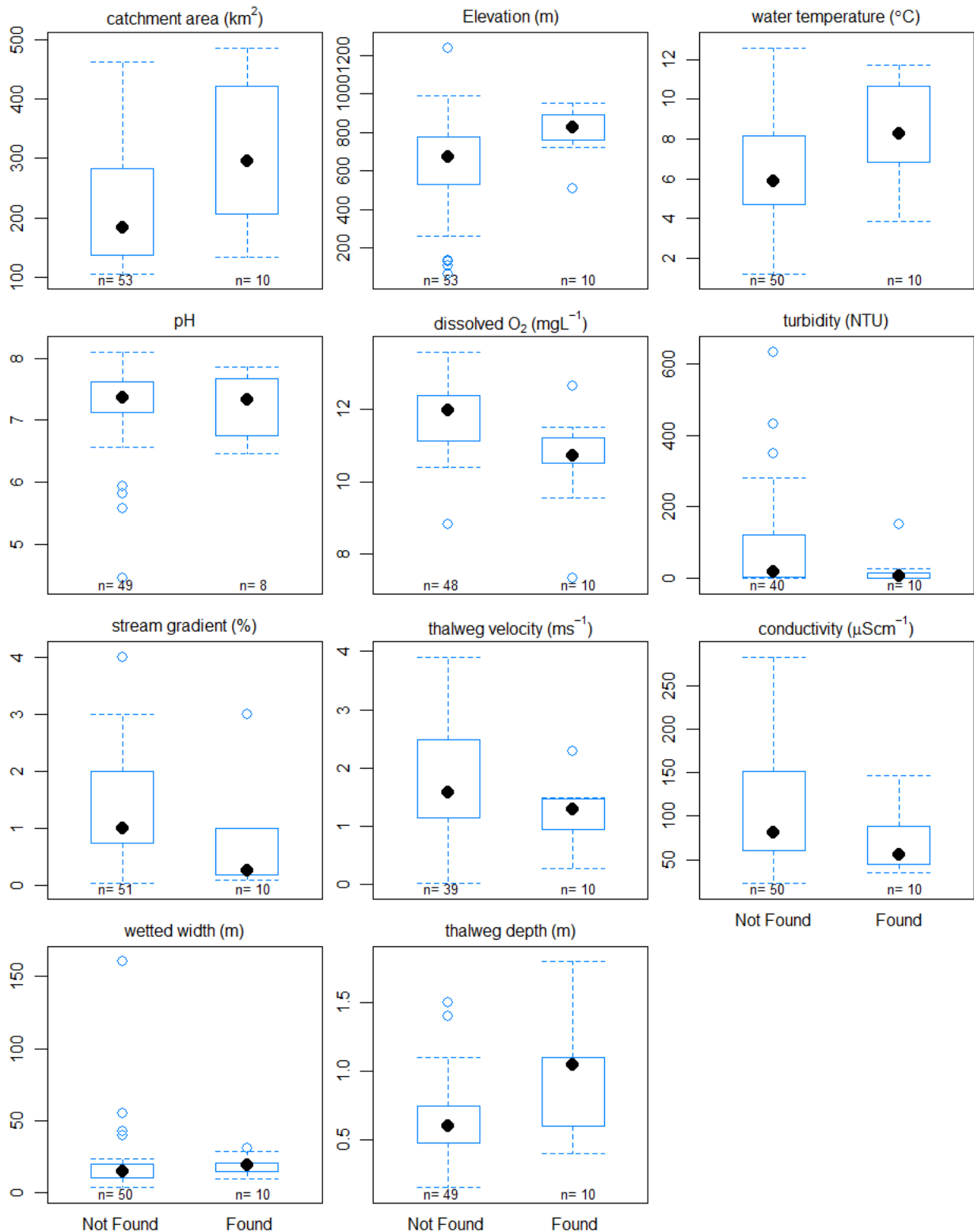
no fish found - Small Streams (<100 km²)



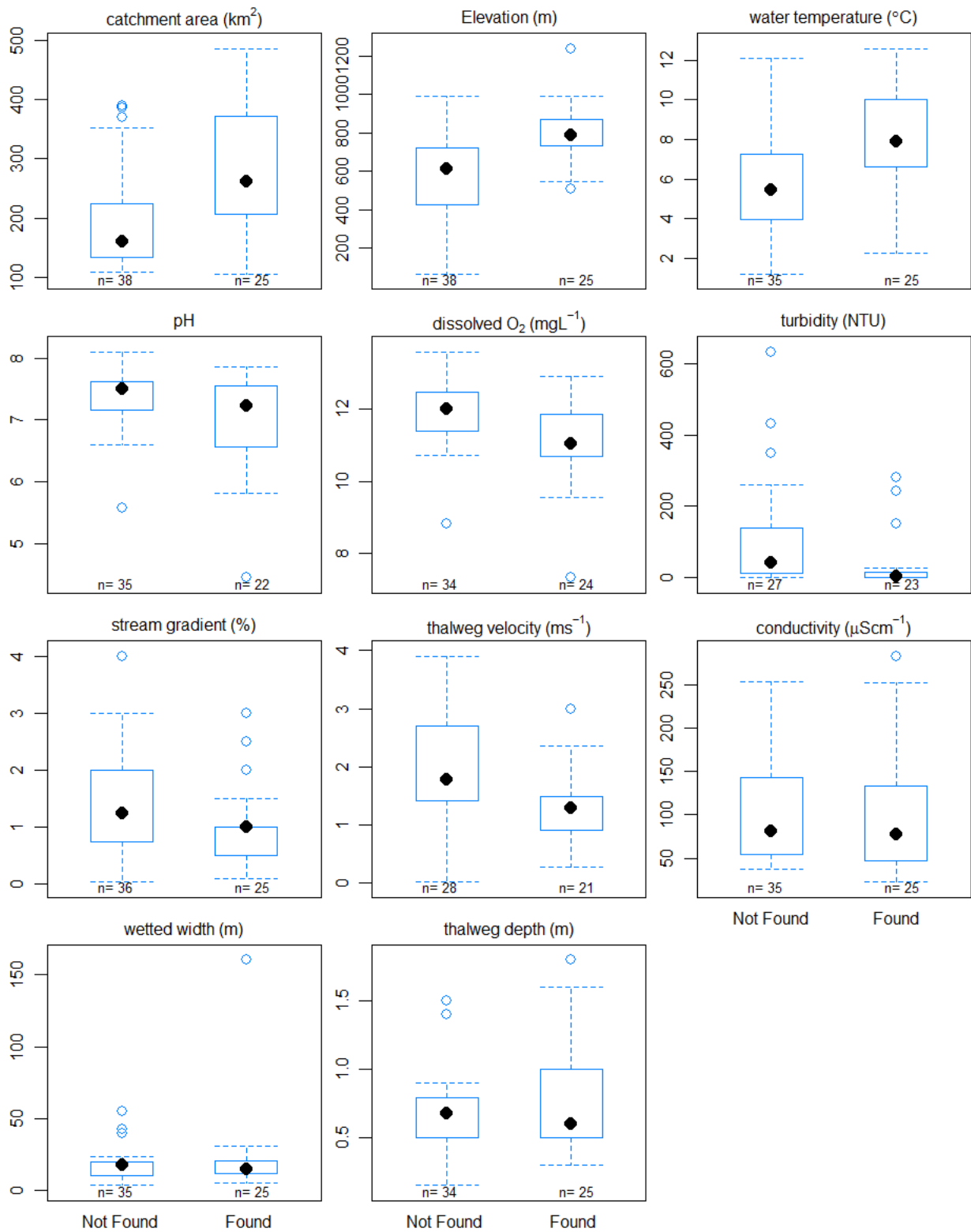
longnose sucker - Medium Streams (100-500 km²)



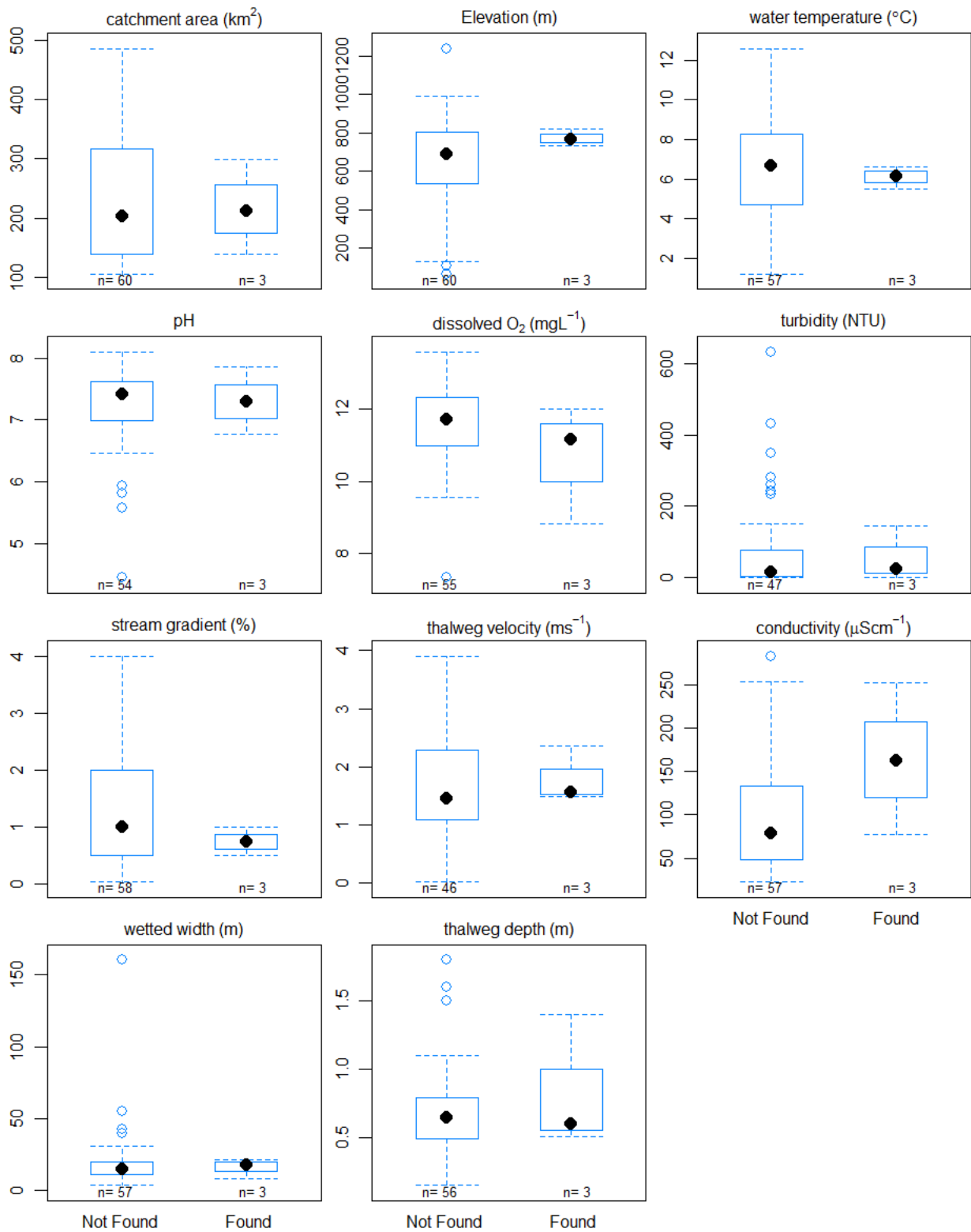
round whitefish - Medium Streams (100-500 km²)



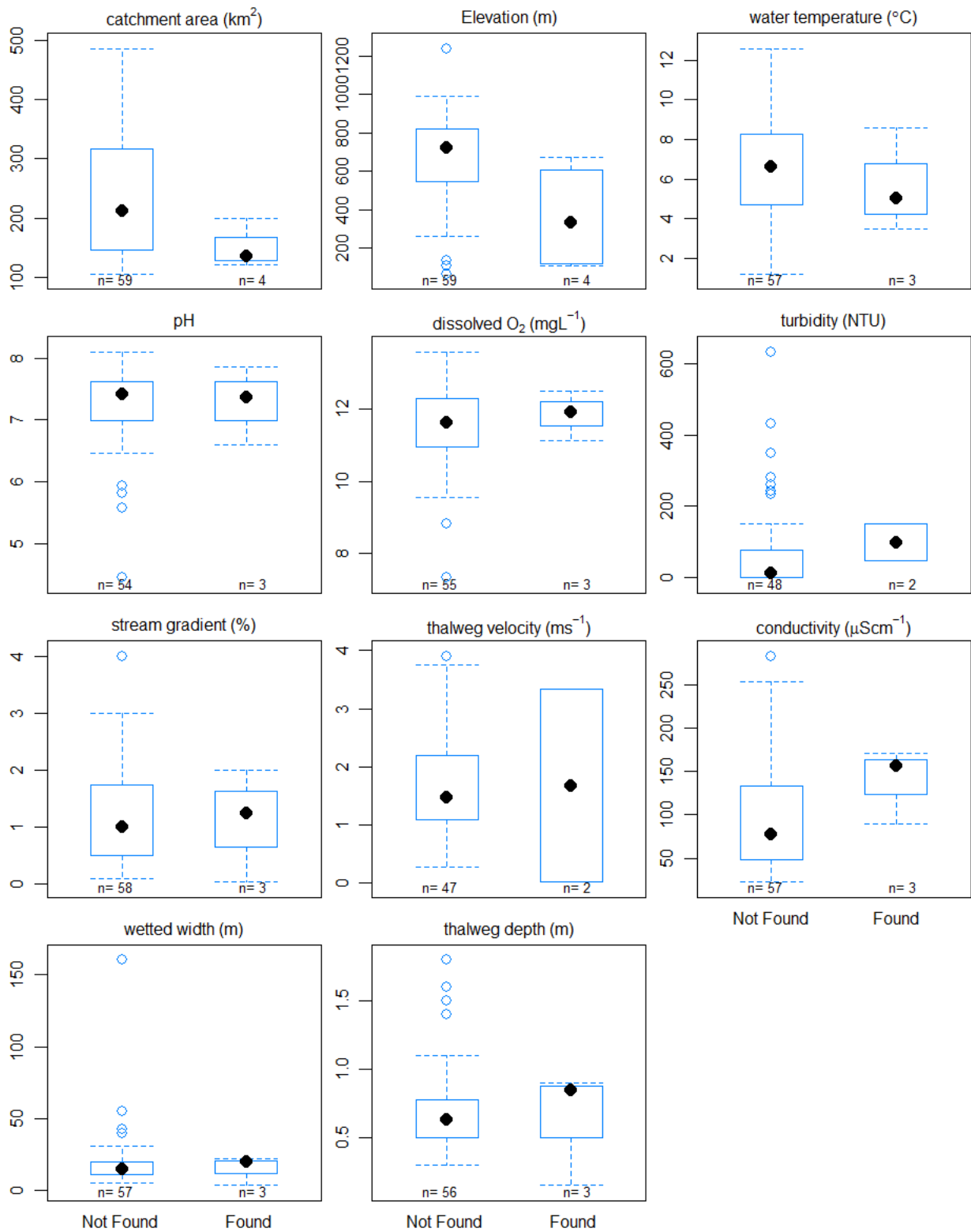
Arctic grayling - Medium Streams (100-500 km²)



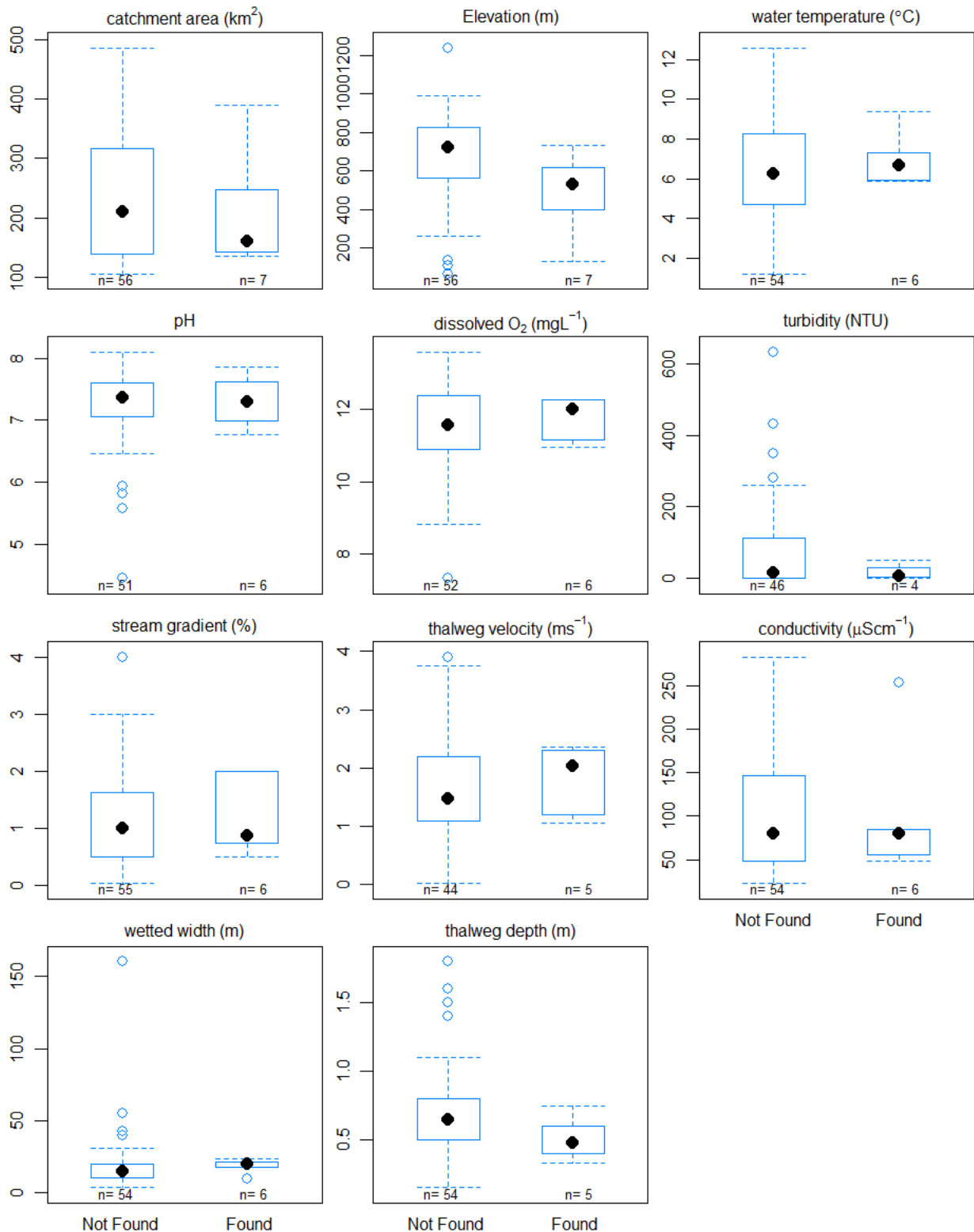
rainbow trout - Medium Streams (100-500 km²)



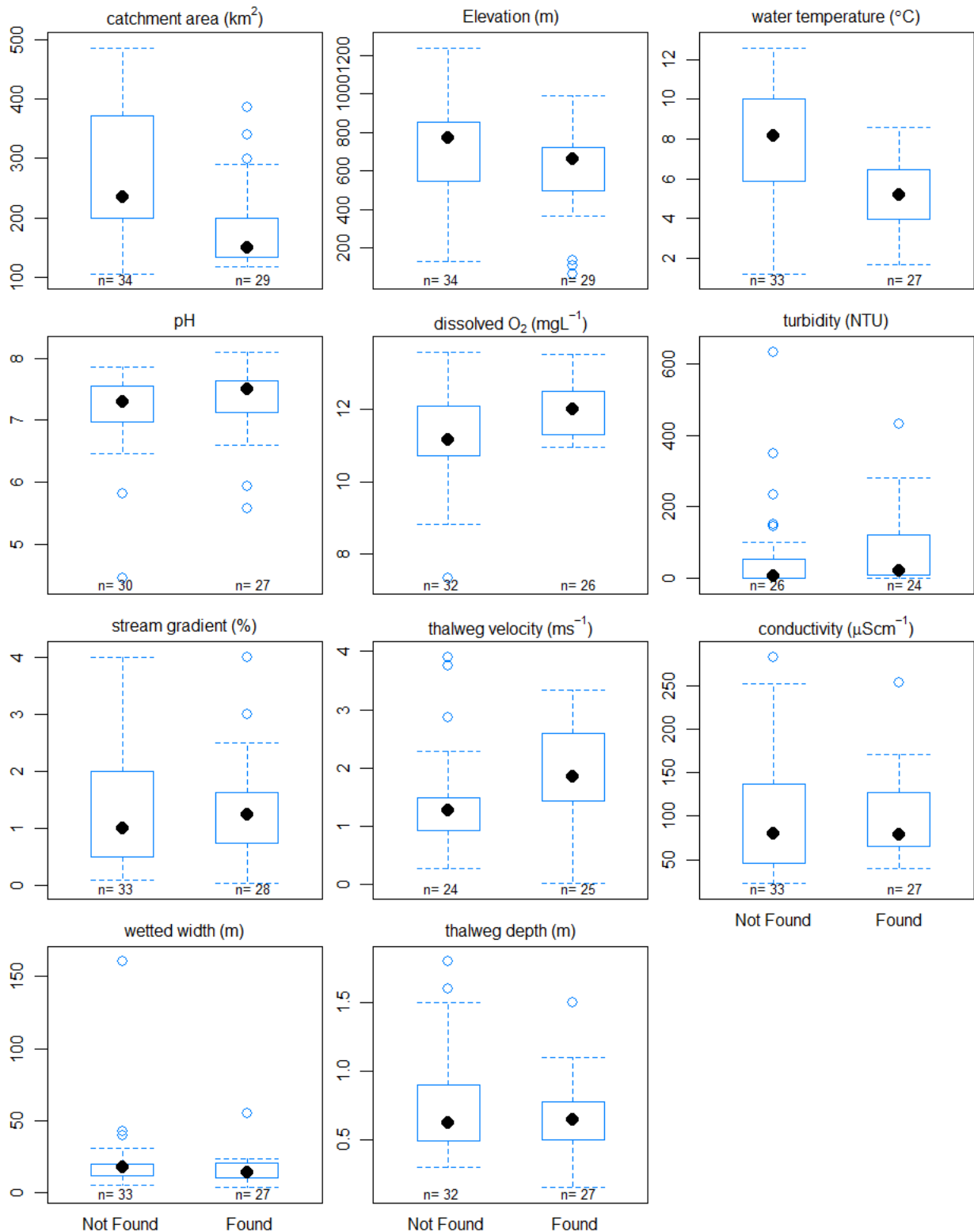
sockeye salmon - Medium Streams (100-500 km²)



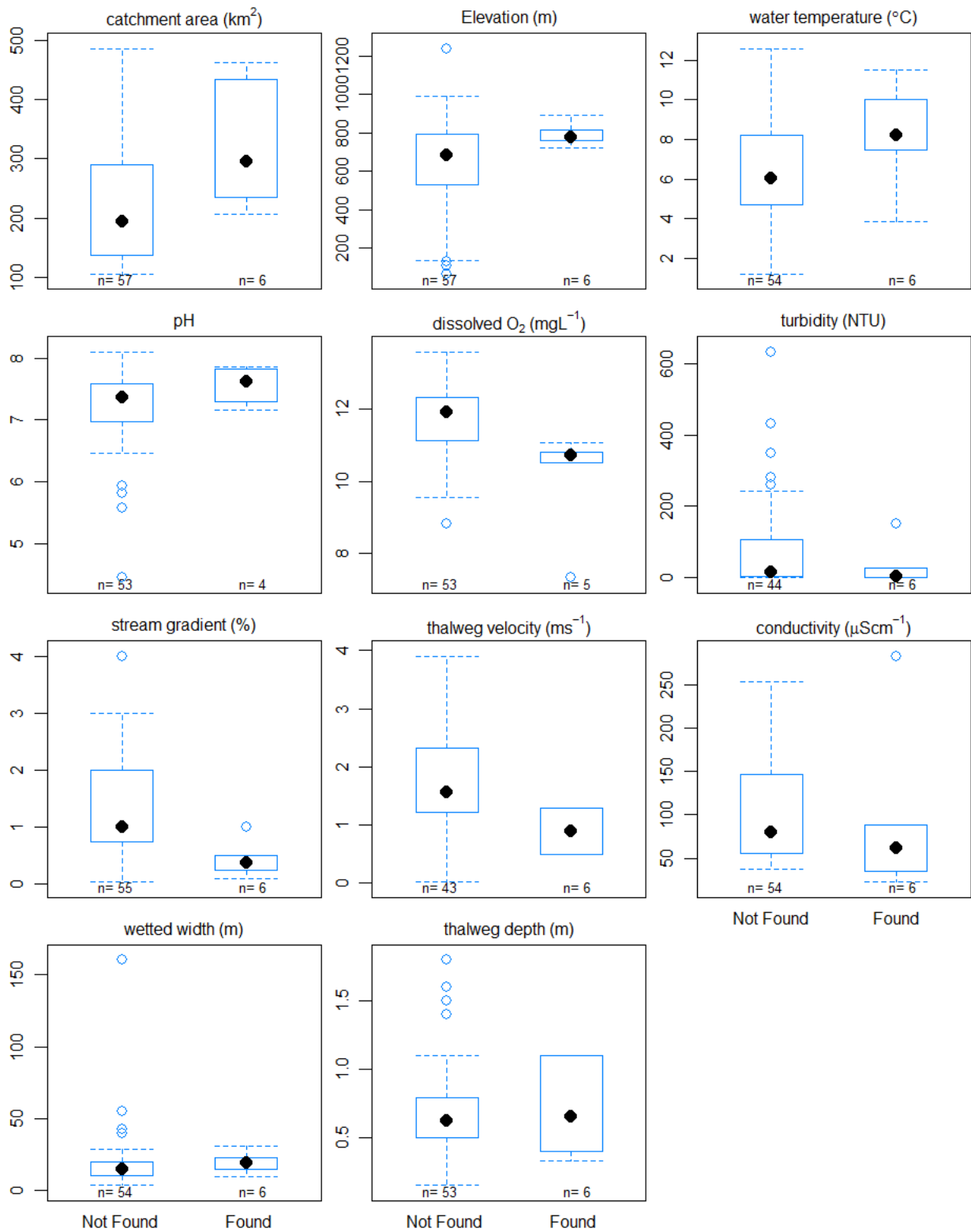
Chinook salmon - Medium Streams (100-500 km²)



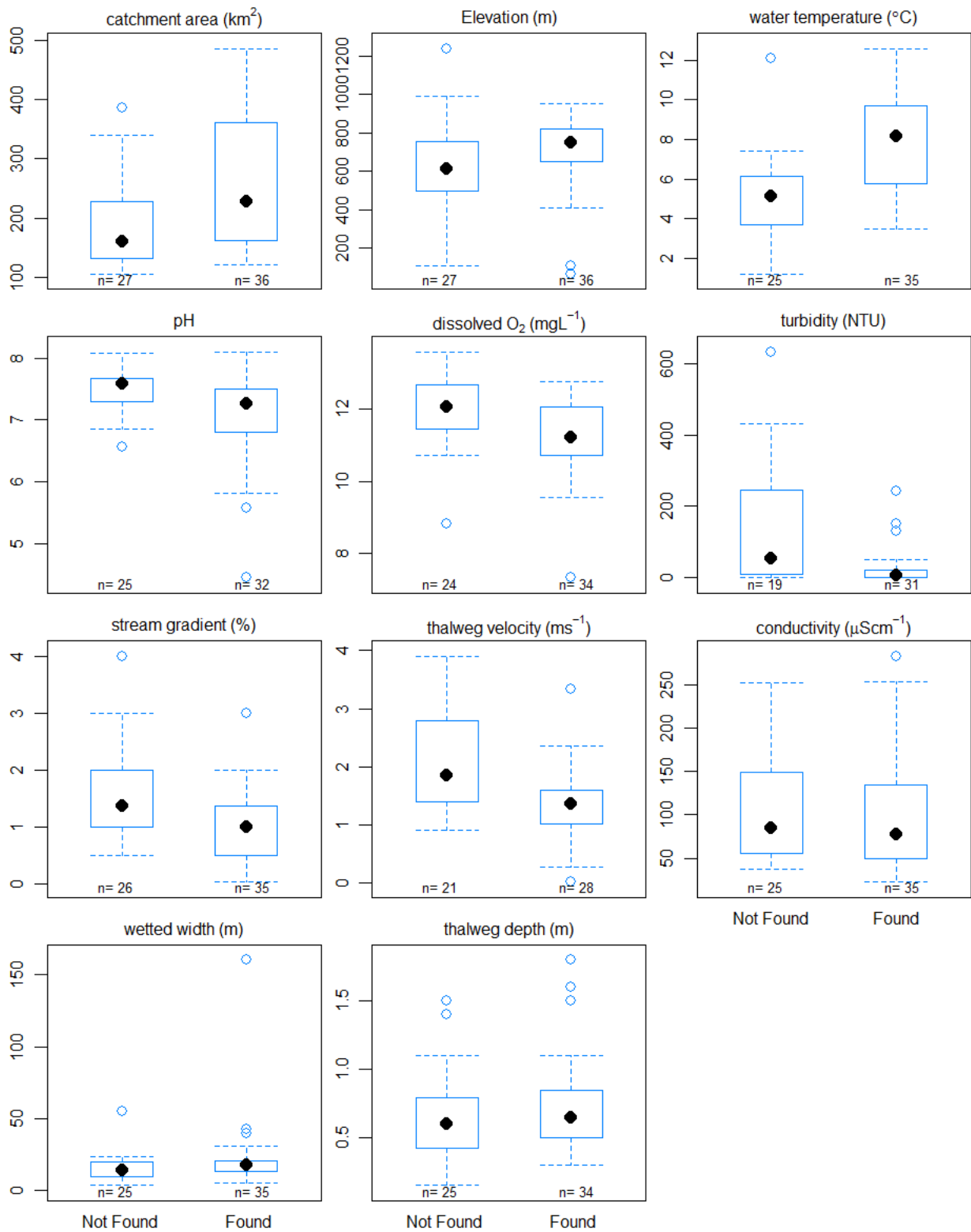
Dolly Varden - Medium Streams (100-500 km²)



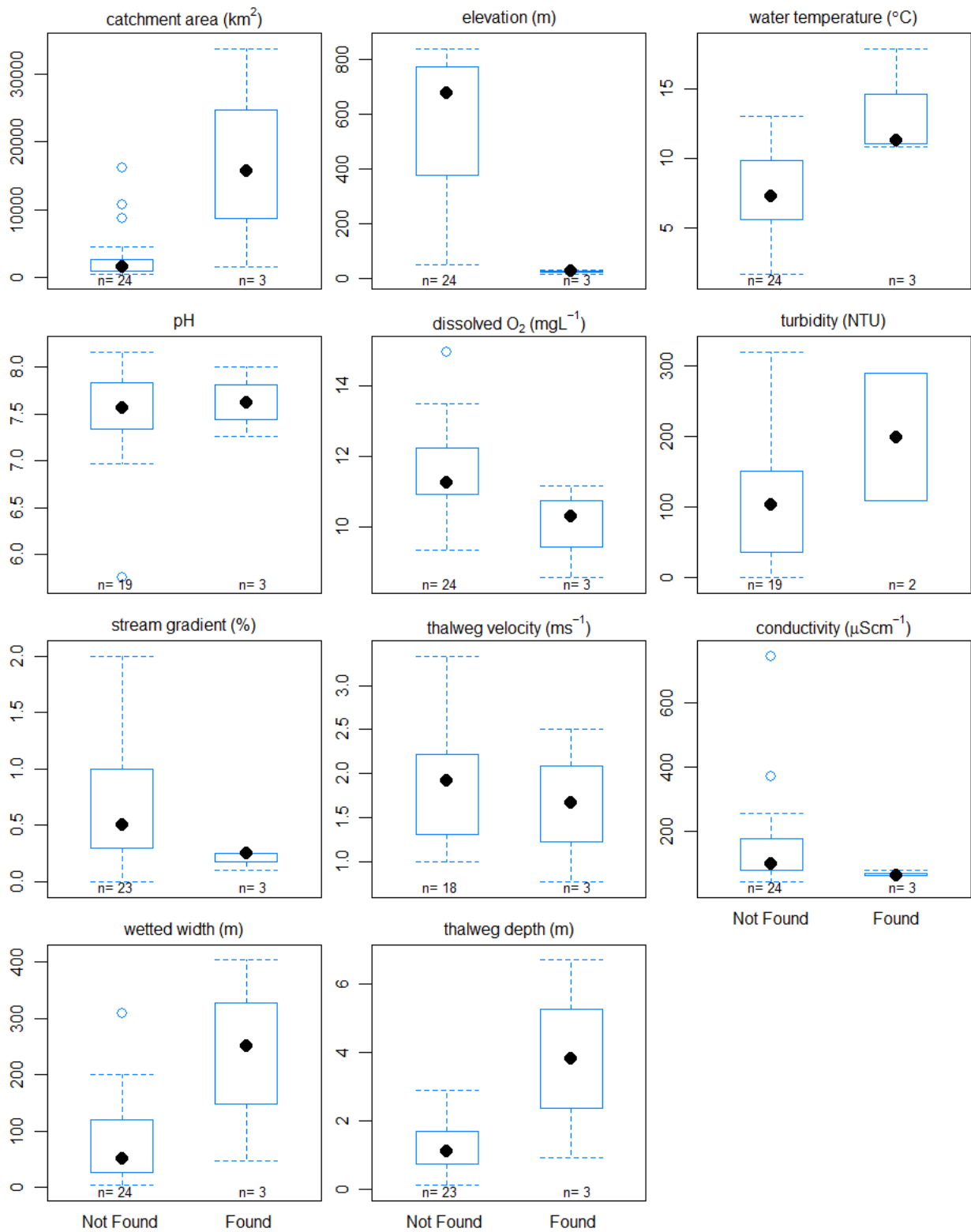
burbot - Medium Streams (100-500 km²)



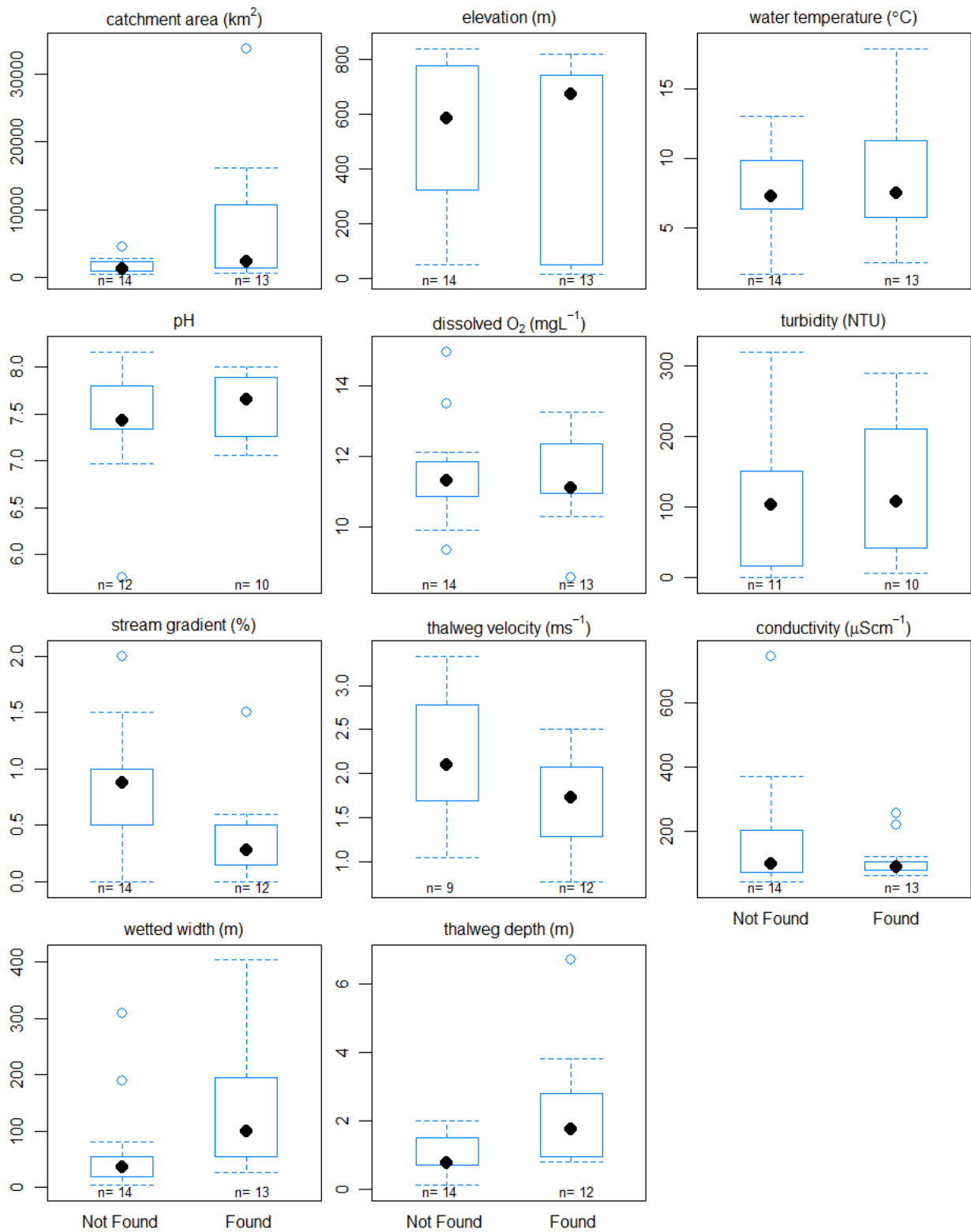
slimy sculpin - Medium Streams (100-500 km²)



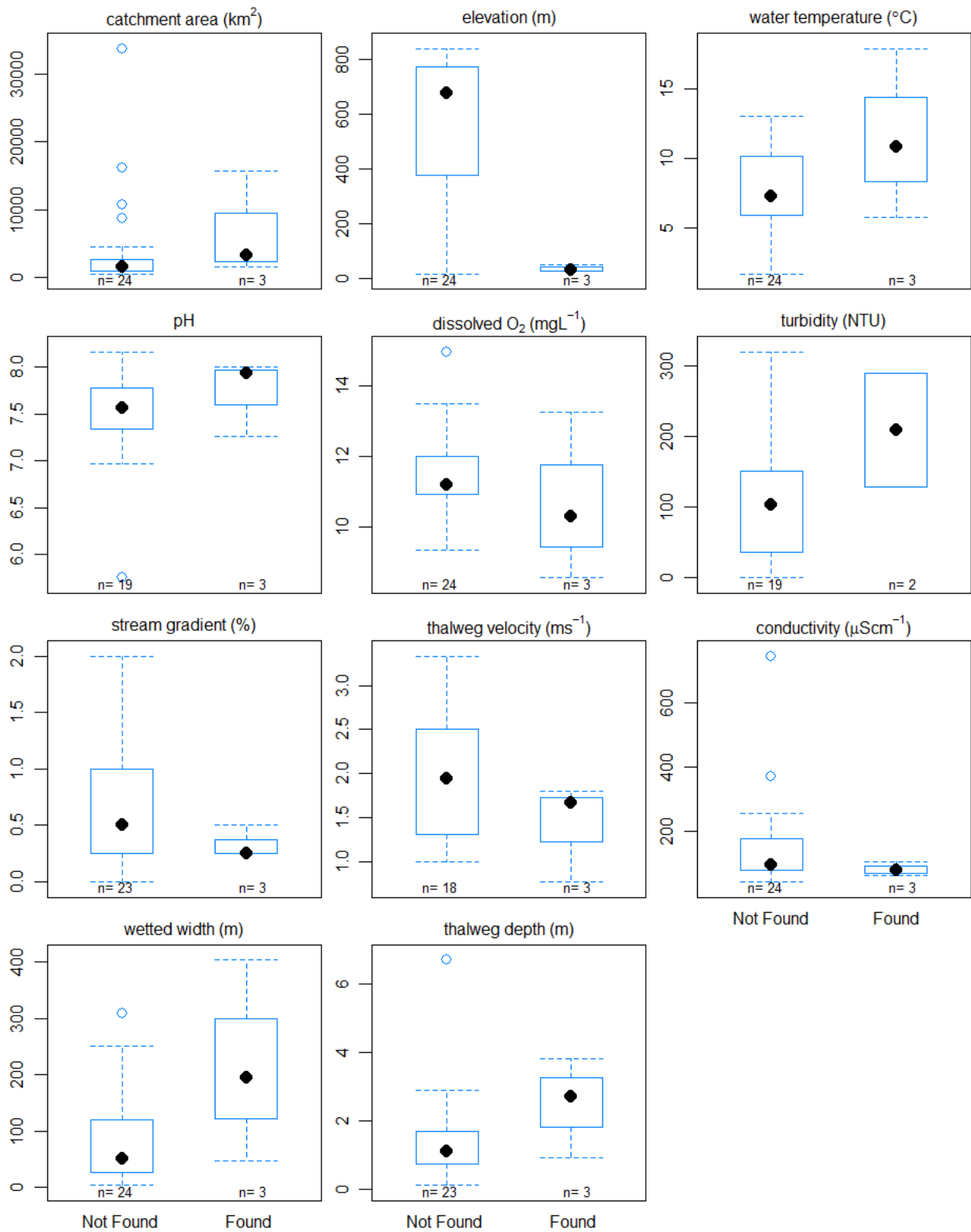
Arctic or Alaskan-brook lamprey - Large Streams (>500 km²)



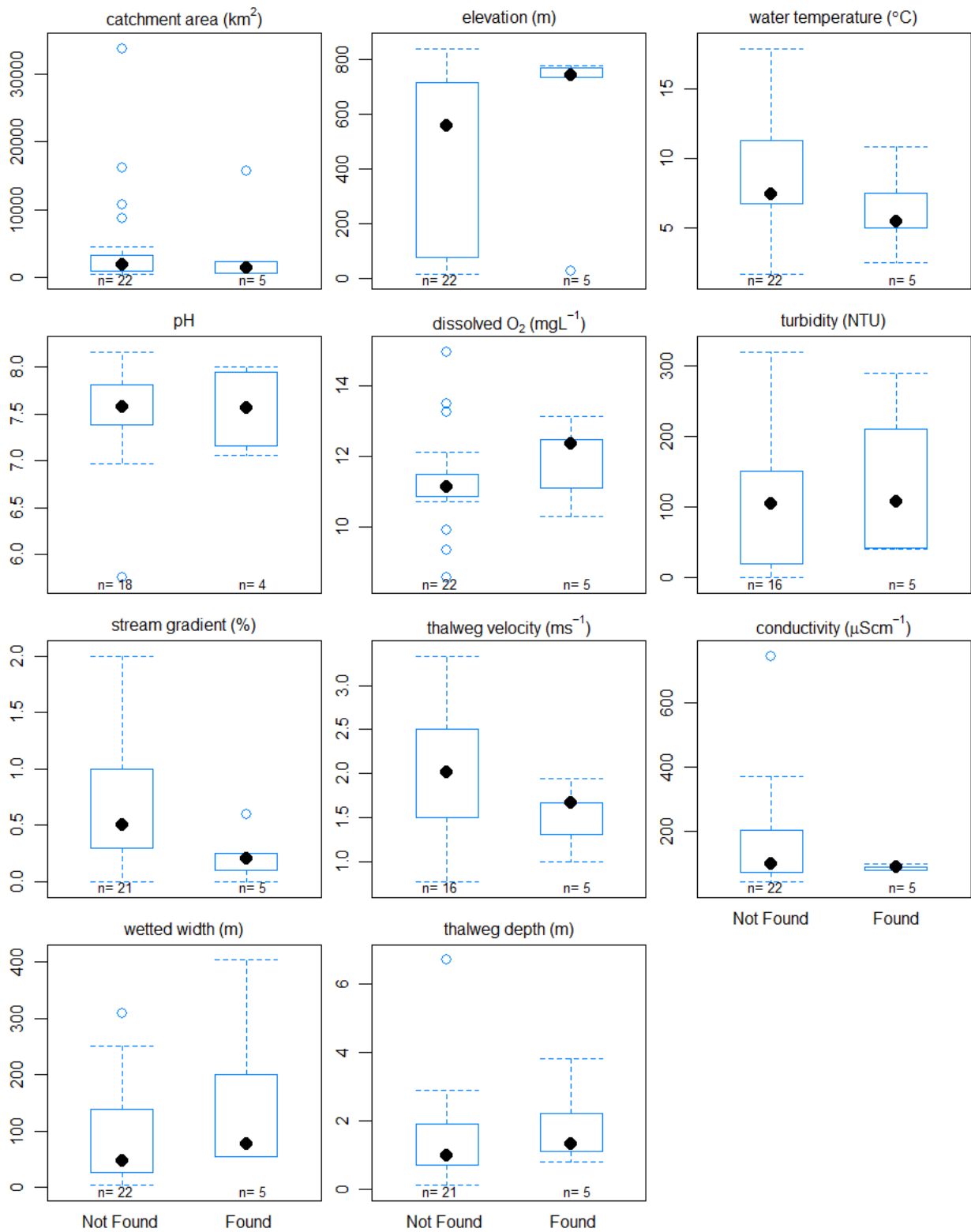
longnose sucker - Large Streams (>500 km²)



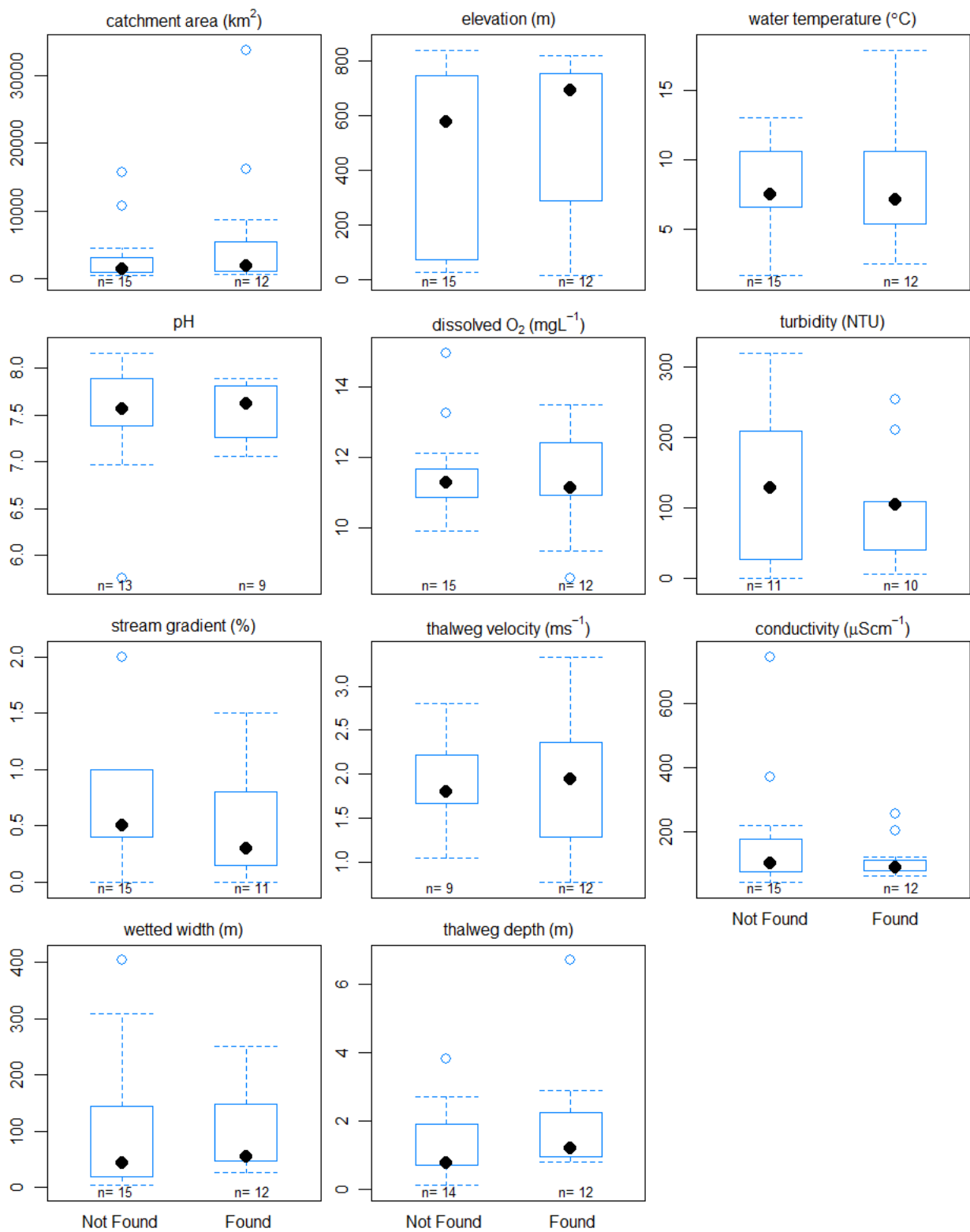
northern pike - Large Streams (>500 km²)



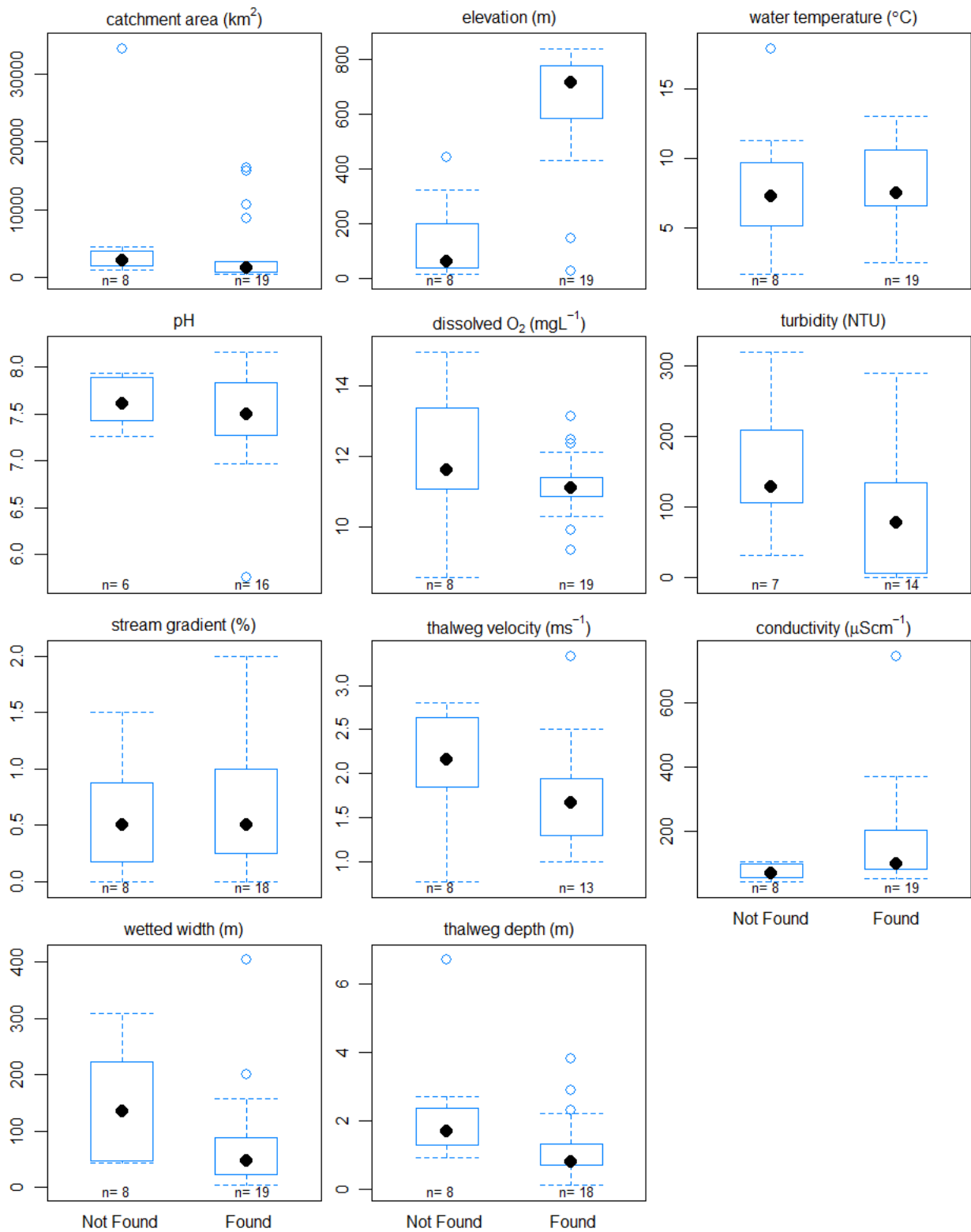
humpback whitefish - Large Streams (>500 km²)



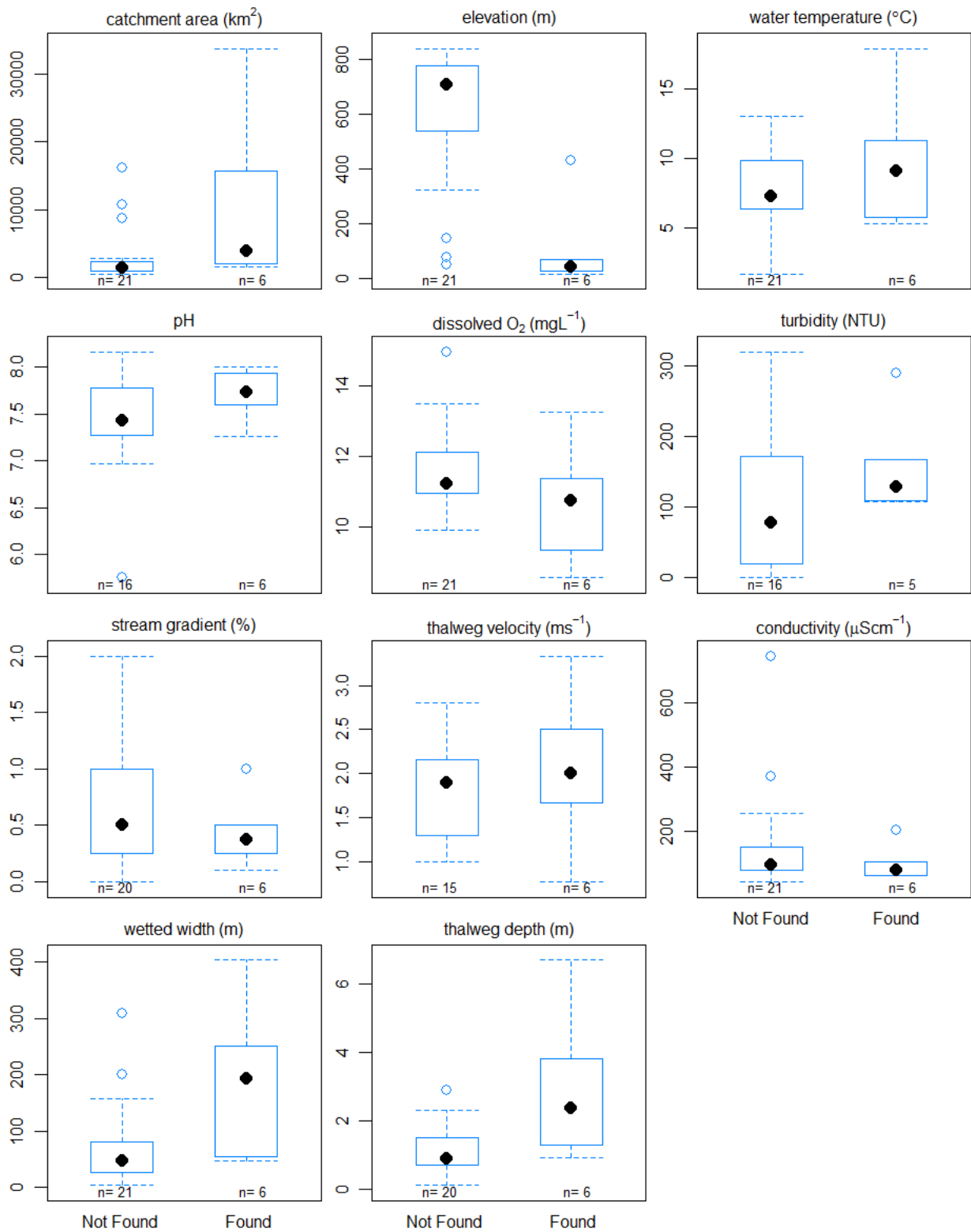
round whitefish - Large Streams (>500 km²)



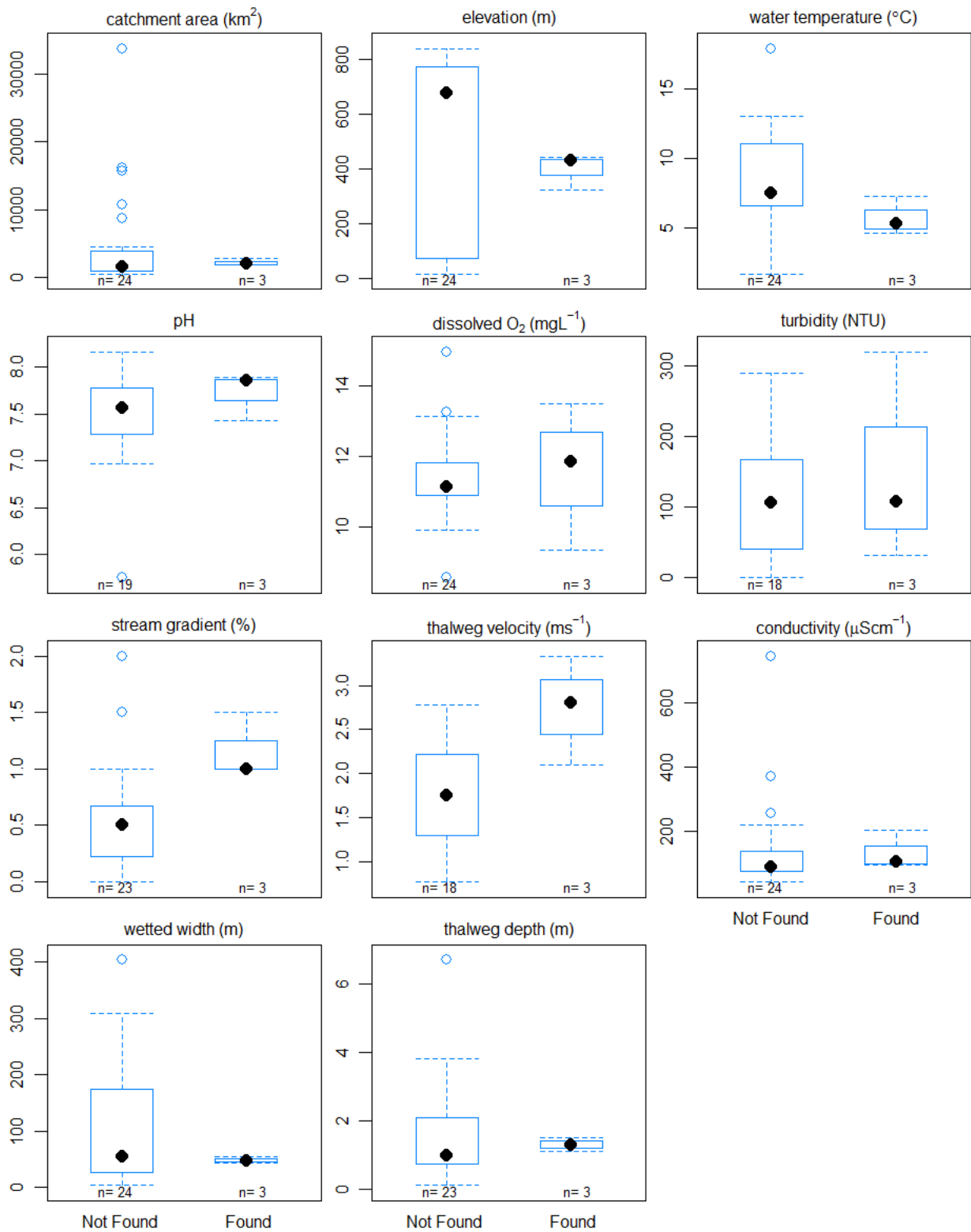
Arctic grayling - Large Streams (>500 km²)



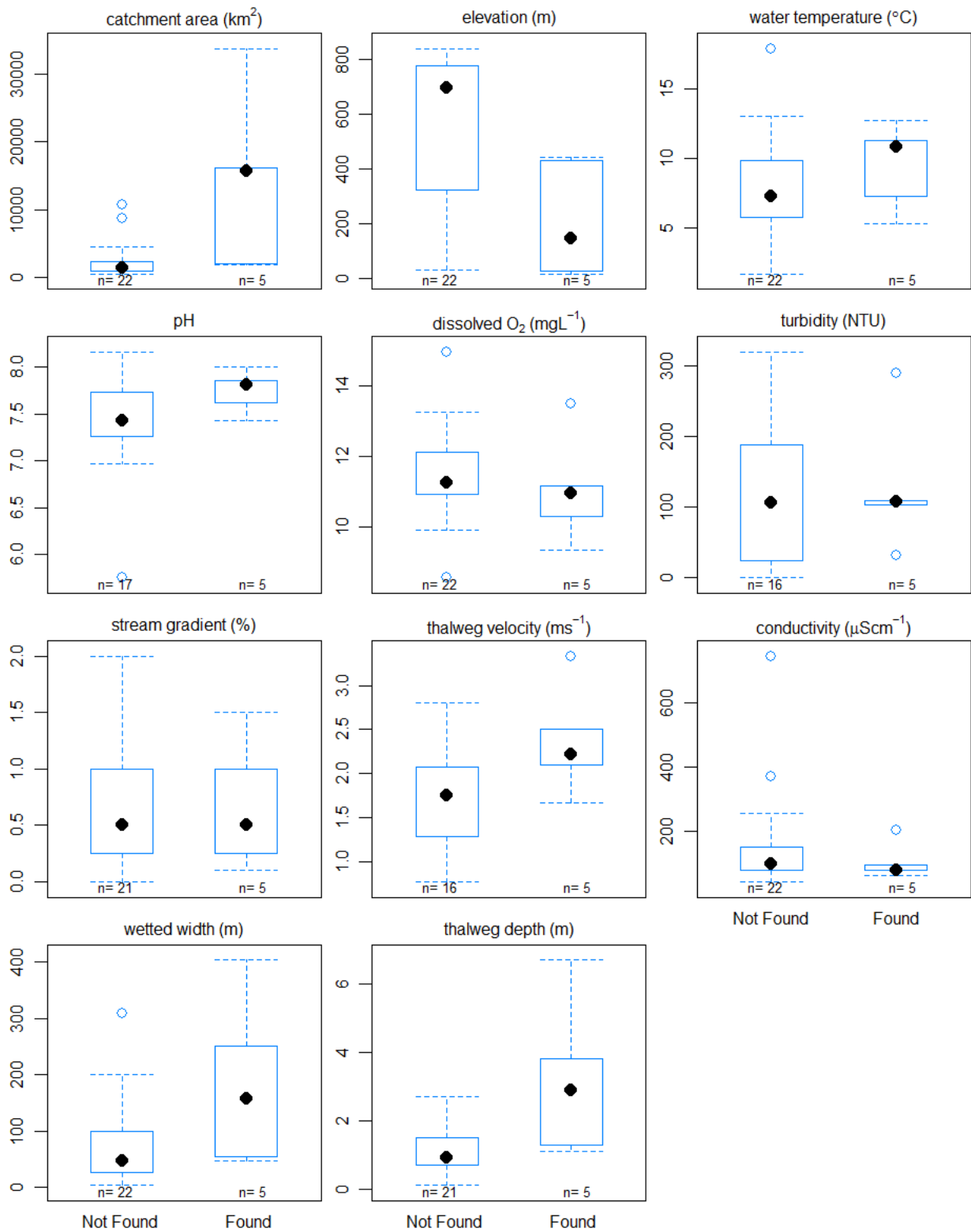
pink salmon - Large Streams (>500 km²)



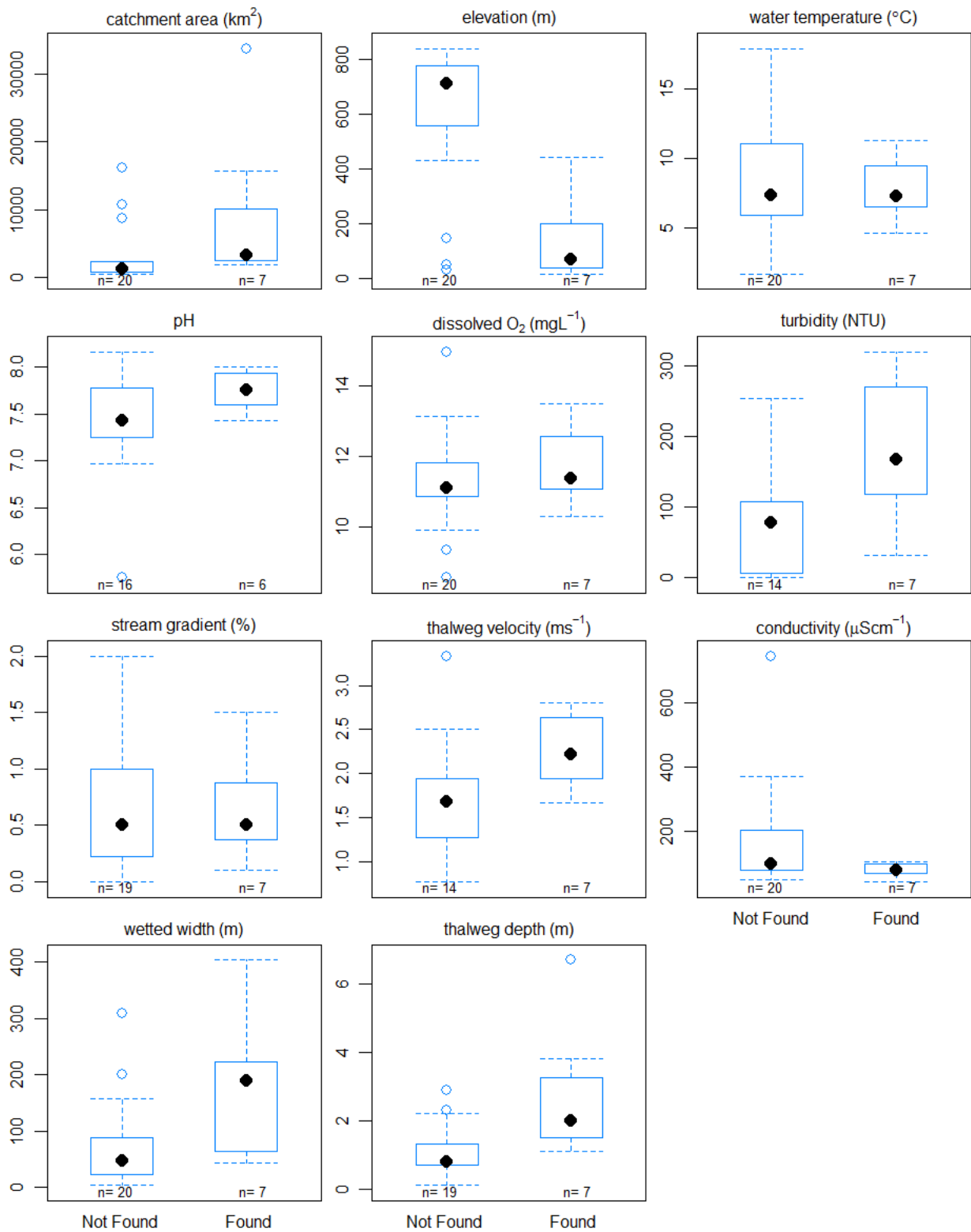
coho salmon - Large Streams (>500 km²)



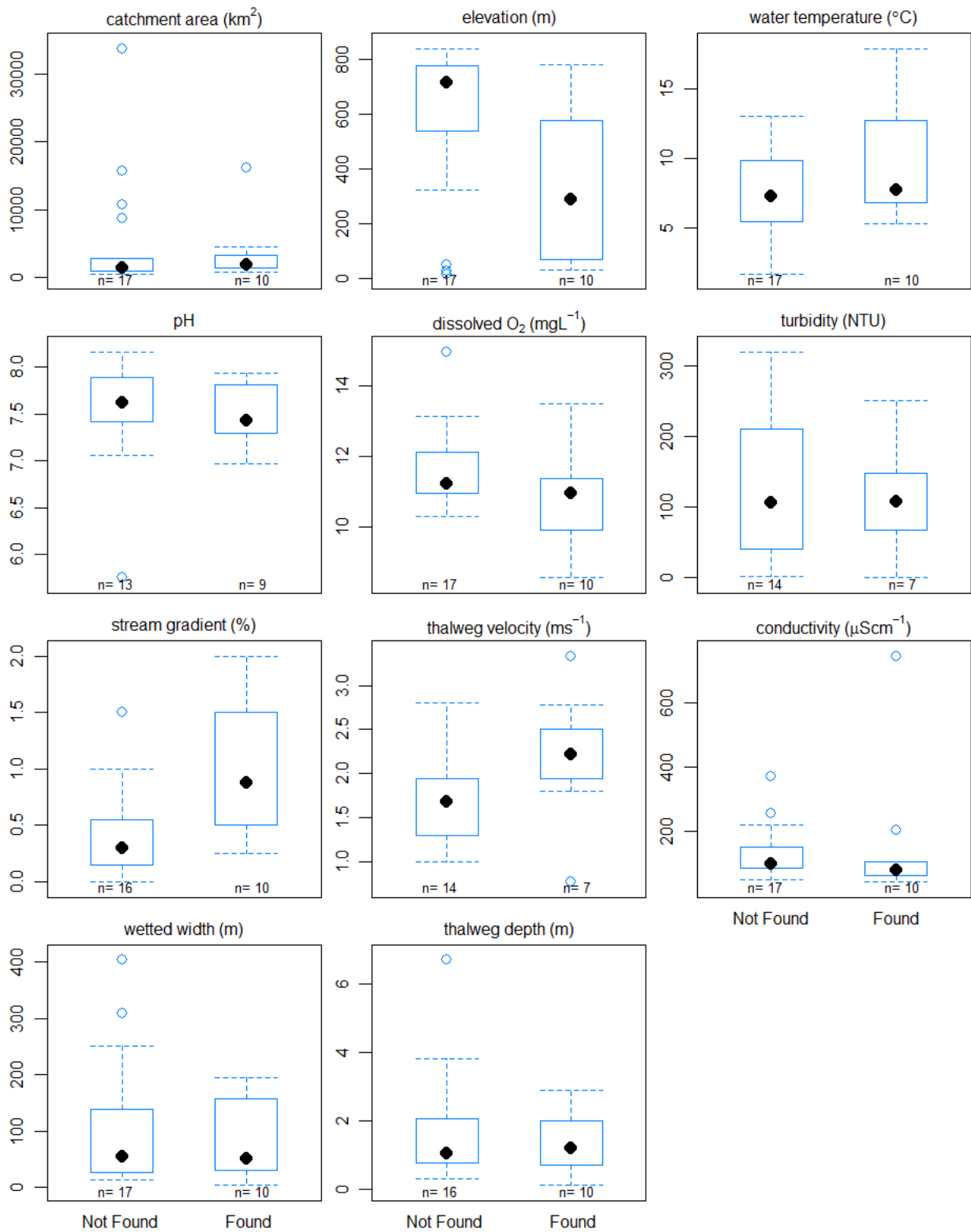
rainbow trout - Large Streams (>500 km²)



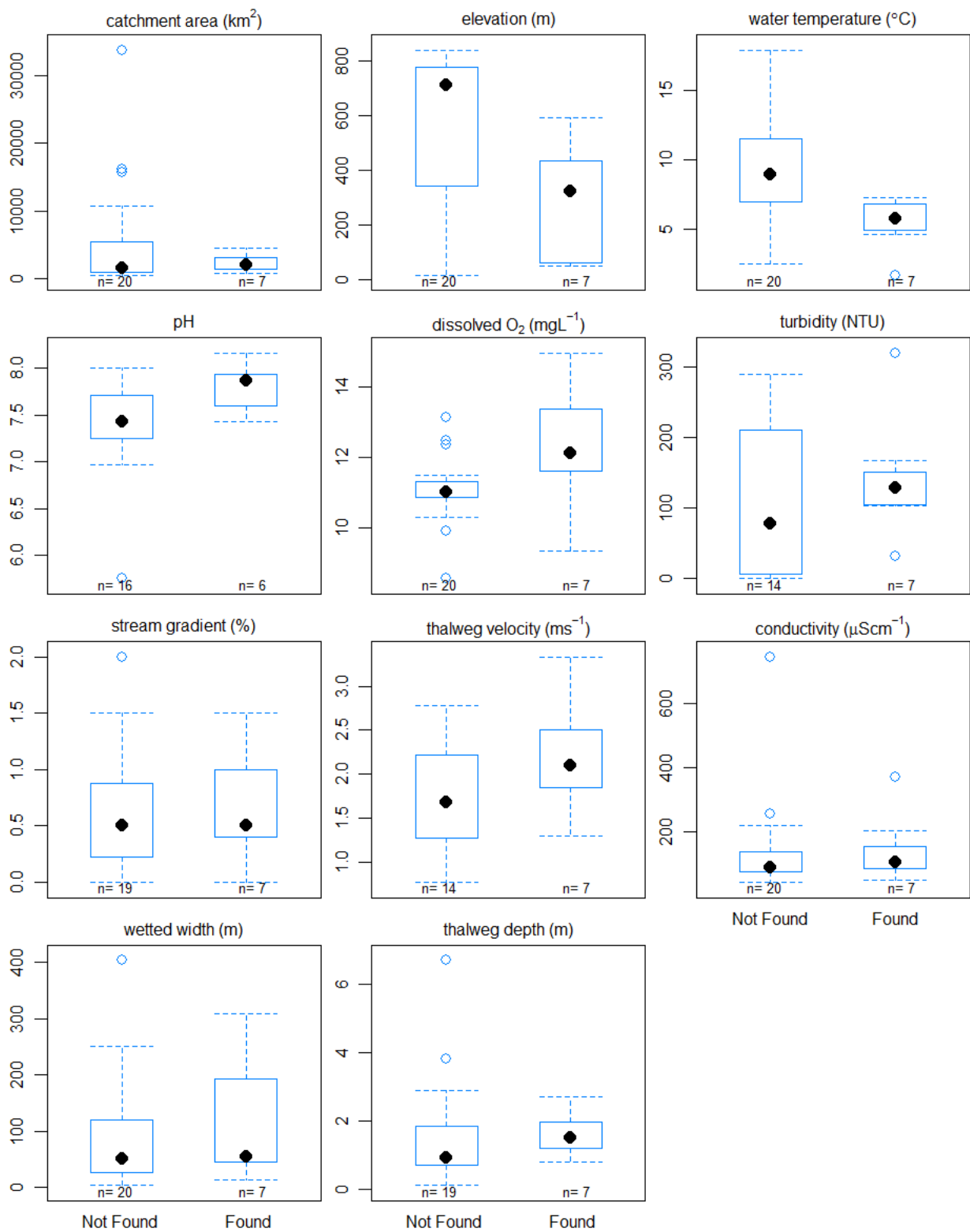
sockeye salmon - Large Streams (>500 km²)



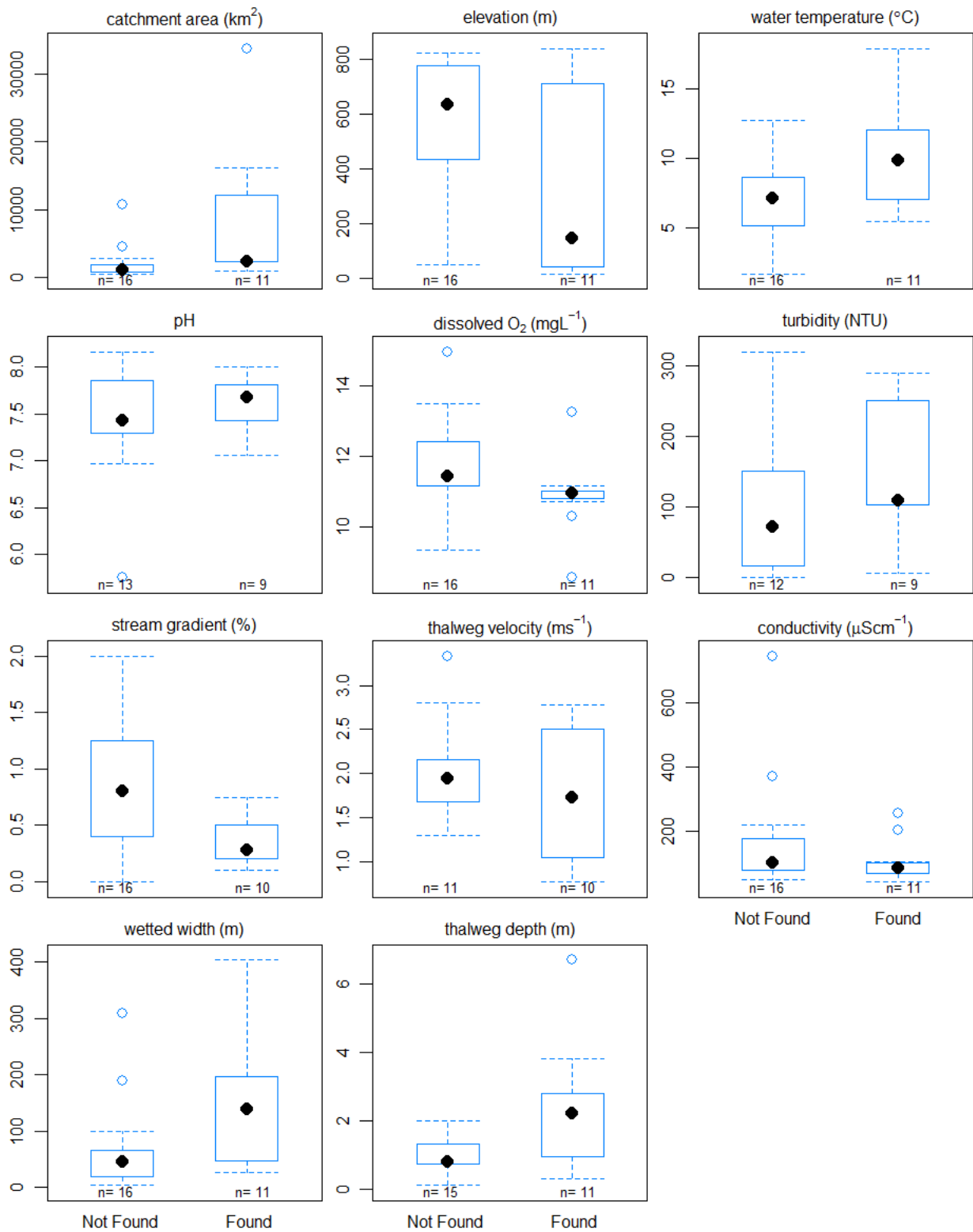
Chinook salmon - Large Streams (>500 km²)



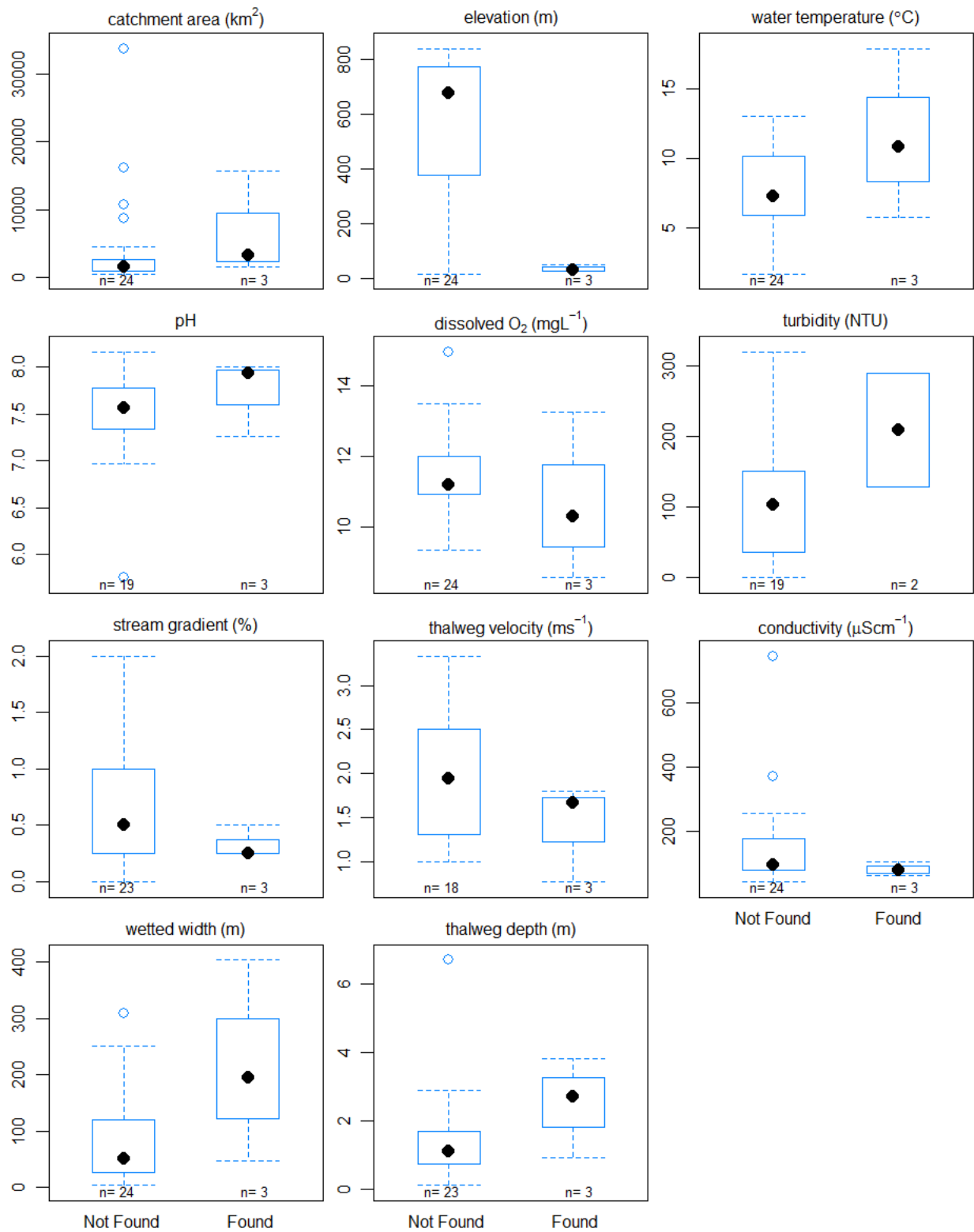
Dolly Varden - Large Streams (>500 km²)



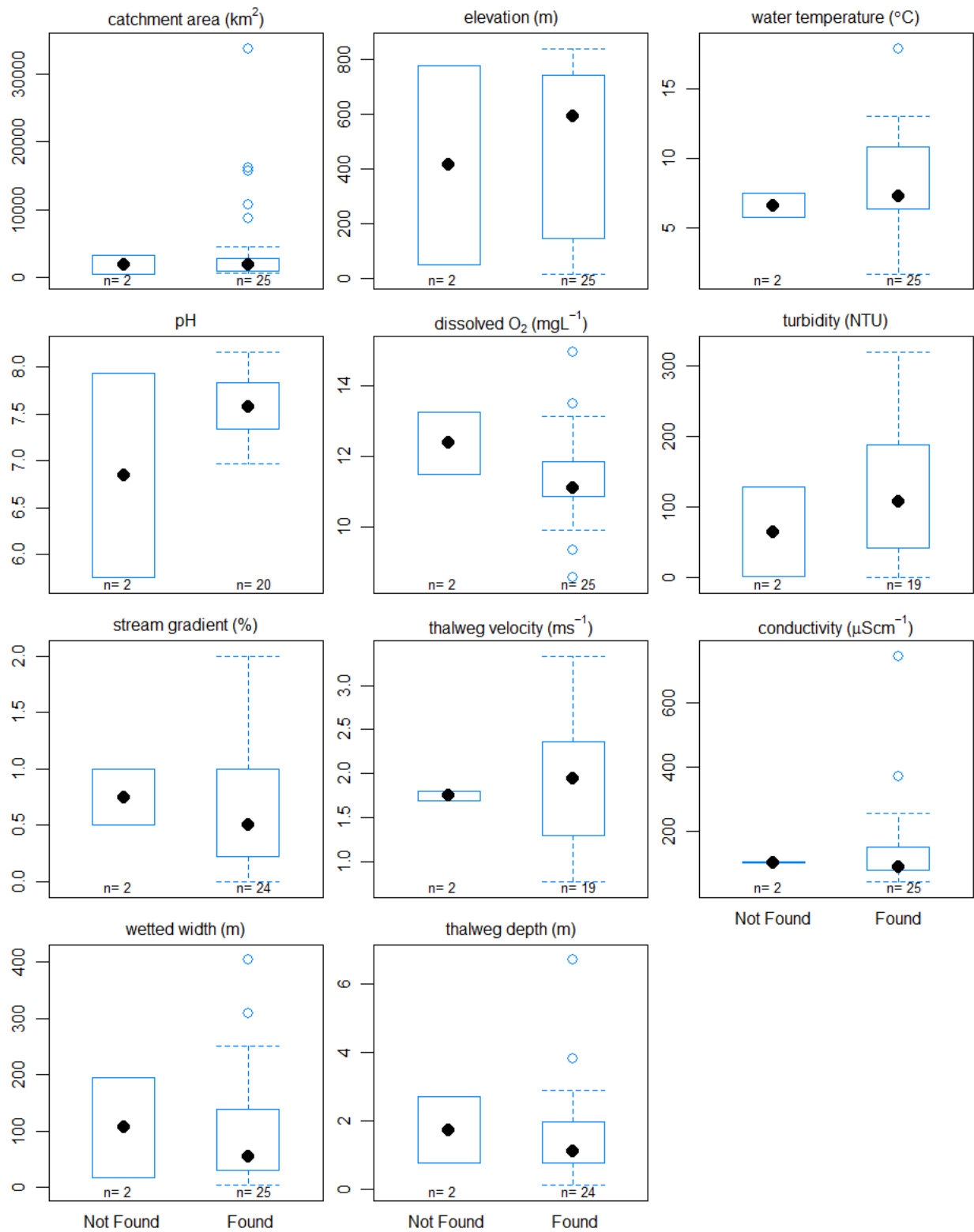
burbot - Large Streams (>500 km²)



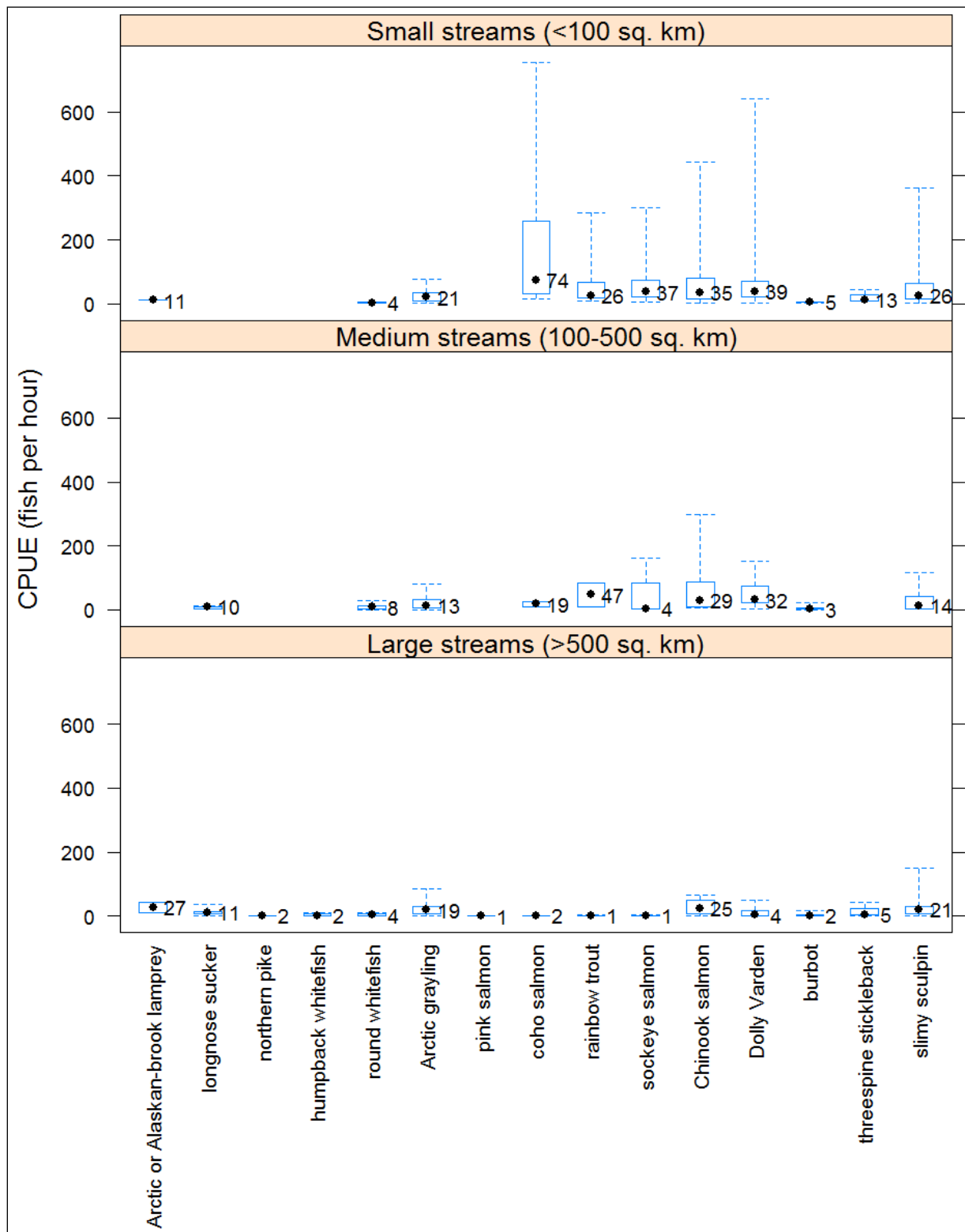
threespine stickleback - Large Streams (>500 km²)



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.	pH	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 (≤ 0.005), 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.

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.

Species	catchment area	elevation	water temp	pH	dissolved oxygen	turbidity	conductivity	stream gradient	thalweg velocity	wetted width	thalweg depth
Small ($\leq 100 \text{ km}^2$) streams											
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 ($> 500 \text{ km}^2$)											
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	~	~	~	~	~	~	~	~	~	~	~

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 not 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).

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

Species ^a	LAC	NOS	PIK	WHB	WRN	GRA	SPI	SCO	TRB	SSE	SCK	CDV	GBR	KTS	USL
Small streams (≤ 100 km², $n = 138$ sites)															
<i>n</i>	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 streams (100–500 km², $n = 57$ sites)															
<i>n</i>	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 streams (≥ 500 km², $n = 27$ sites)															
<i>n</i>	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

^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**

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

Species	Date collected	Station ID	Fish tag number	Fin-clip vial 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
northern pike humpback whitefish	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 fin
	08/06/2011	FSS1104A01	T000405	157026	rt. pectoral fin
			T000410	157030	rt. pectoral fin
			T000408	157032	rt. pectoral fin
	08/08/2011	FSS1106A01	T000432	157056	rt. pectoral fin
	07/20/2011	FSS1108D01	157092	-	-
	07/15/2011	FSS1105D01	^{cd}	05D01_3	rt. pelvic fin
	08/08/2011	FSS1106A01	T000406	157050	rt. pectoral fin
			T000425	157051	rt. pectoral fin
			T000417	157052	rt. pectoral fin
			T000431	157053	rt. pectoral fin
			T000415	157054	rt. pectoral fin
			T000416	157055	rt. pectoral fin
			06A01_1	-	-
			06A01_3	-	-
			^c	157076	rt. pectoral fin
			^c	06A01_4	rt. pectoral fin
			^c	157078	rt. pectoral fin
			^c	06A01_6	rt. pectoral fin
	08/09/2011	FSS1107A01	07A01_1	-	-
			07A01_2	-	-
			^c	07A01_3	rt. pectoral fin
			^c	07A01_4	rt. pectoral fin
			^c	07A01_5	rt. pectoral fin
		FSS1107B01	^c	157073	rt. pectoral fin
			^c	157074	rt. pectoral fin
			^c	157075	rt. pectoral fin
			^c	157079	rt. pectoral fin
			^c	157077	rt. pectoral fin
pygmy whitefish	08/17/2011	FSS1115A01	T000447	157072	rt. pectoral fin

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Appendix II.—Page 2 of 4.

Species	Date collected	Station ID	Fish tag number	Fin-clip vial 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	
	08/05/2011	FSS1102C04	T000388	157012	rt. pectoral fin	
		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	

-continued-

Appendix I1.–Page 3 of 4.

Species	Date collected	Station ID	Fish tag number	Fin-clip vial number	Fin clipped
rainbow trout	07/15/2011	FSS1105D01	05D06	05D06	rt. pelvic fin
Chinook salmon	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
Dolly Varden	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	157045	rt. pectoral fin
			T000428	157046	rt. pectoral fin
			T000433	157047	rt. pectoral fin
			T000424	157048	rt. pectoral fin
			T000434 ^f	157049	rt. pectoral fin
burbot	08/14/2011	FSS1112A01	^g	157071	rt. pectoral fin
	07/15/2011	FSS1105D01	05D04	05D04	rt. pelvic fin
			05D05	05D05	rt. pelvic fin
	07/19/2011	FSS1106D01	157074	-	-
	07/20/2011	FSS1108D01	157093	-	-
	08/05/2011	FSS1103A01	T000452	157016	rt. pectoral fin
			T000376	157017	rt. pectoral fin
			T000453	157018	rt. pectoral fin
		FSS1103B01	T000414	157023	rt. pectoral fin
			T000454	157024	rt. pectoral fin
			T000404	157025	rt. pectoral fin
			T000401	157029	rt. pectoral fin
	08/06/2011	FSS1104A01	T000401	157029	rt. pectoral fin

-continued-

Appendix I1.–Page 4 of 4.

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
threespine stickleback	08/12/2011	FSS1110A01	T000445	157070	rt. pectoral fin
	07/12/2011	FSS1102D01	02D01_1	02D01_1	rt. pelvic fin
			02D01_2	02D01_2	rt. pelvic fin
slimy sculpin	07/15/2011	FSS1105D01	05D01_1	05D01_1	rt. pelvic fin
	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 fin
			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 fin

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.

Appendix I2.—Otoliths sent to USFWS, Fairbanks.

Species	Date collected	Station ID	Otolith vial number	Fin clip vial number ^a
Dolly Varden	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
			653	b
	09/12/2011	FSS1126C02	654	b
			655	b
			656	b
			657	b
			644	b
			645	b
	09/14/2011	FSS1128C08	644	b
	09/19/2011	FSS1129C01	645	b
			666	b
Humpback whitefish	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_3
			07A01_4	07A01_4
			07A01_5	07A01_5
		FSS1107B01	07B01_1	157073
			07B01_2	157074
			07B01_3	157075
			07B01_4	157079
			07B01_5	157077

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.

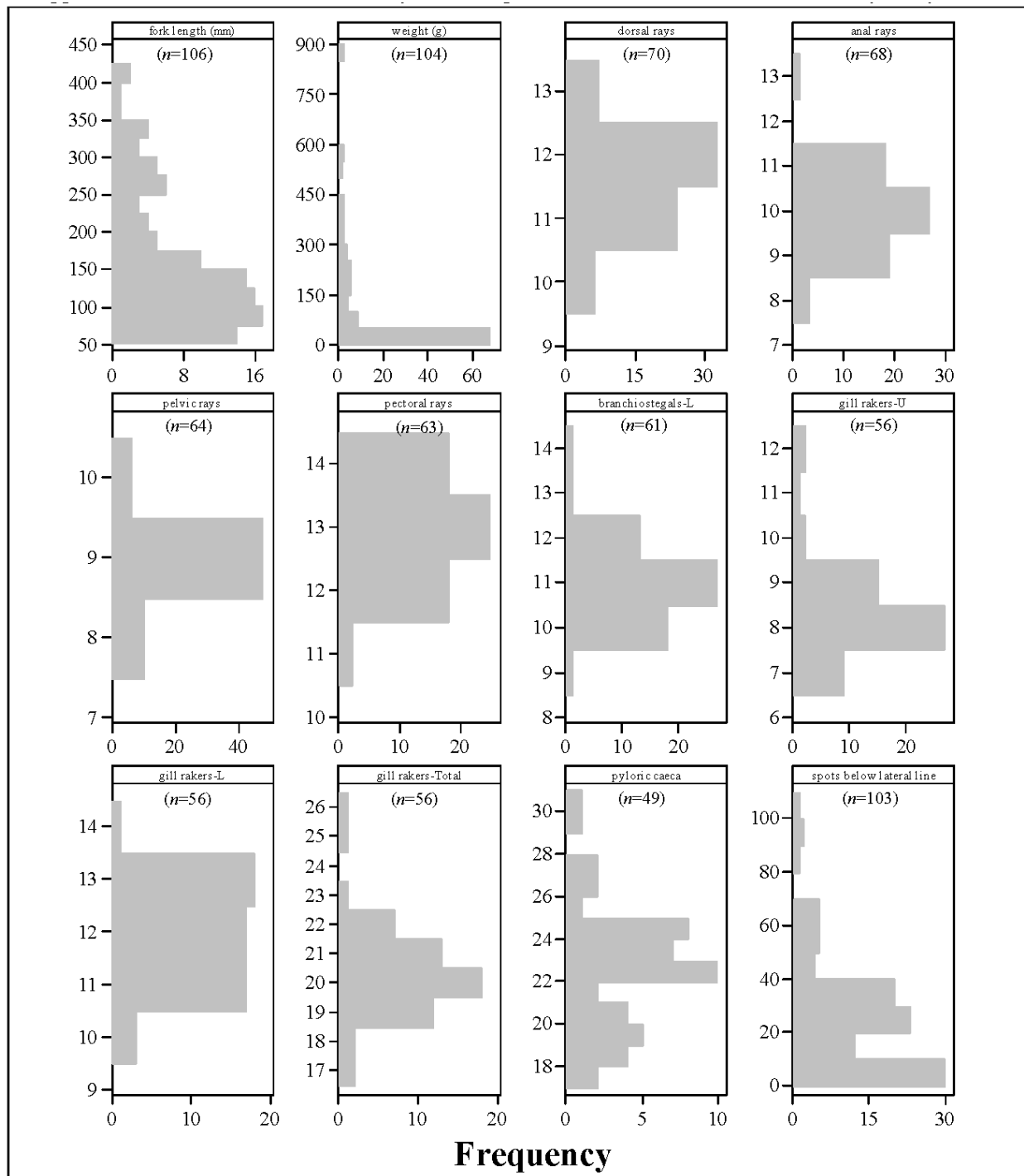
Appendix I3.—Dolly Varden fin clips sent to USFWS Conservation Genetics Lab, Anchorage.

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		97	

Note: The right pelvic fin was clipped.

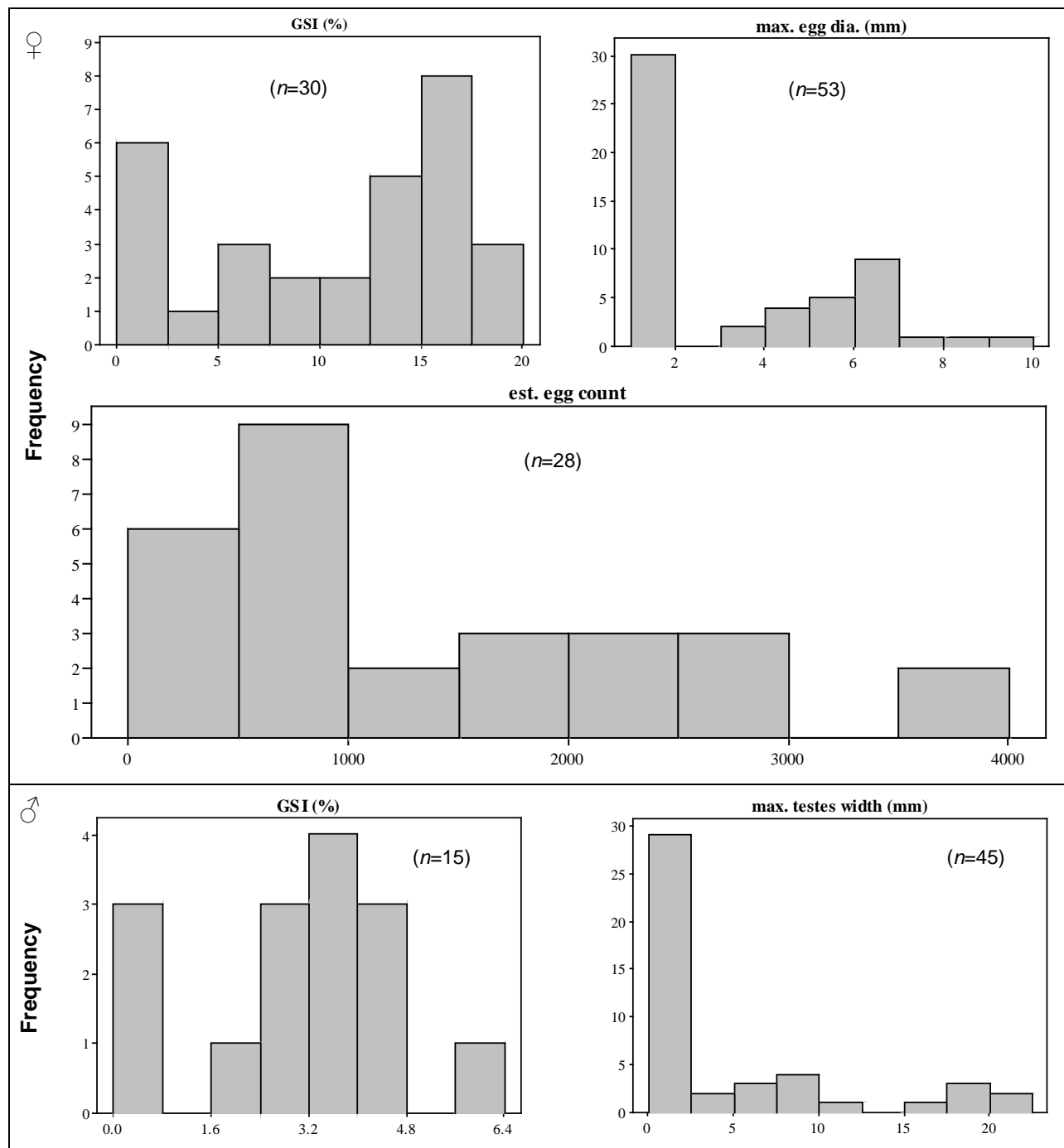
**APPENDIX J. MERISTIC AND GONAD DATA FROM
RETAINED DOLLY VARDEN AND HUMPBACK
WHITEFISH SPECIMENS**

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



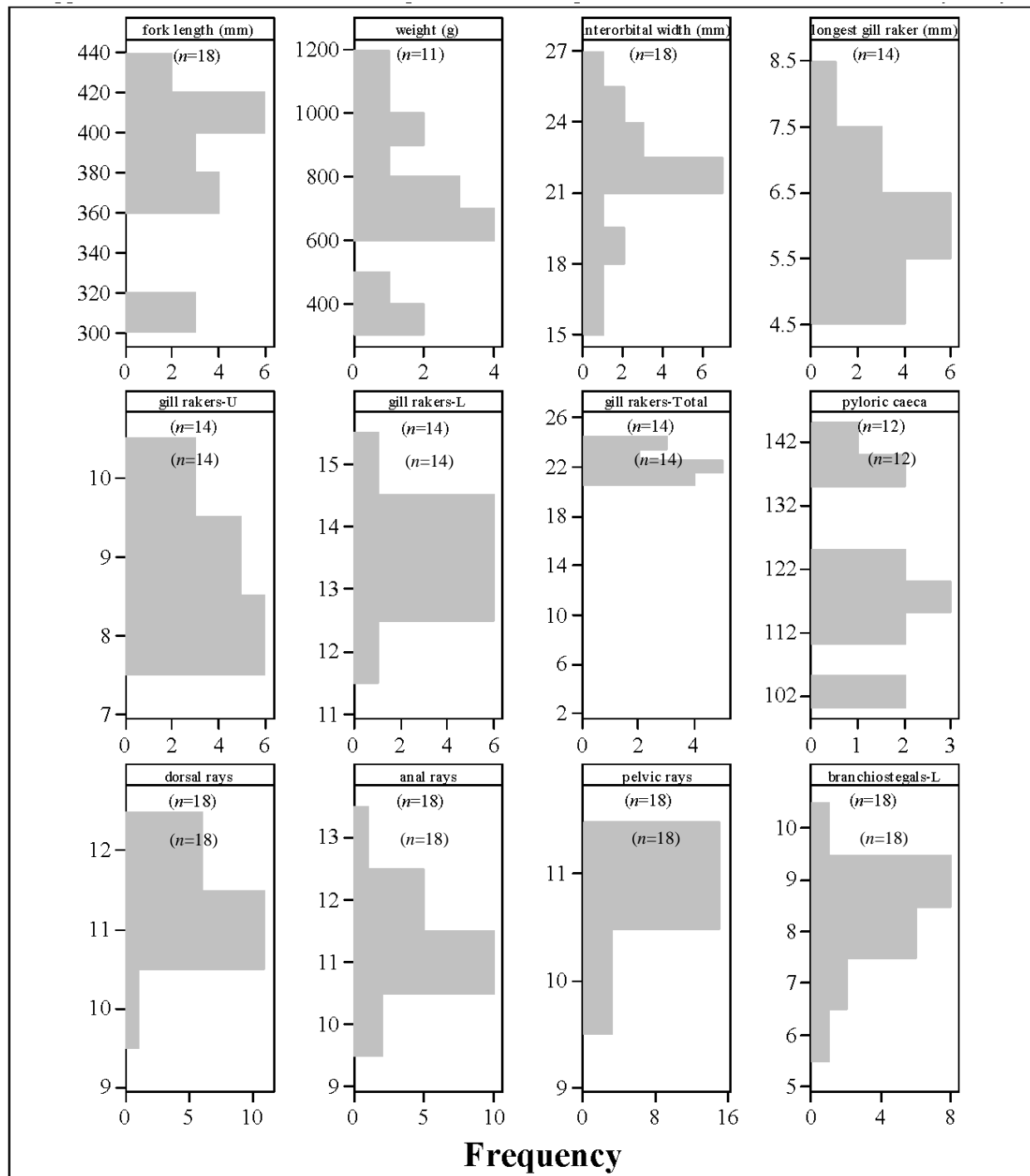
Note: Fish were previously frozen then thawed. Fin rays counted from fin on fish's left-side. Gill rakers counted from the 1st arch on the fish's right side. Rakers in the angle between the upper and lower limb were included with the lower-limb count.

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



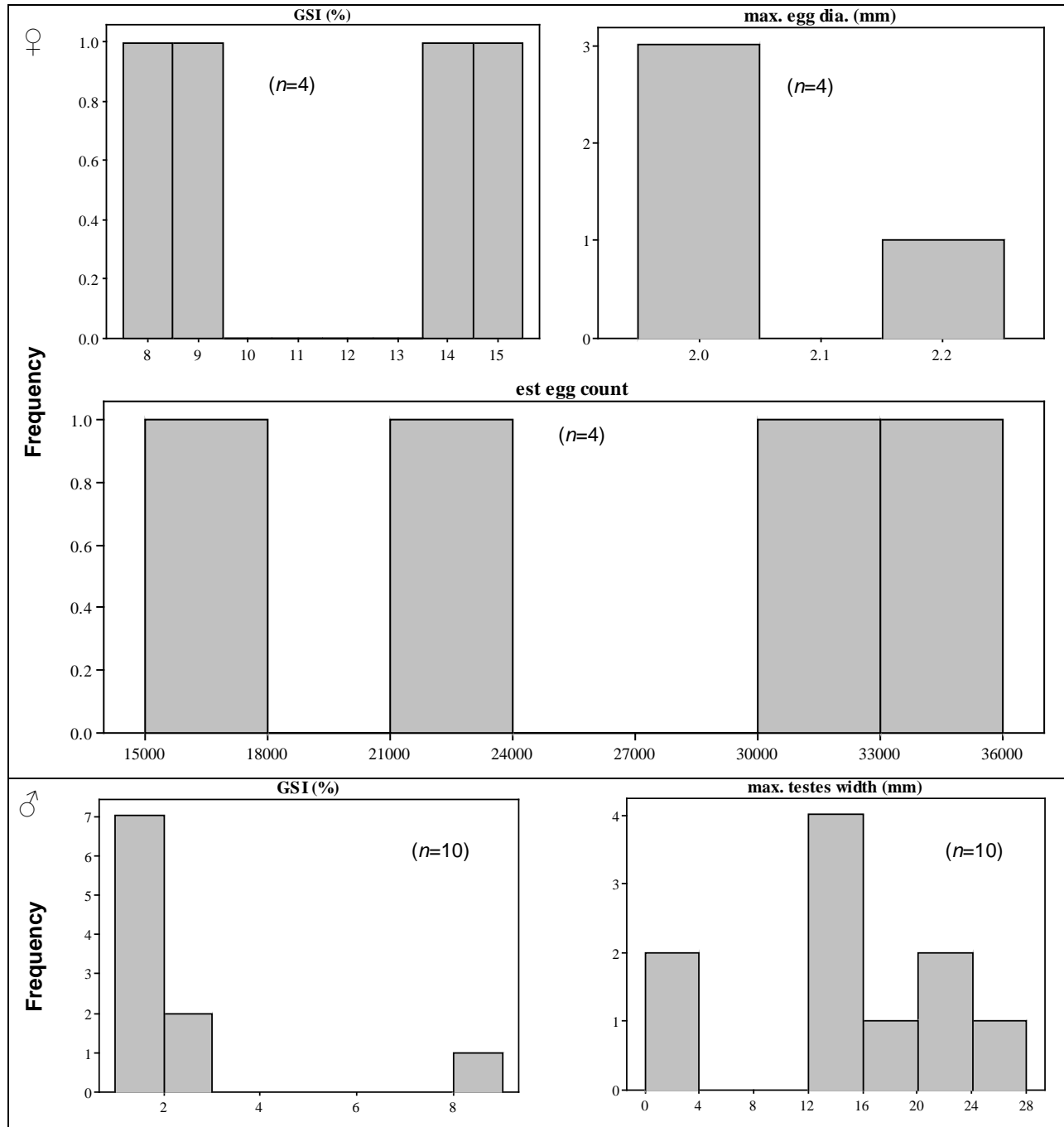
Notes: Fish were previously frozen, then thawed. Top panel shows gonad data for female, and bottom panel male, specimens. *GSI* (gonado-somatic index) is gonad mass as a percent of total body mass. Egg count was estimated as total ovary weight \times no. of eggs counted from a sample taken from a transverse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

Water Temp (C):	DO (mg/L):	DO (%):	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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Tall Alder-Willow Shrub	Closed Tall Alder-Willow Shrub	
5 - 10 Open Tall Alder-Willow Shrub	Closed 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**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**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	62.28946	-148.94875

Elevation NED (m)(ft): 757 2484**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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**

Water Temp (C): 7.20	DO (mg/L):	DO (%):	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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Low Willow Shrub	Closed Tall Willow Shrub	
5 - 10 Closed Low Willow Shrub	Closed Tall 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	62.16893	-148.96389

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:
Catchment Area(sq. km): 400	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History: Anadromous
Total Fish Count: 12	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (12)		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, J Johnson**Date/Time:** 08/04/2003 3:26 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.30647	-149.04903	Coordinates	62.30647	-149.04903

Elevation NED (m)(ft): 623 2044**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-5**Legal Description (MTRS):** S026N002E35**Waterbody Name:** Iron 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):** 212 **Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate:
Width				Subdominant Substrate 1:
Thalweg Depth				Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History: Anadromous
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (2)		Suspected Spawning: Yes
Comments: About 25 more observed downstream.		

Instruments

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

Station Info**Observers:** Joe Buckwalter, J Johnson**Date/Time:** 08/04/2003 3:21 PM**Station Coordinates** Latitude 62.35210 Longitude -149.19194**Sample Coordinates** Latitude 62.35210 Longitude -149.19194**Elevation NED (m)(ft):** 485 1591**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-5**Legal Description (MTRS):** S026N001E12**Waterbody Name:** Iron 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):** 493**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted
Width			
Thalweg Depth			

Dominant Substrate:**Subdominant Substrate 1:****Subdominant Substrate 2:****Rosgen Class:****Riparian Vegetation Communities (Vioreck 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

(VOH) Visual Observation, Helicopter

Fish Observations**Species:** Chinook salmon**Life Stage:** adult**Life History:** Anadromous**Total Fish Count:** 4**Fish Measured:****Fork Lengths (mm) Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOH (4)**Suspected Spawning:** Yes**Comments:** ~ 20 more observed downstream in groups of 2-6.**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:** 08/05/2003 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**

Water Temp (C): 3.70	DO (mg/L):	DO (%):	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:****Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** CobbleWidth 13.0 **Subdominant Substrate 1:** GravelThalweg 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 (Vioreck 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	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		
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**Total Fish Count:** 3 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 150 **Max:** 205 **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:**



FSS0302A001.jpg



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	62.32368	-148.34822

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**

Water Temp (C): 4.00	DO (mg/L):	DO (%):	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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Low Willow Shrub	1 Open Low Willow Shrub	1
5 - 10 Open Low Willow Shrub	1 Open Low Willow Shrub	1
10 - 20 Open Low Willow Shrub	1 Open Low Willow Shrub	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**Total Fish Count:** 2**Fish Measured:****Fork Lengths (mm) Min:****Max:****Mean:****Median:****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:**



FSS0302A004.jpg



FSS0302A005.jpg



FSS0302A006.jpg

Station Info**Observers:** Joe Buckwalter, Jeff Davis, J Johnson**Date/Time:** 08/05/2003 12:01 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.30804	-148.58047	Coordinates	62.30804	-148.58047

Elevation NED (m)(ft): 1092 3583**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-4**Legal Description (MTRS):** S026N005E29**Waterbody Name:** Yellowjacket Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Headwater tributary of Talkeetna 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):** **DO (%):** **Conductivity (μS/cm):** 101 **pH:** 8.39**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** **Thalweg Velocity (m/s)(ft/s):****Stream Channel****Stream Gradient (%):** 3.5**Entrenchment:****Catchment Area(sq. km):** 66**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width			10.0	Subdominant Substrate 1: Cobble
Thalweg Depth				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 (Vioreck 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	Unvegetated		Unvegetated	
5 - 10	Unvegetated		Unvegetated	
10 - 20	Unvegetated		Open Tall Willow Shrub	
20 - 30	Unvegetated		Open Tall Willow Shrub	

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:****Fork Lengths (mm)****Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOG (1)**Comments:** About 140 mm F.L.**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:** Horiba U-10**Transparency:**



FSS0302A007.jpg



FSS0302A008.jpg



FSS0302A010.jpg

Station Info**Observers:** Joe Buckwalter, Jeff Davis, J Johnson**Date/Time:** 08/05/2003 1:05 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.46716	-148.80995	Coordinates	62.46716	-148.80995

Elevation NED (m)(ft): 799 2621**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-4**Legal Description (MTRS):** S028N003E36**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Coordinates derived from GPS track file.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 7.70	DO (mg/L):	DO (%):	Conductivity (µS/cm): 146	pH: 8.44
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2.5**Entrenchment:****Catchment Area(sq. km):** 65**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	9.6	7.7		Subdominant Substrate 1: Gravel
Thalweg Depth		0.43		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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 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)**Comments:** 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:**



FSS0302A011.jpg



FSS0302A012.jpg

Station Info**Observers:** Joe Buckwalter, Jeff Davis, J Johnson**Date/Time:** 08/05/2003 3:14 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.43602	-149.84711	Coordinates	62.43602	-149.84711

Elevation NED (m)(ft): 296 971**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): 15.00	DO (mg/L):	DO (%):	Conductivity (µS/cm): 47	pH: 7.55
Water Color: Clear	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: Sand/Silt/Clay (legacy)
Width	4.0	3.3		Subdominant Substrate 1: Gravel
Thalweg Depth		0.75		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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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-unspecified **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 40 **Fish 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 salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 42 **Max:** 55 **Mean:** 48 **Median:** 48
Sampling Method (No. of fish): PEF (3)
Comments:

Species: rainbow trout **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 115 **Max:** 115 **Mean:** 115 **Median:** 115
Sampling Method (No. of fish): PEF (1)
Comments:

Species: rainbow trout **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 85 **Max:** 89 **Mean:** 87 **Median:** 87
Sampling Method (No. of fish): PEF (2)
Comments:

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.

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:



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FSS0302A016.jpg



FSS0302A017.jpg

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	62.44634	-149.91679

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Bluejoint-Herb	1	Bluejoint-Herb	
5 - 10	Bluejoint-Herb	1	Bluejoint-Herb	
10 - 20	Bluejoint-Herb	1	Bluejoint-Herb	
20 - 30	Open White Spruce Forest	20	Bluejoint-Herb	

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 14 **Fish Measured:** 11 **Fork Lengths (mm)** **Min:** 36 **Max:** 45 **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
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 53 **Max:** 66 **Mean:** 60 **Median:** 59
Sampling Method (No. of fish): PEF (3)
Comments:

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

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price AA meter

Turbidity:

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:
Catchment Area(sq. km):	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 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 Johnson**Date/Time:** 08/06/2003 9:20 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.70746	-148.73398	Coordinates	62.70746	-148.73398

Elevation NED (m)(ft): 764 2507**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-4**Legal Description (MTRS):** S030N004E09**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Gradient estimated - vegetation too dense to measure.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 7.70	DO (mg/L):	DO (%):	Conductivity (µS/cm): 105	pH: 7.79
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 7**Embeddedness:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Sand/Silt/Clay (legacy)**Width** 0.9 1.1 **Subdominant Substrate 1:** Gravel**Thalweg Depth** 0.55 0.55 **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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 **Median:** 123**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:**



FSS0303A002.jpg



FSS0303A003.jpg



FSS0303A004.jpg

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	62.71027	-148.76184

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		2.2	2.4	Subdominant Substrate 1: Gravel
Thalweg Depth			0.34	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)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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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FSS0303A008.jpg



FSS0303A009.jpg



FSS0303A010.jpg

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	62.72200	-148.83977

Elevation NED (m)(ft): 569 1867**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History:** Anadromous**Total Fish Count:** 2**Fish Measured:****Fork Lengths (mm) Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOH (2)**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:** 08/06/2003 1:07 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.60857	-148.94177	Coordinates	62.60857	-148.94177

Elevation NED (m)(ft): 757 2484**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	3.8 3.7
Thalweg Depth	0.24
	Dominant Substrate: Boulder
	Subdominant Substrate 1: Cobble
	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)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
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 Mean: 125 Median: 125
Sampling Method (No. of fish): PEF (2)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 68 Max: 68 Mean: 68 Median: 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 clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

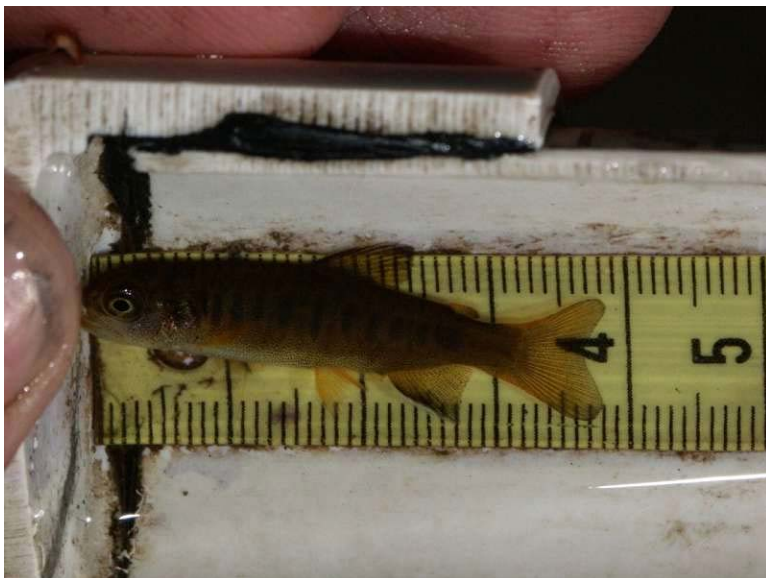
Transparency:



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FSS0303A012.jpg



FSS0303A013.jpg



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	62.66884	-149.05033

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		3.8	3.7	Subdominant Substrate 1: Boulder
Thalweg Depth			0.24	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 Stage: adult	Life History: Resident
Total Fish Count: 8	Fish Measured: 8	Fork Lengths (mm) Min: 148 Max: 240 Mean: 170 Median: 194
Sampling Method (No. of fish): PEF (8)		Suspected Spawning: Yes
Comments:		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
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: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 16	Fish Measured: 10	Fork Lengths (mm) Min: 42 Max: 51 Mean: 45 Median: 46
Sampling Method (No. of fish): PEF (16)		Suspected Spawning: Yes
Comments: Average F.L. of additional fish was about 50 mm.		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 23	Fish Measured: 12	Fork Lengths (mm) Min: 34 Max: 58 Mean: 47 Median: 46
Sampling Method (No. of fish): PEF (23)		Suspected Spawning: Yes
Comments: Average F.L. of additional fish was about 50 mm.		

Species: slimy sculpin	Life Stage: 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: 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:



FSS0303A015.jpg



FSS0303A016.jpg



FSS0303A017.jpg



FSS0303A018.jpg



FSS0303A019.jpg

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	62.60604	-149.17093

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 (%):	Conductivity (µS/cm):	pH:
Water Color:	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%):	Entrenchment:
Catchment Area(sq. km): 42	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History: Anadromous
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (2)		
Comments: About 10 more observed downstream.		

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:** 08/06/2003 3:49 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.60695	-149.18317	Coordinates	62.60695	-149.18317

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:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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	62.65413	-148.87344

Elevation NED (m)(ft): 707 2320**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

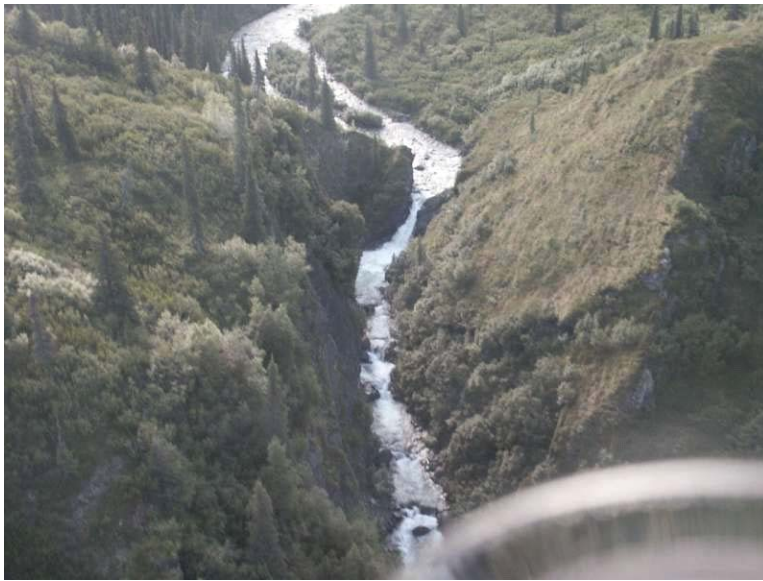
(NON) None

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:



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	62.47181	-149.61885

Elevation NED (m)(ft): 373 1224**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate:
Width				Subdominant Substrate 1:
Thalweg Depth				Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0303A021.jpg

Station Info**Observers:** Joe Buckwalter, Jeff Davis, J Johnson**Date/Time:** 08/07/2003 9:08 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.66673	-149.21414	Coordinates	62.66673	-149.21414

Elevation NED (m)(ft): 896 2940**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-5**Legal Description (MTRS):** S030N001E26**Waterbody Name:** Chunilna Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Local name: Clear Creek.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 10.30	DO (mg/L):	DO (%):	Conductivity (µS/cm): 20	pH: 7.60
Water Color: Clear		Turbidity (NTU):	Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 20**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	6.5	5.1		Subdominant Substrate 1: Cobble
Thalweg Depth		0.34		Subdominant Substrate 2: Boulder

Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck 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	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 Stage: adult	Life History: Resident				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 72	Max: 79	Mean: 75	Median: 75
Sampling Method (No. of fish): PEF (2)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 50	Max: 61	Mean: 54	Median: 55
Sampling Method (No. of fish): PEF (5)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 24	Max: 46	Mean: 35	Median: 35
Sampling Method (No. of fish): PEF (2)						
Comments:						

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0304A001.jpg



FSS0304A002.jpg



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	62.64464	-149.47969

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:
Catchment Area(sq. km): 100	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Boulder
Bankfull	
OHW	
Wetted	Subdominant Substrate 1: Cobble
Width	10.0
Thalweg Depth	0.70
	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 (Vioreck 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	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
Total Fish Count: 11	Fish Measured: 11	Fork Lengths (mm) Min: 49 Max: 63 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: Horiba U-10	Transparency:



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FSS0304A005.jpg



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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		6.9	6.0	Subdominant Substrate 1: Cobble
Thalweg Depth			0.21	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open White Spruce Forest	15 Open White Spruce Forest	15
5 - 10 Open White Spruce Forest	15 Open White Spruce Forest	15
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
Total Fish Count: 3 **Fish Measured:** Fork Lengths (mm) Min: Max: Mean: Median:
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				
Total Fish Count: 6	Fish Measured: 6	Fork Lengths (mm)	Min: 61	Max: 89	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				
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 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:



FSS0304A017.jpg



FSS0304A018.jpg



FSS0304A019.jpg



FSS0304A020.jpg



FSS0304A021.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	62.53476	-149.93348

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		8.8	5.5	Subdominant Substrate 1: Cobble
Thalweg Depth			0.24	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Alder Shrub	5	Closed Tall Alder Shrub
5 - 10 Closed Tall Alder Shrub	5	Closed Tall Alder Shrub
10 - 20 Closed Tall Alder Shrub	5	Closed Tall Alder Shrub
20 - 30 Closed Tall Alder Shrub	5	Closed Tall Alder Shrub

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: 109 Max: 109 Mean: 109 Median: 109
Sampling Method (No. of fish): PEF (1)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
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)		
Comments:		
Species: rainbow trout	Life Stage: juvenile	Life History: Resident
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 32 Max: 67 Mean: 47 Median: 49
Sampling Method (No. of fish): PEF (4)		
Suspected Spawning: Yes		
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0304A024.jpg



FSS0304A025.jpg



FSS0304A027.jpg

Station Info**Observers:** Joe Buckwalter, Jeff Davis, J Johnson**Date/Time:** 08/07/2003 3:50 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.47401	-149.98050	Coordinates	62.47401	-149.98050

Elevation NED (m)(ft): 286 938**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-6**Legal Description (MTRS):** S028N004W34**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Upper end of reach passes through a drained beaver pond. Gradient in this portion is 1% and vegetation is herbacious, graminoid meadow.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 12.30	DO (mg/L):	DO (%):	Conductivity (µS/cm): 34	pH: 7.46
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1.5	Entrenchment:
Catchment Area(sq. km): 15	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Width	7.1
Thalweg Depth	0.24
	Subdominant Substrate 1: Cobble
	Subdominant Substrate 2:

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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 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

(VOG) Visual Observation, Ground

(VOH) Visual Observation, Helicopter

Fish Observations

Species: Chinook 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): VOG (3)		
Comments:		
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 45 Max: 58 Mean: 49 Median: 51
Sampling Method (No. of fish): PEF (4)		
Comments:		
Species: coho salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 6	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (6)		
Comments:		

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

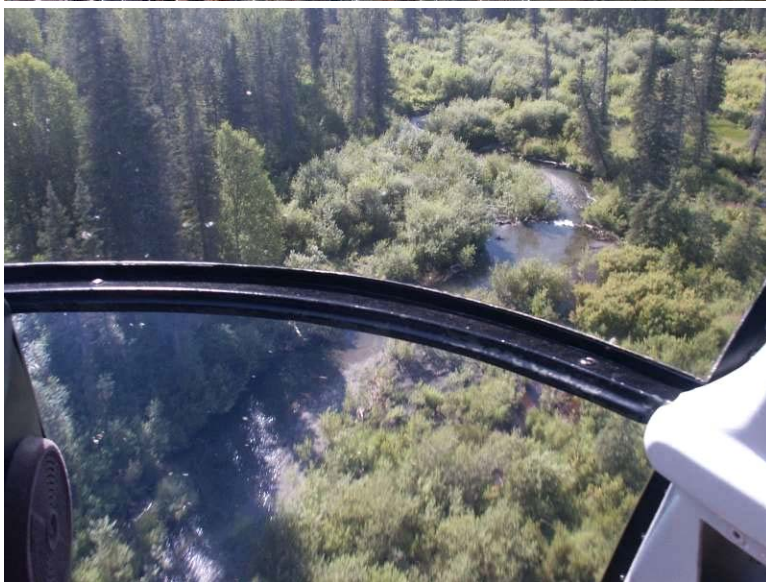
Stream Gradient: handheld optical clinometer	Channel Depths: graduated wading rod
Stream Velocity: Price pygmy meter	Channel Widths: measuring tape
Turbidity:	Electrofischer: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



FSS0304A028.jpg



FSS0304A029.jpg



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	62.53673	-149.93179

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:
Catchment Area(sq. km): 14	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 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: Mean: Median:
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 Quadrangle:** 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:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

Species: coho salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 10	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (10)		
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 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 Quadrangle:** 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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History: Anadromous
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (1)		
Comments: Observed by J. Johnson.		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity: Price pygmy meter	Channel Widths:
Turbidity:	Electrofischer:
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	62.54936	-149.83186

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate:
Width				Subdominant Substrate 1:
Thalweg Depth				Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



FSS0304A007.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/13/2003 1:06 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.77432	-148.70844	Coordinates	62.77432	-148.70844

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:****Visit Comments:** Width estimated. Velocity measured in thalweg (depth 2.0 ft) at 60% of depth with AA meter. 71 revolutions in 40.1 seconds.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 9.40	DO (mg/L): 12.03	DO (%):	Conductivity (µS/cm): 81	pH: 7.12
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s): 1.20 3.94	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 390**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width			18.0	Subdominant Substrate 1: Boulder
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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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

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: 5	Fish Measured: 4	Fork Lengths (mm) Min: 56 Max: 91 Mean: 71 Median: 73
Sampling Method (No. of fish): PEF (4) VOG (1)		
Comments: Fork length 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 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: 53 Max: 53 Mean: 53 Median: 53
Sampling Method (No. of fish): PEF (1)		
Comments:		

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)		
Comments: Did not capture; may have been a sucker. F.L. was about 300 mm.		

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: Horiba U-10	Transparency:



FSS0305A002.jpg



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	Sample	Latitude	Longitude
Coordinates	62.84005	-148.57626	Coordinates	62.84005	-148.57626

Elevation NED (m)(ft): 496 1627**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-4**Legal Description (MTRS):** S032N005E29**Waterbody Name:** Tsusena Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Waterfall about 2 km upstream at station 05A05 is a barrier to upstream migration of all species and life stages.**Visit Comments:** Stream not wadeable. Width, depth estimated.**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 Depth			1.50	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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 Stage: adult	Life History: Resident
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 84 Max: 84 Mean: 84 Median: 84
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: 52 Max: 52 Mean: 52 Median: 52
Sampling Method (No. of fish): PEF (1)		
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:** Horiba U-10**Transparency:**



FSS0305A011.jpg



FSS0305A012.jpg



FSS0305A013.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/13/2003 4:21 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.89774	-148.12112	Coordinates	62.89774	-148.12112

Elevation NED (m)(ft): 640 2100**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-3**Legal Description (MTRS):** S032N007E03**Waterbody Name:** Watana Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Main channel not wadeable. Depth, width estimated. Landslides about 5 km downstream depositing sediment into channel. Water clear above, but highly turbid below landslides. Landslides appear to be recent, probably triggered by earthquake in 2003.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 10.20	DO (mg/L): 11.38	DO (%):	Conductivity (µS/cm): 131	pH: 7.49
Water Color: Clear	Turbidity (NTU): 1.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 323**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width			19.5	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
Thalweg Depth			0.70	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)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	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 Stage:** juvenile**Life History:** Resident**Total Fish Count:** 2 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 44 **Max:** 45 **Mean:** 44 **Median:** 44**Sampling Method (No. of 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:** Horiba U-10**Transparency:**



FSS0305A015.jpg



FSS0305A016.jpg



FSS0305A017.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/13/2003 5:38 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.84628	-148.23525	Coordinates	62.84628	-148.23525

Elevation NED (m)(ft): 508 1667**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-3**Legal Description (MTRS):** S032N006E24**Waterbody Name:****Anadromous Waters Catalog Number:****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 (%):	Conductivity (µS/cm): 255	pH: 7.64
Water Color: Clear	Turbidity (NTU): 1.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 23**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	3.0	3.0		Subdominant Substrate 1: Cobble
Thalweg Depth		0.30		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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 63 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	62.85316	-148.55460

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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



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:
Catchment Area(sq. km):	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(NON) None

Fish Observations

No Fish Found

Instruments

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



FSS0305A014.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/14/2003 10:00 AM

Station	Latitude	Longitude	Sample	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:****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. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 Stage: juvenile	Life History: Resident
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 61 Max: 84 Mean: 72 Median: 72
Sampling Method (No. of fish): PEF (2)		
Comments:		
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 73 Max: 73 Mean: 73 Median: 73
Sampling Method (No. of fish): PEF (1)		
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	Life History: Resident
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 20 Max: 27 Mean: 22 Median: 23
Sampling Method (No. of fish): PEF (3)		
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity: Horiba U-10

Water 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:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Cobble**Width** 10.3 9.6 **Subdominant Substrate 1:** Boulder**Thalweg Depth** 0.40 **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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Tall Willow Shrub	3	Closed Tall Willow Shrub	3
5 - 10	Closed Balsam Poplar-White Spruce Forest	25	Closed Tall Willow Shrub	3
10 - 20	Closed Balsam Poplar-White Spruce Forest	25	Open White Spruce Forest	4
20 - 30	Closed Balsam Poplar-White Spruce Forest	25	Open White Spruce Forest	4

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

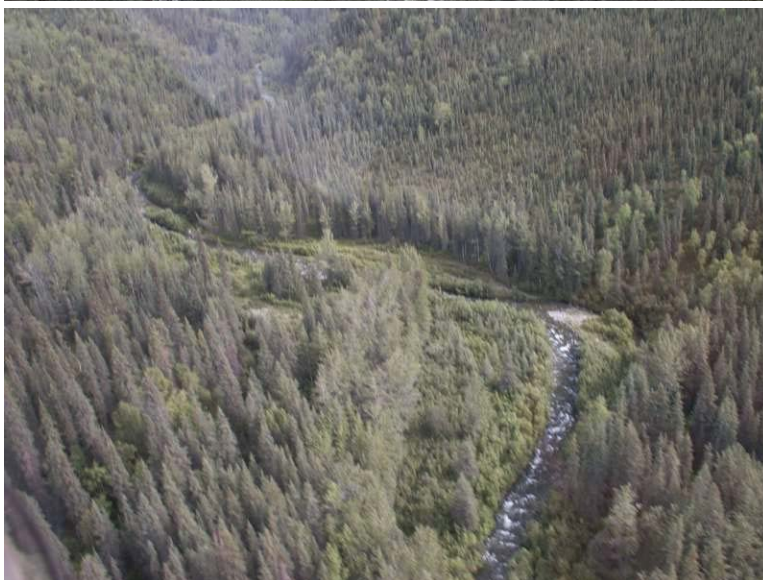
Fish Observations**Species:** Arctic grayling**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 3 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 83 **Max:** 83 **Mean:** 83 **Median:** 83**Sampling Method (No. of fish):** PEF (1) VOG (2)**Comments:** Average F.L. of additional 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:**



FSS0306A006.jpg



FSS0306A007.jpg



FSS0306A008.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/14/2003 2:12 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.75510	-147.72154	Coordinates	62.75510	-147.72154

Elevation NED (m)(ft): 539 1768**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-2**Legal Description (MTRS):** S031N009E23**Waterbody Name:** Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:** Susitna River and right bank side channel.

Visit Comments: River not wadeable. Width estimated - main channel only. Water quality parameters entered above were measured in side channel. Main channel: temperature (C) 8.5, pH 7.66, conductivity 155, turbidity 999 (exceeds maximum value), D.O. 11.69, color - high glacial turbidity. Stage - medium. Substrate: cobble, silt, boulder

Wildlife Comments: Major caribou migration trails.**Water Quality \ Stream Flow**

Water Temp (C): 11.70	DO (mg/L): 11.10	DO (%):	Conductivity (µS/cm): 220	pH: 7.56
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 0.5	Entrenchment:
Catchment Area(sq. km): 10768	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	
OHW	
Wetted	100.0
Width	Subdominant Substrate 1: Cobble
Thalweg Depth	Subdominant Substrate 2: Gravel

Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 20 **Fish Measured:** 10 **Fork Lengths (mm)** **Min:** 62 **Max:** 133 **Mean:** 74 **Median:** 97
Sampling Method (No. of fish): PEF (10) VOG (10)
Comments: Average F.L. of additional fish was about 70 mm.

Species: longnose sucker **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 23 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 32 **Max:** 115 **Mean:** 64 **Median:** 73
Sampling Method (No. of fish): PEF (3) VOG (20)
Comments: F.L. of additional fish ranged from about 50 to 120 mm.

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 71 **Max:** 101 **Mean:** 86 **Median:** 86
Sampling Method (No. of fish): PEF (2)
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): VOG (3)						
Comments: Average F.L. was about 50 mm.						
<hr/>						
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:						
<hr/>						
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 Velocity: Price pygmy meter	Channel Widths: Visual estimate
Turbidity:	Electrofischer: Smith-Root LR-24
Water Quality: Horiba U-10	Transparency:



FSS0306A010.jpg



FSS0306A011.jpg



FSS0306A012.jpg



FSS0306A014.jpg



FSS0306A015.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/14/2003 3:30 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.62784	-147.45495	Coordinates	62.62784	-147.45495

Elevation NED (m)(ft): 690 2264**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** S029N011E06**Waterbody Name:** Goose Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Algae covers substrate.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 11.10	DO (mg/L): 10.99	DO (%):	Conductivity (µS/cm): 75	pH: 7.55
Water Color: Clear	Turbidity (NTU): 0.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 262**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	15.0	14.7		Subdominant Substrate 1: Cobble
Thalweg Depth		0.60		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 (Vioreck 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	Closed Tall Willow Shrub	2	Closed Tall Willow Shrub	2
5 - 10	Closed Tall Willow Shrub	2	Closed White Spruce Forest	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 Observations

Species: Arctic grayling	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 72	Max: 72	Mean: 72	Median: 72
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: slimy sculpin	Life Stage: adult	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 74	Max: 74	Mean: 74	Median: 74
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 15	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish): VOG (15)						
Comments: Average F.L. was about 50 mm.						
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 21	Max: 33	Mean: 24	Median: 27
Sampling Method (No. of fish): PEF (4)						
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:



FSS0306A016.jpg



FSS0306A017.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/14/2003 4:54 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.61765	-147.38179	Coordinates	62.61765	-147.38179

Elevation NED (m)(ft): 681 2234**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** S029N011E10**Waterbody Name:** Oshetna River**Anadromous Waters Catalog Number:****Geographic Comments:** Station located at left bank side channel of Oshetna River.

Visit Comments: All fish (except 1 grayling) collected from clear side channel. Habitat data entered pertains to side channel. Main channel: Conductivity 146; turbidity 35; D.O. 10.97; temperature © 10.4; pH 7.57; substrate boulder, gravel, cobble; Rosgen type C2. Stream stage high; Water color - high glacial turbidity; velocity - fast.

Wildlife Comments:**Water Quality \ Stream Flow**

Water Temp (C): 6.80	DO (mg/L): 11.28	DO (%):	Conductivity (µS/cm): 744	pH: 6.97
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 1440	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Boulder
Bankfull	
Width	3.5
Thalweg Depth	0.10
	Subdominant Substrate 1: Cobble
	Subdominant Substrate 2: Gravel

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

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

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: 7 **Fish Measured:** 7 **Fork Lengths (mm)** Min: 48 **Max:** 72 **Mean:** 59 **Median:** 60
Sampling Method (No. of fish): PEF (7)
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): VOG (2)
Comments: Average F.L. was about 70 mm.

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 52 **Max:** 67 **Mean:** 61 **Median:** 59
Sampling Method (No. of fish): PEF (3)
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
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:**



FSS0306A019.jpg



FSS0306A020.jpg



FSS0306A021.jpg



FSS0306A022.jpg



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
Width		14.6	10.4	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
Thalweg Depth			0.50	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open White Spruce Forest	25 Unvegetated	
5 - 10 Open White Spruce Forest	25 Closed Tall Willow Shrub	2
10 - 20 Open White Spruce Forest	25 Closed Tall Willow Shrub	2
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

Species: Arctic grayling	Life Stage: juvenile	Life History: Resident
Total Fish Count: 20	Fish Measured: 1	Fork Lengths (mm) Min: 62 Max: 62 Mean: 62 Median: 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
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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:**



FSS0307A001.jpg



FSS0307A002.jpg



FSS0307A003.jpg



FSS0307A004.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/15/2003 12:20 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.67477	-147.05419	Coordinates	62.67477	-147.05419

Elevation NED (m)(ft): 716 2349**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** C010N010W02**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:** 1 curious caribou. Kingfisher, bald eagle.**Water Quality \ Stream Flow**

Water Temp (C): 12.60	DO (mg/L): 10.40	DO (%):	Conductivity (µS/cm): 80	pH: 7.27
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 137**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	6.0	5.3		Subdominant Substrate 1: Cobble
Thalweg Depth		0.30		Subdominant Substrate 2:

Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck et al. 1992)**

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

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

Comments: F.L. was about 250 mm.

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident

Total Fish Count: 5	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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Sampling Method (No. of fish): VOG (5)

Comments: Average F.L. was about 45 mm.

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

Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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Sampling Method (No. of fish): VOG (2)

Comments: Average F.L. was about 30 mm.

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0307A007.jpg



FSS0307A008.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/15/2003 1:02 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.67445	-147.05508	Coordinates	62.67445	-147.05508

Elevation NED (m)(ft): 716 2349**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** C010N010W02**Waterbody Name:** Tyone River**Anadromous Waters Catalog Number:****Geographic Comments:** At confluence with 07A02 stream.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 13.00	DO (mg/L): 10.70	DO (%):	Conductivity (µS/cm): 206	pH: 7.43
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 0.5**Entrenchment:****Catchment Area(sq. km):** 2348**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width			26.5	Subdominant Substrate 1: Cobble
Thalweg Depth			0.31	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 (Vioreck 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	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: burbot	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 73	Max: 73	Mean: 73	Median: 73
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: Arctic grayling	Life Stage: juvenile	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 90 mm.						
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: F.L. was about 70 mm.						

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0307A009.jpg



FSS0307A010.jpg



FSS0307A011.jpg

Date/Time: 08/15/2003 2:30 PM

Elevation NED (m)(ft): 823 2700

Coordinate Determination Method: Non-Differential GPS Field Measurement **Datum:** NAD83

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:** 7.42

Water Color: Clear **Turbidity (NTU):** 1.00 **Thalweg Velocity (m/s)(ft/s):**

Stream Channel

Stream Gradient (%): 0.5 **Entrenchment:**

Catchment Area(sq. km): 894 **Embeddedness:**

Channel Dimensions (m): **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Gravel

Width	20.0	Subdominant Substrate 1: Cobble
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Thalweg Depth	0.70	Subdominant Substrate 2:
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Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.

Riparian Vegetation Communities (Vioreck 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	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	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: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 11 **Fish Measured:** 6 **Fork Lengths (mm) Min:** 54 **Max:** 72 **Mean:** 59 **Median:** 63
Sampling Method (No. of fish): PEF (6) VOG (5)
Comments: Average F.L. of additional fish was about 80 mm.

Species: slimy sculpin	Life Stage: adult	Life History: Resident	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 72	Max: 72 Mean: 72 Median: 72
Sampling Method (No. of fish): PEF (1)			
Comments:			

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 17 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 53 **Max:** 65 **Mean:** 59 **Median:** 59
Sampling Method (No. of fish): PEF (2) VOG (15)
Comments: Average F.L. of additional fish was about 50 mm.

Species: slimy sculpin	Life Stage: juvenile	Life History: Resident
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 34 Max: 43 Mean: 38 Median: 38
Sampling Method (No. of fish): PEF (4)		
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity: Horiba U-10

Water Quality: Horiba U-10

Channel Depths: Visual estimate

Channel Widths: Visual estimate

Electrofisher: Smith-Root LR-24

Transparency:



FSS0307A012.jpg



FSS0307A013.jpg



FSS0307A014.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/15/2003 4:30 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.69465	-147.99674	Coordinates	62.69465	-147.99674

Elevation NED (m)(ft): 778 2552**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-2**Legal Description (MTRS):** S030N008E17**Waterbody Name:** Tsisi Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Left bank tributary of Kosina Creek. Station located at downstream end of reach.**Visit Comments:** Not wadeable - width, depth estimated.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 12.10 **DO (mg/L):** 10.72 **DO (%):****Conductivity (µS/cm):** 93 **pH:** 7.44**Water Color:** Clear**Turbidity (NTU):****Thalweg Velocity (m/s)(ft/s):****Stream Channel****Stream Gradient (%):** 4**Entrenchment:****Catchment Area(sq. km):** 224**Embeddedness:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Boulder**Width** 8.0 **Subdominant Substrate 1:** Cobble**Thalweg Depth** 0.50 **Subdominant Substrate 2:** Gravel**Rosgen Class:** A2 Steep, entrenched, cascading, step/pool streams. Very stable.**Riparian Vegetation Communities (Vioreck 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	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

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/15/2003 5:01 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.69379	-147.99668	Coordinates	62.69379	-147.99668

Elevation NED (m)(ft): 781 2562**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-2**Legal Description (MTRS):** S030N008E17**Waterbody Name:** Kosina Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Mainstem reach immediately upstream of 07A05.**Visit Comments:** Unwadeable - width, depth estimated**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 12.70	DO (mg/L): 9.89	DO (%):	Conductivity (µS/cm): 55	pH: 7.30
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 752**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width			30.0	Subdominant Substrate 1: Cobble
Thalweg Depth			0.50	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 (Vioreck 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	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

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 56	Max: 56	Mean: 56	Median: 56
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: salmonid-unspecified	Life Stage: juvenile	Life History: Unknown				
Total Fish Count: 3	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish): VOG (3)						
Comments: Average F.L. was about 70 mm.						
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 70	Max: 75	Mean: 72	Median: 72
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: 55	Max: 55	Mean: 55	Median: 55
Sampling Method (No. of fish): PEF (1)						
Comments:						

-continued-

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: Visual estimate

Channel Widths: Visual estimate

Electrofisher: Smith-Root LR-24

Transparency:



FSS0307A015.jpg



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**

Water Temp (C): 7.20	DO (mg/L): 12.30	DO (%):	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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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 White Spruce Forest	20	Closed Tall Willow Shrub	2
10 - 20	Closed White Spruce Forest	20	Closed Tall Willow Shrub	2
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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (2)		Suspected Spawning: Yes
Comments: 1 was in spawning colors. Average F.L. was about 300 mm.		

Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 15	Fish Measured: 10	Fork Lengths (mm) Min: 41 Max: 57 Mean: 48 Median: 49
Sampling Method (No. of fish): PEF (10) VOG (5)		Suspected Spawning: 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:** Horiba U-10**Transparency:**



FSS0308A001.jpg



FSS0308A002.jpg



FSS0308A003.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/16/2003 12:10 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	63.06009	-147.71604	Coordinates	63.06009	-147.71604

Elevation NED (m)(ft): 829 2720**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Healy A-2**Legal Description (MTRS):** F021S001W27**Waterbody Name:** Butte Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Stream unwadeable - width, depth estimated.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 9.20	DO (mg/L): 12.34	DO (%):	Conductivity (µS/cm): 137	pH: 7.50
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1 **Entrenchment:****Catchment Area(sq. km):** 352 **Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width			40.0	Subdominant Substrate 1: Gravel
Thalweg Depth			0.60	Subdominant Substrate 2: Boulder

Rosgen Class: F3 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck 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	Open Low Shrub Birch-Ericaceous Shrub Bog	0	Closed Tall Willow Shrub	2
10 - 20	Open Low Shrub Birch-Ericaceous Shrub Bog	0	Closed Tall Willow Shrub	2
20 - 30	Open Low Shrub Birch-Ericaceous Shrub Bog	0	Open Low Shrub Birch-Ericaceous Shrub Bog	0

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: slimy sculpin	Life Stage: adult	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 77	Max: 77	Mean: 77	Median: 77
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 4	Fish Measured: 2	Fork Lengths (mm)	Min: 63	Max: 67	Mean: 65	Median: 65
Sampling Method (No. of fish): PEF (2) VOG (2)						
Comments: Average F.L. of additional fish was about 60 mm.						
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 13	Max: 37	Mean: 25	Median: 25
Sampling Method (No. of fish): PEF (2)						
Comments:						

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: Visual estimate

Channel Widths: Visual estimate

Electrofisher: Smith-Root LR-24

Transparency:



FSS0308A008.jpg



FSS0308A009.jpg



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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
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 Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open Low Mixed Shrub-Sedge Tussock Tundra	1	Open Low Mixed Shrub-Sedge Tussock Tundra	1
5 - 10	Open Low Mixed Shrub-Sedge Tussock Tundra	1	Open Low Mixed Shrub-Sedge Tussock Tundra	1
10 - 20	Open Low Mixed Shrub-Sedge Tussock Tundra	1	Open Low Mixed Shrub-Sedge Tussock Tundra	1
20 - 30	Open Low Mixed Shrub-Sedge Tussock Tundra	1	Open Low Mixed Shrub-Sedge Tussock Tundra	1

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 Mean: 58 Median: 57
Sampling Method (No. of fish): PEF (4) VOG (6)		
Comments: Average F.L. of additional fish was about 50 mm.		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity: Horiba U-10

Water Quality: Horiba U-10

Channel Depths: Visual estimate

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0308A011.jpg



FSS0308A012.jpg



FSS0308A013.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/16/2003 3:35 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.90009	-148.23165	Coordinates	62.90009	-148.23165

Elevation NED (m)(ft): 730 2395**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-3**Legal Description (MTRS):** S033N006E36**Waterbody Name:** Delusion Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Sample reach located upstream of a beaver pond.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 11.30	DO (mg/L): 10.68	DO (%):	Conductivity (µS/cm): 147	pH: 7.30
Water Color: Muddy	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 0.5**Entrenchment:****Catchment Area(sq. km):** 30**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	4.8	5.2		Subdominant Substrate 1: Gravel
Thalweg Depth	0.40	0.40		Subdominant Substrate 2: Sand/Silt/Clay (legacy)

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 (Vioreck et al. 1992)**

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

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

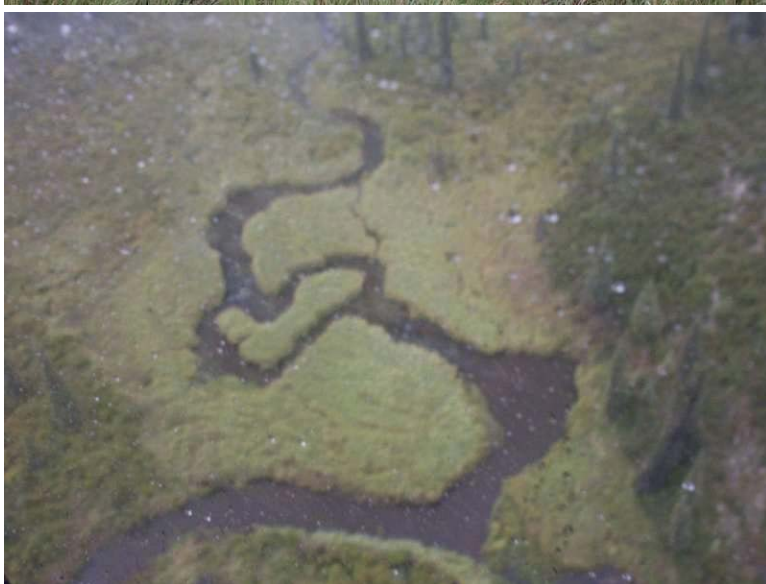
Fish Observations**Species:** slimy sculpin**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 7**Fish Measured:** 4**Fork Lengths (mm)** Min: 51**Max:** 59**Mean:** 55**Median:** 55**Sampling Method (No. of fish):** PEF (4) VOG (3)**Comments:** Average F.L. of additional fish was about 55 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:**



FSS0308A014.jpg



FSS0308A015.jpg



FSS0308A016.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/18/2003 11:12 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.94236	-149.06318	Coordinates	61.94236	-149.06318

Elevation NED (m)(ft): 495 1624**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Anchorage D-6**Legal Description (MTRS):** S021N002E03**Waterbody Name:** Kashwitna River**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Stream not wadeable - width, depth estimated. Velocity measured in mainstem riffle adjacent to thalweg.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 4.70 **DO (mg/L):** 12.77 **DO (%):** **Conductivity (µS/cm):** 44 **pH:** 7.30**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 130.00 **Thalweg Velocity (m/s)(ft/s):** 1.61 5.28**Stream Channel****Stream Gradient (%):** 3**Entrenchment:****Catchment Area(sq. km):** 121**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. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Alder Shrub	3 Closed Tall Alder Shrub	3
5 - 10 Closed Tall Alder Shrub	3 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 White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20

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: 11 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 155 **Max:** 250 **Mean:** 185 **Median:** 202
Sampling Method (No. of fish): PEF (6) VOG (5) **Suspected Spawning:** Yes
Comments: Average F.L. of additional fish was about 200 mm.

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 95 **Max:** 106 **Mean:** 100 **Median:** 100
Sampling Method (No. of fish): PEF (2)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 44 **Max:** 51 **Mean:** 46 **Median:** 47
Sampling Method (No. of fish): PEF (3) **Suspected Spawning:** Yes
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: F.L. was about 50 mm.		

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



FSS0309A001.jpg



FSS0309A002.jpg



FSS0309A003.jpg



FSS0309A005.jpg



FSS0309A006.jpg



FSS0309A007.jpg



FSS0309A008.jpg



FSS0309A010.jpg



FSS0309A011.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/18/2003 1:51 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.10400	-149.33403	Coordinates	62.10400	-149.33403

Elevation NED (m)(ft): 774 2539**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts A-5**Legal Description (MTRS):** S023N001E07**Waterbody Name:** Sheep Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 5.80	DO (mg/L): 11.65	DO (%):	Conductivity (µS/cm): 15	pH: 6.80
Water Color: Glacial, Low Turbidit	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 51	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	13.8 13.8
Thalweg Depth	0.80 0.70
	Dominant Substrate: Gravel
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2: Cobble

Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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

(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: 188 Max: 188 Mean: 188 Median: 188
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: 92 Max: 92 Mean: 92 Median: 92
Sampling Method (No. of fish): PEF (1)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 3	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (3)		
Comments: Average F.L. was about 75 mm.		
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 5	Fish Measured: 4	Fork Lengths (mm) Min: 47 Max: 57 Mean: 50 Median: 52
Sampling Method (No. of fish): PEF (4) VOG (1)		
Comments: F.L. was about 50 mm.		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

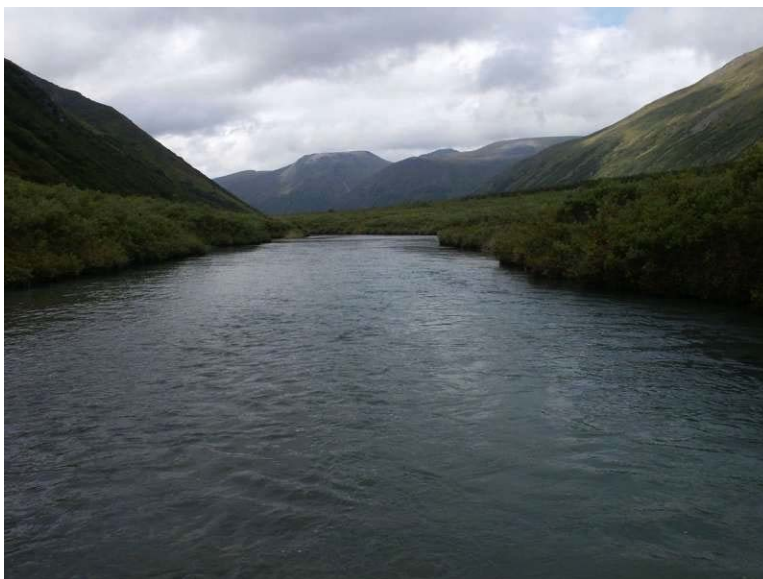
Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0309A012.jpg



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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 Quadrangle:** 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):** 13**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		3.5	3.5	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 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
Total Fish Count: 72	Fish Measured: 22	Fork Lengths (mm) Min: 34 Max: 52 Mean: 43 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
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 20 Max: 49 Mean: 38 Median: 34
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:**



FSS0309A018.jpg



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): 6	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	OHW
Width	3.3
Thalweg Depth	0.10
	Subdominant Substrate 1: Gravel
	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Alder Shrub	4 Closed Tall Alder Shrub	4
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
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 33 Max: 33 Mean: 33 Median: 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
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 24 Max: 41 Mean: 33 Median: 32
Sampling Method (No. of fish): PEF (3)		

Comments:

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



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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 Quadrangle:** 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): 17	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	OHW
Width	Wetted
Thalweg Depth	
	Subdominant Substrate 1:
	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 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	Bluejoint-Shrub	1
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:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofisher:** Smith-Root LR-24**Water Quality:** Horiba U-10**Transparency:**



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FSS0309A033.jpg



FSS0309A034.jpg



FSS0309A035.jpg



FSS0309A036.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/19/2003 9:56 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.94816	-149.60428	Coordinates	62.94816	-149.60428

Elevation NED (m)(ft): 508 1667**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-6**Legal Description (MTRS):** S033N002W14**Waterbody Name:** Pass Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 6.30	DO (mg/L): 12.32	DO (%):	Conductivity (µS/cm): 13	pH: 6.23
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 2	Entrenchment:
Catchment Area(sq. km): 7	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Width	4.7
Thalweg Depth	0.40
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2: Cobble

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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Willow Shrub	2 Bluejoint-Herb	0
5 - 10 Closed Tall Willow Shrub	2 Bluejoint-Herb	0
10 - 20 Closed Tall Willow Shrub	2 Closed Tall Willow Shrub	2
20 - 30 Closed White Spruce Forest	20 Closed 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: 4 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 109 **Max:** 124 **Mean:** 116 **Median:** 116
Sampling Method (No. of fish): PEF (2) VOG (2)
Comments: Average F.L. of additional fish was about 100 mm.

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 46 **Max:** 77 **Mean:** 61 **Median:** 61
Sampling Method (No. of fish): PEF (2) **Suspected Spawning:** Yes
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 81 **Max:** 81 **Mean:** 81 **Median:** 81
Sampling Method (No. of fish): PEF (1)
Comments:

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

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:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Width	6.9
Thalweg Depth	0.50
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Willow Shrub	2 Closed Tall Willow Shrub	2
5 - 10 Closed Tall Willow Shrub	2 Open White Spruce Forest	20
10 - 20 Closed Tall Willow Shrub	2 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 **Mean:** 121 **Median:** 121
Sampling Method (No. of fish): PEF (1)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 2 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 41 **Max:** 41 **Mean:** 41 **Median:** 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
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 47 **Max:** 47 **Mean:** 47 **Median:** 47
Sampling Method (No. of fish): PEF (1)
Comments:

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0310A004.jpg



FSS0310A005.jpg



FSS0310A006.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/19/2003 12:39 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.46866	-149.77762	Coordinates	62.46866	-149.77762

Elevation NED (m)(ft): 448 1470**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-6**Legal Description (MTRS):** S028N003W35**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 9.00	DO (mg/L): 11.82	DO (%):	Conductivity (µS/cm): 20	pH: 6.60
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 6	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	7.8 5.9
Thalweg Depth	0.30
Dominant Substrate: Sand/Silt/Clay (legacy)	
Subdominant Substrate 1: Gravel	
Subdominant Substrate 2: Cobble	

Rosgen Class: F5 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
0 - 5 Subarctic Lowland Sedge-Bog Meadow	0 Subarctic Lowland Sedge-Shrub Wet Meadow	0
5 - 10 Closed Tall Willow Shrub	2 Subarctic Lowland Sedge-Shrub Wet Meadow	0
10 - 20 Closed Tall Willow Shrub	2 Subarctic Lowland Sedge-Shrub Wet Meadow	0
20 - 30 Open White Spruce Forest	15 Subarctic Lowland Sedge-Shrub Wet Meadow	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:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)		
Comments: F.L. was about 180 mm.		
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident
Total Fish Count: 6	Fish Measured: 1	Fork Lengths (mm) Min: 70 Max: 70 Mean: 70 Median: 70
Sampling Method (No. of fish): PEF (1) 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: 4	Fish Measured: 4	Fork Lengths (mm) Min: 33 Max: 49 Mean: 40 Median: 41
Sampling Method (No. of fish): PEF (4)		
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

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 Lazar**Date/Time:** 08/19/2003 1:46 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.43716	-150.04579	Coordinates	62.43716	-150.04579

Elevation NED (m)(ft): 207 679**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-1**Legal Description (MTRS):** S027N004W08**Waterbody Name:** Wiggle Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 10.70	DO (mg/L): 11.55	DO (%):	Conductivity (µS/cm): 26	pH: 6.70
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 0.5	Entrenchment:
Catchment Area(sq. km): 6	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull	OHW
Width	3.9
Thalweg Depth	0.30
	Subdominant Substrate 1:
	Subdominant Substrate 2:

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)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
0 - 5 Open Low Sweetgale-Graminoid Bog	1 Subarctic Lowland Sedge-Shrub Wet Meadow	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

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: salmonid-unspecified **Life Stage:** juvenile/adult **Life History:** Unknown
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: threespine stickleback **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: rainbow trout **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 172 **Max:** 172 **Mean:** 172 **Median:** 172
Sampling Method (No. of fish): PEF (1)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 34 **Fish Measured:** 14 **Fork Lengths (mm)** **Min:** 52 **Max:** 69 **Mean:** 57 **Median:** 60
Sampling Method (No. of fish): PEF (14) VOG (20)
Comments: Average F.L. of additional fish was about 50 mm.

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:

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:**



FSS0310A020.jpg



FSS0310A021.jpg



FSS0310A023.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/19/2003 11:41 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.90517	-149.73691	Coordinates	62.90517	-149.73691

Elevation NED (m)(ft): 362 1188**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-6**Legal Description (MTRS):** S033N002W31**Waterbody Name:** Pass 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:****Channel Dimensions (m):****Bankfull OHW Wetted****Dominant Substrate:****Width****Subdominant Substrate 1:****Thalweg Depth****Subdominant Substrate 2:****Rosgen Class:****Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:**



FSS0310A010.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/19/2003 11:48 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.81198	-149.66928	Coordinates	62.81198	-149.66928

Elevation NED (m)(ft): 367 1204**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-6**Legal Description (MTRS):** S031N002W04**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Waterfalls on right-bank Indian River tributary. 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:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0310A011.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/19/2003 3:01 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.22645	-149.87572	Coordinates	62.22645	-149.87572

Elevation NED (m)(ft): 306 1004**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts A-6**Legal Description (MTRS):** S025N003W29**Waterbody Name:** North Fork Montana 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0310A024.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**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-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts A-6**Legal Description (MTRS):** S024N003W05**Waterbody Name:** Middle Fork Montana 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



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	62.18009	-149.85644

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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOG) Visual Observation, Ground

Fish Observations

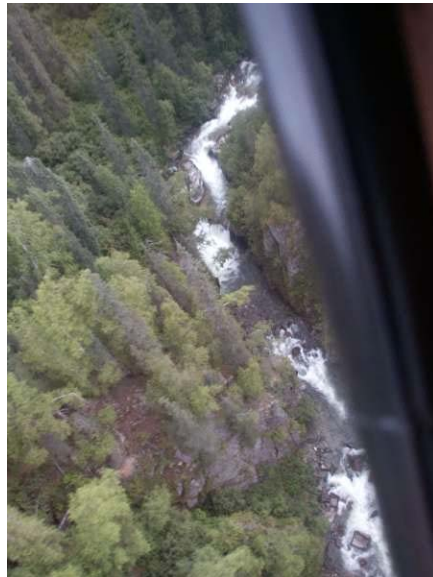
Species: salmonid-unspecified	Life Stage: adult	Life History: Unknown
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (2)		
Comments: Falls 2.4 meters high - may not be a barrier.		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofischer:
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	62.41061	-150.31003

Elevation NED (m)(ft): 183 600**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width		2.5	2.5	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
Thalweg Depth		1.40	1.40	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)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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 Max: 68 Mean: 68 Median: 68
Sampling Method (No. of fish): MTQ (1)		
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:** Horiba 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	62.40872	-150.19981

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width	1.6	1.6		Subdominant Substrate 1: Gravel
Thalweg Depth		0.98		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)	<u>Left Bank Vegetation Type</u>	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

Instruments**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:**



FSS0311A009.jpg



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	62.43356	-150.09041

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width		0.6	0.6	Subdominant Substrate 1:
Thalweg Depth		0.30	0.30	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)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	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

Instruments**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:**



FSS0311A011.jpg



FSS0311A012.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/20/2003 2:58 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.37108	-150.28362	Coordinates	62.37108	-150.28362

Elevation NED (m)(ft): 155 509**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-1**Legal Description (MTRS):** S026N005W06**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 15.10	DO (mg/L): 7.15	DO (%):	Conductivity (µS/cm): 14	pH: 6.36
Water Color: Humic	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 0**Entrenchment:****Catchment Area(sq. km):** 10**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width		4.5	4.5	Subdominant Substrate 1:
Thalweg Depth		1.35	1.35	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	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 Max: 124 Mean: 124 Median: 124
Sampling Method (No. of fish): MTQ (1)		
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:** Horiba U-10**Transparency:**



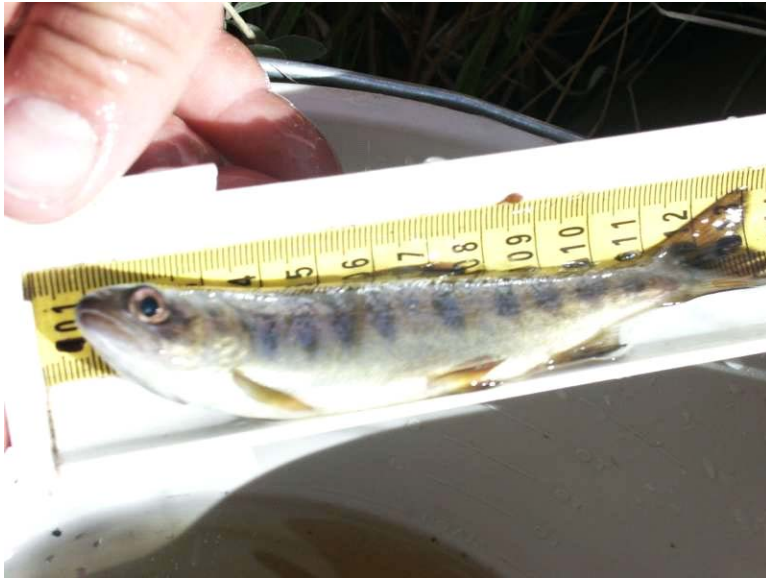
FSS0311A015.jpg



FSS0311A016.jpg



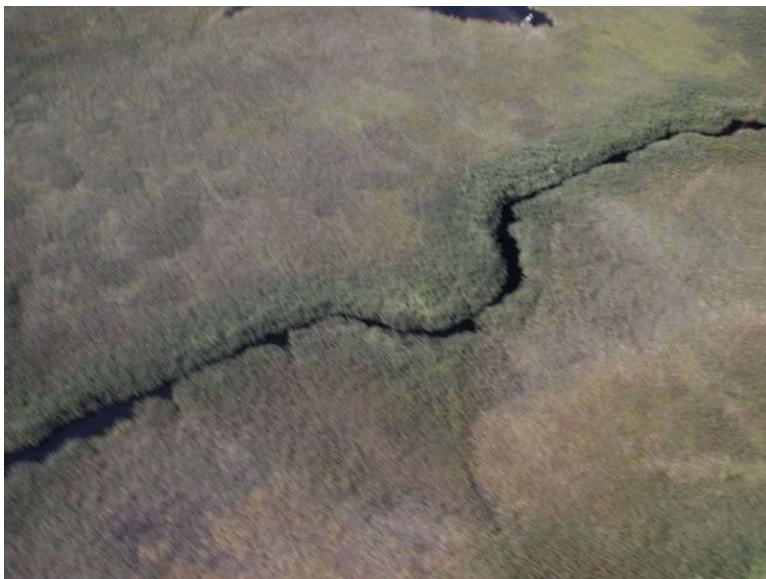
FSS0311A017.jpg



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	62.36800	-150.11881

Elevation NED (m)(ft): 114 374**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 0**Entrenchment:****Catchment Area(sq. km):** 32**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width		4.8	4.8	Subdominant Substrate 1:
Thalweg Depth		1.40	1.40	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)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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
Total Fish Count: 6	Fish Measured: 6	Fork Lengths (mm) Min: 39 Max: 60 Mean: 50 Median: 49
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:		

Instruments**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	62.37583	-150.18445

Elevation NED (m)(ft): 121 397**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width		2.3	2.3	Subdominant Substrate 1: Cobble
Thalweg Depth		0.70	0.70	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:** Horiba U-10**Transparency:**



FSS0311A026.jpg



FSS0311A027.jpg



FSS0311A028.jpg

Station Info**Observers:** Joe Buckwalter, John Wells, Jim Lazar**Date/Time:** 08/20/2003 10:45 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.52034	-149.97524	Coordinates	62.52034	-149.97524

Elevation NED (m)(ft): 514 1686**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts C-6**Legal Description (MTRS):** S028N004W14**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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate:
Width				Subdominant Substrate 1:
Thalweg Depth				Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0311A003.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/21/2003 11:23 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.47916	-151.60611	Coordinates	62.47916	-151.60611	62.47973	-151.60350

Elevation NED (m)(ft): 536 1759**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-4**Legal Description (MTRS):** S028N013W36**Waterbody Name:** Sunflower Creek**Anadromous Waters Catalog Number:****Geographic Comments:** GPS coordinates for downstream terminus of reach acquired while on the ground. Coordinates for upstream terminus acquired while flying. Elevation measured at downstream terminus of reach.**Visit Comments:** Adult sockeye were initially observed by helicopter throughout the reach. Then ground observations were made at the downstream end of the reach, where two chum salmon were observed (in addition to many sockeye).**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): 108	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOG) Visual Observation, Ground

Fish Observations

Species: chum 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): VOG (2)		
Comments: Photo 11.		
Species: sockeye salmon	Life Stage: adult spawning	Life History: Anadromous
Total Fish Count: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (200)		
Comments: Photos 1, 2, 8, 9.		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)		
Comments: Photo 10.		

Instruments

Stream Gradient:

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality:

Channel Depths:

Channel Widths:

Electrofisher:

Transparency:



FSS0312A001.jpg



FSS0312A002.jpg



FSS0312A008.jpg



FSS0312A009.jpg



FSS0312A010.jpg



FSS0312A011.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/21/2003 10:14 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.54314	-151.66127	Coordinates	62.54314	-151.66127

Elevation NED (m)(ft): 686 2251**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna C-4**Legal Description (MTRS):** S028N013W03**Waterbody Name:** Sunflower Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:** 1 female moose on hillside above station; 1 kingfisher. 1 male moose observed ~ 3 miles downstream of station.**Water Quality \ Stream Flow****Water Temp (C):** 6.10 **DO (mg/L):** 11.70 **DO (%):** **Conductivity (µS/cm):** 33 **pH:** 6.53**Water Color:** Clear **Turbidity (NTU):** **Thalweg Velocity (m/s)(ft/s):****Stream Channel****Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 25**Embeddedness:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Cobble**Width** 11.2 10.6 **Subdominant Substrate 1:** Gravel**Thalweg Depth** 0.50 **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)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	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**Total Fish Count:** 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 91 **Max:** 111 **Mean:** 104 **Median:** 101**Sampling Method (No. of fish):** PEF (3)**Comments:****Species:** Dolly Varden**Life Stage:** juvenile**Life History:** Unknown**Total Fish Count:** 4 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 32 **Max:** 56 **Mean:** 47 **Median:** 44**Sampling Method (No. of fish):** PEF (4)**Suspected Spawning:** Yes**Comments:****Species:** Chinook salmon**Life Stage:** juvenile**Life History:** Anadromous**Total Fish Count:** 7 **Fish Measured:** 7 **Fork Lengths (mm)** **Min:** 47 **Max:** 56 **Mean:** 50 **Median:** 51**Sampling Method (No. of fish):** PEF (7)**Comments:**

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 Stage: adult		Life History: Resident			
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			
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:						

Instruments

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



FSS0312A003.jpg



FSS0312A004.jpg



FSS0312A005.jpg



FSS0312A006.jpg



FSS0312A007.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	62.54052	-151.59685

Elevation NED (m)(ft): 868 2848**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Cobble**Width** 3.8 3.8 **Subdominant Substrate 1:** Boulder**Thalweg Depth** 0.40 0.40 **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		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	Height(m)	<u>Right Bank Vegetation Type</u>	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:** Smith-Root LR-24**Water Quality:** Horiba 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 Quadrangle:** 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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		5.5	5.2	Subdominant Substrate 1: Boulder
Thalweg Depth			0.30	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	Closed Tall Willow Shrub	3
5 - 10	Mixed Herbs	1	Open Low Scrub	0
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 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)		
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:		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 53 Max: 62 Mean: 57 Median: 57
Sampling Method (No. of fish): PEF (2)		Suspected Spawning: Yes
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0312A014.jpg



FSS0312A015.jpg



FSS0312A016.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**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-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-4**Legal Description (MTRS):** S028N012W32**Waterbody Name:** Bonanza Creek**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 (%):	Conductivity (µS/cm): 32	pH: 6.63
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1.5**Entrenchment:****Catchment Area(sq. km):** 8**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		5.6	5.6	Subdominant Substrate 1: Gravel
Thalweg Depth			0.40	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Willow Shrub	2	Closed Tall Willow Shrub
5 - 10 Mixed Herbs	0	Closed Tall Willow Shrub
10 - 20 Mixed Herbs	0	Closed Tall Willow Shrub
20 - 30 Mixed Herbs	0	Closed Tall Willow 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:** 3 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 45 **Max:** 70 **Mean:** 57 **Median:** 57**Sampling Method (No. of fish):** PEF (2) VOG (1)**Suspected Spawning:** Yes**Comments:** F.L. of additional fish was about 60 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:**



FSS0312A017.jpg



FSS0312A018.jpg



FSS0312A019.jpg



FSS0312A020.jpg

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	62.30271	-151.27770

Elevation NED (m)(ft): 366 1201**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): 12.50	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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		2.7	2.8	Subdominant Substrate 1: Boulder
Thalweg Depth			0.20	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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Tall Willow Shrub	2	Open Tall Willow Shrub
5 - 10 Open Tall Willow Shrub	2	Open Tall Willow Shrub
10 - 20 Open Tall Willow Shrub	2	Open Tall Willow Shrub
20 - 30 Open Tall Willow Shrub	2	Open Tall Willow Shrub

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

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

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0312A021.jpg



FSS0312A022.jpg



FSS0312A023.jpg



FSS0312A024.jpg

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):** 3**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		3.5	3.5	Subdominant Substrate 1: Gravel
Thalweg Depth			0.30	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 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	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
Sampling Method (No. of fish): PEF (8)		
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0312A025.jpg



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**

Water Temp (C): 6.50	DO (mg/L): 11.70	DO (%):	Conductivity (µS/cm): 5	pH: 5.91
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 3**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	3.2	2.2		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 (Vioreck 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 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

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: 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: Average F.L. was about 150 mm.		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 73 Max: 80 Mean: 76 Median: 76
Sampling Method (No. of fish): PEF (2)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 32	Fish Measured: 26	Fork Lengths (mm) Min: 42 Max: 63 Mean: 49 Median: 52
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 clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0313A002.jpg



FSS0313A003.jpg



FSS0313A004.jpg



FSS0313A005.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/22/2003 10:03 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.26141	-151.35533	Coordinates	62.26141	-151.35533

Elevation NED (m)(ft): 420 1378**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-3**Legal Description (MTRS):** S025N011W17**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Reach located immediately upstream of abandoned, blown-out beaver dam.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 7.90	DO (mg/L): 11.03	DO (%):	Conductivity (µS/cm): 9	pH: 5.75
Water Color: Humic	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 0.5	Entrenchment:
Catchment Area(sq. km): 2	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	OHW
Width	2.1
Thalweg Depth	0.40
	2.2
	0.30
	Subdominant Substrate 1:
	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
0 - 5 Subarctic Lowland Sedge-Moss Bog Meadow	0 Subarctic Lowland Sedge-Moss Bog Meadow	0
5 - 10 Subarctic Lowland Sedge-Moss Bog Meadow	0 Subarctic Lowland Sedge-Moss Bog Meadow	0
10 - 20 Subarctic Lowland Sedge-Moss Bog Meadow	0 Open White Spruce Forest	6
20 - 30 Subarctic Lowland Sedge-Moss Bog Meadow	0 Closed White Spruce Forest	18

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: salmonid-unspecified	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (4)		
Comments: Probably Dolly Varden. Average F.L. was about 70 mm.		
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 60 Max: 67 Mean: 64 Median: 63
Sampling Method (No. of fish): PEF (3)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 6	Fish Measured: 6	Fork Lengths (mm) Min: 43 Max: 59 Mean: 47 Median: 51
Sampling Method (No. of fish): PEF (6)		
Comments:		
Species: slimy sculpin	Life Stage: adult	Life History: Resident
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 80 Max: 80 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: 6 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 52 **Max:** 68 **Mean:** 62 **Median:** 60
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: Horiba U-10 **Transparency:**



FSS0313A006.jpg



FSS0313A007.jpg



FSS0313A008.jpg



FSS0313A009.jpg



FSS0313A010.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/22/2003 11:28 AM

Station	Latitude	Longitude
Coordinates	62.19889	-151.36230

Sample	Latitude	Longitude
Coordinates	62.19889	-151.36230

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:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Boulder**Width** 2.0 2.2 **Subdominant Substrate 1:** Cobble**Thalweg Depth** 0.20 **Subdominant Substrate 2:** Sand/Silt/Clay (legacy)**Rosgen Class:** E2 XXX**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	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:** Smith-Root LR-24**Water Quality:** Horiba U-10**Transparency:**



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FSS0313A012.jpg



FSS0313A013.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/22/2003 1:30 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.22814	-151.40929	Coordinates	62.22814	-151.40929

Elevation NED (m)(ft): 368 1207**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-3**Legal Description (MTRS):** S025N012W25**Waterbody Name:** Mill Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Suspect lower forested reach of stream is important for coho and/or chinook salmon, but no landing zones available downstream of this station.**Visit Comments:** Reach located immediately downstream of an abandoned, blown-out beaver dam.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 12.20	DO (mg/L): 10.21	DO (%):	Conductivity (µS/cm): 12	pH: 6.09
Water Color: Humic	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 18	Embeddedness:

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	4.0	4.0		Subdominant Substrate 1: Cobble
Thalweg Depth		0.30		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 (Vioreck 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	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

(VOG) Visual Observation, Ground

Fish Observations

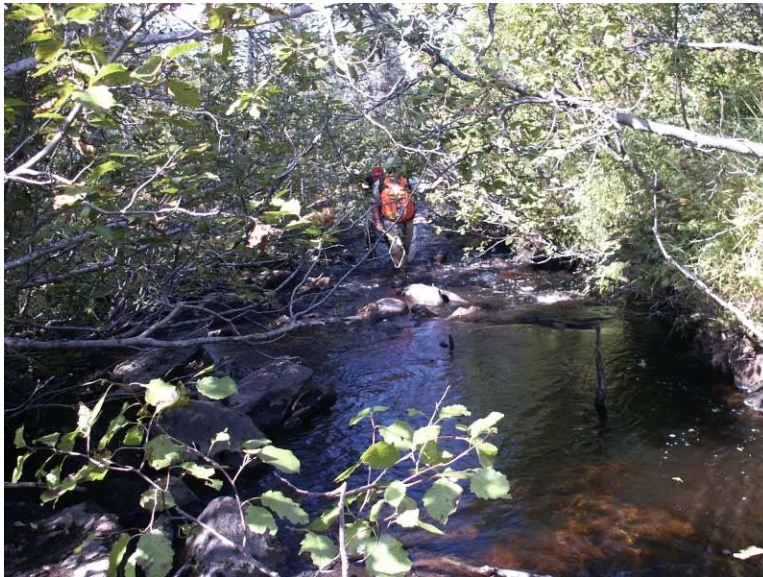
Species: rainbow trout	Life Stage: juvenile/adult	Life History: Resident
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 112 Max: 116 Mean: 114 Median: 114
Sampling Method (No. of fish): PEF (2)		
Comments: No fish captured upstream at 13A03.		

Species: rainbow trout	Life Stage: juvenile	Life History: Resident
Total Fish Count: 6	Fish Measured: 3	Fork Lengths (mm) Min: 86 Max: 92 Mean: 88 Median: 89
Sampling Method (No. of fish): PEF (3) VOG (3)		
Comments: Average F.L. of additional fish was about 80 mm. No fish captured upstream at 13A03.		

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:**



FSS0313A014.jpg



FSS0313A015.jpg



FSS0313A016.jpg



FSS0313A017.jpg



FSS0313A018.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/22/2003 2:17 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.22828	-151.51992	Coordinates	62.22828	-151.51992

Elevation NED (m)(ft): 146 479**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S025N012W28**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Suspect forested reach upstream is important for coho and/or chinook salmon, but no landing zones available upstream of this station.**Visit Comments:** Upper end of reach is low gradient (~0.5%) glide. Lower end of reach is riffle/pool with gradient = 1.5%.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 9.30	DO (mg/L): 11.29	DO (%):	Conductivity (µS/cm): 24	pH: 6.24
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 26	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull	
Width	4.2 4.3
Thalweg Depth	0.40
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2: Gravel

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 (Vioreck 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	Bluejoint Meadow	1	Bluejoint Meadow	1
5 - 10	Open Black Spruce-White Spruce Forest	10	Open Black Spruce-White Spruce Forest	10
10 - 20	Open Black Spruce-White Spruce Forest	10	Open Black Spruce-White Spruce Forest	10
20 - 30	Open Black Spruce-White Spruce Forest	10	Open Black Spruce-White Spruce Forest	10

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: salmonid-unspecified	Life Stage: juvenile/adult	Life History: Unknown
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: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 10	Fish Measured: 10	Fork Lengths (mm) Min: 37 Max: 67 Mean: 45 Median: 52
Sampling Method (No. of fish): PEF (10)		Suspected Spawning: Yes
Comments:		
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 36 Max: 36 Mean: 36 Median: 36
Sampling Method (No. of fish): PEF (1)		
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



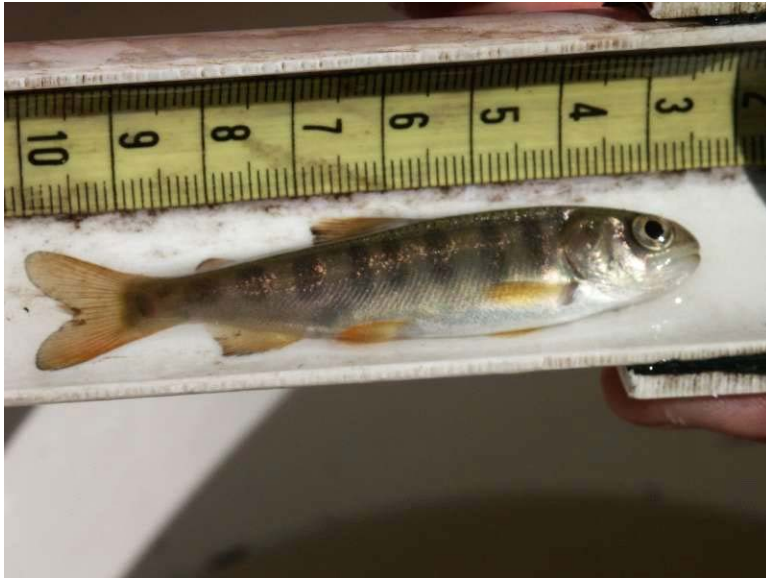
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FSS0313A020.jpg



FSS0313A021.jpg



FSS0313A022.jpg



FSS0313A023.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/22/2003 5:06 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.27542	-151.92910	Coordinates	62.27542	-151.92910

Elevation NED (m)(ft): 240 787**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-4**Legal Description (MTRS):** S025N014W07**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Old beaver dam at downstream end of reach. Reach located in old pond.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 12.60	DO (mg/L): 10.31	DO (%):	Conductivity (µS/cm): 8	pH: 5.80
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 7**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Sand/Silt/Clay (legacy)
Width	2.2	2.0		Subdominant Substrate 1:
Thalweg Depth		0.20		Subdominant Substrate 2:

Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Subarctic Lowland Sedge Wet Meadow	0
5 - 10	Subarctic Lowland Sedge Wet Meadow	0	Subarctic Lowland Sedge Wet Meadow	0
10 - 20	Subarctic Lowland Sedge Wet Meadow	0	Subarctic Lowland Sedge Wet Meadow	0
20 - 30	Subarctic Lowland Sedge Wet Meadow	0	Subarctic Lowland Sedge Wet Meadow	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:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)		
Comments: F.L.was about 150 mm.		
Species: slimy sculpin	Life Stage: adult	Life History: Resident
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 94 Max: 94 Mean: 94 Median: 94
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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FSS0313A027.jpg



FSS0313A028.jpg

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	62.36120	-151.64638

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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Tall Scrub	2	Closed Tall Scrub	2
5 - 10	Closed Tall Scrub	2	Closed Tall Scrub	2
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 Stage: juvenile/adult	Life History: Resident
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 Stage: juvenile	Life History: Resident
Total Fish Count: 9	Fish Measured: 9	Fork Lengths (mm) Min: 32 Max: 49 Mean: 39 Median: 40
Sampling Method (No. of fish): PEF (9)		
Comments:		

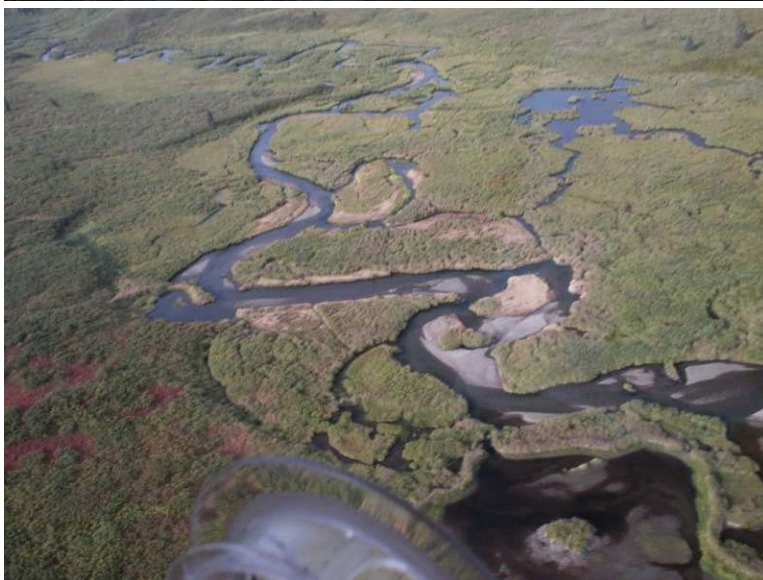
Instruments**Stream Gradient:** handheld optical clinometer**Channel Depths:** graduated wading rod**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofisher:** Smith-Root LR-24**Water Quality:** Horiba U-10**Transparency:**



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FSS0314A002.jpg



FSS0314A003.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/23/2003 10:23 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.27112	-151.86451	Coordinates	62.27112	-151.86451

Elevation NED (m)(ft): 101 331**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-4**Legal Description (MTRS):** S025N014W09**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** At least 6 active beaver ponds in lower reach of stream.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 7.50	DO (mg/L): 11.89	DO (%):	Conductivity (µS/cm): 25	pH: 6.44
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 25**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		10.5	8.6	Subdominant Substrate 1: Gravel
Thalweg Depth			0.30	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Tall Alder-Willow Shrub	3	Closed Tall Alder-Willow Shrub	3
5 - 10	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20
10 - 20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20
20 - 30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	20

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: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 55 **Max:** 55 **Mean:** 55 **Median:** 55
Sampling Method (No. of fish): PEF (1)
Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 70 **Max:** 70 **Mean:** 70 **Median:** 70
Sampling Method (No. of fish): PEF (1)
Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 15 **Fish Measured:** 15 **Fork Lengths (mm)** Min: 38 **Max:** 58 **Mean:** 47 **Median:** 48
Sampling Method (No. of fish): PEF (15) **Suspected Spawning:** Yes
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): VOG (1)			
Comments: Male.			

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



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FSS0314A005.jpg



FSS0314A006.jpg



FSS0314A007.jpg



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 Quadrangle:** 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**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 12**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		7.3	6.0	Subdominant Substrate 1: Gravel
Thalweg Depth			0.40	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 (Vioreck 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	Closed Tall Alder-Willow Shrub	4	Closed Tall Alder-Willow Shrub	3
5 - 10	Closed Tall Alder-Willow Shrub	4	Closed Paper Birch Forest	15
10 - 20	Open Balsam Poplar (Black Cottonwood) Forest	25	Closed Paper Birch Forest	15
20 - 30	Open Balsam Poplar (Black Cottonwood) Forest	25	Closed Paper Birch Forest	15

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: 5	Fish Measured: 1	Fork Lengths (mm) Min: 47 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
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 38 Max: 38 Mean: 38 Median: 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**Turbidity:****Electrofisher:** Smith-Root LR-24**Water Quality:** Horiba U-10**Transparency:**



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FSS0314A012.jpg



FSS0314A013.jpg



FSS0314A014.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/23/2003 1:29 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.20736	-151.83164	Coordinates	62.20736	-151.83164

Elevation NED (m)(ft): 213 699**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S025N014W35**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Station located at blown-out beaver dam. Sampled reach downstream of dam. OHW mark could not be determined due to recent blow-out of beaver dam.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 8.10	DO (mg/L): 11.14	DO (%):	Conductivity (µS/cm): 11	pH: 6.22
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1.5	Entrenchment:
Catchment Area(sq. km): 4	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	
OHW	
Wetted	
Width	2.4
Thalweg Depth	0.20
	Subdominant Substrate 1: Gravel
	Subdominant Substrate 2: Boulder

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 (Vioreck 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	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 White Spruce Forest	25	Closed White Spruce Forest	25

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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (2)		
Comments: Average F.L. was about 150 mm.		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 103 Max: 103 Mean: 103 Median: 103
Sampling Method (No. of fish): PEF (1)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 29	Fish Measured: 23	Fork Lengths (mm) Min: 38 Max: 79 Mean: 49 Median: 58
Sampling Method (No. of fish): PEF (23) VOG (6)		Suspected Spawning: Yes
Comments: Average F.L. of additional fish was about 45 mm.		

Species: rainbow trout		Life Stage: juvenile		Life History: Resident		
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 79	Max: 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		
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 41	Max: 44	Mean: 42	Median: 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:	



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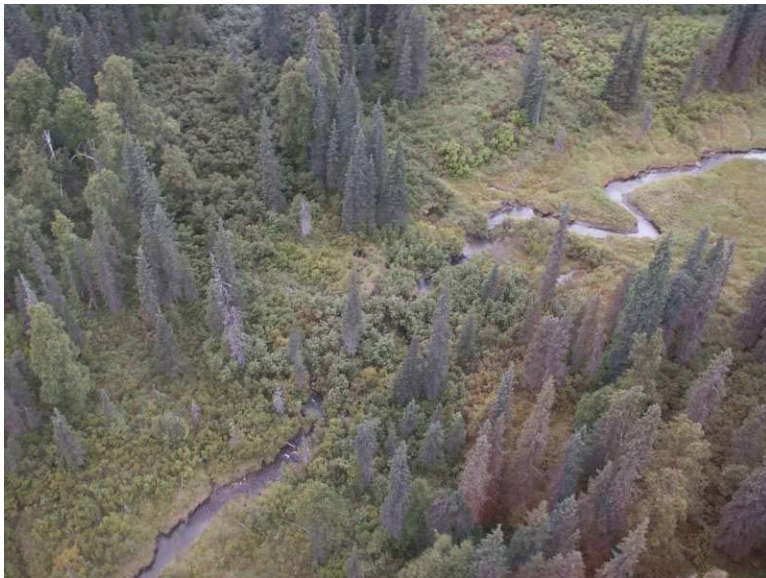
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FSS0314A017.jpg



FSS0314A018.jpg



FSS0314A019.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/23/2003 2:56 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.17686	-151.84080	Coordinates	62.17686	-151.84080

Elevation NED (m)(ft): 250 820**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S024N014W16**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Large beaver dam downstream of sample reach. Could not access stream below beaver dam - vegetation (alders/willow) too dense.**Wildlife Comments:** Bear, moose tracks.**Water Quality \ Stream Flow**

Water Temp (C): 8.90	DO (mg/L): 10.89	DO (%):	Conductivity (µS/cm): 18	pH: 6.37
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 0.5	Entrenchment:
Catchment Area(sq. km): 6	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	Subdominant Substrate 1: Cobble
OHW	Subdominant Substrate 2: Sand/Silt/Clay (legacy)
Wetted	
Width	
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 Bank (m)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
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	Closed Tall Alder-Willow Shrub	3	Closed Tall Alder-Willow Shrub	3

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: salmonid-unspecified	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (2)		
Comments: Probably Dolly Varden. Average F.L. was about 100 mm.		

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



FSS0314A020.jpg



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 Quadrangle:** 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**

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): 66	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History: Anadromous
Total Fish Count: 300	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (300)		Suspected Spawning: Yes
Comments:		

Instruments

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



FSS0314A027.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/23/2003 4:04 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.26222	-152.19804	Coordinates	62.26222	-152.19804

Elevation NED (m)(ft): 767 2516**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-5**Legal Description (MTRS):** S025N016W14**Waterbody Name:** Nakochna River**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 6.80	DO (mg/L): 10.99	DO (%):	Conductivity (µS/cm): 46	pH: 6.88
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 5**Entrenchment:****Catchment Area(sq. km):** 11**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		8.7	7.3	Subdominant Substrate 1: Boulder
Thalweg Depth			0.35	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)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy 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, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 6	Fish Measured: 2	Fork Lengths (mm) Min: 120 Max: 122 Mean: 121 Median: 121
Sampling Method (No. of fish): PEF (2) VOG (4)		
Comments: Average F.L. of additional fish was about 120 mm.		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 35 Max: 66 Mean: 54 Median: 50
Sampling Method (No. of fish): PEF (4)		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:**



FSS0314A024.jpg



FSS0314A025.jpg



FSS0314A026.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/24/2003 11:45 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.08165	-151.99744	Coordinates	62.08165	-151.99744

Elevation NED (m)(ft): 371 1217**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S023N015W15**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 8.00	DO (mg/L): 11.11	DO (%):	Conductivity (µS/cm): 88	pH: 7.26
Water Color: Clear	Turbidity (NTU): 1.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 2**Entrenchment:****Catchment Area(sq. km):** 6**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		3.8	3.1	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
Thalweg Depth			0.20	Subdominant Substrate 2:

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	2	Closed Tall Alder-Willow Shrub 2
5 - 10 Closed Balsam Poplar-White Spruce Forest	25	Closed Balsam Poplar-White Spruce Forest 25
10 - 20 Closed Balsam Poplar-White Spruce Forest	25	Closed Balsam Poplar-White Spruce Forest 25
20 - 30 Closed Balsam Poplar-White Spruce Forest	25	Closed Balsam Poplar-White Spruce Forest 25

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: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 46 **Max:** 46 **Mean:** 46 **Median:** 46
Sampling Method (No. of fish): PEF (1)

Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 17 **Fish Measured:** 12 **Fork Lengths (mm)** Min: 40 **Max:** 97 **Mean:** 53 **Median:** 68
Sampling Method (No. of fish): PEF (12) VOG (5) **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: 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 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:



FSS0315A028.jpg



FSS0315A029.jpg



FSS0315A030.jpg



FSS0315A031.jpg



FSS0315A032.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/24/2003 1:25 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.11538	-151.84991	Coordinates	62.11538	-151.84991

Elevation NED (m)(ft): 213 699**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S023N014W04**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Reach located downstream of old blown-out beaver dam.**Visit Comments:** Reach entrenched in wider channel formed by former beaver dam downstream.**Wildlife Comments:** Tracks: brown bear & cub, moose, otter?**Water Quality \ Stream Flow**

Water Temp (C): 10.20	DO (mg/L): 10.63	DO (%):	Conductivity (µS/cm): 11	pH: 6.18
Water Color: Clear	Turbidity (NTU): 1.00		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	3.6 2.4
Thalweg Depth	0.15
Dominant Substrate: Gravel	
Subdominant Substrate 1: Sand/Silt/Clay (legacy)	
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 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	Open Black Spruce Forest	8

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: 29	Fish Measured: 23	Fork Lengths (mm) Min: 35 Max: 60 Mean: 41 Median: 47
Sampling Method (No. of fish): PEF (23) VOG (6)		Suspected Spawning: Yes
Comments: Average F.L. of additional fish was about 40 mm.		
Species: slimy sculpin	Life Stage: juvenile/adult	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): PEF (1)		
Comments:		
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 48 Max: 48 Mean: 48 Median: 48
Sampling Method (No. of fish): PEF (1)		
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:



FSS0315A033.jpg



FSS0315A034.jpg



FSS0315A035.jpg



FSS0315A036.jpg



FSS0315A037.jpg



FSS0315A038.jpg



FSS0315A039.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/24/2003 2:35 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.10551	-151.87487	Coordinates	62.10551	-151.87487

Elevation NED (m)(ft): 265 869**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S023N014W05**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Old blown-out beaver dam at upstream end of reach.**Visit Comments:****Wildlife Comments:** Old beaver ponds, tadpole.**Water Quality \ Stream Flow**

Water Temp (C): 10.20	DO (mg/L): 10.63	DO (%):	Conductivity (µS/cm): 11	pH: 6.18
Water Color: Clear	Turbidity (NTU): 1.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 2	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	OHW
Width	Wetted
	2.9 2.6
Thalweg Depth	Subdominant Substrate 1: Gravel
	0.10 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 (Vioreck 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	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	12	Open White Spruce Forest	12

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

Fish Observations

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:		

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



FSS0315A041.jpg



FSS0315A042.jpg



FSS0315A043.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/24/2003 3:28 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.01563	-151.62251	Coordinates	62.01563	-151.62251

Elevation NED (m)(ft): 183 600**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-4**Legal Description (MTRS):** S022N013W10**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 13.70 **DO (mg/L):** 9.02 **DO (%):** **Conductivity (µS/cm):** 15 **pH:** 6.03**Water Color:** Humic **Turbidity (NTU):** **Thalweg Velocity (m/s)(ft/s):****Stream Channel****Stream Gradient (%):** 0.5**Entrenchment:****Catchment Area(sq. km):** 18**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		4.9	4.9	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
Thalweg Depth			0.15	Subdominant Substrate 2: Cobble

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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Bluejoint-Shrub	1 Bluejoint-Shrub	1
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 Black Spruce Forest	6 Closed Black Spruce Forest	6

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** ninespine stickleback**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 63 **Max:** 63 **Mean:** 63 **Median:** 63**Sampling Method (No. of fish):** PEF (1)**Comments:****Species:** coho salmon**Life Stage:** juvenile**Life History:** Anadromous**Total Fish Count:** 26 **Fish Measured:** 20 **Fork Lengths (mm)** **Min:** 38 **Max:** 53 **Mean:** 43 **Median:** 45**Sampling Method (No. of fish):** PEF (20) VOG (6)**Suspected Spawning:** Yes**Comments:** Average F.L. of additional fish was about 45 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:**



FSS0315A044.jpg



FSS0315A045.jpg



FSS0315A046.jpg



FSS0315A047.jpg



FSS0315A048.jpg



FSS0315A049.jpg

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	62.08863	-152.27210	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**

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): 103	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 100	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (100)		
Comments: No sockeye observed upstream at 15A06.		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity: Price pygmy meter	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	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	62.08686	-152.39984

Elevation NED (m)(ft): 530 1739**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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):	Dominant Substrate: Gravel
Bankfull	Wetted
Width	8.1 7.7
Thalweg Depth	0.30
	Subdominant Substrate 1: Cobble
	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)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
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**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:**



FSS0315A051.jpg



FSS0315A052.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/24/2003 5:43 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.09367	-152.37300	Coordinates	62.09367	-152.37300

Elevation NED (m)(ft): 446 1463**Coordinate Determination Method:** Non-Differential 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:****Water Quality \ Stream Flow****Water Temp (C):** 6.70 **DO (mg/L):** 10.74 **DO (%):** **Conductivity (µS/cm):** 37 **pH:** 6.56**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** **Thalweg Velocity (m/s)(ft/s):****Stream Channel****Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 78**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		13.4	13.1	Subdominant Substrate 1: Gravel
Thalweg Depth		0.70	0.50	Subdominant Substrate 2:

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	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 Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 95 Max: 110 Mean: 102 Median: 102
Sampling Method (No. of fish): PEF (2)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 32 Max: 38 Mean: 34 Median: 35
Sampling Method (No. of fish): PEF (3)		Suspected Spawning: Yes
Comments:		

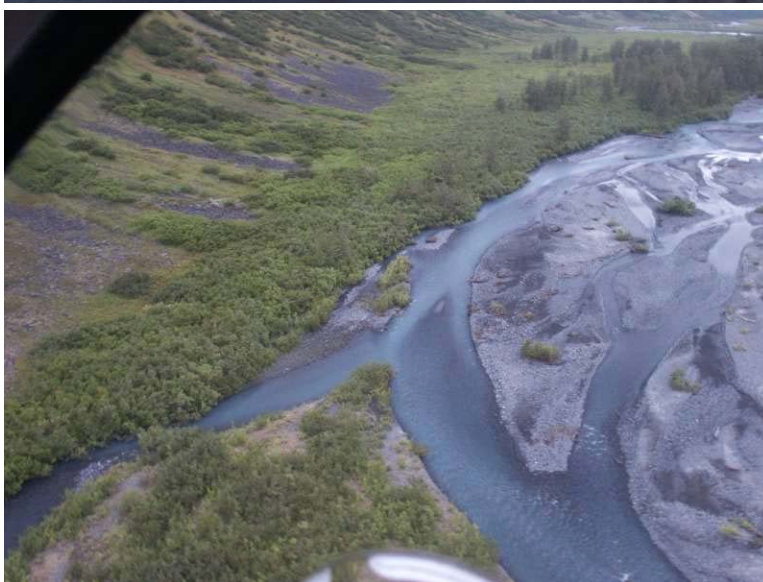
Instruments**Stream Gradient:** handheld optical clinometer**Channel Depths:** graduated wading rod**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofisher:** Smith-Root LR-24**Water Quality:** Horiba U-10**Transparency:**



FSS0315A053.jpg



FSS0315A054.jpg



FSS0315A055.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/25/2003 9:18 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.86857	-151.16537	Coordinates	61.86857	-151.16537	61.86915	-151.16282

Elevation NED (m)(ft): 51 167**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-4**Legal Description (MTRS):** S021N010W31**Waterbody Name:** Eightmile 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): 122	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

Species: Chinook salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 6	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (6)		Suspected Spawning: Yes
Comments: No adult chinook observed upstream at 16A02.		
Species: sockeye salmon	Life Stage: adult spawning	Life History: Anadromous
Total Fish Count: 20	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (20)		
Comments: No adult sockeye observed upstream at 16A02.		

Instruments

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

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/25/2003 9:53 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.81345	-151.24661	Coordinates	61.81345	-151.24661

Elevation NED (m)(ft): 103 338**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-4**Legal Description (MTRS):** S020N011W22**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Headwater stream of Eightmile Creek. Stream flows west to east.**Visit Comments:** Several active beaver dams downstream of station.**Wildlife Comments:** Frog. Otter tracks.**Water Quality \ Stream Flow**

Water Temp (C): 10.60	DO (mg/L): 8.59	DO (%):	Conductivity (µS/cm): 68	pH: 6.50
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 0	Entrenchment:
Catchment Area(sq. km): 18	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	4.4 4.6
Thalweg Depth	0.40
Dominant Substrate: Gravel	
Subdominant Substrate 1: Sand/Silt/Clay (legacy)	
Subdominant Substrate 2: Cobble	

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 (Vioreck 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	Bluejoint Meadow	1	Bluejoint Meadow	1
20 - 30	Bluejoint Meadow	1	Bluejoint Meadow	1

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: threespine stickleback **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 49 **Max:** 53 **Mean:** 51 **Median:** 51
Sampling Method (No. of fish): PEF (2)
Comments:

Species: threespine stickleback **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 20 **Max:** 29 **Mean:** 24 **Median:** 24
Sampling Method (No. of fish): PEF (2) **Suspected Spawning:** Yes
Comments:

Species: lamprey-unspecified **Life Stage:** juvenile **Life History:** Unknown
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:

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: Horiba U-10	Transparency:



FSS0316A001.jpg



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

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.89160	-151.63676	Coordinates	61.89160	-151.63676

Elevation NED (m)(ft): 205 673**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-5**Legal Description (MTRS):** S021N013W22**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:**

Visit Comments: Used backup electrofisher (Smith-Root model LR-24, yellow) for first time at this station. Noticed that this electrofisher put out more power (179 W, set on 500 V) than green electrofisher used to this point (~100 W max, even when set on 990 Volts).

Wildlife Comments:**Water Quality \ Stream Flow**

Water Temp (C): 11.10	DO (mg/L): 9.96	DO (%):	Conductivity (µS/cm): 30	pH: 6.46
Water Color: Clear	Turbidity (NTU): 0.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 0.5	Entrenchment:
Catchment Area(sq. km): 4	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Width	3.0
Thalweg Depth	0.40
Wetted	3.4
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2:

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 (Vioreck 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	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 Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 104 **Max:** 115 **Mean:** 109 **Median:** 109
Sampling Method (No. of fish): PEF (2) **Suspected Spawning:** Yes
Comments:

Species: rainbow trout **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 14 **Fish Measured:** 14 **Fork Lengths (mm)** **Min:** 35 **Max:** 57 **Mean:** 44 **Median:** 46
Sampling Method (No. of fish): PEF (14)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 72 **Max:** 84 **Mean:** 78 **Median:** 78
Sampling Method (No. of fish): PEF (2)
Comments:

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	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:



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	61.92660	-151.59683	61.92719	-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**

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):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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
Comments: Photos 13, 14.		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity: Price pygmy meter	Channel Widths:
Turbidity:	Electrofischer:
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	61.92920	-151.74618

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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOG) Visual Observation, Ground

Fish Observations

Species: chum 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): VOG (2)		Suspected Spawning: Yes
Comments: Photo 16. No salmon observed upstream at 16A06		
Species: pink salmon	Life Stage: adult spawning	Life History: Anadromous
Total Fish Count: 25	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (25)		
Comments: Photo 17 (redd). No salmon observed upstream at 16A06		
Species: sockeye salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (200)		
Comments: Photos 15,16. No salmon observed upstream at 16A06		

Instruments

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

Water Quality:

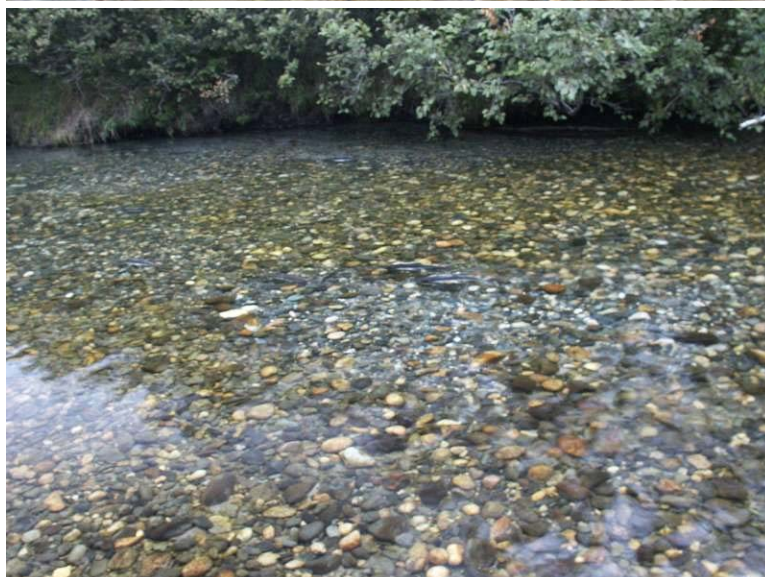
Transparency:



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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**

Water Temp (C): 8.30	DO (mg/L): 11.07	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): 1	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Width	Wetted
	2.4 2.1
Thalweg Depth	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2:
	0.05

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Mixed Herbs	0	Closed Tall Alder Shrub	3
5 - 10	Open Paper Birch Forest	10	Closed Tall Alder Shrub	3
10 - 20	Open Paper Birch Forest	10	Closed Tall Alder Shrub	3
20 - 30	Open Paper Birch Forest	10	Closed Tall Alder Shrub	3

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

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/25/2003 1:43 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.84398	-151.51984	Coordinates	61.84398	-151.51984

Elevation NED (m)(ft): 155 509**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-5**Legal Description (MTRS):** S020N012W07**Waterbody Name:** Quartz 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0316A007.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/26/2003 11:12 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.07565	-151.16923	Coordinates	62.07565	-151.16923

Elevation NED (m)(ft): 367 1204**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-3**Legal Description (MTRS):** S023N010W19**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Reach located in beaver meadow (old pond).**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 7.70	DO (mg/L): 10.86	DO (%):	Conductivity (µS/cm): 34	pH: 6.46
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1.5	Entrenchment:
Catchment Area(sq. km): 12	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Width	5.6
Thalweg Depth	0.30
	Subdominant Substrate 1: Cobble
	Subdominant Substrate 2:

Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck 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	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

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

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	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)		
Comments: F.L. was about 150 mm.		
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (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 Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/26/2003 12:59 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.05353	-151.07159	Coordinates	62.05353	-151.07159

Elevation NED (m)(ft): 251 823**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-3**Legal Description (MTRS):** S023N010W26**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Water high - poor electrofishing conditions.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 10.20	DO (mg/L): 9.76	DO (%):	Conductivity (µS/cm): 6	pH: 4.98
Water Color: Humic	Turbidity (NTU): 1.00		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1.5**Entrenchment:****Catchment Area(sq. km):** 9**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	3.6	3.6		Subdominant Substrate 1: Boulder
Thalweg Depth		0.80		Subdominant Substrate 2:

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Bluejoint-Shrub	1 Open Tall Alder Shrub	4
5 - 10 Bluejoint-Shrub	1 Open Tall Alder Shrub	4
10 - 20 Bluejoint-Shrub	1 Open Tall Alder Shrub	4
20 - 30 Bluejoint-Shrub	1 Closed Spruce-Paper Birch Forest	20

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:****Fork Lengths (mm) Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOG (1)**Comments:** F.L. was about 150 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:**



FSS0317A004.jpg



FSS0317A005.jpg



FSS0317A006.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/26/2003 1:37 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.99763	-151.03109	Coordinates	61.99763	-151.03109

Elevation NED (m)(ft): 46 151**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-3**Legal Description (MTRS):** S022N010W13**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Bog.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 12.00	DO (mg/L): 4.56	DO (%):	Conductivity (µS/cm): 94	pH: 6.33
Water Color: Humic	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 0**Entrenchment:****Catchment Area(sq. km):** 9**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width	2.5	2.5		Subdominant Substrate 1:
Thalweg Depth		0.45		Subdominant Substrate 2:

Rosgen Class: WET Wetland**Riparian Vegetation Communities (Vioreck 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**Channel Depths:** graduated wading rod**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofischer:****Water Quality:** Horiba U-10**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	61.90519	-151.01931

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 **DO (%):** **Conductivity (µS/cm):** 44 **pH:** 5.97**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**Width**

3.5

3.5

Subdominant Substrate 1:**Thalweg Depth**

2.00

Subdominant Substrate 2:**Rosgen Class:** WET Wetland**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
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:****Electrofischer:****Water Quality:** Horiba U-10**Transparency:**



FSS0317A009.jpg



FSS0317A010.jpg



FSS0317A011.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	61.92352	-151.24876

Elevation NED (m)(ft): 50 164**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:****Catchment Area(sq. km):** 8**Embeddedness:****Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 Stage:** juvenile**Life History:** Anadromous**Total Fish Count:** 14 **Fish Measured:** 14 **Fork Lengths (mm) Min:** 68 **Max:** 114 **Mean:** 99 **Median:** 91**Sampling Method (No. of fish):** MTQ (14)**Comments:** These fish were originally ID'd as Chinook; however, they are now thought to be coho presmolts which are begi**Species:** sockeye salmon**Life Stage:** juvenile**Life History:** Anadromous**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 58 **Max:** 58 **Mean:** 58 **Median:** 58**Sampling Method (No. of fish):** MTQ (1)**Comments:****Instruments****Stream Gradient:** handheld optical clinometer**Channel Depths:** Visual estimate**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofischer:****Water Quality:** Horiba 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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		14.3	13.2	Subdominant Substrate 1: Gravel
Thalweg Depth			0.30	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 (Vioreck 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	3
5 - 10	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	3
10 - 20	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	3
20 - 30	Open Tall Willow Shrub	2	Closed Tall Willow Shrub	3

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:** **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:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown

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 **Max:** 54 **Mean:** 54 **Median:** 54

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

Comments:

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

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:
Catchment Area(sq. km): 6	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	
OHW	
Wetted	
Width	6.1 4.0
Thalweg Depth	0.05
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2: Cobble

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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 Low Willow Shrub	1	Closed Tall Willow Shrub	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	2

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.

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
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
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: 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.

Species: slimy sculpin	Life Stage: adult		Life History: Resident			
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 80	Max: 80	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			
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 33	Max: 33	Mean: 33	Median: 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:



FSS0318A006.jpg



FSS0318A007.jpg



FSS0318A008.jpg



FSS0318A012.jpg



FSS0318A013.jpg



FSS0318A016.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	-152.97709	Coordinates	61.58861	-152.97709

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		14.3	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Open Tall Willow Shrub	2	Open Tall Willow Shrub	2
5 - 10	Vaccinium Dwarf Shrub Tundra	0	Vaccinium Dwarf Shrub Tundra	0
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 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:



FSS0318A017.jpg



FSS0318A018.jpg



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	61.79414	-152.84927

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	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 3**Entrenchment:****Catchment Area(sq. km):** 61**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		8.7	7.2	Subdominant Substrate 1: Gravel
Thalweg Depth			0.60	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
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: 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:		

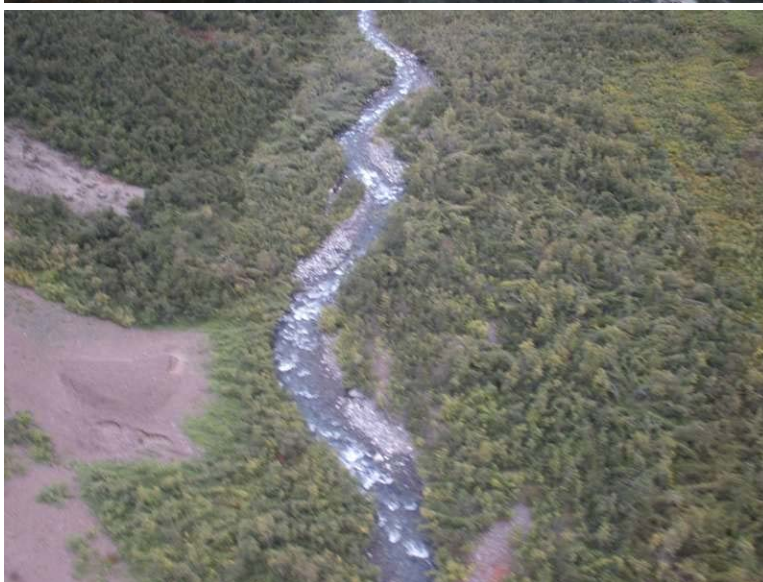
Instruments**Stream Gradient:** handheld optical clinometer**Channel Depths:** graduated wading rod**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofisher:** Smith-Root LR-24**Water Quality:** Horiba U-10**Transparency:**



FSS0318A022.jpg



FSS0318A023.jpg



FSS0318A024.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/27/2003 4:35 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.97649	-152.82902	Coordinates	61.97649	-152.82902

Elevation NED (m)(ft): 611 2005**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-8**Legal Description (MTRS):** S022N019W19**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Left bank tributary of Portage Creek.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 5.80	DO (mg/L): 11.74	DO (%):	Conductivity (µS/cm): 23	pH: 7.15
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 2**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	4.1	3.7		Subdominant Substrate 1: Gravel
Thalweg Depth		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 (Vioreck 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**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 121 **Max:** 121 **Mean:** 121 **Median:** 121**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:**



FSS0318A030.jpg



FSS0318A031.jpg



FSS0318A032.jpg



FSS0318A033.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/27/2003 4:18 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.95786	-152.85282	Coordinates	61.95786	-152.85282

Elevation NED (m)(ft): 673 2208**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-8**Legal Description (MTRS):** S022N020W36**Waterbody Name:** Portage Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Waterfall. 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 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	62.16694	-152.93635

Elevation NED (m)(ft): 724 2375**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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**

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): 232	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:		
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:	Electrofischer:
Water Quality:	Transparency:



FSS0319A002.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/28/2003 9:42 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.11588	-153.07000	Coordinates	62.11588	-153.07000	62.11649	-153.06739

Elevation NED (m)(ft): 802 2631**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Mc Grath A-1**Legal Description (MTRS):** S023N021W02**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**

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): 86	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 19	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (19)		
Comments:		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 13	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (13)		
Comments:		

Instruments

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



FSS0319A003.jpg



FSS0319A004.jpg

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	62.05693	-153.09985

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 (mg/L): 11.43	DO (%):	Conductivity (µS/cm): 100	pH: 7.45
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1**Entrenchment:****Catchment Area(sq. km):** 18**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	Closed Tall Willow Shrub	1
5 - 10	Closed Tall Willow Shrub	1	Closed Tall Willow Shrub	1
10 - 20	Closed Tall Willow Shrub	1	Closed Tall Willow Shrub	1
20 - 30	Closed Tall Willow Shrub	1	Closed Tall Willow Shrub	1

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: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 27	Max: 35	Mean: 31	Median: 31
Sampling Method (No. of fish): PEF (2)			Suspected Spawning: Yes			
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				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 30	Max: 44	Mean: 36	Median: 37
Sampling Method (No. of fish): PEF (4)						
Comments:						

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0319A005.jpg



FSS0319A006.jpg



FSS0319A007.jpg



FSS0319A008.jpg



FSS0319A009.jpg



FSS0319A010.jpg



FSS0319A011.jpg



FSS0319A012.jpg



FSS0319A013.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/28/2003 11:28 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.11602	-153.02408	Coordinates	62.11602	-153.02408

Elevation NED (m)(ft): 822 2697**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Mc Grath A-1**Legal Description (MTRS):** S023N020W06**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Left-bank Puntilla Creek tributary.**Visit Comments:** Main channel barely wadeable, but difficult to electrofish (deep, fast). All electrofishing occurred in side channel and off channel habitat.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 4.80	DO (mg/L): 11.66	DO (%):	Conductivity (µS/cm): 88	pH: 7.33
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):** 1 **Entrenchment:****Catchment Area(sq. km):** 39 **Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		6.5	6.5	Subdominant Substrate 1: Cobble
Thalweg Depth			0.60	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 (Vioreck 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	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 Stage: juvenile	Life History: Anadromous
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 41 Max: 50 Mean: 46 Median: 45
Sampling Method (No. of fish): PEF (3)		
Comments:		

Species: sockeye salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 47 Max: 47 Mean: 47 Median: 47
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:**



FSS0319A014.jpg



FSS0319A015.jpg



FSS0319A016.jpg



FSS0319A017.jpg



FSS0319A018.jpg



FSS0319A019.jpg



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	62.17361	-152.81188

Elevation NED (m)(ft): 674 2211**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:****Catchment Area(sq. km):** 122**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		4.2	3.6	Subdominant Substrate 1: Boulder
Thalweg Depth			0.15	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 (Vioreck 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	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:** adult**Life History:** Resident**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 164 **Max:** 164 **Mean:** 164 **Median:** 164**Sampling Method (No. of fish):** PEF (1)**Comments:** No fish captured or observed upstream at station 19A08.**Species:** sockeye salmon**Life Stage:** juvenile**Life History:** Anadromous**Total Fish Count:** 9 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 35 **Max:** 64 **Mean:** 51 **Median:** 49**Sampling Method (No. of fish):** PEF (9)**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:**



FSS0319A021.jpg



FSS0319A022.jpg



FSS0319A023.jpg



FSS0319A024.jpg



FSS0319A025.jpg



FSS0319A026.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	62.16708	-153.05657

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width		6.9	5.4	Subdominant Substrate 1: Cobble
Thalweg Depth			0.50	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 Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy 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:**

FSS0319A027.jpg



FSS0319A028.jpg



FSS0319A029.jpg



Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/28/2003 3:23 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.21646	-152.69509	Coordinates	62.21646	-152.69509

Elevation NED (m)(ft): 666 2185**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-6**Legal Description (MTRS):** S025N018W31**Waterbody Name:** Moose Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:****Wildlife Comments:** Bear tracks, droppings, remnants of salmon carcasses.**Water Quality \ Stream Flow**

Water Temp (C): 6.30	DO (mg/L): 10.79	DO (%):	Conductivity (µS/cm): 71	pH: 7.52
Water Color: Glacial, Low Turbidity	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 7	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	
Width	9.0
Thalweg Depth	0.50
OH	8.3
Wetted	
	Subdominant Substrate 1: Sand/Silt/Clay (legacy)
	Subdominant Substrate 2:

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 32 Max: 71 Mean: 46 Median: 51
Sampling Method (No. of fish): PEF (4)		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 31. Sockeye observed up to Moose Creek Lk.		

Species: sockeye salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 36 Max: 44 Mean: 39 Median: 40
Sampling Method (No. of fish): PEF (4)		Suspected Spawning: Yes
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0319A030.jpg



FSS0319A031.jpg



FSS0319A033.jpg



FSS0319A034.jpg



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	62.22500	-152.90769

Elevation NED (m)(ft): 739 2425**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:****Catchment Area(sq. km):** 65**Embeddedness:**

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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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**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:**



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	62.16064	-152.73400	62.16124	-152.73139

Elevation NED (m)(ft): 627 2057**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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**

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): 86	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 150	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (150)		
Comments:		

Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 30	Fish Measured:	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:	Electrofischer:
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	62.18225	-152.87793	62.18286	-152.87532

Elevation NED (m)(ft): 703 2306**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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**

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): 93	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 15	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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:
Turbidity:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/29/2003 9:12 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.92063	-151.89391	Coordinates	61.92063	-151.89391

Elevation NED (m)(ft): 153 502**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S021N014W08**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Right bank tributary to Hayes River. Barrier falls upstream at station 20A13. 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): 91	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 6	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (6)		
Comments: No sockeye observed upstream at 20A02.		

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:** 08/29/2003 9:48 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.89920	-151.92488	Coordinates	61.89920	-151.92488

Elevation NED (m)(ft): 209 686**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S021N014W19**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Right bank tributary to Hayes 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 (%):	Conductivity (µS/cm): 30	pH: 7.36
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 2	Entrenchment:
Catchment Area(sq. km): 86	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull	Subdominant Substrate 1: Gravel
Width	Subdominant Substrate 2: Sand/Silt/Clay (legacy)
Thalweg Depth	

Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck 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	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 Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
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 100 mm.		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm) Min: 44 Max: 57 Mean: 51 Median: 50
Sampling Method (No. of fish): PEF (5)		Suspected Spawning: Yes
Comments:		
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 57 Max: 67 Mean: 61 Median: 62
Sampling Method (No. of fish): PEF (4)		
Comments:		

Species: slimy sculpin

Life Stage: adult

Life History: Resident

Total Fish Count: 1

Fish Measured: 1

Fork Lengths (mm) Min: 119

Max: 119

Mean: 119

Median: 119

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:



FSS0320A001.jpg



FSS0320A002.jpg



FSS0320A003.jpg



FSS0320A004.jpg



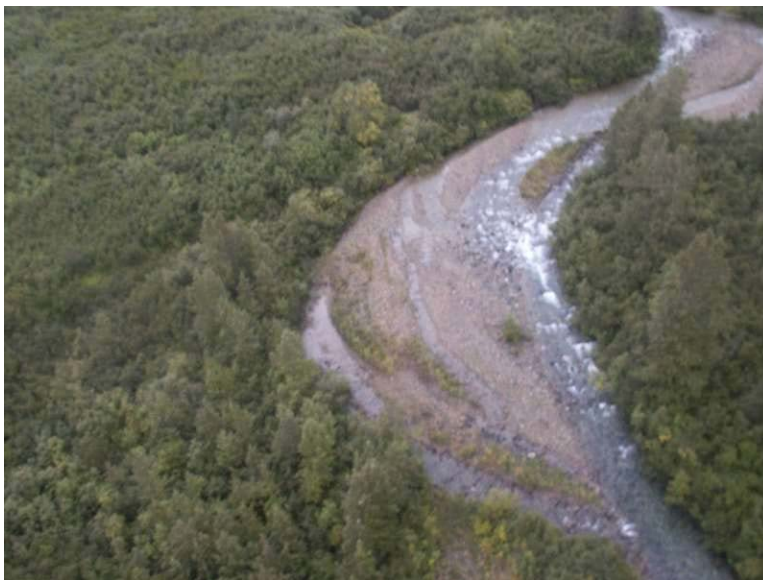
FSS0320A005.jpg



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	61.91086	-151.99293

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:
Catchment Area(sq. km): 2	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 6	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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: Mean: Median:
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:	Electrofischer:

Water Quality:

Transparency:



FSS0320A009.jpg



FSS0320A010.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/29/2003 10:48 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.82424	-152.08335	Coordinates	61.82424	-152.08335	61.82484	-152.08078

Elevation NED (m)(ft): 197 646**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S020N016W13**Waterbody Name:** Trimble River**Anadromous Waters Catalog Number:****Geographic Comments:** Fish observed in clear side channels, tributary mouths throughout reach. Barrier falls about 2.5 miles upstream at station 20A14. 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): 528	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 230	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (230)		
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): VOH (2)		
Comments:		

Instruments

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

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/29/2003 11:23 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.89166	-152.07682	Coordinates	61.89166	-152.07682	61.89226	-152.07425

Elevation NED (m)(ft): 200 656**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S021N015W20**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed clear left bank tributary to Spring Creek. Barrier falls about 7 miles upstream at station 20A15. 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): 140	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 8	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (8)		
Comments:		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (1)		
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:** 08/29/2003 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):	Dominant Substrate: Gravel
Bankfull	OHW
Width	25.0
Thalweg Depth	0.40
	Subdominant Substrate 1: Cobble
	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 (Vioreck 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	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**Transparency:**



FSS0320A014.jpg



FSS0320A015.jpg



FSS0320A016.jpg



FSS0320A017.jpg



FSS0320A018.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/29/2003 2:17 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	61.96390	-152.42719	Coordinates	61.96390	-152.42719

Elevation NED (m)(ft): 325 1066**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-7**Legal Description (MTRS):** S022N017W29**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Clear, right-bank Chickak River tributary.**Visit Comments:** Reach sampled was in clear right bank tributary. Main channel: conductivity 286, turbidity 210, D.O. 12.6, temperature 6.2, pH 8.08.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 5.20	DO (mg/L): 12.56	DO (%):	Conductivity (µS/cm): 167	pH: 8.16
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 5	Embeddedness:

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	7.3	6.1		Subdominant Substrate 1: Gravel
Thalweg Depth		0.05		Subdominant Substrate 2: Boulder

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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 Stage: adult	Life History: Resident
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 Dolly Varden observed upstream at 20A02.		

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

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0320A019.jpg



FSS0320A020.jpg



FSS0320A021.jpg



FSS0320A022.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 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-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S021N016W12**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Tributary stream to Red 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	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 2	Entrenchment:
Catchment Area(sq. km): 37	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull	OHW
Width	12.0
Thalweg Depth	0.30
	Subdominant Substrate 1: Gravel
	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 (Vioreck 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	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

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 11 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 106 **Max:** 106 **Mean:** 106 **Median:** 106
Sampling Method (No. of fish): PEF (1) VOG (10)
Comments: Average F.L. of additional fish was about 90 mm.

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 20 **Fish Measured:** 20 **Fork Lengths (mm)** **Min:** 36 **Max:** 85 **Mean:** 62 **Median:** 60
Sampling Method (No. of fish): PEF (20) **Suspected Spawning:** Yes
Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 13 **Fish Measured:** 8 **Fork Lengths (mm)** **Min:** 42 **Max:** 47 **Mean:** 44 **Median:** 44
Sampling Method (No. of fish): PEF (8) VOG (5)
Comments: Average F.L. of additional fish was about 45 mm.

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

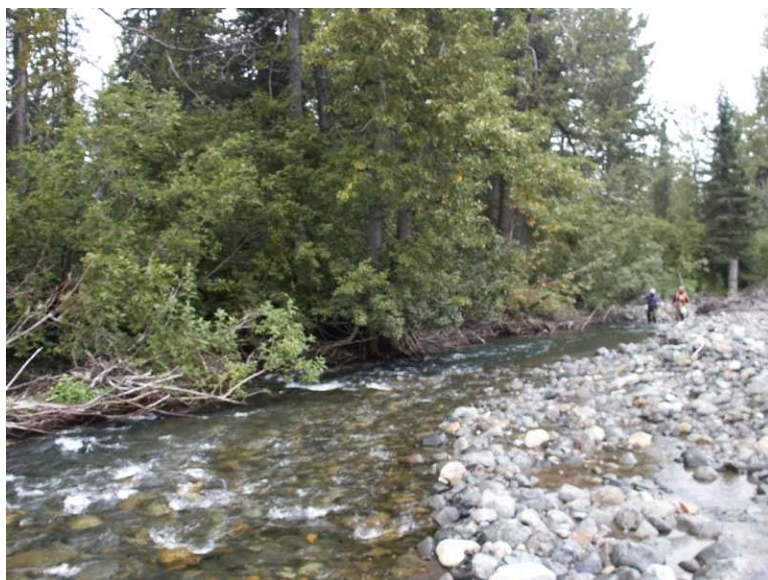
Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0320A025.jpg



FSS0320A026.jpg



FSS0320A027.jpg



FSS0320A028.jpg



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	62.19517	-152.28158	62.19576	-152.27898

Elevation NED (m)(ft): 250 820**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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**

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): 479	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 100	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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

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

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/29/2003 5:04 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.27030	-152.56767	Coordinates	62.27030	-152.56767

Elevation NED (m)(ft): 367 1204**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna B-6**Legal Description (MTRS):** S025N018W11**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Clear left bank tributary (spring flow in abandoned channel) of Kichatna River.**Visit Comments:****Wildlife Comments:** tracks: moose, wolf, bear.**Water Quality \ Stream Flow**

Water Temp (C): 9.10	DO (mg/L): 8.33	DO (%):	Conductivity (µS/cm): 104	pH: 7.35
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1	Entrenchment:
Catchment Area(sq. km): 96	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull	
OHW	
Wetted	
Width	4.6 2.2
Thalweg Depth	0.05
	Subdominant Substrate 1: Gravel
	Subdominant Substrate 2: Sand/Silt/Clay (legacy)

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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 Balsam Poplar-White Spruce Forest	25	Closed Tall Alder-Willow Shrub	2

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: 161 Max: 161 Mean: 161 Median: 161
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: 41 Max: 55 Mean: 48 Median: 48
Sampling Method (No. of fish): PEF (3)		Suspected Spawning: Yes
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 79	Fish Measured: 29	Fork Lengths (mm) Min: 37 Max: 77 Mean: 52 Median: 57
Sampling Method (No. of fish): PEF (29) VOG (50)		Suspected Spawning: Yes
Comments: Average F.L. of additional fish was about 50 mm.		
Species: sockeye salmon	Life Stage: adult spawning	Life History: Anadromous
Total Fish Count: 75	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (75)		
Comments:		

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				
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 36	Max: 49	Mean: 41	Median: 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:



FSS0320A036.jpg



FSS0320A037.jpg



FSS0320A038.jpg



FSS0320A039.jpg



FSS0320A040.jpg



FSS0320A042.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/29/2003 11:09 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.80257	-152.09309	Coordinates	61.80257	-152.09309	61.80317	-152.09053

Elevation NED (m)(ft): 229 751**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S020N016W24**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Clear left bank tributary to Trimble River. 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:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 1000	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (1000)		
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:** 08/29/2003 3:15 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.93991	-152.01482	Coordinates	61.93991	-152.01482	61.94051	-152.01225

Elevation NED (m)(ft): 171 561**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S021N015W03**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed tributary to Red Salmon Lake. 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): 62	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 History: Anadromous
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (1)		Suspected Spawning: Yes
Comments: No sockeye observed upstream at 20A08.		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 5	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (5)		
Comments: No sockeye observed upstream at 20A08.		

Instruments

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

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**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-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S021N015W36**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Waterfall. 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 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	61.74568	-152.00078

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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate:
Width				Subdominant Substrate 1:
Thalweg Depth				Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0320A011.jpg

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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS0320A013.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/30/2003 9:28 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.11145	-150.99389	Coordinates	62.11145	-150.99389

Elevation NED (m)(ft): 282 925**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-2**Legal Description (MTRS):** S023N009W06**Waterbody Name:****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):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	OHW
Width	Wetted
	2.5 2.9
Thalweg Depth	Subdominant Substrate 1: Gravel
	Subdominant Substrate 2: Cobble
	0.50

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 (Vioreck 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	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	Open White Spruce Forest	20

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: rainbow trout	Life Stage: juvenile	Life History: Resident
Total Fish Count: 23	Fish Measured: 18	Fork Lengths (mm) Min: 35
		Max: 98
Sampling Method (No. of fish): PEF (18) VOG (5)	Mean: 52	Median: 66
Comments: Average F.L. of additional fish was about 50 mm.	Suspected Spawning: Yes	

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:



FSS0321A001.jpg



FSS0321A002.jpg



FSS0321A003.jpg



FSS0321A004.jpg



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:
Catchment Area(sq. km): 17	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Width	Wetted
	5.4 4.7
Thalweg Depth	Subdominant Substrate 1: Cobble
	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 (Vioreck 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	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
20 - 30	Open White Spruce Forest	20	Closed Tall Alder-Willow Shrub	3

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
Sampling Method (No. of fish): PEF (18) VOG (5) **Suspected Spawning:** Yes
Comments: Average F.L. of additional fish was about 50 mm.

Species: rainbow trout **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 6 **Fish Measured:** 6 **Fork Lengths (mm)** Min: 32 Max: 68 Mean: 41 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:

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:**



FSS0321A006.jpg



FSS0321A007.jpg



FSS0321A009.jpg



FSS0321A010.jpg



FSS0321A011.jpg



FSS0321A012.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson, Jim Lazar**Date/Time:** 08/30/2003 11:42 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.13623	-151.17196	Coordinates	62.13623	-151.17196

Elevation NED (m)(ft): 458 1503**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna A-3**Legal Description (MTRS):** S024N010W30**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Right-bank Yenlo Creek tributary.**Visit Comments:****Wildlife Comments:** Bull and cow moose.**Water Quality \ Stream Flow**

Water Temp (C): 7.80	DO (mg/L):	DO (%):	Conductivity (µS/cm): 39	pH: 6.63
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%): 1.5	Entrenchment:
Catchment Area(sq. km): 8	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull	OHW
Width	Wetted
	7.0 5.6
Thalweg Depth	Subdominant Substrate 1: Gravel
	0.25
	Subdominant Substrate 2: Sand/Silt/Clay (legacy)

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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 Stage: juvenile	Life History: Unknown
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 37 Max: 66 Mean: 51 Median: 51
Sampling Method (No. of fish): PEF (2)		Suspected Spawning: Yes
Comments:		

Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 18	Fish Measured: 18	Fork Lengths (mm) Min: 36 Max: 50 Mean: 41 Median: 43
Sampling Method (No. of fish): PEF (18)		Suspected Spawning: Yes
Comments:		

Species: rainbow trout	Life Stage: juvenile	Life History: Resident
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm) Min: 29 Max: 57 Mean: 35 Median: 43
Sampling Method (No. of fish): PEF (5)		Suspected Spawning: Yes
Comments:		

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher: Smith-Root LR-24

Transparency:



FSS0321A013.jpg



FSS0321A014.jpg



FSS0321A016.jpg



FSS0321A017.jpg



FSS0321A018.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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width		4.3	2.7	Subdominant Substrate 1: Gravel
Thalweg Depth			0.15	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)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	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):	Dominant Substrate: Sand/Silt/Clay (legacy)
Bankfull	
Width	15.8
Thalweg Depth	0.30
	Subdominant Substrate 1: Gravel
	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)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	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 stickleback **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 43 **Max:** 57 **Mean:** 51 **Median:** 50
Sampling Method (No. of fish): MTQ (5)
Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 99 **Max:** 110 **Mean:** 106 **Median:** 104
Sampling Method (No. of fish): MTQ (3)
Comments:

Species: sockeye salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 55 **Max:** 59 **Mean:** 57 **Median:** 57
Sampling Method (No. of fish): MTQ (2)
Comments:

Species: rainbow trout **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 122 **Max:** 138 **Mean:** 131 **Median:** 130
Sampling Method (No. of fish): MTQ (3)
Comments:

-continued-

Instruments

Stream Gradient: handheld optical clinometer

Stream Velocity: Price pygmy meter

Turbidity:

Water Quality: Horiba U-10

Channel Depths: graduated wading rod

Channel Widths: measuring tape

Electrofisher:

Transparency:



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FSS0321A026.jpg



FSS0321A027.jpg



FSS0321A028.jpg



FSS0321A029.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	62.14821	-151.89305

Elevation NED (m)(ft): 215 705**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width		2.8	2.8	Subdominant Substrate 1:
Thalweg Depth			1.70	Subdominant Substrate 2:

Rosgen Class: WET Wetland**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	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**Channel Depths:** graduated wading rod**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofisher:****Water Quality:** Horiba U-10**Transparency:**



FSS0321A030.jpg



FSS0321A031.jpg



FSS0321A032.jpg

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	62.33511	-151.24535

Elevation NED (m)(ft): 359 1178**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** 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:****Catchment Area(sq. km):** 6**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Organic
Width	3.4	3.4		Subdominant Substrate 1:
Thalweg Depth	0.90	0.90		Subdominant Substrate 2:

Rosgen Class: WET Wetland**Riparian Vegetation Communities (Vioreck 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	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:****Instruments****Stream Gradient:** handheld optical clinometer**Channel Depths:** graduated wading rod**Stream Velocity:** Price pygmy meter**Channel Widths:** measuring tape**Turbidity:****Electrofischer:****Water Quality:** Horiba U-10**Transparency:**



FSS0321A033.jpg



FSS0321A034.jpg



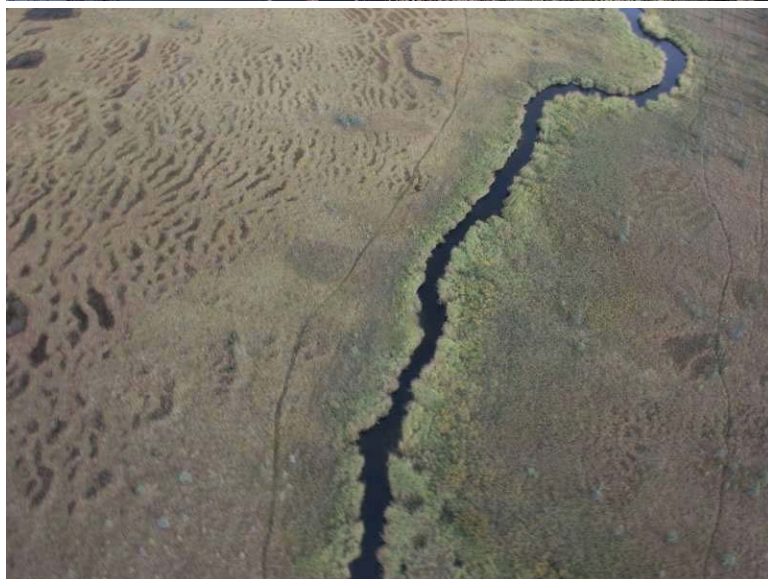
FSS0321A035.jpg



FSS0321A036.jpg



FSS0321A037.jpg



FSS0321A038.jpg

Station Info**Observers:** Joe Buckwalter, J Johnson**Date/Time:** 08/01/2003 11:54 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.26748	-149.25465	Coordinates	62.26748	-149.25465	62.26802	-149.25212

Elevation NED (m)(ft): 280 919**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts B-5**Legal Description (MTRS):** S025N001E10**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:
Catchment Area(sq. km): 750	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 29	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (29)		Suspected Spawning: Yes
Comments: No chinook observed upstream at 01A01, 01A03.		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity: Price pygmy meter	Channel Widths:
Turbidity:	Electrofisher:
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:
Catchment Area(sq. km): 390	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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 Buckwalter, J Johnson**Date/Time:** 08/01/2003 9:31 AM

Station	Latitude	Longitude
Coordinates	62.83455	-148.59018

Sample	Latitude	Longitude
Coordinates	62.83455	-148.59018

Elevation NED (m)(ft): 472 1549**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** NAD83**USGS Quadrangle:** Talkeetna Mts D-4**Legal Description (MTRS):** S032N005E30**Waterbody Name:** Tsusena Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Impassable falls upstream at station 05A05. 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):** 371**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted
Width			
Thalweg Depth			

Dominant Substrate:**Subdominant Substrate 1:****Subdominant Substrate 2:****Rosgen Class:****Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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**Total Fish Count:** 1**Fish Measured:****Fork Lengths (mm)****Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOH (1)**Comments:** No chinook observed upstream at 05A02. Waterfall about 2.5 miles upstream at 05A05 is a population barrier t**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:** Price pygmy meter**Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**

APPENDIX L. 2011 STATION REPORTS AND PHOTOS

Station Info**Observers:** Daniel Reed, Tim Sundlov**Date/Time:** 08/03/2011 12:00 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.93620	-147.28810	Coordinates	62.93620	-147.28810	62.92624	-147.26120

Elevation NED (m)(ft): 763 2503**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-1**Legal Description (MTRS):** S033N011E24**Waterbody Name:** Coal Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** pH meter not working properly.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 8.17	DO (mg/L): 10.81	DO (%): 91.70	Conductivity (µS/cm): 23	pH:
Water Color: Clear	Turbidity (NTU): 1.24	Thalweg Velocity (m/s)(ft/s): 0.70 2.30		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 235 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	21.5		19.8	Subdominant Substrate 1: Gravel
Thalweg Depth	0.46		0.33	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 (Vioreck 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	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 Electrofishing Time (s):** 2909

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Arctic grayling **Life Stage:** adult **Life History:** Resident
Total Fish Count: 32 **Fish Measured:** 19 **Fork Lengths (mm) Min:** 332 **Max:** 407 **Mean:** 356 **Median:** 369
Sampling Method (No. of fish): BEF (19) VOB (13)
Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 29 **Fish Measured:** 27 **Fork Lengths (mm) Min:** 29 **Max:** 50 **Mean:** 42 **Median:** 39
Sampling Method (No. of fish): BEF (27) VOB (2)
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
Total Fish Count: 6 **Fish Measured:** 5 **Fork Lengths (mm)** Min: 280 Max: 372 Mean: 322 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 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:**



FSS1101A010357.jpg



FSS1101A010359.jpg



FSS1101A010363.jpg

FSS1101A010365.jpg



Station Info**Observers:** Jonathan Kirsch, Ashley Reed**Date/Time:** 08/03/2011 11:34 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.95278	-147.00649	Coordinates	62.95278	-147.00649	/ 62.93615	-147.00451

Elevation NED (m)(ft): 777 2549**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-1**Legal Description (MTRS):** C014N009W31**Waterbody Name:** Clearwater Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IU6**Visit Comments:** Stream velocity calculated from TVHR readings is 1.77 m/s.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.45 **DO (mg/L):** 11.49 **DO (%):** 95.70 **Conductivity (µS/cm):** 103 **pH:** 5.75**Water Color:** Clear **Turbidity (NTU):** 1.24 **Thalweg Velocity (m/s)(ft/s):** 1.70 5.58**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 554 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	38.0		18.0	Subdominant Substrate 1: Gravel
Thalweg Depth	1.50		0.75	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 (Vioreck 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	Closed Tall Willow Shrub	2.7	Closed Tall Willow Shrub	3.3
5 - 10	Closed White Spruce Forest	9	Closed Tall Willow Shrub	3.3
10 - 20	Closed White Spruce Forest	9	Closed Tall Willow Shrub	3.3
20 - 30	Closed White Spruce Forest	9	Closed Black Spruce-White Spruce Forest	13

Key To Fish Sampling Methods**Estimated reach length (m):** 2500 **Total Electrofishing Time (s):** 889

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations**Species:** Arctic grayling**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 20 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 360 **Max:** 380 **Mean:** 370 **Median:** 370**Sampling Method (No. of fish):** BEF (2) VOB (18)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 1 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOB (1)**Comments:** Event O arctic grayling approximately 95mm.**Species:** Arctic grayling**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 3 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 297 **Max:** 307 **Mean:** 303 **Median:** 302**Sampling Method (No. of fish):** BEF (3)**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: 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	63.26862	-146.41500	63.26993	-146.42260

Elevation NED (m)(ft): 992 3255**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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:** Moderately 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
Thalweg Depth	1.80		0.36	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 (Vioreck 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	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 Fish Sampling Methods**Estimated reach length (m):** 490

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 10 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 127 **Max:** 185 **Mean:** 162 **Median:** 156
Sampling Method (No. of fish): PEF (4) VOG (6)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 59 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 56 **Max:** 66 **Mean:** 61 **Median:** 61
Sampling Method (No. of fish): PEF (14) VOG (45)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 71 **Max:** 110 **Mean:** 88 **Median:** 90
Sampling Method (No. of fish): PEF (4)
Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 35 **Max:** 48 **Mean:** 42 **Median:** 41
Sampling Method (No. of fish): PEF (5)
Comments:

-continued-

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:



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FSS1101c010006.jpg

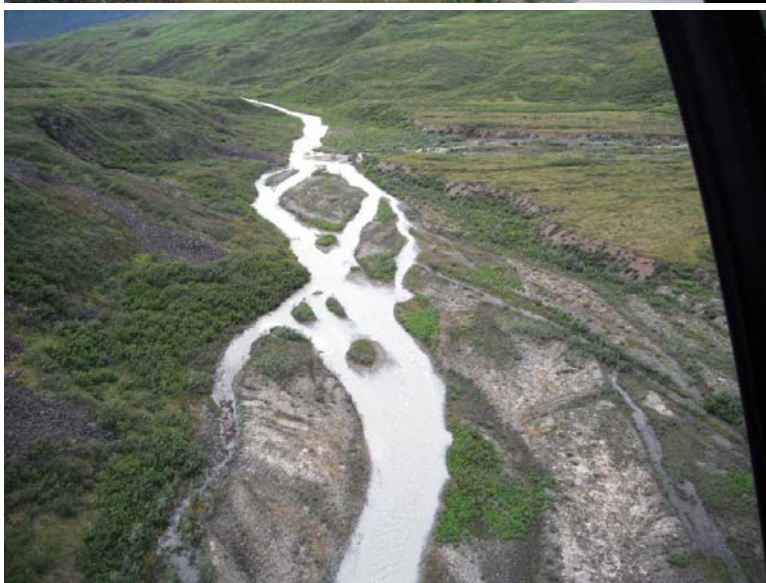
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FSS1101c010008.jpg



FSS1101c010009.jpg



Station Info**Observers:** Raye Ann Neustel, Joe Buckwalter**Date/Time:** 08/03/2011 3:15 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.19090	-146.42755	Coordinates	63.19160	-146.42471	63.18992	-146.42903

Elevation NED (m)(ft): 1035 3396**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes A-5**Legal Description (MTRS):** F020S007E09**Waterbody Name:** Boulder Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HU46**Visit Comments:** Reach discontinuously electrofished--much of the channel was too deep for wading, so we spot-shocked from the banks.**Wildlife Comments:** 4 Caribou.**Water Quality \ Stream Flow****Water Temp (C):** 10.88 **DO (mg/L):** 9.56 **DO (%):** 86.60 **Conductivity (µS/cm):** 16 **pH:** 5.56**Water Color:** Clear **Turbidity (NTU):** 1.00 **Thalweg Velocity (m/s)(ft/s):** 1.42 4.66**Stream Channel****Stream Gradient (%):** 0 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 83 **Embeddedness:** Very High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Sand
Width	13.1		12.7	Subdominant Substrate 1: Gravel
Thalweg Depth	1.25		1.10	Subdominant Substrate 2: Boulder

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 (Vioreck 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 Low Willow Shrub	0.7	Open Low Willow Shrub	0.7
5 - 10	Open Low Willow Shrub	0.7	Open Low Willow Shrub	0.7
10 - 20	Subarctic Lowland Sedge-Moss Bog Meadow	0.3	Bryoid herbaceous	0.3
20 - 30	Subarctic Lowland Sedge-Moss Bog Meadow	0.3	Bryoid herbaceous	0.3

Key To Fish Sampling Methods**Estimated reach length (m):** 310

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling	Life Stage: juvenile	Life History: Resident
Total Fish Count: 10	Fish Measured: 2	Fork Lengths (mm) Min: 35 Max: 35 Mean: 35 Median: 35
Sampling Method (No. of fish): PEF (2) VOG (8)		

Comments:

Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident
Total Fish Count: 36	Fish Measured: 6	Fork Lengths (mm) Min: 51 Max: 65 Mean: 54 Median: 58
Sampling Method (No. of fish): PEF (6) VOG (30)		

Comments:

Species: slimy sculpin	Life Stage: adult	Life History: Resident
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 69 Max: 89 Mean: 79 Median: 79
Sampling Method (No. of fish): PEF (3)		

Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 12 **Fish Measured:** 12 **Fork Lengths (mm)** **Min:** 30 **Max:** 40 **Mean:** 36 **Median:** 35
Sampling Method (No. of fish): PEF (12)
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:**



FSS1101c020012.jpg



FSS1101c020013.jpg



FSS1101c020015.jpg



FSS1101c020017.jpg

Station Info**Observers:** Joe Buckwalter, Jonathan Kirsch**Date/Time:** 06/30/2011 11:30 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.41173	-148.62240	Coordinates	61.41173	-148.62240	/ 61.47519	-148.71428

Elevation NED (m)(ft): 48 157**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S015N005E07**Waterbody Name:** Knik River**Anadromous Waters Catalog Number:****Geographic Comments:**

Visit Comments: Drove jet boat (18-ft G3 with 90/65 Yamaha 4-stroke) 20 miles up Knik River from Old Glenn Highway in 1 hr and 25 minutes. Used approx. 6 gallons of fuel or half a tank. Cruising ground speed 15-20 mph. pH unstable, drifted from 3.8 to 6.4 in 1 hour--still rising. Reach sampled along left bank.

Wildlife Comments:**Water Quality \ Stream Flow**

Water Temp (C): 1.65	DO (mg/L): 14.94	DO (%): 106.00	Conductivity (µS/cm): 51	pH:
Water Color: Glacial, High Turbidit	Turbidity (NTU): 103.00	Thalweg Velocity (m/s)(ft/s): 1.90	6.23	

Stream Channel**Stream Gradient (%):** 0 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 1055 **Embeddedness:** High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	380.0		309.0	Subdominant Substrate 1: Cobble
Thalweg Depth	2.50		1.90	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	2.5	Closed Tall Alder-Willow Shrub	2.5
5 - 10	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	2.5
10 - 20	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	2.5
20 - 30	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	2.5

Key To Fish Sampling Methods**Estimated reach length (m):** #####

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 40 **Fish Measured:** 20 **Fork Lengths (mm)** **Min:** 86 **Max:** 245 **Mean:** 157 **Median:** 165
Sampling Method (No. of fish): BEF (20) VOB (20)
Comments: In individual fish comments section, all fish labeled with "a" were retained for otolith extraction and finclips we

Species: sculpin-unspecified **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 63 **Max:** 63 **Mean:** 63 **Median:** 63
Sampling Method (No. of fish): BEF (1)
Comments:

Instruments**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:**



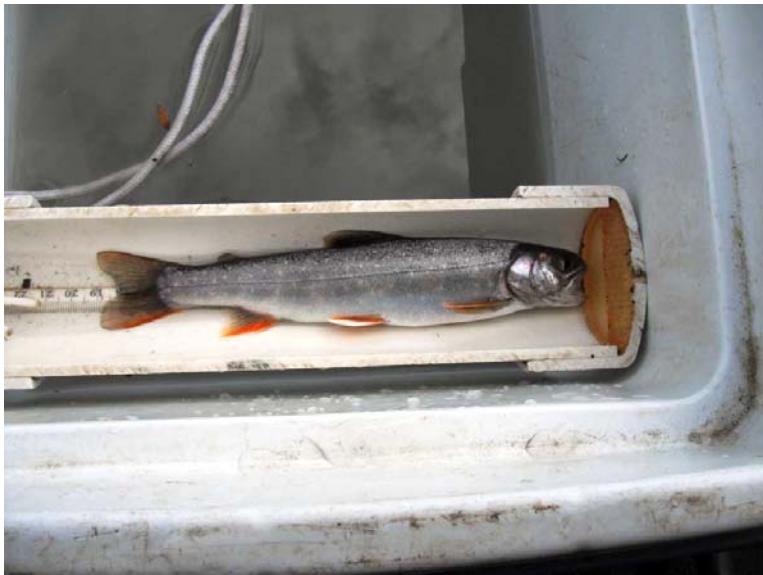
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FSS1101D010204.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/14/2011 11:49 AM

Sample	Latitude	Longitude
Coordinates	61.52410	-148.95267

Elevation NED (m)(ft): 16 52**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-6**Legal Description (MTRS):** S017N003E32**Waterbody Name:** Jim Creek**Anadromous Waters Catalog Number:** 247-50-10200-2081**Geographic Comments:****Visit Comments:** Major ATV crossing area. 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): 123	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 50	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (50)		
Comments: Age 0+ fry.		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 152 Max: 152 Mean: 152 Median: 152
Sampling Method (No. of fish): MTR (1)		
Comments:		

Instruments

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



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FSS1101F010818.jpg



FSS1101F010819.jpg



FSS1101F010820.jpg



FSS1101F010821.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/14/2011 12:18 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.50240	-148.85570	61.50234	-148.85697

Elevation NED (m)(ft): 16 52**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-5**Legal Description (MTRS):** S016N003E02**Waterbody Name:** Knik River**Anadromous Waters Catalog Number:****Geographic Comments:** Springbrook/side channel.**Visit Comments:** This site is at an ATV trail crossing. Minnow trapping only--no electrofishing or habitat assessment occurred. Set 1 trap at downstream coordinate (to the west) and another at upstream coordinate.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C):	DO (mg/L):	DO (%):	Conductivity (µS/cm):	pH:
Water Color: Glacial, Low Turbidit	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%):	Entrenchment:
Catchment Area(sq. km): 1.5	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Sand
Bankfull	OHW
Wetted	Subdominant Substrate 1: Gravel
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(MTR) Minnow Trap

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 9	Fish Measured: 9	Fork Lengths (mm) Min: 86 Max: 145 Mean: 117 Median: 115
Sampling Method (No. of fish): MTR (9)		
Comments:		

Instruments

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



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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	61.49165	-148.72773	61.49078	-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):	Dominant Substrate:
Bankfull	OHW
Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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): 1	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



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FSS1101F040836.jpg

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 10:45 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.76586	-148.53187	62.77535	-148.71770

Elevation NED (m)(ft): 637 2090**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-4**Legal Description (MTRS):** S031N005E21**Waterbody Name:** Fog Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth about 7 miles upstream.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 200**Fish Measured:****Fork Lengths (mm)****Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOH (200)**Comments:** Schools of adult salmonids (probably Arctic grayling) seen throughout. No salmon were observed.**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 11:29 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.85363	-148.55199	62.82351	-148.61366

Elevation NED (m)(ft): 563 1847**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-4**Legal Description (MTRS):** S032N005E20**Waterbody Name:** Tsusena Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth to waterfall about 4 miles upstream.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 200 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOH (200)**Comments:** Schools of adult salmonids (probably Arctic grayling) seen throughout. No salmon were observed.**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**



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Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 11:37 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.96064	-148.07760	62.82935	-148.25803

Elevation NED (m)(ft): 740 2428**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-3**Legal Description (MTRS):** F022S003W35**Waterbody Name:** Watana Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth to about 13 miles upstream.**Visit Comments:** Water was turbid from mouth upstream about 6 miles to a landslide at GPS waypoint 013 (N62.88674 W148.14896), then clear upstream of the landslide.**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):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (200)		
Comments: Schools of adult salmonids (probably Arctic grayling) seen throughout. No salmon were observed.		

Instruments

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

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 1:39 PM

Sample	Latitude	Longitude
Coordinates	62.67335	-148.00421

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):	Dominant Substrate:
Bankfull	OHW
Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank 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: 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): 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:
Turbidity:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 2:20 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.83731	-147.71899	62.77693	-147.88850

Elevation NED (m)(ft): 823 2700**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-2**Legal Description (MTRS):** S032N009E26**Waterbody Name:** Jay Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth to about 8 miles upstream.**Visit Comments:****Wildlife Comments:** Beaver pond about 8 miles up Jay Creek at GPS waypoint 016 (N62.83753 W147.72259).**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (500)		
Comments: Schools of adult salmonids (probably Arctic grayling) seen throughout Jay Creek. No salmon were observed.		

Instruments

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

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 5:37 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.11209	-147.45890	63.11303	-147.51917

Elevation NED (m)(ft): 814 2671**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:** Aerial survey from mouth to about 3 miles upstream.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

Species: Arctic grayling	Life Stage: adult	Life History: Resident
Total Fish Count: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (200)		
Comments: Schools of grayling, especially near mouth. No salmon were observed.		

Instruments

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



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FSS1101G060262.jpg



FSS1101G060263.jpg

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 5:50 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.19221	-147.42788	63.16515	-147.50691

Elevation NED (m)(ft): 904 2966**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-1**Legal Description (MTRS):** F020S002E07**Waterbody Name:** Valdez Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth to about 3.5 miles upstream.**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 (Vioreck 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

(VOH) Visual Observation, Helicopter

Fish Observations**Species:** Arctic grayling**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 200 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOH (200)**Comments:** Many grayling observed, especially near mouth. No salmon.**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**



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FSS1101G070266.jpg



FSS1101G070267.jpg



FSS1101G070268.jpg



FSS1101G070269.jpg



FSS1101G070270.jpg

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 6:18 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.32844	-147.24294	63.32674	-147.26762

Elevation NED (m)(ft): 785 2575**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal Description (MTRS):** F018S003E30**Waterbody Name:** Boulder Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth to about 1 mile upstream.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 200 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOH (200)**Comments:** Schools of adult salmonids (probably Arctic grayling) seen throughout. No salmon were observed.**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 6:25 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.40475	-147.17250	63.37350	-147.19403

Elevation NED (m)(ft): 797 2615**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal Description (MTRS):** F017S003E33**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed right-bank East Fork Susitna River tributary.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 200 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOH (200)**Comments:** Schools of adult salmonids (probably Arctic grayling) seen throughout. No salmon were observed.**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 6:30 PM

Sample	Latitude	Longitude
Coordinates	63.43257	-147.18558

Elevation NED (m)(ft): 846 2776**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal Description (MTRS):** F017S003E21**Waterbody Name:** Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:** Fly-by only--photos of Susitna Glacier.**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 (Vioreck 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**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:**



FSS1101G100272.jpg



FSS1101G100273.jpg



FSS1101G100274.jpg

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 6:40 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.34960	-147.40474	63.30971	-147.39042

Elevation NED (m)(ft): 859 2818**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal Description (MTRS):** F018S002E17**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed right-bank Susitna River tributary (Target Stream ID HU33). Aerial survey from mouth upstream about 3 miles.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (200)		
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:

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/27/2011 7:04 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.30764	-147.65388	63.30496	-147.53951

Elevation NED (m)(ft): 789 2589**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-2**Legal Description (MTRS):** F018S001W36**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed right-bank West Fork Susitna River tributary. Aerial survey from lake down to mouth (about 4 miles).**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):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (200)		
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Daniel Reed, David Pluth**Date/Time:** 08/04/2011 9:53 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.06144	-147.60517	Coordinates	63.06142	-147.60439	63.06053	-147.55556

Elevation NED (m)(ft): 762 2500**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-2**Legal Description (MTRS):** F021S001E29**Waterbody Name:** Butte Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IU8**Visit Comments:** pH sensor was malfunctioning.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 8.28	DO (mg/L): 11.07	DO (%): 94.60	Conductivity (µS/cm): 35	pH:
Water Color: Clear	Turbidity (NTU): 0.32	Thalweg Velocity (m/s)(ft/s): 1.10 3.61		

Stream Channel**Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 434 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	29.0		18.9	Subdominant Substrate 1: Gravel
Thalweg Depth	1.12		0.66	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 (Vioreck 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 Low Willow Shrub	1	Unvegetated	
5 - 10	Open Low Willow Shrub	1.5	Unvegetated	
10 - 20	Open Low Willow Shrub	3	Open Low Willow Shrub	1.5
20 - 30	Open Black Spruce Forest	5	Open Low Willow Shrub	1.5

Key To Fish Sampling Methods**Estimated reach length (m):** 3100 **Total Electrofishing Time (s):** 2098

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 46 **Fish Measured:** 33 **Fork Lengths (mm)** Min: 123 Max: 411 Mean: 285 Median: 267
Sampling Method (No. of fish): BEF (33) VOB (9) VOG (4)
Comments:

Species: longnose sucker **Life Stage:** adult **Life History:** Resident
Total Fish Count: 10 **Fish Measured:** 7 **Fork Lengths (mm)** Min: 196 Max: 429 Mean: 358 Median: 312
Sampling Method (No. of fish): BEF (7) VOG (3)
Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 10 **Fish Measured:** 10 **Fork Lengths (mm)** Min: 31 Max: 58 Mean: 47 Median: 44
Sampling Method (No. of fish): BEF (10)
Comments:

Species: slimy sculpin **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:

-continued-

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 263 Max: 263 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 **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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FSS1102A010370.jpg



FSS1102A010371.jpg



FSS1102A010372.jpg



FSS1102A010373.jpg



FSS1102A010374.jpg

Station Info**Observers:** Jonathan Kirsch, Ashley Reed**Date/Time:** 08/04/2011 10:25 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.85475	-148.22310	Coordinates	62.85475	-148.22310	62.84066	-148.24245

Elevation NED (m)(ft): 509 1670**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-3**Legal Description (MTRS):** S032N007E19**Waterbody Name:** Watana Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IU21**Visit Comments:** pH sensor was malfunctioning.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 11.75	DO (mg/L): 10.70	DO (%): 98.70	Conductivity (µS/cm): 44	pH:
Water Color: Clear	Turbidity (NTU): 6.33		Thalweg Velocity (m/s)(ft/s): 1.50 4.92	

Stream Channel**Stream Gradient (%):** 1 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 422 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	22.0		14.0	Subdominant Substrate 1: Gravel
Thalweg Depth	1.00		0.60	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	15
5 - 10	Closed Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	15
10 - 20	Closed Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	15
20 - 30	Closed Spruce-Paper Birch Forest	20	Closed Spruce-Paper Birch Forest	15

Key To Fish Sampling Methods**Estimated reach length (m):** 2200 **Total Electrofishing Time (s):** 659

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 91 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 235 **Max:** 252 **Mean:** 243 **Median:** 243
Sampling Method (No. of fish): BEF (2) VOB (89)
Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 103 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 190 **Max:** 315 **Mean:** 249 **Median:** 252
Sampling Method (No. of fish): BEF (5) VOB (98)
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): VOB (1)
Comments:

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 110 **Max:** 145 **Mean:** 128 **Median:** 127
Sampling Method (No. of fish): BEF (5)
Comments:

-continued-

Species: round whitefish **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 195 Max: 195 Mean: 195 Median: 195
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: 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	63.40664	-147.17268	63.40526	-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**Catchment Area(sq. km):** 31 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	22.6		7.6	Subdominant Substrate 1: Gravel
Thalweg Depth	1.00		0.70	Subdominant Substrate 2: Sand

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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
10 - 20	Halophytic Grass Wet Meadow	0.3	Closed Tall Willow Shrub	0.9
20 - 30	Halophytic Grass Wet Meadow	0.3	Closed Tall Willow Shrub	0.9

Key To Fish Sampling Methods**Estimated reach length (m):** 276

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident

Total Fish Count: 12 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**

Sampling Method (No. of fish): VOG (12)

Comments:

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

Total Fish Count: 6 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**

Sampling Method (No. of fish): VOG (6)

Comments:

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

Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 40 **Max:** 40 **Mean:** 40 **Median:** 40

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

Comments:

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

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:

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:



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FSS1102c010021.jpg

FSS1102c010022.jpg



FSS1102c010023.jpg



FSS1102c010025.jpg



Station Info**Observers:** Raye Ann Neustel, Joe Buckwalter**Date/Time:** 08/04/2011 11:28 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.30010	-147.06947	Coordinates	63.29864	-147.06781	63.30010	-147.06947

Elevation NED (m)(ft): 1082 3550**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal 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****Water Temp (C):** 7.37 **DO (mg/L):** 10.25 **DO (%):** 85.30 **Conductivity (µS/cm):** 85 **pH:** 6.67**Water Color:** Glacial, Low Turbidity **Turbidity (NTU):** 8.80 **Thalweg Velocity (m/s)(ft/s):** 0.59 1.94**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 71 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	27.2		17.3	Subdominant Substrate 1: Silt/Clay
Thalweg Depth	1.10		0.45	Subdominant Substrate 2:

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	1.3	Closed Low Willow Shrub	1.9
5 - 10	Closed Low Willow Shrub	1.3	Closed Tall Willow Shrub	1.9
10 - 20	Closed Low Willow Shrub	1.3	Closed Tall Willow Shrub	1.9
20 - 30	Closed Low Willow Shrub	1.3	Closed Tall Willow Shrub	1.9

Key To Fish Sampling Methods**Estimated reach length (m):** 337

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

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

Total Fish Count: 6 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 35 **Max:** 35 **Mean:** 35 **Median:** 35

Sampling Method (No. of fish): PEF (1) VOG (5)

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 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:**



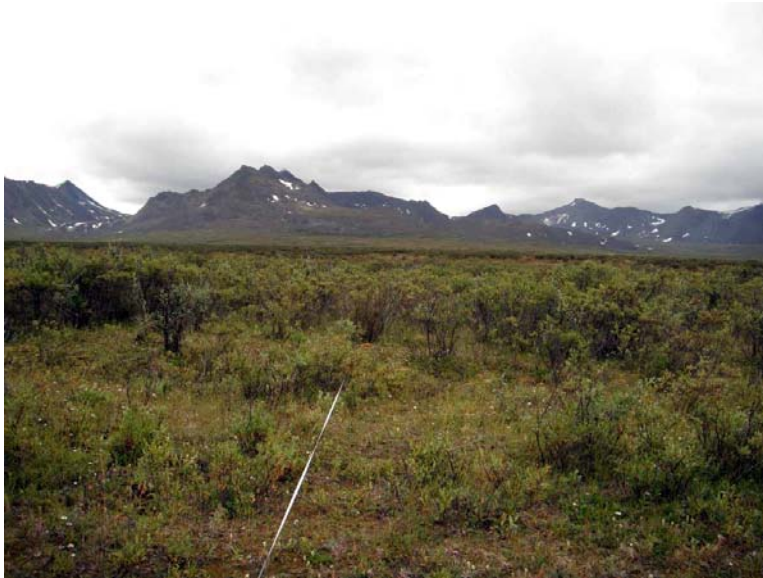
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Station Info**Observers:** Raye Ann Neustel, Joe Buckwalter**Date/Time:** 08/04/2011 1:41 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.21684	-147.22313	Coordinates	63.21714	-147.21956	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****Water Temp (C):** 9.27 **DO (mg/L):** 9.89 **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

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	0.7	Open Low Willow Shrub	1.35
5 - 10	Open Low Willow Shrub	0.7	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 **Mean:** 29 **Median:** 30
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



FSS1102C030038.jpg



FSS1102C030039.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	63.11157	-147.47378	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 134 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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 Alder-Willow Shrub	1.3	Closed Tall Alder-Willow Shrub	2.5
5 - 10	Open White Spruce Forest	30	Closed White Spruce Forest	30
10 - 20	Open White Spruce Forest	30	Closed White Spruce Forest	30
20 - 30	Closed Low Willow Shrub	1.3	Closed White Spruce Forest	30

Key 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
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 275 Max: 275 Mean: 275 Median: 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
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm) Min: 35 Max: 44 Mean: 40 Median: 39
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 Max: 205 Mean: 205 Median: 205
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:**



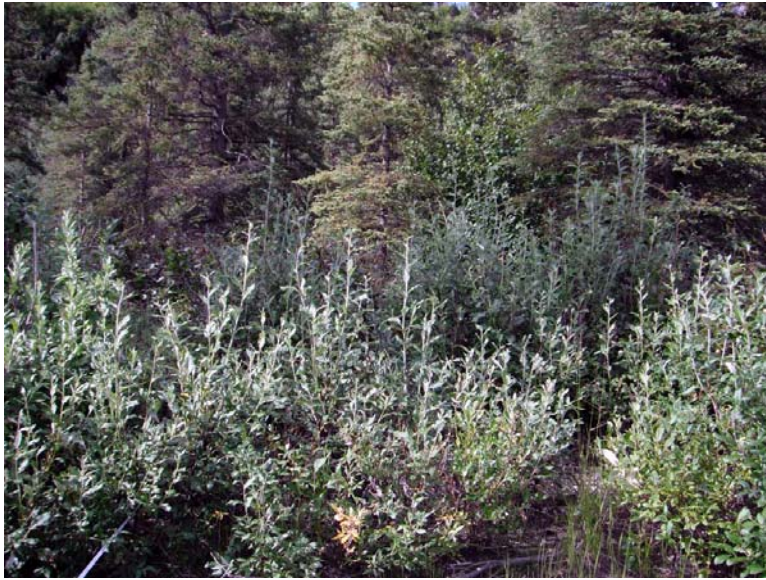
FSS1102C040049.jpg



FSS1102C040050.jpg



FSS1102C040051.jpg



FSS1102C040052.jpg



FSS1102C040053.jpg



FSS1102C040054.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	62.10807	-151.49313	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 3313 **Embeddedness:** Very High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Sand
Width	230.0		195.0	Subdominant Substrate 1: Gravel
Thalweg Depth	4.60		2.70	Subdominant Substrate 2:

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**Total Fish Count:** 16 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 81 **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:**Species:** threespine stickleback**Life Stage:** adult**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:**

Species: sockeye salmon	Life Stage: adult	Life History: Anadromous					
Total Fish Count: 13	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
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					
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 390	Max: 390	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					
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 level

Stream Velocity: GPS Float

Turbidity: LaMotte 2020e turbidimeter

Water Quality: YSI 556

Channel Depths: handheld sonar depth finder

Channel Widths: handheld laser rangefinder

Electrofischer: Smith-Root GPP 2.5

Transparency:



FSS1102D010206.jpg



FSS1102D010207.jpg



FSS1102D010209.jpg



FSS1102D010210.jpg
Chinook salmon juvenile.



FSS1102D010211.jpg



FSS1102D010212.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/15/2011 11:17 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.49675	-148.83879	61.49657	-148.84011

Elevation NED (m)(ft): 17 56**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S016N003E12**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Knik River tributary, flows along north edge of Knik River braid plain.**Visit Comments:** Minnow trapping only--no electrofishing or habitat assessment occurred. Set 1 trap at downstream coordinate (to the west) and another at upstream coordinate.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C):	DO (mg/L):	DO (%):	Conductivity (µS/cm):	pH:
Water Color: Glacial, Low Turbidit	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%):	Entrenchment:
Catchment Area(sq. km): 1	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Silt/Clay
Bankfull	OHW
Wetted	Subdominant Substrate 1: Gravel
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 8	Fish Measured: 8	Fork Lengths (mm) Min: 58 Max: 91 Mean: 69 Median: 74
Sampling Method (No. of fish): MTR (8)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 82 Max: 82 Mean: 82 Median: 82
Sampling Method (No. of fish): MTR (1)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 103 Max: 144 Mean: 117 Median: 123
Sampling Method (No. of fish): MTR (4)		
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.

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/15/2011 11:34 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.48809	-148.80398	61.48820	-148.80538

Elevation NED (m)(ft): 24 79**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S016N004E07**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Knik River tributary, flows along north edge of Knik River braid plain.**Visit Comments:** Minnow trapping only--no electrofishing or habitat assessment occurred. Set 1 trap at downstream coordinate (to the west) and another at upstream coordinate.**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): 2	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	OHW
Wetted	Subdominant Substrate 1: Silt/Clay
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(MTR) Minnow Trap

Fish Observations

Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 66 Max: 66 Mean: 66 Median: 66
Sampling Method (No. of fish): MTR (1)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 67 Max: 67 Mean: 67 Median: 67
Sampling Method (No. of fish): MTR (1)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 86 Max: 86 Mean: 86 Median: 86
Sampling Method (No. of fish): MTR (1)		
Comments:		

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	61.48469	-148.79094

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:
Channel Dimensions (m):	Dominant Substrate: Silt/Clay
Bankfull	OHW
Wetted	Subdominant Substrate 1: Gravel
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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	61.47498	-148.69513

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):	Dominant Substrate: Sand
Bankfull	Subdominant Substrate 1: Gravel
OHW	Subdominant Substrate 2:
Wetted	
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): MTR (15)		

Comments:

Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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	Fish Measured:	Fork Lengths (mm)		Min:	Max:	Mean:	Median:		
Sampling Method (No. of fish): VOG (2)									
Comments: ~ 200 mm.									
Species: sockeye salmon		Life Stage: adult spawning		Life History: Anadromous					
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:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	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	61.46956	-148.69250

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:
Catchment Area(sq. km): 30	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate: Sand
Thalweg Depth	Subdominant Substrate 1: Gravel
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/15/2011 1:30 PM

Sample	Latitude	Longitude
Coordinates	61.46892	-148.68853

Elevation NED (m)(ft): 50 164**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:** Downstream of 02F07.**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): 30	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)		
Comments: On redd.		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)		Suspected Spawning: Yes
Comments:		

Instruments

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



FSS1102F060865.jpg



FSS1102F060866.jpg
Sockeye redd.



FSS1102F060867.jpg
Adult sockeye.



FSS1102F060868.jpg



FSS1102F060869.jpg



FSS1102F060870.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/15/2011 1:44 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.46707	-148.67900	61.46768	-148.68591

Elevation NED (m)(ft): 51 167**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:** Tributary to stream at sites 21B02, 02F04, 03F03, and 21A01 (mouth).**Visit Comments:** Visual observations of salmon only--no electrofishing or habitat assessment occurred. ATV trail in stream bed through sockeye salmon spawning area. Sockeye salmon were observed spawning at upstream and downstream ends of this reach.**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): 29	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (4)		
Comments:		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (4)		Suspected Spawning: Yes
Comments:		

Instruments

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



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FSS1102F070874.jpg



FSS1102F070875.jpg



FSS1102F070876.jpg



FSS1102F070877.jpg



FSS1102F070878.jpg

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 8:17 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.37194	-147.49338	62.63921	-147.38654

Elevation NED (m)(ft): 902 2959**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-1**Legal Description (MTRS):** S026N011E06**Waterbody Name:** Oshetna River**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth 24 miles upstream to confluence with Little Oshetna River.**Visit Comments:** Poor visibility in water. Lower Oshetna River is turbid (glacial) from Black River confluence down and is fast and turbulent.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

No Fish Found

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofischer:
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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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) Min: 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:	Electrofischer:
Water Quality:	Transparency:



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Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 9:35 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.28247	-147.45091	62.58866	-147.20250

Elevation NED (m)(ft): 1126 3694**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-1**Legal Description (MTRS):** S025N011E05**Waterbody Name:** Tyone Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from headwaters (Sanona Creek) 33 miles downstream.**Visit Comments:****Wildlife Comments:** Beaver dam complex in Joe Creek (Sonona Creek tributary) at GPS waypoint 018 (N62.32009 W147.42480).**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (200)		
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 10:18 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.66577	-147.03624	62.67947	-147.15283

Elevation NED (m)(ft): 715 2346**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** C010N010W11**Waterbody Name:** Tyone River**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey of lower Tyone River from Tyone Creek confluence downstream 6 miles.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 200 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOH (200)**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:**

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 11:52 AM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.05892	-146.93490	62.89566	-147.13509

Elevation NED (m)(ft): 904 2966**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes A-6**Legal Description (MTRS):** F021S004E35**Waterbody Name:** Clearwater Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth upstream 22 miles to about 3 miles upstream of the Denali Highway crossing.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 100	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (100)		
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:

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 12:36 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.06563	-146.86098	63.04264	-146.88088

Elevation NED (m)(ft): 940 3084**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes A-6**Legal Description (MTRS):** F021S005E30**Waterbody Name:** Little Clearwater Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from mouth (just upstream of Denali Highway crossing) about 2 miles upstream.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** 100 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOH (100)**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:**

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 1:41 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.18642	-146.71754	63.16080	-146.54941

Elevation NED (m)(ft): 950 3117**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes A-6**Legal Description (MTRS):** F020S005E13**Waterbody Name:** West Fork Maclaren River**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey of lower 7 miles.**Visit Comments:** Glacial, high turbidity.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOH) Visual Observation, Helicopter

Fish Observations

No Fish Found

Instruments

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

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 1:57 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.27272	-146.51971	62.83702	-147.12493

Elevation NED (m)(ft): 931 3054**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes B-6**Legal Description (MTRS):** F019S006E13**Waterbody Name:** Maclaren River**Anadromous Waters Catalog Number:****Geographic Comments:** Aerial survey from glacier to mouth.**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

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/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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (300)		
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Raye Ann Neustel**Date/Time:** 07/28/2011 2:32 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.94556	-146.47989	62.94567	-146.53054

Elevation NED (m)(ft): 845 2772**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Gulkana D-5**Legal Description (MTRS):** C014N007W36**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed left-bank Maclaren River tributary (Target Stream ID IU34).**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (300)		
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:

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Station Info**Observers:** Joe Buckwalter, David Pluth**Date/Time:** 08/05/2011 1:00 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.50381	-147.06345	Coordinates	62.50381	-147.06345	62.51550	-147.05959

Elevation NED (m)(ft): 785 2575**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** C008N010W03**Waterbody Name:** Tyone Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Floodprone width is 30 m.**Visit Comments:** Dissolved oxygen probe not working on YSI 556 water quality meter.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 10.03	DO (mg/L):	DO (%):	Conductivity (µS/cm): 283	pH: 7.15
Water Color: Clear	Turbidity (NTU): 2.19		Thalweg Velocity (m/s)(ft/s): 0.50 1.64	

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Entrenched**Catchment Area(sq. km):** 463 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	23.5		22.6	Subdominant Substrate 1: Silt/Clay
Thalweg Depth	1.02		0.65	Subdominant Substrate 2: Cobble

Rosgen Class: F4 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck 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	Closed Low Willow Shrub	0.4	Closed Low Willow Shrub	0.4
5 - 10	Closed Low Willow Shrub	0.4	Closed Low Willow Shrub	0.4
10 - 20	Open Black Spruce Forest	5	Closed Black Spruce-White Spruce Forest	7
20 - 30	Open Black Spruce Forest	5	Closed Black Spruce-White Spruce Forest	7

Key To Fish Sampling Methods**Estimated reach length (m):** 4200 **Total Electrofishing Time (s):** 4157

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: longnose sucker **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 10 **Fish Measured:** 5 **Fork Lengths (mm) Min:** 249 **Max:** 330 **Mean:** 290 **Median:** 289
Sampling Method (No. of fish): BEF (5) VOB (5)
Comments: Longnose sucker in Event AA was approximately 300 mm.

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 105 **Fish Measured:** 9 **Fork Lengths (mm) Min:** 53 **Max:** 67 **Mean:** 61 **Median:** 60
Sampling Method (No. of fish): BEF (29) VOB (76)
Comments: Slimy Sculpin in Event AA was approximately 50 mm.

Species: longnose sucker **Life Stage:** adult **Life History:** Resident
Total Fish Count: 7 **Fish Measured:** 6 **Fork Lengths (mm) Min:** 370 **Max:** 430 **Mean:** 410 **Median:** 400
Sampling Method (No. of fish): BEF (6) VOB (1)
Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 25 **Fish Measured:** 24 **Fork Lengths (mm) Min:** 19 **Max:** 50 **Mean:** 39 **Median:** 34
Sampling Method (No. of fish): BEF (24) VOB (1)
Comments:

Species: salmonid-unspecified	Life Stage: juvenile	Life History: Unknown				
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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 Stage: juvenile	Life History: Resident				
Total Fish Count: 4	Fish Measured: 3	Fork Lengths (mm)	Min: 63	Max: 73	Mean: 67	Median: 68
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:						
Species: burbot	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 202	Max: 256	Mean: 229	Median: 229
Sampling Method (No. of fish): BEF (2)						
Comments:						

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: Orange Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofischer: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1103A010381.jpg



FSS1103A010383.jpg



FSS1103A010385.jpg



FSS1103A010387.jpg

Station Info**Observers:** Jonathan Kirsch, Ashley Reed**Date/Time:** 08/05/2011 9:22 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.30016	-146.60692	Coordinates	62.29481	-146.61988	62.30854	-146.60589

Elevation NED (m)(ft): 722 2369**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Gulkana B-6**Legal Description (MTRS):** C006N008W13**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** IU4. Unnamed stream connecting Little Lake Louise with Lake Louise.**Visit Comments:** Habitat transect (pictures 312-313) was established downstream from upper reach point Pictures 309-311 are of upper reach point. Stream velocity calculated from TVHR readings is .61 m/s.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 11.52	DO (mg/L): 10.51	DO (%): 92.00	Conductivity (µS/cm): 88	pH: 7.45
Water Color: Clear	Turbidity (NTU): 1.71	Thalweg Velocity (m/s)(ft/s): 0.50 1.64		

Stream Channel**Stream Gradient (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 311 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	13.0		10.0	Subdominant Substrate 1: Gravel
Thalweg Depth	0.80		0.40	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed White Spruce Forest	12	Closed White Spruce Forest	14
5 - 10	Closed White Spruce Forest	12	Closed White Spruce Forest	14
10 - 20	Closed Black Spruce-White Spruce Forest	8	Closed Black Spruce-White Spruce Forest	9
20 - 30	Closed Black Spruce-White Spruce Forest	8	Closed Black Spruce-White Spruce Forest	9

Key To Fish Sampling Methods**Estimated reach length (m):** 2270 **Total Electrofishing Time (s):** 1102

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: longnose sucker **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 6507 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 285 **Max:** 345 **Mean:** 315 **Median:** 315
Sampling Method (No. of fish): BEF (2) VOB (6505)
Comments:

Species: longnose sucker **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 200 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOB (200)
Comments: Event B observations were of tiny longnose sucker fry.

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 39 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOB (39)
Comments:

Species: burbot **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 8 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 385 **Max:** 440 **Mean:** 412 **Median:** 412
Sampling Method (No. of fish): BEF (2) VOB (6)
Comments:

-continued-

Species: round whitefish	Life Stage: juvenile/adult	Life History: Resident	
Total Fish Count: 859	Fish Measured: 4	Fork Lengths (mm) Min: 210 Max: 245 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:			
Species: Arctic grayling	Life Stage: juvenile/adult	Life History: Resident	
Total Fish Count: 127	Fish Measured: 2	Fork Lengths (mm) Min: 253 Max: 255 Mean: 254	Median: 254
Sampling Method (No. of fish): BEF (2) VOB (125)			
Comments:			
Species: longnose sucker	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:			
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: 5	Fish Measured: 5	Fork Lengths (mm) Min: 145 Max: 193 Mean: 163	Median: 169
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 Mean: 137	Median: 137
Sampling Method (No. of fish): BEF (2)			
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: handheld laser rangefinder
Electrofisher: Smith-Root GPP 2.5
Transparency:



FSS1103B010310.jpg



FSS1103B010311.jpg



FSS1103B010312.jpg

FSS1103B010315.jpg



FSS1103B010316.jpg



Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/05/2011 9:53 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.32573	-147.36840	Coordinates	62.32449	-147.37042	62.32573	-147.36840

Elevation NED (m)(ft): 997 3271**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-1**Legal Description (MTRS):** S026N011E23**Waterbody Name:** Tyone Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Mining marker 300 meters off of right bank & near transect site.**Visit Comments:** Thalweg on river left.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.52 **DO (mg/L):** 12.23 **DO (%):** 99.70 **Conductivity (µS/cm):** 257 **pH:** 7.02**Water Color:** Clear **Turbidity (NTU):** 0.20 **Thalweg Velocity (m/s)(ft/s):** 1.40 4.59**Stream Channel****Stream Gradient (%):** 0.75 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 94 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	10.4		9.9	Subdominant Substrate 1: Gravel
Thalweg Depth	0.83		0.60	Subdominant Substrate 2: Boulder

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Closed Tall Alder-Willow Shrub	2.1	Closed Low Willow Shrub	1.3
5 - 10	Closed Tall Alder-Willow Shrub	2.1	Closed Low Willow Shrub	1.3
10 - 20	Closed Tall Alder-Willow Shrub	1.5	Closed Low Willow Shrub	1.3
20 - 30	Closed Tall Alder-Willow Shrub	1.5	Closed Tall Alder-Willow Shrub	2.3

Key To Fish Sampling Methods**Estimated reach length (m):** 250

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 9 **Fish Measured:** 6 **Fork Lengths (mm)** Min: 200 Max: 324 Mean: 263 Median: 262
Sampling Method (No. of fish): PEF (6) VOG (3)

Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 21 **Fish Measured:** 11 **Fork Lengths (mm)** Min: 54 Max: 66 Mean: 60 Median: 60
Sampling Method (No. of fish): PEF (11) VOG (10)

Comments:

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 124 Max: 173 Mean: 149 Median: 148
Sampling Method (No. of fish): PEF (3)

Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 9 **Fish Measured:** 9 **Fork Lengths (mm)** Min: 69 Max: 91 Mean: 80 Median: 80
Sampling Method (No. of fish): PEF (9)

Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 41 **Max:** 41 **Mean:** 41 **Median:** 41
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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FSS1103c010057.jpg



FSS1103c010058.jpg



FSS1103c010059.jpg



FSS1103c010060.jpg



FSS1103c010061.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/05/2011 1:52 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.74560	-147.47480	Coordinates	62.74645	-147.47723	62.74544	-147.47428

Elevation NED (m)(ft): 862 2828**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** S031N011E30**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Mining camp approximately 1 mile downstream. Unnamed tributary to Susitna River**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 8.96	DO (mg/L): 10.35	DO (%): 89.60	Conductivity (µS/cm): 127	pH: 7.41
Water Color: Humic	Turbidity (NTU): 0.60	Thalweg Velocity (m/s)(ft/s): 1.41 4.62		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 63 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	4.8		4.5	Subdominant Substrate 1: Boulder
Thalweg Depth	0.70		0.35	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Low Willow Shrub	0.7 Closed Low Willow Shrub	0.6
5 - 10 Closed Low Willow Shrub	0.7 Closed Low Willow Shrub	0.6
10 - 20 Closed Low Willow Shrub	0.7 Closed Low Willow Shrub	0.6
20 - 30 Closed Low Willow Shrub	0.7 Closed Low Willow Shrub	0.6

Key To Fish Sampling Methods**Estimated reach length (m):** 255

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

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): 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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FSS1103c020066.jpg



FSS1103c020067.jpg



FSS1103c020069.jpg



FSS1103c020070.jpg

Station Info**Observers:** Joe Buckwalter, Jonathan Kirsch**Date/Time:** 07/13/2011 10:00 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.86531	-151.44310	Coordinates	61.86531	-151.44310	61.95488	-151.25152

Elevation NED (m)(ft): 68 223**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-4**Legal Description (MTRS):** S021N012W34**Waterbody Name:** Skwentna River**Anadromous Waters Catalog Number:** 247-41-10200-2053-3205**Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.28 **DO (mg/L):** 11.36 **DO (%):** 94.30 **Conductivity (µS/cm):** 79 **pH:** 7.60**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 167.00 **Thalweg Velocity (m/s)(ft/s):** 2.22 7.28**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 4584 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	265.0		190.0	Subdominant Substrate 1: Sand
Thalweg Depth	3.32		2.00	Subdominant Substrate 2: Gravel

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	Closed Spruce-Paper Birch Forest	18	Closed Tall Alder-Willow Shrub	4
5 - 10	Closed Spruce-Paper Birch Forest	18	Closed Tall Alder-Willow Shrub	4
10 - 20	Closed Spruce-Paper Birch Forest	18	Closed Tall Alder-Willow Shrub	4
20 - 30	Closed Spruce-Paper Birch Forest	18	Open Balsam Poplar (Black Cottonwood) Forest	24

Key To Fish Sampling Methods**Estimated reach length (m):** 2080 **Total Electrofishing Time (s):** 5715

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden **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: Pacific salmon-unspecified **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: possibly sockeye.

Species: Chinook 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: pink salmon **Life Stage:** adult **Life History:** Anadromous
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 335 **Max:** 335 **Mean:** 335 **Median:** 335
Sampling Method (No. of fish): BEF (1)
Comments:

Species: sockeye salmon		Life Stage: adult		Life History: Anadromous				
Total Fish Count:	6	Fish Measured:		Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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:	Mean:	Median:
Sampling Method (No. of fish):		VOB (1)						
Comments: probably burbot								
Species: Dolly Varden		Life Stage: juvenile/adult		Life History: Unknown				
Total Fish Count:	1	Fish Measured:	1	Fork Lengths (mm)	Min: 309	Max: 309	Mean: 309	Median: 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:								

Instruments

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 Buckwalter, Joe Giefer**Date/Time:** 09/23/2011 11:20 AM

Sample	Latitude	Longitude
Coordinates	61.48228	-148.78775

Elevation NED (m)(ft): 22 72**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S016N004E17**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 along the outer margin of the Friday Creek alluvial fan.**Visit Comments:** Fish sampling only--no habitat assessment occurred. Heavy ATV use in and around channel.**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): 0.6	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	Subdominant Substrate 1: Silt/Clay
OHW	Subdominant Substrate 2:
Wetted	
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(PEF) Backpack Electrofisher

(MTR) Minnow Trap

(VOG) Visual Observation, Ground

Fish Observations

Species: threespine stickleback	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 44 Max: 44 Mean: 44 Median: 44
Sampling Method (No. of fish): MTR (1)		
Comments:		
Species: sockeye salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 109	Fish Measured: 9	Fork Lengths (mm) Min: 33 Max: 58 Mean: 45 Median: 45
Sampling Method (No. of fish): PEF (9) VOG (100)		
Comments:		
Species: Pacific salmon-unspecified	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 20	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (20)		
Comments: 60-80 mm.		

Instruments

Stream Gradient:

Stream Velocity:

Turbidity:

Water Quality:

Channel Depths:

Channel Widths:

Electrofisher:

Transparency:



FSS1103F010893.jpg



FSS1103F010894.jpg



FSS1103F010895.jpg



FSS1103F010896.jpg



FSS1103F010945.jpg
Sockeye salmon juvenile.

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/23/2011 12:10 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.51030	-148.74270	61.50711	-148.74389

Elevation NED (m)(ft): 131 430**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-5**Legal Description (MTRS):** S016N004E04**Waterbody Name:** Friday Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Upstream end of reach located where channel runs against left-bank bedrock canyon wall.**Visit Comments:** Fish sampled--habitat assessed only qualitatively. Water had some glacial turbidity (~5 NTU), but was fairly clear. Low voltage required for electrofishing implies water conductivity was high. Wetted width visually estimated at 10 m. Bankfull width visually estimated at 60 m.**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 (%):** 4 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 149 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width				Subdominant Substrate 1: Gravel
Thalweg Depth				Subdominant Substrate 2: Sand

Rosgen Class:**Riparian Vegetation Communities (Vioreck 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	Closed Paper Birch Forest	18	Unvegetated	
5 - 10	Closed Paper Birch Forest	18	Unvegetated	
10 - 20	Closed Paper Birch Forest	18	Unvegetated	
20 - 30	Closed Paper Birch Forest	18	Unvegetated	

Key To Fish Sampling Methods**Estimated reach length (m):** 380

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: adult	Life History: Unknown
Total Fish Count: 3	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (3)		
Comments: Bright yellow spots.		

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 19	Fish Measured: 12	Fork Lengths (mm) Min: 105 Max: 225 Mean: 149 Median: 165
Sampling Method (No. of fish): PEF (12) VOG (7)		
Comments:		

Instruments**Stream Gradient:** handheld optical clinometer**Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:** Smith-Root LR-24**Water Quality:****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	61.47714	-148.70383

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):	Dominant Substrate:
Bankfull OHW	Subdominant Substrate 1:
Wetted	Subdominant Substrate 2:
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(VOG) Visual Observation, Ground

Fish Observations

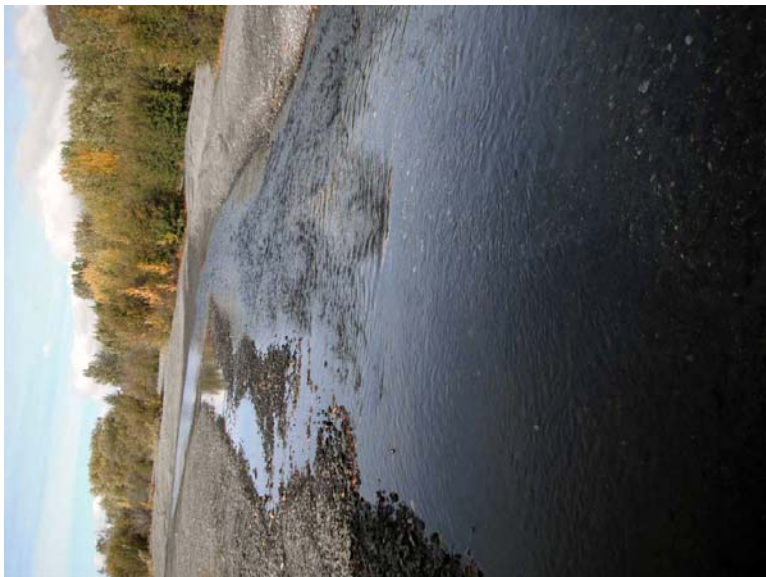
Species: sockeye salmon	Life Stage: adult spawning	Life History: Anadromous
Total Fish Count: 5	Fish Measured:	Fork Lengths (mm)
Sampling Method (No. of fish): VOG (5)	Min:	Max:
Comments: Salmon were on redds.	Mean:	Median:

Instruments

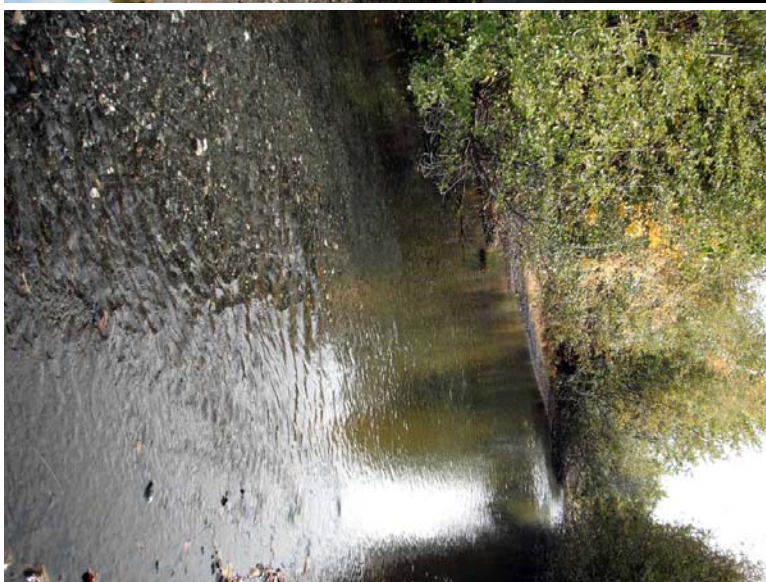
Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



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**

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): 3	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
		Mean: 50
		Median: 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 Velocity:	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



FSS1103F040906.jpg



FSS1103F040907.jpg



FSS1103F040908.jpg



FSS1103F040909.jpg
Suspected salmon (sockeye)
redds.

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 09/23/2011 3:07 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.43610	-148.64620	/ 61.43606	-148.67074

Elevation NED (m)(ft): 46 151**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S016N004E36**Waterbody Name:** Knik River**Anadromous Waters Catalog Number:** 247-50-10200

Geographic Comments: Clear Knik River side channel--apparently an abandoned mainstem channel (see topo map, attached), now flowing with hyporheic water (spring-fed). This channel is located within the currently-active braid plain of the Knik River. This channel is visible on Bing Maps Aerial Imagery (attached), and has apparently been stable in its current configuration since at least 1996 (based on historical Google Earth image, attached).

Visit Comments: Upstream waypoint located at source of continuously-wetted channel. Visual observations of salmon 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): 1	Embeddedness:
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull OHW Wetted	Subdominant Substrate 1: Silt/Clay
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**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		
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: 100	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (100)		
Comments: Spread throughout reach in pools and glides, on redds.		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (4)		Suspected Spawning: Yes
Comments:		

Instruments

Stream Gradient:

Stream Velocity:

Turbidity:

Water Quality:

Channel Depths:

Channel Widths:

Electrofisher:

Transparency:



FSS1103F050914.jpg



FSS1103F050916.jpg



FSS1103F050917.jpg



FSS1103F050918.jpg



FSS1103F050919.jpg



FSS1103F050920.jpg



FSS1103F050921.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, Joe Giefer**Date/Time:** 09/23/2011 3:52 PM

Sample	Latitude	Longitude
Coordinates	61.46739	-148.70594

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:** See 03F04 comments.**Visit Comments:** Visual observations of salmon only--no fish collection 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): 3	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 10	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (10)		
Comments:		

Instruments

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



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):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, David Pluth**Date/Time:** 08/06/2011 9:30 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.65552	-147.31278	Coordinates	62.65552	-147.31278	62.69473	-147.46353

Elevation NED (m)(ft): 674 2211**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** S030N011E25**Waterbody Name:** Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:** MU9.

Visit Comments: pH sensor not working. Generator low on gas, so sampling crew skipped approximately 1 subreach after subreach 5 in order to reach Oshetna River mouth (subreach 6). Then skipped to mouth of Goose Creek and then to mouth of Jay creek to sample.

Wildlife Comments:**Water Quality \ Stream Flow**

Water Temp (C): 6.75	DO (mg/L): 10.95	DO (%): 89.60	Conductivity (µS/cm): 86	pH:
Water Color: Glacial, High Turbidit	Turbidity (NTU): 254.00	Thalweg Velocity (m/s)(ft/s): 2.50 8.20		

Stream Channel**Stream Gradient (%):****Entrenchment:** Entrenched**Catchment Area(sq. km):** 8637**Embeddedness:**

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	153.0		139.0	Subdominant Substrate 1: Cobble
Thalweg Depth	3.80		2.30	Subdominant Substrate 2: Silt/Clay

Rosgen Class: F2 Entrenched, relatively low to moderate sinuosity, riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
0 - 5 Open Black Spruce-White Spruce Forest	7 Open White Spruce Forest	7
5 - 10 Open Black Spruce-White Spruce Forest	7 Open White Spruce Forest	7
10 - 20 Open Black Spruce-White Spruce Forest	7 Open White Spruce Forest	7
20 - 30 Open Black Spruce-White Spruce Forest	7 Open White Spruce Forest	7

Key To Fish Sampling Methods**Estimated reach length (m): ##### Total Electrofishing Time (s):** 5827

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 7 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 224 Max: 231 Mean: 228 Median: 227
Sampling Method (No. of fish): BEF (3) VOB (4)
Comments:

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 4 **Fork Lengths (mm)** Min: 158 Max: 181 Mean: 167 Median: 169
Sampling Method (No. of fish): BEF (4) VOB (1)
Comments:

Species: general fish observation, no s **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: longnose sucker		Life Stage: adult		Life History: Resident				
Total Fish Count:	17	Fish Measured:	8	Fork Lengths (mm)	Min: 362	Max: 405	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	Mean: 87	Median: 87
Sampling Method (No. of fish):		BEF (1)						
Comments:								
Species: sculpin-unspecified		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):		VOB (1)						
Comments:								
Species: longnose sucker		Life Stage: juvenile/adult		Life History: Resident				
Total Fish Count:	7	Fish Measured:	4	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				
Total Fish Count:	2	Fish Measured:		Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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	Mean: 223	Median: 204
Sampling Method (No. of fish):		BEF (3)						
Comments:								
Species: Arctic grayling		Life Stage: adult		Life History: Resident				
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				
Total Fish Count:	2	Fish Measured:	2	Fork Lengths (mm)	Min: 320	Max: 325	Mean: 322	Median: 322
Sampling Method (No. of fish):		BEF (2)						
Comments:								
Species: burbot		Life Stage: juvenile/adult		Life History: Resident				
Total Fish Count:	1	Fish Measured:	1	Fork Lengths (mm)	Min: 497	Max: 497	Mean: 497	Median: 497
Sampling Method (No. of fish):		BEF (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
Stream Velocity: GPS Float
Turbidity: LaMotte 2020e turbidimeter
Water Quality: YSI 556

Channel Depths: handheld sonar depth finder
Channel Widths: handheld laser rangefinder
Electrofischer: Smith-Root GPP 2.5
Transparency:



FSS1104A010389.jpg



FSS1104A010390.jpg



FSS1104A010391.jpg



FSS1104A010392.jpg



FSS1104A010395.jpg
Round whitefish with fungus.



FSS1104A010397.jpg



FSS1104A010398.jpg



FSS1104A010399.jpg
Looking downstream at Watana
Canyon from sample reach.

Station Info**Observers:** Jonathan Kirsch, Ashley Reed**Date/Time:** 08/06/2011 10:35 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.76426	-148.46492	Coordinates	62.76426	-148.46492	62.76308	-148.48293

Elevation NED (m)(ft): 681 2234**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-3**Legal Description (MTRS):** S031N005E23**Waterbody Name:** Fog Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IU25

Visit Comments: Large salmon redds (almost certainly Chinook) were observed at waypoint "SCKred". Photos 321-327 were taken in an effort to document these redds, but none came out particularly good. Stream velocity calculated from TVHR readings is 1.14 m/s.

Wildlife Comments:**Water Quality \ Stream Flow**

Water Temp (C): 6.33	DO (mg/L): 12.50	DO (%): 101.30	Conductivity (µS/cm): 78	pH: 5.58
Water Color: Clear	Turbidity (NTU): 16.80	Thalweg Velocity (m/s)(ft/s): 1.10 3.61		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 156 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	18.0		14.0	Subdominant Substrate 1: Gravel
Thalweg Depth	0.80		0.50	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 (Vioreck 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	3	Closed Spruce-Paper Birch Forest	14
5 - 10	Closed Tall Alder-Willow Shrub	3	Closed Spruce-Paper Birch Forest	14
10 - 20	Closed Spruce-Paper Birch Forest	18	Closed Spruce-Paper Birch Forest	14
20 - 30	Closed Spruce-Paper Birch Forest	18	Closed Spruce-Paper Birch Forest	14

Key To Fish Sampling Methods**Estimated reach length (m):** 2200 **Total Electrofishing Time (s):** 947

(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:** 100 **Max:** 245 **Mean:** 189 **Median:** 172
Sampling Method (No. of fish): BEF (8) VOB (20)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 14 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOB (14)
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:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 125 Max: 125 Mean: 125 Median: 125
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: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



FSS1104B010319.jpg



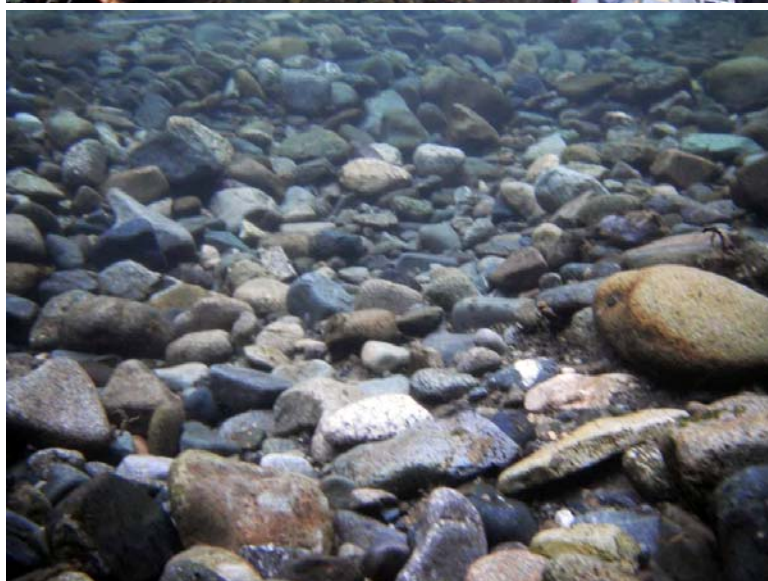
FSS1104B010320.jpg



FSS1104B010321.jpg



FSS1104B010323.jpg



FSS1104B010324.jpg



FSS1104B010328.jpg



FSS1104B010329.jpg



FSS1104B010330.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/06/2011 7:56 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.68477	-148.58492	Coordinates	62.68394	-148.58511	62.68501	-148.58498

Elevation NED (m)(ft): 874 2867**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-4**Legal Description (MTRS):** S030N005E18**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Fog Creek has a series of 4 ledges less than 15 ft each, last 2 km before confluence with Susitna River. Unnamed tributary of Fog Creek. HU56**Visit Comments:** Very fast moving water in main channel with rearing habitat parallel to river continually until canyon section approximately 2 km above confluence with Susitna River.**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	Turbidity (NTU): 1.00	Thalweg Velocity (m/s)(ft/s): 1.68 5.51		

Stream Channel**Stream Gradient (%):** 1.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 94 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	18.6		11.1	Subdominant Substrate 1: Cobble
Thalweg Depth	1.00		0.60	Subdominant Substrate 2:

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	5	Closed Tall Willow Shrub	5
5 - 10	Closed Tall Willow Shrub	5	Tall Scrub	6
10 - 20	Closed Tall Willow Shrub	5	Fireweed	3
20 - 30	Closed Tall Willow Shrub	5	Closed Tall Willow Shrub	5

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: 8 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 49 **Max:** 61 **Mean:** 55 **Median:** 55

Sampling Method (No. of fish): PEF (5) VOG (3)

Comments:

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

Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 94 **Max:** 94 **Mean:** 94 **Median:** 94

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

Comments:

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

Total Fish Count: 4 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 51 **Max:** 52 **Mean:** 51 **Median:** 51

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

Comments:

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:

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 downstream from
transect site.



FSS1104c010074.jpg
Looking upstream from transect
site.



FSS1104c010076.jpg



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	62.61258	-148.31368	/	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**Catchment Area(sq. km):** 79 **Embeddedness:** Negligible

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 (Vioreck 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 Tall Willow Shrub	4
5 - 10	Closed Tall Willow Shrub	3.5	Closed Tall Willow Shrub	2.5
10 - 20	Closed Tall Willow Shrub	3.5	Closed Tall Willow Shrub	2.5
20 - 30	Closed Tall Willow Shrub	3.5	Closed Tall Willow Shrub	2.5

Key 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				
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				
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 78	Max: 92	Mean: 87	Median: 85
Sampling Method (No. of fish): PEF (3)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 52	Max: 59	Mean: 54	Median: 55
Sampling Method (No. of fish): PEF (4)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 11	Fish Measured: 6	Fork Lengths (mm)	Min: 30	Max: 50	Mean: 43	Median: 40
Sampling Method (No. of fish): PEF (6) VOG (5)						
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:



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	62.76321	-148.40220	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 141 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	9.9		9.4	Subdominant Substrate 1: Boulder
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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Alder-Willow Shrub	3.5 Open White Spruce Forest	25
5 - 10 Closed Tall Alder-Willow Shrub	3.5 Open White Spruce Forest	25
10 - 20 Closed Tall Alder-Willow Shrub	3.5 Open White Spruce Forest	25
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
Total Fish Count: 15 **Fish Measured:** 15 **Fork Lengths (mm)** Min: 30 Max: 50 Mean: 42 Median: 40
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
Total Fish Count: 15 **Fish Measured:** 15 **Fork Lengths (mm)** Min: 70 Max: 111 Mean: 88 Median: 90
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)
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:**



FSS1104c030086.jpg



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	61.96491	-150.73813	61.92617	-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):** 2357 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	120.0		80.0	Subdominant Substrate 1: Gravel
Thalweg Depth	2.82		1.50	Subdominant Substrate 2: Boulder

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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 Fish Sampling Methods**Estimated reach length (m):** 1090 **Total Electrofishing Time (s):** 2374

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

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: 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:

Species: sockeye 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: 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 level

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

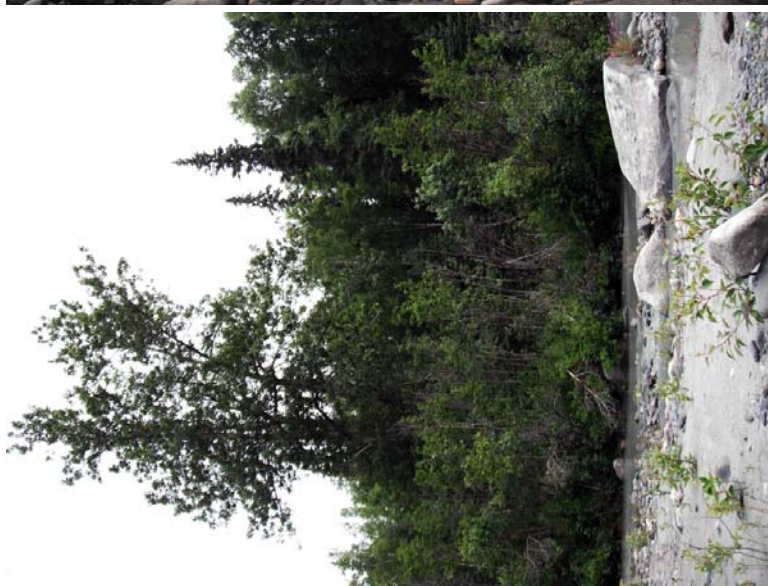
Transparency:



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FSS1104D010223.jpg



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FSS1104D010225.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	62.49302	-147.47168	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
Catchment Area(sq. km): 891	Embeddedness: Negligible
Channel Dimensions (m):	Dominant Substrate: Cobble
Width 48.0	Subdominant Substrate 1: Boulder
Thalweg Depth 1.62	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 Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Open 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
Total Fish Count: 11 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 336 **Max:** 415 **Mean:** 360 **Median:** 375
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:

Species: round whitefish	Life Stage: adult	Life History: Resident				
Total Fish Count: 7	Fish Measured: 6	Fork Lengths (mm)	Min: 341	Max: 408	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:						
Species: general fish observation, no s	Life Stage: juvenile	Life History: Unknown				
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 332	Max: 341	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:						
Species: Arctic grayling	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 9	Fish Measured: 7	Fork Lengths (mm)	Min: 70	Max: 188	Mean: 146	Median: 129
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	Mean: 82	Median: 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

Stream Velocity: GPS Float

Turbidity:

Water Quality: YSI 556

Channel Depths: graduated wading rod

Channel Widths: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



FSS1105A010401.jpg



FSS1105A010402.jpg



FSS1105A010403.jpg



FSS1105A010404.jpg



FSS1105A010406.jpg
Lesions on round whitefish.



FSS1105A010407.jpg

FSS1105A010408.jpg



Station Info**Observers:** Jonathan Kirsch, Ashley Reed**Date/Time:** 08/07/2011 10:48 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.50195	-147.17393	Coordinates	62.50195	-147.17393	62.51330	-147.16673

Elevation NED (m)(ft): 790 2592**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-1**Legal Description (MTRS):** S028N012E23**Waterbody Name:** Sonona Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IU12**Visit Comments:** pH sensor may have been malfunctioning. Stream velocity calculated from TVHR readings is 1.14 m/s.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.92 **DO (mg/L):** 10.71 **DO (%):** 90.00 **Conductivity (µS/cm):** 184 **pH:** 4.45**Water Color:** Clear **Turbidity (NTU):** 15.00 **Thalweg Velocity (m/s)(ft/s):** 1.10 3.61**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 372 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	25.5		11.2	Subdominant Substrate 1: Gravel
Thalweg Depth	1.20		0.65	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 (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
0 - 5	Open Tall Willow Shrub	2.2	Open Tall Willow Shrub	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 length (m):** 2100 **Total Electrofishing Time (s):** 921

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 100 **Max:** 100 **Mean:** 100 **Median:** 100
Sampling Method (No. of fish): BEF (1)
Comments:

Species: Arctic grayling **Life Stage:** 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: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 21 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 52 **Max:** 52 **Mean:** 52 **Median:** 52
Sampling Method (No. of fish): BEF (1) VOB (20)
Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 6 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 290 **Max:** 290 **Mean:** 290 **Median:** 290
Sampling Method (No. of fish): BEF (1) VOB (5)
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 level**Stream Velocity:** GPS Float**Turbidity:** LaMotte 2020e turbidimeter**Water Quality:** YSI 556**Channel Depths:** graduated wading rod**Channel Widths:** handheld laser rangefinder**Electrofisher:** Smith-Root GPP 2.5**Transparency:**



FSS1105B010332.jpg



FSS1105B010333.jpg



FSS1105B010334.jpg

FSS1105B010335.jpg



Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/07/2011 9:24 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.17855	-147.36518	Coordinates	62.17954	-147.36516	62.17855	-147.36518

Elevation NED (m)(ft): 1085 3560**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-1**Legal Description (MTRS):** S024N011E12**Waterbody Name:** Tyone Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HU2.**Visit Comments:** Possible mining downstream, heavy equipment, Atcos staged, photos 99 & 100.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 3.60 **DO (mg/L):** 12.80 **DO (%):** 96.90 **Conductivity (µS/cm):** 309 **pH:** 8.01**Water Color:** Clear **Turbidity (NTU):** 0.10 **Thalweg Velocity (m/s)(ft/s):** 1.00 3.28**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 60 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	15.9		5.9	Subdominant Substrate 1: Sand
Thalweg Depth	0.85		0.57	Subdominant Substrate 2: Gravel

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
0 - 5	Closed Low Willow Shrub	0.9	Scrub	0.75
5 - 10	Closed Low Willow Shrub	0.9	Closed Low Willow Shrub	0.75
10 - 20	Closed Low Willow Shrub	0.9	Closed Low Willow Shrub	0.75
20 - 30	Closed Low Willow Shrub	0.9	Closed Low Willow Shrub	0.75

Key To Fish Sampling Methods**Estimated reach length (m):** 175

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Arctic grayling**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)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 7**Fish Measured:** 5**Fork Lengths (mm)****Min:** 32**Max:** 44**Mean:** 39**Median:** 38**Sampling Method (No. of fish):** PEF (5) VOG (2)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 14**Fish Measured:** 11**Fork Lengths (mm)****Min:** 201**Max:** 300**Mean:** 231**Median:** 250**Sampling Method (No. of fish):** PEF (11) VOG (3)**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:

FSS1105c010093.jpg



FSS1105c010094.jpg



FSS1105c010095.jpg





FSS1105c010096.jpg



FSS1105c010097.jpg



FSS1105c010098.jpg



FSS1105c010099.jpg



FSS1105c010102.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/07/2011 10:28 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.18553	-147.71104	Coordinates	62.18462	-147.71460	62.18588	-147.71058

Elevation NED (m)(ft): 1197 3927**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-2**Legal Description (MTRS):** S024N009E12**Waterbody Name:** Little Oshetna River**Anadromous Waters Catalog Number:****Geographic Comments:** HU15. Probable barrier to fish passage 300 m upriver, waterfalls (3) photos 101-103.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 5.46	DO (mg/L): 12.21	DO (%): 96.80	Conductivity (µS/cm): 161	pH: 7.96
Water Color: Clear	Turbidity (NTU): 1.00	Thalweg Velocity (m/s)(ft/s): 0.74 2.43		

Stream Channel**Stream Gradient (%):** 0.75 **Entrenchment:** Entrenched**Catchment Area(sq. km):** 49 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	43.0		10.6	Subdominant Substrate 1: Cobble
Thalweg Depth	0.78		0.38	Subdominant Substrate 2: Gravel

Rosgen Class: F2 Entrenched, relatively low to moderate sinuosity, riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
0 - 5 Willow Dwarf Shrub Tundra	0.1 Open Low Willow Shrub	0.6
5 - 10 Willow Dwarf Shrub Tundra	0.1 Open Low Willow Shrub	0.6
10 - 20 Open Tall Willow Shrub	1.7 Open Low Willow Shrub	0.6
20 - 30 Open Tall Willow Shrub	1.7 Open Low Willow Shrub	0.6

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
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/adult	Life History: Resident
Total Fish Count: 8	Fish Measured: 3	Fork Lengths (mm) Min: 200 Max: 214 Mean: 208 Median: 207
Sampling Method (No. of fish): PEF (3) VOG (5)		
Comments:		
Species: slimy sculpin	Life Stage: adult	Life History: Resident
Total Fish Count: 17	Fish Measured: 17	Fork Lengths (mm) Min: 71 Max: 115 Mean: 88 Median: 93
Sampling Method (No. of fish): PEF (17)		
Comments:		
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident
Total Fish Count: 28	Fish Measured: 1	Fork Lengths (mm) Min: 57 Max: 57 Mean: 57 Median: 57
Sampling Method (No. of fish): PEF (1) VOG (27)		
Comments:		

Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 81 Max: 81 Mean: 81 Median: 81
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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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	62.28690	-147.70756	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**Catchment Area(sq. km):** 53 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Seral Herbs	0.7	Seral Herbs	0.3
5 - 10	Seral Herbs	0.7	Closed Low Willow Shrub	1
10 - 20	Seral Herbs	0.7	Closed Low Willow Shrub	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				
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: 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				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 364	Max: 364	Mean: 364	Median: 364
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: Arctic grayling	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): VOG (3)						
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:



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FSS1105c030113.jpg



FSS1105c030114.jpg



FSS1105c030115.jpg



FSS1105c030116.jpg



FSS1105c030117.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	62.44560	-147.54899	62.44684	-147.54768

Elevation NED (m)(ft): 970 3182**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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 (Vioreck 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 Shrub Birch	1	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	1	Closed Tall Willow Shrub	1.8
20 - 30	Closed Low Shrub Birch	1	Closed Tall Willow Shrub	1.8

Key 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				
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/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				
Total Fish Count: 10	Fish Measured: 1	Fork Lengths (mm)	Min: 93	Max: 93	Mean: 93	Median: 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:						

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:			

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/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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 51 **Embeddedness:** Moderate

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 (Vioreck 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 Mixed Shrub-Sedge Tussock Bog	0.3	Crustose Lichen	0.4
5 - 10	Open Low Mixed Shrub-Sedge Tussock Bog	0.3	Wet Graminoid Herbaceous (emergent)	0.4
10 - 20	Open Low Mixed Shrub-Sedge Tussock Bog	0.3	Wet Graminoid Herbaceous (emergent)	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				
Total Fish Count: 12	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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				
Total Fish Count: 6	Fish Measured: 4	Fork Lengths (mm)	Min: 73	Max: 116	Mean: 94	Median: 94
Sampling Method (No. of fish): PEF (4) VOG (2)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 73	Fish Measured: 10	Fork Lengths (mm)	Min: 53	Max: 64	Mean: 58	Median: 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)
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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FSS1105c050129.jpg



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Station Info**Observers:** Joe Buckwalter, Jonathan Kirsch**Date/Time:** 07/14/2011 3:30 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.74941	-150.69255	Coordinates	61.74941	-150.69255	61.70139	-150.64966

Elevation NED (m)(ft): 26 85**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek C-2**Legal Description (MTRS):** S019N008W10**Waterbody Name:** Yentna River**Anadromous Waters Catalog Number:** 247-41-10200-2053**Geographic Comments:** MA5. Lower Yentna River, downstream of Kahiltna River and Moose Creek mouths.**Visit Comments:** Completed habitat transect and electrofished right-bank tributary mouth on 7/14/11. E-fished subreaches 1-3 on 7/15/11.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 10.84 **DO (mg/L):** 10.28 **DO (%):** 92.80 **Conductivity (µS/cm):** 81 **pH:** 8.00**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 290.00 **Thalweg Velocity (m/s)(ft/s):** 1.67 5.48**Stream Channel****Stream Gradient (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 15755 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	410.0		403.0	Subdominant Substrate 1: Sand
Thalweg Depth	6.24		3.80	Subdominant Substrate 2:

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Spruce-Paper Birch Forest	10.5	Closed Tall Alder Shrub	3
5 - 10	Closed Spruce-Paper Birch Forest	10.5	Open Spruce-Paper Birch Forest	10.5
10 - 20	Closed Spruce-Paper Birch Forest	10.5	Open Spruce-Paper Birch Forest	10.5
20 - 30	Closed Spruce-Paper Birch Forest	10.5	Closed Spruce-Paper Birch Forest	10.5

Key To Fish Sampling Methods**Estimated reach length (m): #####** **Total Electrofishing Time (s):** 7191

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: threespine stickleback **Life Stage:** adult **Life History:** Unknown
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:

Species: threespine stickleback **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 209 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 27 **Max:** 27 **Mean:** 27 **Median:** 27
Sampling Method (No. of fish): BEF (9) VOB (200)
Comments:

Species: longnose sucker **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 115 **Max:** 115 **Mean:** 115 **Median:** 115
Sampling Method (No. of fish): BEF (1)
Comments:

Species: northern pike **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: estimated at 24".

Species: sockeye salmon	Life Stage: adult	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	Mean: 424	Median: 424	
Sampling Method (No. of fish): BEF (2) VOB (2)							
Comments:							
Species: burbot	Life Stage: juvenile	Life History: Resident					
Total Fish Count: 5	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (5)							
Comments:							
Species: sculpin-unspecified	Life Stage: juvenile/adult	Life History: Resident					
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					
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: 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 Stage: juvenile/adult	Life History: Resident					
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					
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (2)							
Comments:							
Species: rainbow trout	Life Stage: juvenile/adult	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:							
Species: sculpin-unspecified	Life Stage: juvenile	Life History: Resident					
Total Fish Count: 6	Fish Measured: 6	Fork Lengths (mm)	Min: 37	Max: 55	Mean: 47	Median: 46	
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					
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 level

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:



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FSS1105D010233.jpg



FSS1105D010234.jpg



FSS1105D010235.jpg

Station Info**Observers:** Joe Buckwalter, David Pluth**Date/Time:** 08/08/2011 10:00 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.30504	-147.38915	Coordinates	63.31106	-147.39440	63.28021	-147.44041

Elevation NED (m)(ft): 768 2520**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal Description (MTRS):** F018S002E32**Waterbody Name:** Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Upper point of reach in a clear, right bank Susitna River tributary. We floated/electrofished down to the Susitna River mainstem and established a habitat transect. pH meter was not working.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 4.96 **DO (mg/L):** 12.34 **DO (%):** 96.60 **Conductivity (µS/cm):** 89 **pH:****Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 41.50 **Thalweg Velocity (m/s)(ft/s):** 1.31 4.30**Stream Channel****Stream Gradient (%):** 0 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 623 **Embeddedness:** High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	83.0		78.0	Subdominant Substrate 1: Silt/Clay
Thalweg Depth	1.88		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 (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
0 - 5	Open Low Willow Shrub	1.4	Open Low Willow Shrub	1.4
5 - 10	Open Low Willow Shrub	1.4	Open Low Willow Shrub	1.4
10 - 20	Open Low Willow Shrub	1.4	Open Low Willow Shrub	1.4
20 - 30	Open Low Willow Shrub	1.4	Closed Low Willow Shrub	1.4

Key To Fish Sampling Methods**Estimated reach length (m):** 7100 **Total Electrofishing Time (s):** 4087

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations**Species:** Arctic grayling **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:** longnose sucker **Life Stage:** adult **Life History:** Resident**Total Fish Count:** 22 **Fish Measured:** 14 **Fork Lengths (mm)** **Min:** 349 **Max:** 415 **Mean:** 381 **Median:** 382**Sampling Method (No. of fish):** BEF (14) VOB (8)**Comments:****Species:** slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident**Total Fish Count:** 8 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 56 **Max:** 56 **Mean:** 56 **Median:** 56**Sampling Method (No. of fish):** BEF (1) VOB (7)**Comments:****Species:** whitefish-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:**

-continued-

Species: humpback whitefish	Life Stage: adult	Life History: Unknown	
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm) Min: 378 Max: 443	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 Stage: juvenile	Life History: Resident	
Total Fish Count: 4	Fish Measured: 2	Fork Lengths (mm) Min: 63 Max: 167	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	
Total Fish Count: 6	Fish Measured: 2	Fork Lengths (mm) Min: 336 Max: 345	Mean: 340 Median: 340
Sampling Method (No. of fish): BEF (2) VOB (4)			
Comments:			
Species: humpback whitefish	Life Stage: juvenile	Life History: Unknown	
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	
Total Fish Count: 5	Fish Measured: 3	Fork Lengths (mm) Min: 295 Max: 325	Mean: 307 Median: 310
Sampling Method (No. of fish): BEF (3) VOB (2)			
Comments:			
Species: slimy sculpin	Life Stage: adult	Life History: Resident	
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm) Min: 80 Max: 112	Mean: 90 Median: 96
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: 47 Max: 47	Mean: 47 Median: 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 level
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:



FSS1106A010426.jpg



FSS1106A010427.jpg



FSS1106A010428.jpg



FSS1106A010430.jpg



FSS1106A010431.jpg



FSS1106A010432.jpg



FSS1106A010433.jpg



FSS1106A010434.jpg



FSS1106A010435.jpg



FSS1106A010436.jpg



FSS1106A010437.jpg

Station Info**Observers:** Jonathan Kirsch, Ashley Reed**Date/Time:** 08/08/2011 10:35 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.37322	-147.00434	Coordinates	63.37322	-147.00434	63.36795	-147.08594

Elevation NED (m)(ft): 816 2677**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-1**Legal Description (MTRS):** F018S004E09**Waterbody Name:** East Fork Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:** IU10**Visit Comments:** Most fish caught within subreaches straddling the mouths of clearwater tributaries. Large number of caddis fly larvae present. Stream velocity calculated from TVHR readings is 1.25 m/s.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 3.85 **DO (mg/L):** 10.72 **DO (%):** 81.50 **Conductivity (µS/cm):** 39 **pH:** 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 (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 206 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	40.0		15.0	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 (Vioreck 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	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 length (m):** 6800 **Total Electrofishing Time (s):** 2304

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: round whitefish **Life Stage:** adult **Life History:** Resident
Total Fish Count: 3 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 347 **Max:** 404 **Mean:** 375 **Median:** 375
Sampling Method (No. of fish): BEF (2) VOB (1)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **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:** 45 **Max:** 45 **Mean:** 45 **Median:** 45
Sampling Method (No. of fish): BEF (1)
Comments:

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 10 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 235 **Max:** 316 **Mean:** 280 **Median:** 275
Sampling Method (No. of fish): BEF (3) VOB (7)
Comments:

Species: Arctic grayling	Life Stage: juvenile/adult	Life History: Resident	
Total Fish Count: 17	Fish Measured: 5	Fork Lengths (mm) Min: 210 Max: 295	Mean: 239 Median: 252
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	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 348 Max: 348	Mean: 348 Median: 348
Sampling Method (No. of fish): BEF (1)			
Comments:			
Species: burbot	Life Stage: juvenile	Life History: Resident	
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 250 Max: 255	Mean: 252 Median: 252
Sampling Method (No. of fish): BEF (2)			
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:			

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofischer: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1106B010338.jpg



FSS1106B010339.jpg



FSS1106B010340.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/08/2011 9:34 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.73537	-149.39327	Coordinates	62.73396	-149.39626	62.73537	-149.39327

Elevation NED (m)(ft): 930 3051**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-5**Legal Description (MTRS):** S031N001W35**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HU85 Small dirt road parallel to creek approximately 50 M upriver of transect site and ending at that point. Unnamed tributary of Susitna River.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.38 **DO (mg/L):** 11.03 **DO (%):** 91.80 **Conductivity (µS/cm):** 16 **pH:** 7.23**Water Color:** Clear **Turbidity (NTU):** 0.00 **Thalweg Velocity (m/s)(ft/s):** 0.80 2.62**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 34 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	24.5		11.2	Subdominant Substrate 1: Sand
Thalweg Depth	1.06		0.85	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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**Estimated reach length (m):** 290

(PEF) Backpack Electrofisher

(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
Total Fish Count: 8 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 56 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 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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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	62.66400	-149.33536	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 **Entrenchment:** Slightly Entrenched**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 (Vioreck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Wet Sedge-Grass Meadow Tundra	0.2	Wet Sedge-Grass Meadow Tundra	0.2
5 - 10	Wet Sedge-Grass Meadow Tundra	0.2	Wet Sedge-Grass Meadow Tundra	0.2
10 - 20	Wet Sedge-Grass Meadow Tundra	0.2	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
Total Fish Count: 43 **Fish Measured:** 12 **Fork Lengths (mm)** **Min:** 88 **Max:** 152 **Mean:** 127 **Median:** 120
Sampling Method (No. of fish): PEF (12) VOG (31)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 9 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 68 **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
Total Fish Count: 1 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOG (1)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 11 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 58 **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 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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FSS1106c020145.jpg



FSS1106c020146.jpg



FSS1106c020148.jpg



FSS1106c020149.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 Quadrangle:** 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**Catchment Area(sq. km):** 285 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	50.0		11.0	Subdominant 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 (Vioreck 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	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	35	Sedge-Willow Tundra	0.5
5 - 10	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	35	Sedge-Willow Tundra	0.5
10 - 20	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	35	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	25
20 - 30	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	35	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	25

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

Species: sockeye 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): VOG (2)						
Comments: photo # 171						

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:**



FSS1106c040157.jpg
Spawned out Chinook 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	62.96324	-148.06820	62.96210	-148.07029

Elevation NED (m)(ft): 743 2438**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**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**Catchment Area(sq. km):** 90 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	1.2	Wet Sedge-Grass Meadow Tundra	0.4
5 - 10	Closed Tall Willow Shrub	1.2	Wet Sedge-Grass Meadow Tundra	0.4
10 - 20	Closed Tall Willow Shrub	1.2	Closed Tall Willow Shrub	1.5
20 - 30	Closed Tall Willow Shrub	1.2	Closed Tall Willow Shrub	1.5

Key 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
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 330 **Max:** 349 **Mean:** 339 **Median:** 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
Total Fish Count: 24 **Fish Measured:** 10 **Fork Lengths (mm)** **Min:** 32 **Max:** 94 **Mean:** 42 **Median:** 63
Sampling Method (No. of fish): PEF (10) VOG (14)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 69 **Max:** 103 **Mean:** 78 **Median:** 86
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 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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FSS1106c050180.jpg



FSS1106c050181.jpg



FSS1106c050182.jpg

Station Info**Observers:** Joe Buckwalter, Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 07/19/2011 2:30 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.52663	-150.11449	Coordinates	62.53343	-150.10374	62.45053	-150.12639

Elevation NED (m)(ft): 145 476**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna C-1**Legal Description (MTRS):** S028N005W12**Waterbody Name:** Susitna River**Anadromous Waters Catalog Number:** 247-41-10200**Geographic Comments:** 16 miles upstream of Talkeetna. Railroad runs along left bank. Upstream end of fish-collection reach located at mouth of Lane Creek (left bank Susitna River tributary).**Visit Comments:** Most of the fish (except suckers) from this reach were collected from clear water (Lane Creek) at the upstream end of the reach.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 12.73 **DO (mg/L):** 10.95 **DO (%):** 103.40 **Conductivity (µS/cm):** 80 **pH:** 7.81**Water Color:** Glacial, High Turbidity **Turbidity (NTU):** 103.10 **Thalweg Velocity (m/s)(ft/s):** 2.22 7.28**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 16180 **Embeddedness:** Negligible**Channel Dimensions (m):** **Bankfull OHW Wetted** **Dominant Substrate:** Cobble**Width** 167.0 157.0 **Subdominant Substrate 1:** Gravel**Thalweg Depth** 5.14 2.90 **Subdominant Substrate 2:** Sand**Rosgen Class:** C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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 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
Total Fish Count: 11 **Fish Measured:** 8 **Fork Lengths (mm)** **Min:** 219 **Max:** 310 **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:

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:	Mean:	Median:
Sampling Method (No. of fish):		VOB (10)					
Comments:							
Species: slimy sculpin		Life Stage: juvenile/adult		Life History: Resident			
Total Fish Count:	108	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		BEF (17) VOB (91)					
Comments:							
Species: Chinook salmon		Life Stage: adult		Life History: Anadromous			
Total Fish Count:	6	Fish Measured:	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:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		BEF (1)					
Comments:							
Species: round whitefish		Life Stage: juvenile		Life History: Resident			
Total Fish Count:	3	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		BEF (3)					
Comments:							
Species: longnose sucker		Life Stage: adult		Life History: Resident			
Total Fish Count:	2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		BEF (2)					
Comments:							
Species: rainbow trout		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):		BEF (2)					
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):		BEF (2)					
Comments:							
Species: slimy sculpin		Life Stage: juvenile		Life History: Resident			
Total Fish Count:	11	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		BEF (11)					
Comments:							
Species: slimy sculpin		Life Stage: adult		Life History: Resident			
Total Fish Count:	12	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		BEF (12)					
Comments:							
Species: longnose sucker		Life Stage: juvenile		Life History: Resident			
Total Fish Count:	1	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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: handheld sonar depth finder

Channel Widths: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



FSS1106D010240.jpg



FSS1106D010241.jpg



FSS1106D010242.jpg



FSS1106D010243.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/09/2011 2:28 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.29768	-147.51377	Coordinates	63.31049	-147.55004	63.28756	-147.50504

Elevation NED (m)(ft): 776 2546**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-2**Legal Description (MTRS):** F018S001E33**Waterbody Name:** West Fork Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Started reach in a clear, right bank tributary for sampling events A and B. Waypoint 009 is mouth of clear tributary.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 2.43 **DO (mg/L):** 12.46 **DO (%):** 91.30 **Conductivity (µS/cm):** 81 **pH:** 7.89**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 210.00 **Thalweg Velocity (m/s)(ft/s):** 1.94 6.36**Stream Channel****Stream Gradient (%):** 0.2 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 564 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Silt/Clay
Width	76.0		54.0	Subdominant Substrate 1: Gravel
Thalweg Depth	1.70		0.80	Subdominant Substrate 2: Boulder

Rosgen Class: B5 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Open Tall Willow Shrub	1.6	Closed Tall Willow Shrub	1.6
5 - 10	Open Tall Willow Shrub	1.6	Closed Tall Willow Shrub	1.6
10 - 20	Open Tall Willow Shrub	1.6	Closed Tall Willow Shrub	1.6
20 - 30	Open Tall Willow Shrub	1.6	Closed Tall Willow Shrub	1.6

Key To Fish Sampling Methods**Estimated reach length (m):** 4000 **Total Electrofishing Time (s):** 2148

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

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

Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 40 **Max:** 46 **Mean:** 43 **Median:** 43

Sampling Method (No. of fish): BEF (2)

Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident

Total Fish Count: 66 **Fish Measured:** 31 **Fork Lengths (mm)** **Min:** 156 **Max:** 353 **Mean:** 277 **Median:** 254

Sampling Method (No. of fish): BEF (44) VOB (22)

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:

Species: longnose sucker	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 33	Fish Measured: 16	Fork Lengths (mm)	Min: 165	Max: 407	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:						
Species: round whitefish	Life Stage: juvenile/adult	Life History: Resident				
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				
Total Fish Count: 6	Fish Measured: 2	Fork Lengths (mm)	Min: 338	Max: 339	Mean: 338	Median: 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				
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofischer: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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FSS1107A010440.jpg



FSS1107A010441.jpg



FSS1107A010442.jpg



FSS1107A010444.jpg



FSS1107A010445.jpg



FSS1107A010446.jpg



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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	63.10460	-147.51791	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 **Entrenchment:** Moderatley Entrenched**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Alder-Willow Shrub	3.3 Open Black Spruce Forest	5
5 - 10 Closed Tall Alder-Willow Shrub	3.3 Open Black Spruce Forest	5
10 - 20 Closed Tall Alder-Willow Shrub	3.3 Open Black Spruce Forest	5
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
Total Fish Count: 4 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 300 Max: 340 Mean: 320 Median: 320
Sampling Method (No. of fish): BEF (2) VOB (2)
Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
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
Total Fish Count: 8 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 235 Max: 280 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:

Species: humpback whitefish	Life Stage: adult	Life History: Unknown				
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:						
Species: Arctic grayling	Life Stage: adult	Life History: Resident				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 340	Max: 365	Mean: 352	Median: 352
Sampling Method (No. of fish): BEF (2)						
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): 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:						
Species: burbot	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 165	Max: 165	Mean: 165	Median: 165
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: handheld sonar depth finder

Channel Widths: handheld laser rangefinder

Electrofischer: Smith-Root GPP 2.5

Transparency:



FSS1107B010342.jpg



FSS1107B010343.jpg



FSS1107B010344.jpg



FSS1107B010345.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/09/2011 10:08 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.05451	-146.76549	Coordinates	63.05533	-146.76440	63.05436	-146.76554

Elevation NED (m)(ft): 942 3091**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes A-6**Legal 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 (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 38 **Embeddedness:** High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	4.4		3.4	Subdominant Substrate 1: Boulder
Thalweg Depth	0.51		0.44	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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 - 20	Closed Tall Willow Shrub	12	Closed Tall Willow Shrub	8
20 - 30	Closed Tall Willow Shrub	12	Closed Tall Willow Shrub	8

Key To Fish Sampling Methods**Estimated reach length (m):** 165

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: burbot **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 141 Max: 147 Mean: 144 Median: 144
Sampling Method (No. of fish): PEF (2)
Comments:

Species: Arctic grayling **Life Stage:** adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 337 Max: 337 Mean: 337 Median: 337
Sampling Method (No. of fish): PEF (1)
Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 32 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 214 Max: 244 Mean: 227 Median: 229
Sampling Method (No. of fish): PEF (3) VOG (29)
Comments:

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
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:

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:						

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:



FSS1107c010183.jpg



FSS1107c010184.jpg



FSS1107c010186.jpg



FSS1107c010187.jpg



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	63.12165	-146.79579	63.11925	-146.79703

Elevation 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**

Water Temp (C): 6.55	DO (mg/L): 10.35	DO (%): 84.30	Conductivity (µS/cm): 23	pH: 7.25
Water Color: Clear	Turbidity (NTU): 0.20	Thalweg Velocity (m/s)(ft/s): 1.05 3.44		

Stream Channel**Stream Gradient (%):** 2 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 55 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Tall Willow Shrub	1.8	Unvegetated	
5 - 10	Closed Tall Willow Shrub	1.8	Unvegetated	
10 - 20	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	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
Total Fish Count: 5 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 70 **Max:** 80 **Mean:** 75 **Median:** 75
Sampling Method (No. of fish): PEF (2) VOG (3)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
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
Total Fish Count: 13 **Fish Measured:** 4 **Fork Lengths (mm) Min:** 52 **Max:** 63 **Mean:** 59 **Median:** 57
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 **Max:** 87 **Mean:** 87 **Median:** 87
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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FSS1107c020192.jpg



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	62.96847	-147.20762	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**Catchment Area(sq. km):** 95 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	9.5		6.5	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	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	1 Closed Low Willow Shrub	0.7
20 - 30 Open White Spruce Forest	28 Closed Low Willow Shrub	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
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 71 **Max:** 122 **Mean:** 96 **Median:** 96
Sampling Method (No. of fish): PEF (2)
Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
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
Total Fish Count: 6 **Fish Measured:** 6 **Fork Lengths (mm)** Min: 42 **Max:** 111 **Mean:** 62 **Median:** 76
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:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
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
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 134 **Max:** 134 **Mean:** 134 **Median:** 134
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

Electrofischer: Smith-Root LR-24

Water Quality: YSI 556

Transparency:



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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 Turbidity **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 (Vioreck 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 Alder-Willow Shrub	1.2	Closed Tall Alder-Willow Shrub	3
5 - 10	Closed Low Alder-Willow Shrub	1.2	Closed Tall Alder-Willow Shrub	3
10 - 20	Closed Low Alder-Willow Shrub	1.2	Closed Tall Alder-Willow Shrub	3
20 - 30	Closed Low Alder-Willow Shrub	1.2	Closed Spruce-Paper Birch Forest	30

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
Total Fish Count: 13 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 52 **Max:** 63 **Mean:** 56 **Median:** 57
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 **Max:** 94 **Mean:** 94 **Median:** 94
Sampling Method (No. of fish): BEF (1)
Comments:

Species: lamprey-unspecified	Life Stage: juvenile	Life History: Unknown					
Total Fish Count: 43	Fish Measured: 3	Fork Lengths (mm)	Min: 125	Max: 125	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:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (1295)							
Comments:							
Species: sockeye salmon	Life Stage: adult	Life History: Anadromous					
Total Fish Count: 890	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (890)							
Comments:							
Species: burbot	Life Stage: juvenile/adult	Life History: Resident					
Total Fish Count: 8	Fish Measured:	Fork Lengths (mm)	Min:	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					
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 40	Max: 50	Mean: 45	Median: 45	
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					
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					
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 355	Max: 355	Mean: 355	Median: 355	
Sampling Method (No. of fish): BEF (1)							
Comments:							
Species: longnose sucker	Life Stage: juvenile	Life History: Resident					
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:							

Instruments

Stream Gradient: handheld abney level
Stream Velocity: GPS Float
Turbidity: LaMotte 2020e turbidimeter
Water Quality: YSI 556

Channel Depths: handheld sonar depth finder
Channel Widths: handheld laser rangefinder
Electrofischer: Smith-Root GPP 2.5
Transparency:



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FSS1107D010247.jpg



Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/10/2011 11:51 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.45961	-147.58261	Coordinates	62.45961	-147.58261	62.47370	-147.53950

Elevation NED (m)(ft): 911 2989**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-2**Legal Description (MTRS):** S027N010E03**Waterbody Name:** Black River**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Wetted width measured to edge of flowing water--some standing water between boulders on right bank was not included.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.85 **DO (mg/L):** 10.68 **DO (%):** 87.70 **Conductivity (µS/cm):** 46 **pH:** 7.55**Water Color:** Glacial, Low Turbidity **Turbidity (NTU):** 7.63 **Thalweg Velocity (m/s)(ft/s):** 1.39 4.56**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 332 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	37.0		21.0	Subdominant Substrate 1: Cobble
Thalweg Depth	1.50		1.00	Subdominant Substrate 2:

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Closed Low Willow Shrub	1	Closed Low Willow Shrub	1
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**Estimated reach length (m):** 3500 **Total Electrofishing Time (s):** 1700

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 8 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 215 **Max:** 305 **Mean:** 278 **Median:** 260
Sampling Method (No. of fish): BEF (5) VOB (3)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 6 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOB (6)
Comments:

Species: general fish observation, no s **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): VOB (5)
Comments: Event B probably round whitefish.

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 8 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 70 **Max:** 87 **Mean:** 79 **Median:** 78
Sampling Method (No. of fish): BEF (5) VOB (3)
Comments:

-continued-

Species: Arctic grayling	Life Stage: juvenile	Life History: Resident				
Total Fish Count: 4	Fish Measured: 3	Fork Lengths (mm)	Min: 160	Max: 185	Mean: 173	Median: 172
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:						

Instruments

Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: handheld laser rangefinder
Turbidity: LaMotte 2020e turbidimeter	Electrofischer: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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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	62.30904	-147.50218	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

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	2.5	Closed Tall Willow Shrub	2.5
5 - 10	Open Tall Willow Shrub	2.5	Closed Tall Willow Shrub	2.5
10 - 20	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	2.5
20 - 30	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	2.5

Key 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
Total Fish Count: 10 **Fish Measured:** 10 **Fork Lengths (mm)** **Min:** 330 **Max:** 365 **Mean:** 341 **Median:** 347
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:

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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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	63.14078	-147.92446	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 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 77 **Embeddedness:** Negligible

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Midgrass-Shrub	1.5 Open Tall Willow Shrub	1.8
5 - 10 Midgrass-Shrub	1.5 Open Tall Willow Shrub	1.8
10 - 20 Midgrass-Shrub	1.5 Open Tall Willow Shrub	1.8
20 - 30 Midgrass-Shrub	1.5 Open Tall Willow Shrub	1.8

Key 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 Mean: 250 Median: 256
Sampling Method (No. of fish): PEF (5) VOG (25)
Comments:

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
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
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** Min: 70 Max: 97 Mean: 81 Median: 83
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:

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:

Species: round whitefish **Life Stage:** juvenile/adult **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 **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/Time:** 08/10/2011 11:38 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.15421	-149.71345	Coordinates	63.15593	-149.71823	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****Water Temp (C):** 4.42 **DO (mg/L):** 12.66 **DO (%):** 97.30 **Conductivity (µS/cm):** 220 **pH:** 8.26**Water Color:** Glacial, Low Turbidity **Turbidity (NTU):** 10.00 **Thalweg Velocity (m/s)(ft/s):** 0.96 3.15**Stream Channel****Stream Gradient (%):** 2 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 30 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Tall Alder-Willow Shrub	3 Ferns	0.4
5 - 10 Open Tall Alder-Willow Shrub	3 Ferns	0.4
10 - 20 Open Tall Alder-Willow Shrub	3 Fireweed	0.5
20 - 30 Open Tall Alder-Willow Shrub	3 Closed Low 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**Total Fish Count:** 10 **Fish Measured:** 5 **Fork Lengths (mm) Min:** 104 **Max:** 143 **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:**



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Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/10/2011 1:24 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.24879	-148.99004	Coordinates	63.24705	-148.98905	63.24879	-148.99004

Elevation NED (m)(ft): 895 2936**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-4**Legal Description (MTRS):** F019S008W24**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HU160. Unnamed tributary to Middle Fork Chulitna River.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.67 **DO (mg/L):** 10.62 **DO (%):** 84.70 **Conductivity (µS/cm):** 134 **pH:** 7.89**Water Color:** Clear **Turbidity (NTU):** 0.30 **Thalweg Velocity (m/s)(ft/s):** 1.59 5.22**Stream Channel****Stream Gradient (%):** 1.25 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 47 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	26.5		8.4	Subdominant Substrate 1: Boulder
Thalweg Depth	0.85		0.57	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Tall Willow Shrub	3 Unvegetated	
5 - 10 Closed Tall Willow Shrub	3 Unvegetated	
10 - 20 Closed Tall Willow Shrub	3 Unvegetated	
20 - 30 Closed Tall Willow Shrub	1.7 Unvegetated	

Key To Fish Sampling Methods**Estimated reach length (m):** 260

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 18 **Fish Measured:** 6 **Fork Lengths (mm) Min:** 95 **Max:** 210 **Mean:** 149 **Median:** 152
Sampling Method (No. of fish): PEF (6) VOG (12)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 13 **Fish Measured:** 13 **Fork Lengths (mm) Min:** 35 **Max:** 74 **Mean:** 56 **Median:** 54
Sampling Method (No. of fish): PEF (13)
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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FSS1108c030244.jpg



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FSS1108c030246.jpg



FSS1108c030247.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	63.27874	-148.92532	63.27781	-148.92708

Elevation NED (m)(ft): 948 3110**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 54 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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 Willow Shrub	3	Closed Low Willow Shrub 1.2
5 - 10 Closed Tall Willow Shrub	3	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
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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
Total Fish Count: 43	Fish Measured: 13	Fork Lengths (mm) Min: 35 Max: 53 Mean: 44 Median: 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 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:



FSS1108c040250.jpg



FSS1108c040251.jpg



FSS1108c040253.jpg



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



FSS1108c040262.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	63.02121	-147.54747	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**Catchment Area(sq. km):** 45 **Embeddedness:** Negligible

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 (Vioreck 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	28	Closed Tall Willow Shrub	6
5 - 10	Open White Spruce Forest	28	Open White Spruce Forest	29
10 - 20	Open White Spruce Forest	28	Open White Spruce Forest	29
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
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 109 Max: 151 Mean: 121 Median: 130
Sampling Method (No. of fish): PEF (4)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 39 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
Total Fish Count: 8	Fish Measured: 3	Fork Lengths (mm) Min: 244 Max: 300 Mean: 274 Median: 272
Sampling Method (No. of fish): PEF (3) VOG (5)		
Comments:		

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 117 Max: 117 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

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:**



FSS1108c050266.jpg



FSS1108c050267.jpg



FSS1108c050268.jpg



FSS1108c050270.jpg



FSS1108c050272.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/10/2011 11:38 AM

Sample	Latitude	Longitude
Coordinates	63.24817	-149.27878

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:** Joe Buckwalter, Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 07/21/2011 11:00 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.78589	-150.34673	Coordinates	61.78589	-150.34673	61.76472	-150.33906

Elevation NED (m)(ft): 30 98**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-1**Legal Description (MTRS):** S020N006W34**Waterbody Name:** Deshka River**Anadromous Waters Catalog Number:** 247-41-10200-2081**Geographic Comments:****Visit Comments:** Habitat transect at orange sign just upstream of weir. Turbidity meter not working (ERR 2/3), but water was very clear (probably <1 NTU). Fresh water mussels and one unidentified frog were observed.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 17.94	DO (mg/L): 8.55	DO (%): 90.20	Conductivity (µS/cm): 63	pH: 7.26
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s): 0.78 2.56	

Stream Channel**Stream Gradient (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 1524 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	62.0		47.0	Subdominant Substrate 1: Gravel
Thalweg Depth	2.90		0.90	Subdominant Substrate 2: Sand

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Open Tall Willow Shrub	1.5	Closed Spruce-Paper Birch Forest	14.2
5 - 10	Open Tall Willow Shrub	1.5	Closed Spruce-Paper Birch Forest	14.2
10 - 20	Closed Tall Willow Shrub	2.5	Closed Spruce-Paper Birch Forest	14.2
20 - 30	Closed Spruce-Paper Birch Forest	14.2	Closed Spruce-Paper Birch Forest	14.2

Key To Fish Sampling Methods**Estimated reach length (m):** 3100 **Total Electrofishing Time (s):** 2393

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: round whitefish **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 104 **Max:** 146 **Mean:** 118 **Median:** 125
Sampling Method (No. of fish): BEF (3)
Comments:

Species: longnose sucker **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm) Min:** 107 **Max:** 184 **Mean:** 154 **Median:** 145
Sampling Method (No. of fish): BEF (4)
Comments:

Species: Pacific lamprey **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: ID confirmed in lab. 3 cusps on supraoral bar (see photo 259) indicate L. tridentata.

Species: longnose sucker **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 37 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 208 **Max:** 219 **Mean:** 213 **Median:** 213
Sampling Method (No. of fish): BEF (2) VOB (35)
Comments:

Species: slimy sculpin	Life Stage: juvenile	Life History: Resident				
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				
Total Fish Count: 53	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):	VOB (53)					
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
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				
Total Fish Count: 29	Fish Measured: 1	Fork Lengths (mm)	Min: 25	Max: 25	Mean: 25	Median: 25
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				
Total Fish Count: 27	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):	VOB (27)					
Comments:						
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous				
Total Fish Count: 50	Fish Measured: 17	Fork Lengths (mm)	Min: 50	Max: 68	Mean: 56	Median: 59
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:	Mean:	Median:
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 **Mean:** 46 **Median:** 46
Sampling Method (No. of fish): BEF (2)
Comments:

Instruments

Stream Gradient: handheld abney level

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:



FSS1108D010254.jpg



FSS1108D010255.jpg



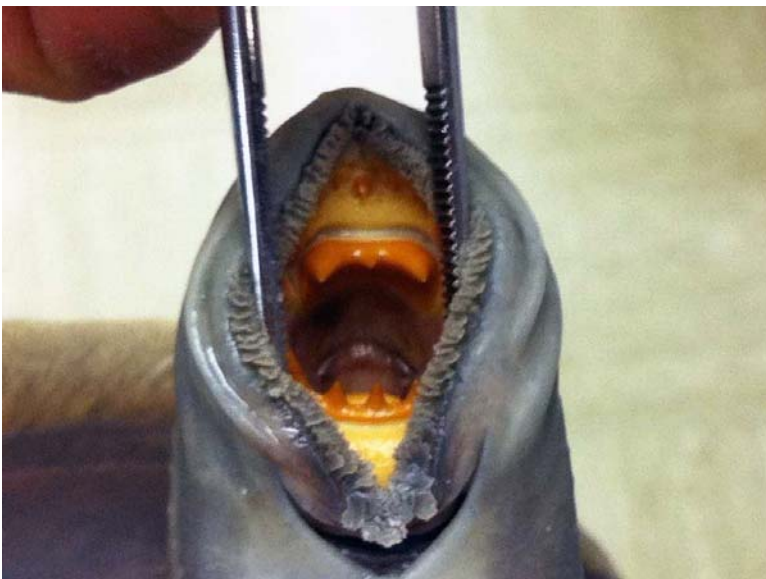
FSS1108D010256.jpg



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 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.05169	-149.60029	Coordinates	63.05169	-149.60029	62.99753	-149.65036

Elevation NED (m)(ft): 430 1411**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-6**Legal Description (MTRS):** F021S011W35**Waterbody Name:** Chulitna River**Anadromous Waters Catalog Number:** 247-41-10200-2381**Geographic Comments:** Habitat transect and upstream end of fish-collection reach located just downstream of confluence of Middle and East Forks Chulitna River and Honolulu Creek.**Visit Comments:** Water quality sampled on right bank from turbid Middle Fork flow, left bank runs clearer (initially, until mixed). Electrofishing was conducted along left-bank side of thalweg.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.26 **DO (mg/L):** 9.34 **DO (%):** 73.70 **Conductivity (µS/cm):** 203 **pH:** 7.86**Water Color:** Glacial, High Turbidity **Turbidity (NTU):** 107.00 **Thalweg Velocity (m/s)(ft/s):** 3.33 10.92**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 2006 **Embeddedness:** Negligible**Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Cobble**Width** 90.0 **Subdominant Substrate 1:** Gravel**Thalweg Depth** 2.10 **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 (Vioreck 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	Closed Tall Alder Shrub	4	Closed Tall Alder Shrub	4
5 - 10	Closed Black Cottonwood Forest	18	Open Spruce-Paper Birch Forest	23
10 - 20	Closed Black Cottonwood Forest	18	Open Spruce-Paper Birch Forest	23
20 - 30	Closed Black Cottonwood Forest	18	Open Spruce-Paper Birch Forest	23

Key To Fish Sampling Methods**Estimated reach length (m):** ##### **Total Electrofishing Time (s):** 4117

(BEF) Boat-Mounted Electrofisher

(DIP) Dip Net

(VOB) Visual Observation, Boat

Fish Observations**Species:** rainbow trout**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 412 **Max:** 412 **Mean:** 412 **Median:** 412**Sampling Method (No. of fish):** BEF (1)**Comments:****Species:** round whitefish**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 4 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 240 **Max:** 315 **Mean:** 277 **Median:** 277**Sampling Method (No. of fish):** BEF (2) VOB (2)**Comments:****Species:** Arctic grayling**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 335 **Max:** 335 **Mean:** 335 **Median:** 335**Sampling Method (No. of fish):** BEF (1)**Comments:**

Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident					
Total Fish Count: 28	Fish Measured: 10	Fork Lengths (mm)	Min: 56	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	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (2)							
Comments:							
Species: salmonid-unspecified	Life Stage: juvenile	Life History: Resident					
Total Fish Count: 12	Fish Measured:	Fork Lengths (mm)	Min:	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)							
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					
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:							
Species: pink salmon	Life Stage: carcass	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: Arctic grayling	Life Stage: juvenile	Life History: Resident					
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 120	Max: 120	Mean: 120	Median: 120	
Sampling Method (No. of fish): BEF (1)							
Comments:							
Species: Pacific salmon-unspecified	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: coho 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: 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 Mean: 215 Median: 215
Sampling Method (No. of fish): BEF (2)
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: 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



FSS1109A010473.jpg



FSS1109A010474.jpg
Mouth of Hurricane Gulch.



FSS1109A010476.jpg



FSS1109A010477.jpg

Station Info**Observers:** Jonathan Kirsch, Stormy Haight**Date/Time:** 08/11/2011 9:09 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.18811	-146.71994	Coordinates	63.18811	-146.71994	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 Turbidity **Turbidity (NTU):** 13.80 **Thalweg Velocity (m/s)(ft/s):** 0.95 3.12**Stream Channel****Stream Gradient (%):** 0.2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 199 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	2.2
5 - 10	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	2.2
10 - 20	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	2.2
20 - 30	Closed Tall Willow Shrub	1.8	Closed Tall Willow Shrub	2.2

Key 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
Total Fish Count: 48 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 230 **Max:** 310 **Mean:** 260 **Median:** 270
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:

Species: round whitefish **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: 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:

Species: round whitefish **Life Stage:** 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: GPS Float

Turbidity: LaMotte 2020e turbidimeter

Water Quality: YSI 556

Channel Depths: graduated wading rod

Channel Widths: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



FSS1109b010353.jpg



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	63.00527	-148.84350	63.00402	-148.84622

Elevation NED (m)(ft): 771 2530**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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**Catchment Area(sq. km):** 56 **Embeddedness:** Negligible

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 (Vioreck 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 Shrub Birch-Willow Shrub	12	Closed Tall Alder-Willow Shrub	24
5 - 10	Closed Tall Shrub Birch-Willow Shrub	12	Closed Tall Alder-Willow Shrub	24
10 - 20	Closed Tall Shrub Birch-Willow Shrub	12	Closed Tall Alder-Willow Shrub	24
20 - 30	Closed Tall Shrub Birch-Willow Shrub	12	Closed Tall Alder-Willow Shrub	24

Key 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
Total Fish Count: 18 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 115 **Max:** 115 **Mean:** 115 **Median:** 115
Sampling Method (No. of fish): PEF (1) VOG (17)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 12 **Fish Measured:** 12 **Fork Lengths (mm)** **Min:** 57 **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
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 75 **Max:** 81 **Mean:** 79 **Median:** 78
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 Median: 65
Sampling Method (No. of fish): PEF (2) VOG (5)
Comments:

Instruments

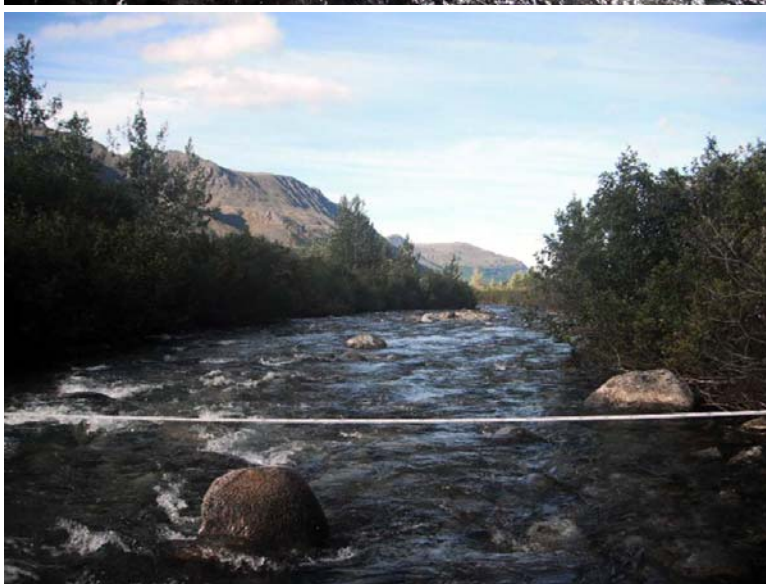
Stream Gradient: handheld abney level **Channel Depths:** graduated wading rod
Stream Velocity: transparent velocity head rod **Channel Widths:** measuring tape
Turbidity: LaMotte 2020e turbidimeter **Electrofisher:** Smith-Root LR-24
Water Quality: YSI 556 **Transparency:**



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FSS1109c010275.jpg



FSS1109c010277.jpg



FSS1109c010278.jpg



FSS1109c010280.jpg



FSS1109c010281.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/11/2011 11:18 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.14352	-149.86998	Coordinates	63.14658	-149.87417	63.14352	-149.86998

Elevation NED (m)(ft): 694 2277**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-6**Legal Description (MTRS):** F020S012W28**Waterbody Name:** Ohio Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HU17. This creek was sampled just downstream of Denali National Park boundary.**Visit Comments:** No photos were taken of sample site. Cataract Team-B floated a section of this creek (10B01) approximately 4 km downstream of this site, photos 357-361.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 3.76 **DO (mg/L):** 13.21 **DO (%):** 100.30 **Conductivity (µS/cm):** 149 **pH:** 7.37**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 7.00 **Thalweg Velocity (m/s)(ft/s):** 1.40 4.59**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 117 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	80.0		10.5	Subdominant Substrate 1: Boulder
Thalweg Depth	2.12		0.90	Subdominant Substrate 2:

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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 Shrub Birch-Willow Shrub	30	Unvegetated	
5 - 10	Open Tall Shrub Birch-Willow Shrub	30	Unvegetated	
10 - 20	Open Tall Shrub Birch-Willow Shrub	30	Unvegetated	
20 - 30	Open Tall Shrub Birch-Willow Shrub	30	Unvegetated	

Key To Fish Sampling Methods**Estimated reach length (m):** 480

(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:** 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: 3 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 74 **Max:** 74 **Mean:** 74 **Median:** 74
Sampling Method (No. of fish): PEF (1) 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:**

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	63.13327	-149.12960	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 73 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Unvegetated	Open White Spruce Forest	16
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
Total Fish Count: 36 **Fish Measured:** 7 **Fork Lengths (mm)** **Min:** 58 **Max:** 64 **Mean:** 60 **Median:** 61
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
Total Fish Count: 47 **Fish Measured:** 17 **Fork Lengths (mm)** **Min:** 48 **Max:** 59 **Mean:** 51 **Median:** 53
Sampling Method (No. of fish): PEF (17) VOG (30)
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:



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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.



FSS1109c030286.jpg

Looking upstream from transect site.



FSS1109c030287.jpg

Juvenile coho and chinook salmon.



FSS1109c030289.jpg

Juvenile sockeye salmon



FSS1109c030290.jpg



FSS1109c030291.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	63.13601	-148.87979	63.13526	-148.88396

Elevation NED (m)(ft): 947 3107**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 50 **Embeddedness:** Negligible

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Tall Willow Shrub	2 Unvegetated	
5 - 10 Open Tall Willow Shrub	2 Unvegetated	
10 - 20 Open Tall Willow Shrub	2 Unvegetated	
20 - 30 Open Tall Willow Shrub	2 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
Total Fish Count: 28 **Fish Measured:** 20 **Fork Lengths (mm) Min:** 86 **Max:** 169 **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
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 25 **Max:** 34 **Mean:** 30 **Median:** 29
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:

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): 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:**



FSS1109c040293.jpg



FSS1109c040294.jpg



FSS1109c040296.jpg



FSS1109c040297.jpg



FSS1109c040298.jpg



FSS1109c040299.jpg

Station Info**Observers:** Raye Ann Neustel, Jonathan Kirsch**Date/Time:** 08/11/2011 7:40 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.02710	-147.28957	Coordinates	63.02699	-147.28604	63.02710	-147.28957

Elevation NED (m)(ft): 770 2526**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-1**Legal Description (MTRS):** F022S002E12**Waterbody Name:** Alpine Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HU157**Visit Comments:** Drove to sampling site from Alpine Creek Lodge via ATV.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.98 **DO (mg/L):** 11.55 **DO (%):** 90.40 **Conductivity (µS/cm):** 65 **pH:** 7.65**Water Color:** Clear **Turbidity (NTU):** 3.00 **Thalweg Velocity (m/s)(ft/s):** 1.05 3.44**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 25 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	7.8		6.2	Subdominant Substrate 1: Gravel
Thalweg Depth	1.60		0.80	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Spruce-Paper Birch Forest	28	Closed Spruce-Paper Birch Forest	25
5 - 10	Closed Spruce-Paper Birch Forest	28	Closed Spruce-Paper Birch Forest	25
10 - 20	Closed Spruce-Paper Birch Forest	28	Closed Spruce-Paper Birch Forest	25
20 - 30	Closed Spruce-Paper Birch Forest	28	Closed Spruce-Paper Birch Forest	25

Key To Fish Sampling Methods**Estimated reach length (m):** 244

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Arctic grayling**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 16 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 334 **Max:** 334 **Mean:** 334 **Median:** 334**Sampling Method (No. of fish):** PEF (2) VOG (14)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 11 **Fish Measured:** 11 **Fork Lengths (mm)** **Min:** 265 **Max:** 320 **Mean:** 286 **Median:** 292**Sampling Method (No. of fish):** PEF (11)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 15 **Fish Measured:** 15 **Fork Lengths (mm)** **Min:** 65 **Max:** 116 **Mean:** 104 **Median:** 90**Sampling Method (No. of fish):** PEF (15)**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:



FSS1109c050306.jpg



FSS1109c050307.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/11/2011 12:50 PM

Sample	Latitude	Longitude
Coordinates	63.02794	-149.29144

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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/12/2011 12:40 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.20435	-146.55463	Coordinates	63.20932	-146.55297	63.16215	-146.54977

Elevation NED (m)(ft): 892 2927**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes A-6**Legal Description (MTRS):** F020S006E02**Waterbody Name:** Maclaren River**Anadromous Waters Catalog Number:****Geographic Comments:**

Visit Comments: Put in at the mouth of a clear right bank tributary (photos 484-485) with water quality readings of 9.6 C, 74 uS/cm conductivity, 59.5% saturation for dissolved oxygen, 6.78 mg/L dissolved oxygen, pH 7.59} and electrofished down into Maclaren River, almost to confluence with West Fork of Maclaren River.

Wildlife Comments:**Water Quality \ Stream Flow****Water Temp (C):** 7.47 **DO (mg/L):** 7.32 **DO (%):** 61.10 **Conductivity (uS/cm):** 85 **pH:** 7.78**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 25.70 **Thalweg Velocity (m/s)(ft/s):** 1.30 4.26**Stream Channel****Stream Gradient (%):** 0.1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 278 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	70.0		31.0	Subdominant Substrate 1: Silt/Clay
Thalweg Depth	1.52		1.10	Subdominant Substrate 2:

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	1	Open Low Willow Shrub	1
5 - 10	Open Low Willow Shrub	1	Open Low Willow Shrub	1
10 - 20	Open Low Willow Shrub	1	Open Low Willow Shrub	1
20 - 30	Open Low Willow Shrub	1	Open Low Willow Shrub	1

Key To Fish Sampling Methods**Estimated reach length (m):** 7400 **Total Electrofishing Time (s):** 3839

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 13 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 199 **Max:** 293 **Mean:** 251 **Median:** 246
Sampling Method (No. of fish): BEF (6) VOB (7)
Comments:

Species: Arctic grayling **Life Stage:** adult **Life History:** Resident
Total Fish Count: 24 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 340 **Max:** 350 **Mean:** 345 **Median:** 345
Sampling Method (No. of fish): BEF (3) VOB (21)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 28 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 51 **Max:** 68 **Mean:** 57 **Median:** 59
Sampling Method (No. of fish): BEF (9) VOB (19)
Comments:

Species: Arctic grayling	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 10	Fish Measured: 9	Fork Lengths (mm)	Min: 195	Max: 306	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	Mean: 52	Median: 52
Sampling Method (No. of fish): BEF (1) VOB (4)						
Comments:						
Species: Arctic grayling	Life Stage: juvenile	Life History: Resident				
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				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 98	Max: 98	Mean: 98	Median: 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:	Mean:	Median:
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				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 69	Max: 87	Mean: 75	Median: 78
Sampling Method (No. of fish): BEF (4)						
Comments:						
Species: round whitefish	Life Stage: adult	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 325	Max: 325	Mean: 325	Median: 325
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: handheld laser rangefinder
Electrofisher: Smith-Root GPP 2.5
Transparency:



FSS1110A010480.jpg



FSS1110A010482.jpg



FSS1110A010484.jpg



FSS1110A010485.jpg



FSS1110A010487.jpg



FSS1110A010488.jpg



FSS1110A010489.jpg



FSS1110A010490.jpg



FSS1110A010492.jpg

FSS1110A010493.jpg



FSS1110A010494.jpg



Station Info**Observers:** Jonathan Kirsch, Stormy Haught**Date/Time:** 08/12/2011 11:01 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.07291	-149.78012	Coordinates	63.07291	-149.78012	63.05680	-149.73851

Elevation NED (m)(ft): 539 1768**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-6**Legal Description (MTRS):** F021S012W25**Waterbody Name:** Ohio Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IU19

Visit Comments: Sampling efficiency very poor for all subreaches. River was very swift with multiple channels and large boulders, large woody debris as well. Given a backpack electrofisher/minnow traps it would be highly 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 Turbidit **Turbidity (NTU):** 47.50 **Thalweg Velocity (m/s)(ft/s):** 3.33 10.92**Stream Channel****Stream Gradient (%):** 1.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 199 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	85.0		19.8	Subdominant Substrate 1: Sand
Thalweg Depth	2.20		0.90	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	2.5	Open Tall Willow Shrub	2
5 - 10	Open Tall Willow Shrub	2.5	Open Tall Willow Shrub	2
10 - 20	Open Tall Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	13
20 - 30	Closed Tall Willow Shrub	2.5	Closed Paper Birch Forest	13

Key To Fish Sampling Methods**Estimated reach length (m):** 3100 **Total Electrofishing Time (s):** 890

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOB (4)		
Comments:		
Species: sockeye salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 2	Fish Measured: 1	Fork Lengths (mm) Min: 510 Max: 510 Mean: 510 Median: 510
Sampling Method (No. of fish): BEF (1) VOB (1)		
Comments: Spawning activity suspected for event I.		
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOB (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: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



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FSS1110B010359.jpg



FSS1110B010360.jpg

FSS1110B010361.jpg



Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/12/2011 9:19 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.67037	-147.87374	Coordinates	62.66996	-147.87193	62.67037	-147.87374

Elevation NED (m)(ft): 866 2841**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-2**Legal Description (MTRS):** S030N008E24**Waterbody Name:** Clarence Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HU133 Down river of lake. There is a smaller creek flowing out of the opposite end of the lake as well.**Visit Comments:****Wildlife Comments:** River otter 10m below transect site.**Water Quality \ Stream Flow**

Water Temp (C): 6.99	DO (mg/L): 12.07	DO (%): 99.20	Conductivity (μS/cm): 67	pH: 5.81
Water Color: Clear	Turbidity (NTU): 0.50	Thalweg Velocity (m/s)(ft/s): 0.68 2.23		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 221 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Sand
Width	17.2		16.5	Subdominant Substrate 1: Cobble
Thalweg Depth	1.15		0.74	Subdominant Substrate 2: Gravel

Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Mesic Sedge-Grass Meadow Tundra	0.5	Bluejoint Meadow	0.5
5 - 10	Mesic Sedge-Grass Meadow Tundra	0.5	Bluejoint Meadow	0.5
10 - 20	Mesic Sedge-Grass Meadow Tundra	0.5	Bluejoint Meadow	0.5
20 - 30	Bluejoint Meadow	0.5	Fresh Grass Marsh	0.5

Key To Fish Sampling Methods**Estimated reach length (m):** 150

(PEF) Backpack Electrofisher

Fish Observations

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 25 **Fish Measured:** 25 **Fork Lengths (mm) Min:** 35 **Max:** 157 **Mean:** 57 **Median:** 96
Sampling Method (No. of fish): PEF (25)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm) Min:** 69 **Max:** 77 **Mean:** 73 **Median:** 73
Sampling Method (No. of fish): PEF (5)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 6 **Fish Measured:** 6 **Fork Lengths (mm) Min:** 52 **Max:** 63 **Mean:** 55 **Median:** 57
Sampling Method (No. of fish): PEF (6)
Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 15 **Fish Measured:** 15 **Fork Lengths (mm) Min:** 23 **Max:** 49 **Mean:** 38 **Median:** 36
Sampling Method (No. of fish): PEF (15)
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:



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FSS1110C010311.jpg



FSS1110C010312.jpg



FSS1110C010313.jpg



FSS1110C010315.jpg



FSS1110C010316.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/12/2011 11:10 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.16504	-147.95327	Coordinates	62.16392	-147.95414	62.16504	-147.95327

Elevation NED (m)(ft): 1240 4068**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-2**Legal Description (MTRS):** S024N008E15**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:** Moderately 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. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck 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	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

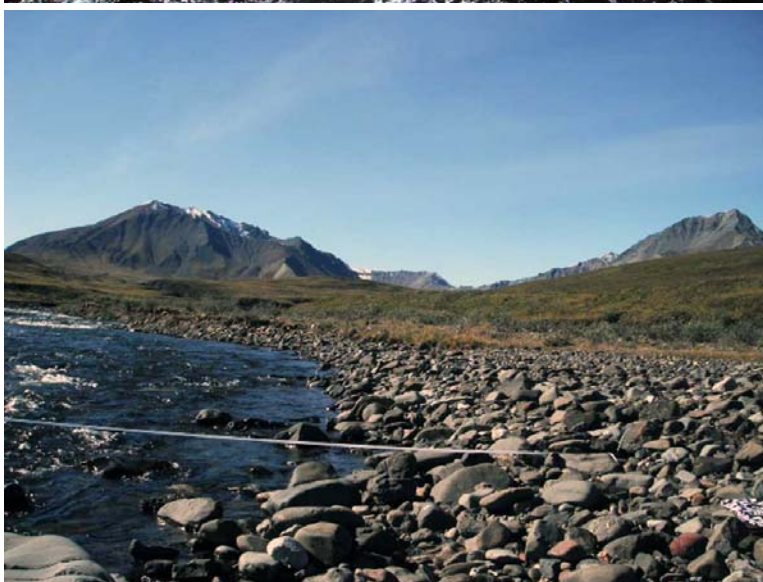
Fish Observations**Species:** Arctic grayling**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 155 **Max:** 155 **Mean:** 155 **Median:** 155**Sampling Method (No. of fish):** PEF (1)**Comments:****Instruments****Stream Gradient:** 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	62.49724	-148.13784	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**Catchment Area(sq. km):** 47 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Wet Sedge Meadow Tundra	0.2	Closed Low Ericaceous Shrub	0.5
5 - 10	Closed Low Ericaceous Shrub	0.5	Closed Low Ericaceous Shrub	0.5
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

Key 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
Total Fish Count: 36 **Fish Measured:** 13 **Fork Lengths (mm)** **Min:** 80 **Max:** 150 **Mean:** 101 **Median:** 115
Sampling Method (No. of fish): PEF (13) VOG (23)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 70 **Max:** 84 **Mean:** 75 **Median:** 77
Sampling Method (No. of fish): PEF (3)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 29 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 51 **Max:** 58 **Mean:** 54 **Median:** 54
Sampling Method (No. of fish): PEF (2) VOG (27)
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:



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FSS1110C030329.jpg



FSS1110C030330.jpg



FSS1110C030331.jpg



FSS1110C030332.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/12/2011 1:22 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.41757	-148.42772	Coordinates	62.41757	-148.42772	62.41685	-148.43073

Elevation NED (m)(ft): 1017 3337**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-3**Legal Description (MTRS):** S027N006E19**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HU73. Unnamed tributary to the Talkeetna River.**Visit Comments:****Wildlife Comments:** 1 caribou.**Water Quality \ Stream Flow****Water Temp (C):** 13.93 **DO (mg/L):** 10.72 **DO (%):** 103.90 **Conductivity (µS/cm):** 65 **pH:** 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 Entrenched**Catchment Area(sq. km):** 83 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	75.0		22.4	Subdominant Substrate 1: Boulder
Thalweg Depth	0.84		0.42	Subdominant Substrate 2: Gravel

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	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

Key To Fish Sampling Methods**Estimated reach length (m):** 285

(PEF) Backpack Electrofisher

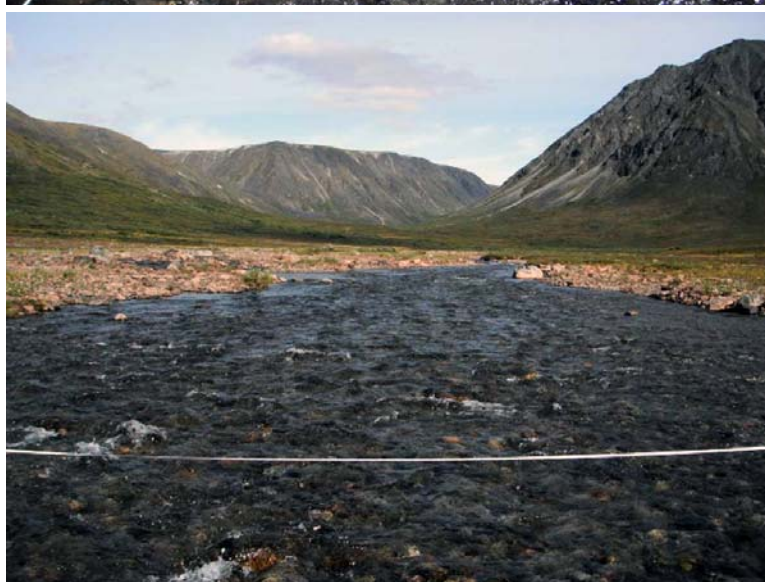
Fish Observations

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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FSS1110C040336.jpg



FSS1110C040337.jpg



FSS1110C040338.jpg



FSS1110C040339.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	62.57313	-147.90164	/ 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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 40 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Tussock Tundra	0.2 Tussock Tundra	0.3
5 - 10 Tussock Tundra	0.2 Tussock Tundra	0.3
10 - 20 Tussock Tundra	0.2 Tussock Tundra	0.3
20 - 30 Tussock Tundra	0.2 Tussock Tundra	0.3

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
Total Fish Count: 2 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
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
Total Fish Count: 1 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
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 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:



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FSS1110C050346.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/13/2011 10:00 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.27483	-149.35990	Coordinates	63.27483	-149.35990	/ 63.23116	-149.40481

Elevation NED (m)(ft): 688 2257**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy B-5**Legal Description (MTRS):** F019S009W18**Waterbody Name:** Bull River**Anadromous Waters Catalog Number:** 247-41-10200-2381-3239-4502**Geographic Comments:****Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.93 **DO (mg/L):** 12.28 **DO (%):** 98.60 **Conductivity (µS/cm):** 254 **pH:** 7.85**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 50.00 **Thalweg Velocity (m/s)(ft/s):** 2.30 7.54**Stream Channel****Stream Gradient (%):** 0.75 **Entrenchment:** Entrenched**Catchment Area(sq. km):** 194 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	25.0		20.2	Subdominant Substrate 1: Gravel
Thalweg Depth	0.85		0.48	Subdominant Substrate 2: Boulder

Rosgen Class: F3 Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.**Riparian Vegetation Communities (Vioreck 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	Closed Tall Willow Shrub	2.5	Closed Tall Willow Shrub	2.5
10 - 20	Closed Tall Willow Shrub	2.5	Closed Tall Willow Shrub	2.5
20 - 30	Closed Tall Willow Shrub	2.5	Closed Tall Willow Shrub	2.5

Key To Fish Sampling Methods**Estimated reach length (m):** 6300 **Total Electrofishing Time (s):** 2291

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 7 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 125 **Max:** 162 **Mean:** 138 **Median:** 143
Sampling Method (No. of fish): BEF (3) VOB (4)
Comments: Event BB Dolly Varden were observed at the mouth of a clear tributary.

Species: Chinook 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): VOB (3)
Comments: event BB photos: 501-502, eggs eaten.

Species: salmonid-unspecified **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 4 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOB (4)
Comments: Event BB-probably a Dolly Varden.

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 105 **Max:** 105 **Mean:** 105 **Median:** 105
Sampling Method (No. of fish): BEF (1)
Comments:

Species: Chinook salmon	Life Stage: juvenile	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)						
Comments:						
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)						
Comments:						

Instruments

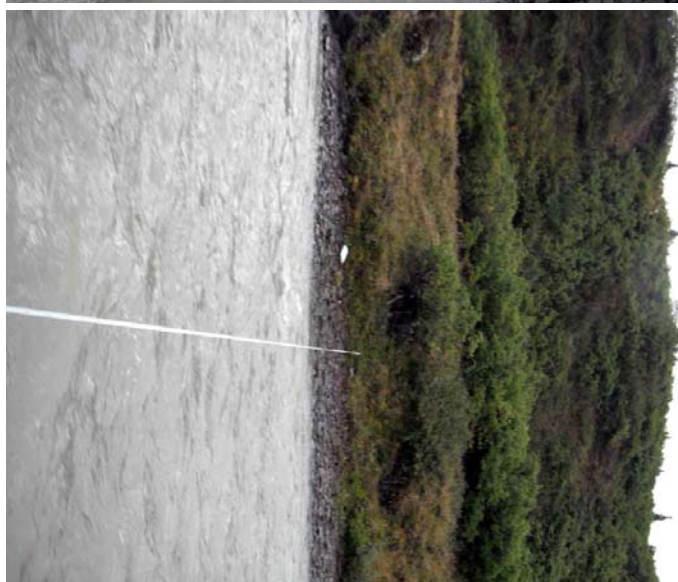
Stream Gradient: handheld abney level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



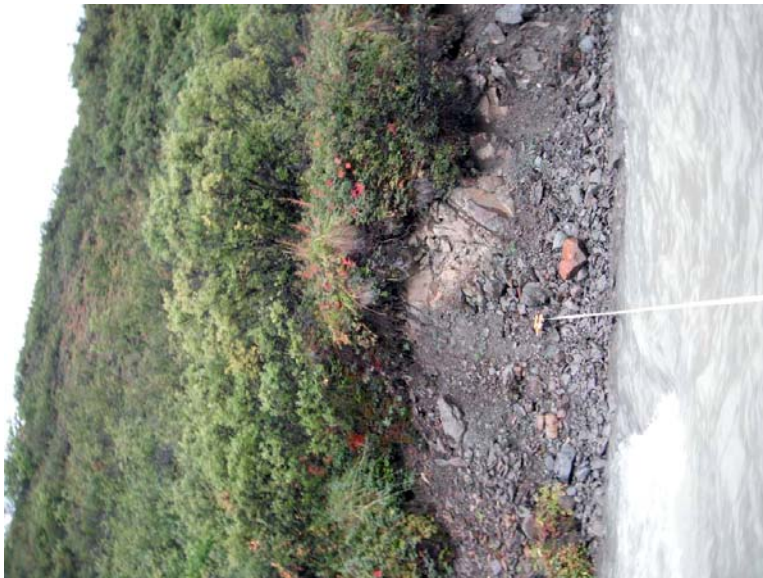
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FSS1111A010497.jpg



FSS1111A010498.jpg



FSS1111A010499.jpg



FSS1111A010501.jpg
Chinook salmon carcass.



FSS1111A010503.jpg
Chinook salmon juvenile.



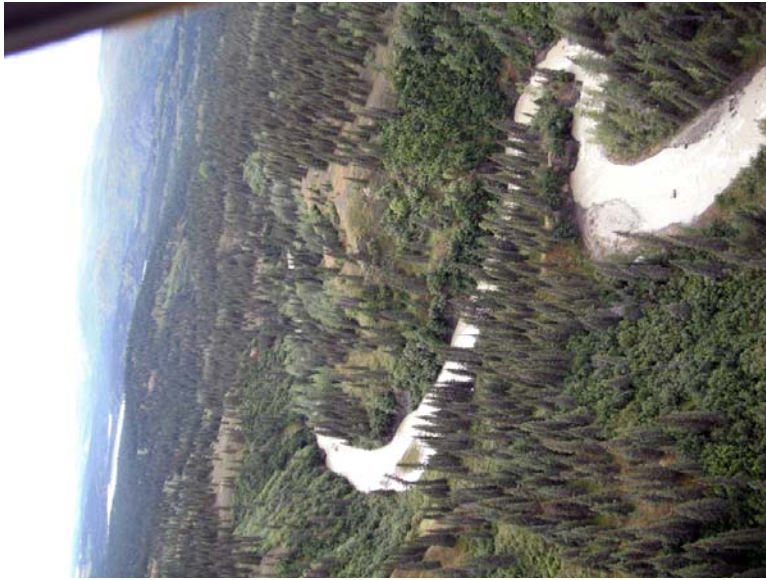
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FSS1111A010506.jpg



FSS1111A010512.jpg



FSS1111A010513.jpg

Station Info**Observers:** Jonathan Kirsch, Stormy Haight**Date/Time:** 08/13/2011 12:23 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.16078	-149.15019	Coordinates	63.16078	-149.15019	63.18226	-149.18593

Elevation NED (m)(ft): 734 2408**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Healy A-5**Legal Description (MTRS):** F020S008W19**Waterbody Name:** East Fork Chulitna River**Anadromous Waters Catalog Number:** 247-41-10200-2381-3260**Geographic Comments:** IU30**Visit Comments:** Stopped sampling short of sufficiency goals due to narrow canyon section.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 6.64	DO (mg/L): 11.16	DO (%): 91.10	Conductivity (µS/cm): 78	pH: 6.76
Water Color: Clear	Turbidity (NTU): 1.75	Thalweg Velocity (m/s)(ft/s): 2.36 7.74		

Stream Channel**Stream Gradient (%):** 0.75 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 299 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	25.0		21.5	Subdominant Substrate 1: Boulder
Thalweg Depth	1.10		0.60	Subdominant Substrate 2: Gravel

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Tall Alder-Willow Shrub	3.5	Closed Tall Alder-Willow Shrub	3
5 - 10	Closed Tall Alder-Willow Shrub	3.5	Closed Spruce-Paper Birch Forest	29
10 - 20	Closed Tall Alder-Willow Shrub	3.5	Closed Spruce-Paper Birch Forest	29
20 - 30	Closed Tall Alder-Willow Shrub	3.5	Open Spruce-Paper Birch Forest	29

Key To Fish Sampling Methods**Estimated reach length (m):** 3500 **Total Electrofishing Time (s):** 1193

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Arctic grayling **Life Stage:** adult **Life History:** Resident
Total Fish Count: 20 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 330 Max: 400 Mean: 360 Median: 365
Sampling Method (No. of fish): BEF (3) VOB (17)

Comments:

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 6 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 110 Max: 210 Mean: 168 Median: 160
Sampling Method (No. of fish): BEF (3) VOB (3)

Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 6 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 58 Max: 65 Mean: 61 Median: 61
Sampling Method (No. of fish): BEF (2) VOB (4)

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 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

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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FSS1111B010364.jpg



FSS1111B010366.jpg



FSS1111B010367.jpg



FSS1111B010371.jpg



FSS1111B010372.jpg

FSS1111B010373.jpg



Station Info**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 Quadrangle:** 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:****Catchment Area(sq. km):** 76**Embeddedness:****Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:**

Width

Subdominant Substrate 1:

Thalweg Depth

Subdominant Substrate 2:**Rosgen Class:****Riparian Vegetation Communities (Vioreck 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

(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:****Mean:****Median:****Sampling Method (No. of fish):** VOH (4)**Comments:** These coho salmon were observed by aerial survey.**Instruments****Stream Gradient:****Channel Depths:****Stream Velocity:****Channel Widths:****Turbidity:****Electrofisher:****Water Quality:****Transparency:**

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/13/2011 10:08 AM

Sample	Latitude	Longitude
Coordinates	62.84751	-149.03675

Elevation NED (m)(ft): 642 2106**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-5**Legal Description (MTRS):** S032N002E23**Waterbody Name:** Devil Creek**Anadromous Waters Catalog Number:****Geographic Comments:** This site represents a waterfall barrier below target stream points HU39. No sampling occurred.**Visit Comments:** No sampling effort.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/13/2011 10:16 AM

Sample	Latitude	Longitude
Coordinates	62.83438	-148.64878

Elevation NED (m)(ft): 503 1650**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-4**Legal Description (MTRS):** S032N004E26**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** This site represents a waterfall barrier below target stream points HUH74. No sampling occurred.**Visit Comments:** No sampling 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):	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/13/2011 10:53 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.91655	-147.90203	Coordinates	62.91655	-147.89921	62.91660	-147.90254

Elevation NED (m)(ft): 864 2835**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-2**Legal Description (MTRS):** S033N008E26**Waterbody Name:** Watana Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HU18 Beaver dam complex 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: 5.89
Water Color: Clear	Turbidity (NTU): 0.20	Thalweg Velocity (m/s)(ft/s): 0.64 2.10		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 61 **Embeddedness:** Moderate**Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** GravelWidth 15.1 13.1 **Subdominant Substrate 1:** CobbleThalweg Depth 0.55 0.38 **Subdominant Substrate 2:** Sand**Rosgen Class:** C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Closed Tall Willow Shrub	2	Unvegetated	
5 - 10	Crustose Lichen	0.2	Unvegetated	
10 - 20	Crustose Lichen	0.2	Closed Low Willow Shrub	0.3
20 - 30	Crustose Lichen	0.2	Closed Tall Alder-Willow Shrub	1.1

Key To Fish Sampling Methods**Estimated reach length (m):** 240

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 34 **Fish Measured:** 34 **Fork Lengths (mm)** Min: 83 Max: 270 Mean: 133 Median: 176
Sampling Method (No. of fish): PEF (34)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 13 **Fish Measured:** 13 **Fork Lengths (mm)** Min: 35 Max: 78 Mean: 47 Median: 56
Sampling Method (No. of fish): PEF (13)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 6 **Fish Measured:** 6 **Fork Lengths (mm)** Min: 73 Max: 108 Mean: 88 Median: 90
Sampling Method (No. of fish): PEF (6)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm)** Min: 54 Max: 68 Mean: 59 Median: 61
Sampling Method (No. of fish): PEF (5)
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

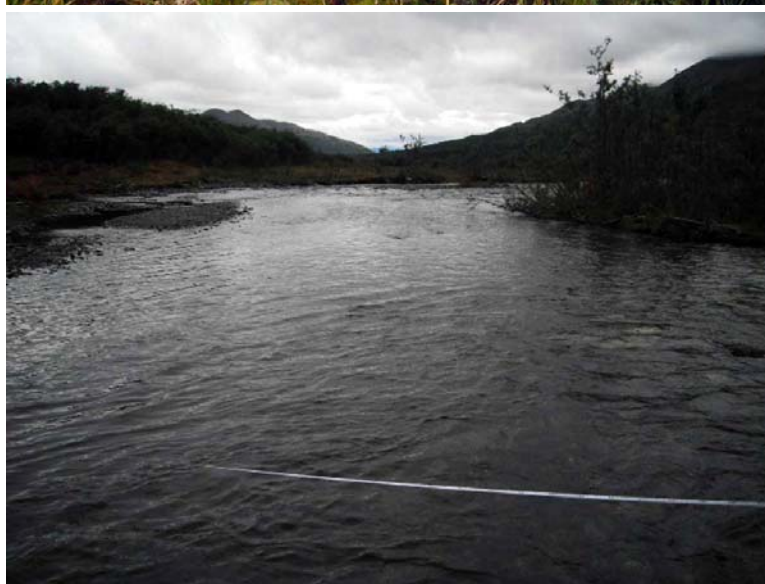
Transparency:



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Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/13/2011 12:04 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.99728	-149.08085	Coordinates	62.99728	-149.08085	62.99614	-149.08337

Elevation NED (m)(ft): 659 2162**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-5**Legal Description (MTRS):** F022S008W21**Waterbody Name:****Anadromous Waters Catalog Number:** 247-41-10200-2585-3223**Geographic Comments:** HU111. Unnamed tributary of Portage Creek.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 5.78	DO (mg/L): 11.98	DO (%): 95.60	Conductivity (µS/cm): 82	pH: 6.43
Water Color: Clear	Turbidity (NTU): 0.10	Thalweg Velocity (m/s)(ft/s): 1.33 4.36		

Stream Channel**Stream Gradient (%):** 1.5 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 62 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	22.8		15.7	Subdominant Substrate 1: Cobble
Thalweg Depth	1.81		0.76	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 (Vioreck 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 Shrub Birch-Willow Shrub	35 Fireweed	2
5 - 10 Closed Tall Shrub Birch-Willow Shrub	35 Open Tall Willow Shrub	5
10 - 20 Closed Tall Shrub Birch-Willow Shrub	35 Open Low Mixed Shrub-Sedge Tussock Tundra	0.5
20 - 30 Closed Tall Shrub Birch-Willow Shrub	35 Closed Tall Alder Shrub	4

Key To Fish Sampling Methods**Estimated reach length (m):** 242

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 28 **Fish Measured:** 9 **Fork Lengths (mm) Min:** 85 **Max:** 167 **Mean:** 119 **Median:** 126
Sampling Method (No. of fish): PEF (9) VOG (19)
Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 76 **Fish Measured:** 37 **Fork Lengths (mm) Min:** 38 **Max:** 66 **Mean:** 44 **Median:** 52
Sampling Method (No. of fish): PEF (37) VOG (39)
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:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 27 **Fish Measured:** 27 **Fork Lengths (mm) Min:** 33 **Max:** 81 **Mean:** 63 **Median:** 57
Sampling Method (No. of fish): PEF (27)
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:



FSS1111C040372.jpg



FSS1111C040373.jpg



FSS1111C040375.jpg



FSS1111C040377.jpg



FSS1111C040378.jpg

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	63.16788	-147.03713	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 53 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	13	Dry Forb Herbaceous	0.3
5 - 10	Closed Tall Willow Shrub	13	Closed Tall Willow Shrub	0.3
10 - 20	Closed Tall Willow Shrub	13	Dry Forb Herbaceous	0.3
20 - 30	Closed Tall Willow Shrub	13	Closed Tall Scrub	5

Key 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 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**

Sampling Method (No. of fish): VOG (3)

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:

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 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:



FSS1111C050380.jpg



FSS1111C050382.jpg



FSS1111C050383.jpg



FSS1111C050384.jpg



FSS1111C050385.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/13/2011 9:56 AM

Sample	Latitude	Longitude
Coordinates	62.99865	-148.86176

Elevation NED (m)(ft): 748 2454**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-4**Legal Description (MTRS):** F022S007W22**Waterbody Name:** Portage Creek**Anadromous Waters Catalog Number:** 247-41-10200-2585**Geographic Comments:** HU59

Visit Comments: No habitat data recorded. This target stream was first visited on 08/11/2011 (Station ID 09C01)--habitat data was collected during that visit. At 11C09 on 8/13/11, we sampled fish in a short reach (~100 m) approximately 1 km downstream of 09C01 to confirm the occurrence of juvenile Chinook 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): 60	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck 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**Estimated reach length (m):** 50

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 25	Fish Measured: 14	Fork Lengths (mm) Min: 38 Max: 48 Mean: 42 Median: 43
Sampling Method (No. of fish): PEF (14) VOG (11)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile/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:		

Instruments

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



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FSS1111c090348.jpg



FSS1111c090350.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/13/2011 3:19 PM

Sample	Latitude	Longitude
Coordinates	62.81700	-147.83733

Elevation NED (m)(ft): 850 2789**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts D-2**Legal Description (MTRS):** S032N009E31**Waterbody Name:** Jay Creek**Anadromous Waters Catalog Number:****Geographic Comments:** No landing zone was found to sample target stream HU45**Visit Comments:** No sampling 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):	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/14/2011 11:15 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.26967	-148.43635	Coordinates	62.26967	-148.43635	62.29387	-148.45131

Elevation NED (m)(ft): 834 2736**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-3**Legal Description (MTRS):** S025N005E12**Waterbody Name:** Talkeetna River**Anadromous Waters Catalog Number:****Geographic Comments:**

Visit Comments: Habitat transect was about 50 m downstream of Clear Creek confluence. Right-bank (Clear Creek) flow is less turbid than left-bank (Talkeetna River) flow. Water quality was sampled approximately 100 m downstream where flow was mixed. At the transect site there is an alluvial fan behind the right bank affecting riparian vegetation.

Wildlife Comments:**Water Quality \ Stream Flow****Water Temp (C):** 5.46 **DO (mg/L):** 11.30 **DO (%):** 89.60 **Conductivity (µS/cm):** 60 **pH:** 7.58**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 35.00 **Thalweg Velocity (m/s)(ft/s):** 2.80 9.18**Stream Channel****Stream Gradient (%):** 2**Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 290**Embeddedness:** Negligible**Channel Dimensions (m):** **Bankfull OHW** **Wetted** **Dominant Substrate:** Cobble**Width** 36.0 18.0 **Subdominant Substrate 1:** Boulder**Thalweg Depth** 1.58 0.60 **Subdominant Substrate 2:** Gravel**Rosgen Class:** D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	1.2
5 - 10	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	1.2
10 - 20	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	1.2
20 - 30	Closed Tall Alder-Willow Shrub	2.5	Closed Tall Alder-Willow Shrub	1.2

Key To Fish Sampling Methods**Estimated reach length (m):** 3090 **Total Electrofishing Time (s):** 1286

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**Total Fish Count:** 45 **Fish Measured:** 7 **Fork Lengths (mm) Min:** 120 **Max:** 148 **Mean:** 137 **Median:** 134**Sampling Method (No. of fish):** BEF (7) VOB (38)**Comments:** Event AA and BB Dolly Varden approximately 60-100 mm.**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 3 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 112 **Max:** 191 **Mean:** 158 **Median:** 151**Sampling Method (No. of fish):** BEF (3)**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:**

-continued-



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FSS1112A010518.jpg



FSS1112A010520.jpg



FSS1112A010524.jpg



FSS1112A010525.jpg



FSS1112A010526.jpg



FSS1112A010527.jpg



FSS1112A010536.jpg



FSS1112A010537.jpg

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/14/2011 4:18 PM

Sample	Latitude	Longitude
Coordinates	62.47276	-148.63006

Elevation NED (m)(ft): 751 2464**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-4**Legal Description (MTRS):** S028N004E36**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Impassible waterfall downstream of target-stream ID HU53. Location originally marked in GPS as waypoint 010. Unnamed tributary to the Talkeetna River.**Visit Comments:** Fly-by and photo 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:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



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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	62.63762	-148.02504	/ 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 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 486 **Embeddedness:** Moderate

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
0 - 5 Closed Low Willow Shrub	0.3 Closed Low Willow Shrub	0.8
5 - 10 Closed Low Willow Shrub	0.3 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
Total Fish Count: 16 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 55 Max: 65 Mean: 60 Median: 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
Total Fish Count: 14 **Fish Measured:** 1 **Fork Lengths (mm)** Min: 295 Max: 295 Mean: 295 Median: 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:

Species: slimy sculpin	Life Stage: adult	Life History: Resident				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 85	Max: 85	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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FSS1112B010377.jpg



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	63.42189	-147.33146	/ 63.42035	-147.33152

Elevation NED (m)(ft): 1054 3458**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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**Catchment Area(sq. km):** 51 **Embeddedness:** Negligible

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 (Vioreck 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	Unvegetated	
5 - 10	Closed Low Willow Shrub	1	Alpine Herbs	0.1
10 - 20	Closed Low Willow Shrub	1	Alpine Herbs	0.1
20 - 30	Closed Low Willow Shrub	1	Open Low Willow Shrub	1.2

Key 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
Total Fish Count: 3 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 84 **Max:** 156 **Mean:** 120 **Median:** 120
Sampling Method (No. of fish): PEF (2) VOG (1)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 49 **Max:** 49 **Mean:** 49 **Median:** 49
Sampling Method (No. of fish): PEF (1)
Comments:

Species: Arctic grayling **Life Stage:** adult **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 330 **Max:** 335 **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:

Species: Arctic grayling		Life Stage: juvenile		Life History: Resident		
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 37	Max: 37	Mean: 37	Median: 37
Sampling Method (No. of fish): PEF (1)						
Comments:						
Species: slimy sculpin		Life Stage: adult		Life History: Resident		
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		
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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	Electrofischer: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1112C010388.jpg



FSS1112C010390.jpg



FSS1112C010391.jpg



FSS1112C010392.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/14/2011 9:14 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	63.32985	-146.70624	Coordinates	63.33120	-146.70943	63.32985	-146.70624

Elevation NED (m)(ft): 1030 3379**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Mt Hayes B-6**Legal Description (MTRS):** F018S005E25**Waterbody Name:** West Fork McLaren River**Anadromous Waters Catalog Number:****Geographic Comments:** HU3**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 4.20 **DO (mg/L):** 11.49 **DO (%):** 88.20 **Conductivity (µS/cm):** 111 **pH:** 5.70**Water Color:** Glacial, High Turbidity **Turbidity (NTU):** 48.00 **Thalweg Velocity (m/s)(ft/s):** 1.09 3.58**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 50 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	14.7		10.0	Subdominant Substrate 1: Boulder
Thalweg Depth	1.17		0.54	Subdominant Substrate 2:

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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		Unvegetated	
10 - 20	Unvegetated		Closed Tall Willow Shrub	3
20 - 30	Unvegetated		Closed Tall Willow Shrub	4

Key To Fish Sampling Methods**Estimated reach length (m):** 205

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** slimy sculpin**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 2 **Fish Measured:** 1 **Fork Lengths (mm) Min:** 83 **Max:** 83 **Mean:** 83 **Median:** 83**Sampling Method (No. of fish):** PEF (1) 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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Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/14/2011 11:06 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.94925	-146.54038	Coordinates	62.94959	-146.53900	62.94930	-146.54235

Elevation NED (m)(ft): 839 2753**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Gulkana D-6**Legal Description (MTRS):** C014N007W34**Waterbody Name:** Maclaren River**Anadromous Waters Catalog Number:****Geographic Comments:** IU34**Visit Comments:** Large braided river. Sampled 1 braid and side-channel habitat.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.26 **DO (mg/L):** 10.86 **DO (%):** 90.00 **Conductivity (µS/cm):** 98 **pH:** 7.74**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 51.50 **Thalweg Velocity (m/s)(ft/s):** 1.05 3.44**Stream Channel****Stream Gradient (%):** 0.2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 969 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	93.6		47.2	Subdominant Substrate 1: Cobble
Thalweg Depth	1.50		0.70	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	Wet Sedge-Herb Meadow Tundra	0.3	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 length (m):** 215

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** burbot**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 2 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 174 **Max:** 174 **Mean:** 174 **Median:** 174**Sampling Method (No. of fish):** PEF (1) VOG (1)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 15 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 220 **Max:** 220 **Mean:** 220 **Median:** 220**Sampling Method (No. of fish):** PEF (1) VOG (14)**Comments:****Species:** Arctic grayling**Life Stage:** juvenile**Life History:** Resident**Total Fish Count:** 15 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 62 **Max:** 174 **Mean:** 118 **Median:** 118**Sampling Method (No. of fish):** PEF (5) VOG (10)**Comments:****Species:** slimy sculpin**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 71 **Fish Measured:** 16 **Fork Lengths (mm)** **Min:** 52 **Max:** 63 **Mean:** 56 **Median:** 57**Sampling Method (No. of fish):** PEF (16) VOG (55)**Comments:**

Species: slimy sculpin	Life Stage: adult	Life History: Resident				
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 73	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	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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FSS1112C030402.jpg



FSS1112C030403.jpg



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FSS1112C030405.jpg



FSS1112C030406.jpg

Station Info**Observers:** Raye Ann Neustel, Daniel Reed**Date/Time:** 08/14/2011 12:57 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.86964	-146.93925	Coordinates	62.86964	-146.93925	62.86941	-146.94139

Elevation NED (m)(ft): 738 2421**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Gulkana D-6**Legal Description (MTRS):** C013N009W33**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HU149. Unnamed tributary to the Maclaren River.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 6.41	DO (mg/L): 10.71	DO (%): 86.90	Conductivity (µS/cm): 71	pH: 7.22
Water Color: Clear	Turbidity (NTU): 1.77	Thalweg Velocity (m/s)(ft/s): 1.00 3.28		

Stream Channel**Stream Gradient (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 54 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	5.8		5.5	Subdominant Substrate 1: Cobble
Thalweg Depth	0.51		0.31	Subdominant Substrate 2:

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
Left Bank Vegetation Type	Right Bank Vegetation Type	
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 Stage:** juvenile **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 112 Max: 118 Mean: 115 Median: 115
Sampling Method (No. of fish): PEF (2)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** Min: 69 Max: 74 Mean: 71 Median: 71
Sampling Method (No. of fish): PEF (4)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** Min: 61 Max: 68 Mean: 63 Median: 64
Sampling Method (No. of fish): PEF (3)
Comments:

Species: slimy sculpin **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** Min: 39 Max: 50 Mean: 43 Median: 44
Sampling Method (No. of fish): PEF (4)
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:



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FSS1112C040411.jpg



FSS1112C040412.jpg



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	63.39560	-146.86753	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****Water Temp (C):** 2.75 **DO (mg/L):** 12.15 **DO (%):** 89.80 **Conductivity (µS/cm):** 43 **pH:** 7.19**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**Catchment Area(sq. km):** 79 **Embeddedness:** Negligible

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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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

Key To Fish Sampling Methods**Estimated reach length (m):** 290

(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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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	62.88313	-146.95309	/ 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 Turbidity **Turbidity (NTU):** 41.00 **Thalweg Velocity (m/s)(ft/s):** 1.67 5.48**Stream Channel****Stream Gradient (%):** 0.6 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 1453 **Embeddedness:** Moderate

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 (Vioreck 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 White Spruce Forest	14
5 - 10	Open Spruce-Balsam Poplar	13	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

Key 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
Total Fish Count: 157 **Fish Measured:** 8 **Fork Lengths (mm) Min:** 51 **Max:** 68 **Mean:** 58 **Median:** 59
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:

Species: longnose sucker		Life Stage: juvenile/adult		Life History: Resident				
Total Fish Count:	22	Fish Measured:	16	Fork Lengths (mm)	Min: 257	Max: 345	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:	Mean:	Median:
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	Mean: 380	Median: 380
Sampling Method (No. of fish):		BEF (1) VOB (3)						
Comments:								
Species: slimy sculpin		Life Stage: juvenile		Life History: Resident				
Total Fish Count:	33	Fish Measured:	13	Fork Lengths (mm)	Min: 33	Max: 50	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				
Total Fish Count:	3	Fish Measured:		Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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	Mean: 120	Median: 140
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				
Total Fish Count:	7	Fish Measured:		Fork Lengths (mm)	Min:	Max:	Mean:	Median:
Sampling Method (No. of fish):		VOB (7)						
Comments:								
Species: humpback whitefish		Life Stage: juvenile		Life History: Unknown				
Total Fish Count:	1	Fish Measured:	1	Fork Lengths (mm)	Min: 66	Max: 66	Mean: 66	Median: 66
Sampling Method (No. of fish):		BEF (1)						
Comments:								
Species: slimy sculpin		Life Stage: adult		Life History: Resident				
Total Fish Count:	9	Fish Measured:	9	Fork Lengths (mm)	Min: 69	Max: 86	Mean: 76	Median: 77
Sampling Method (No. of fish):		BEF (9)						
Comments:								

Instruments

Stream Gradient: handheld abney level
Stream Velocity: GPS Float
Turbidity: LaMotte 2020e turbidimeter
Water Quality: YSI 556

Channel Depths: handheld sonar depth finder
Channel Widths: handheld laser rangefinder
Electrofischer: Smith-Root GPP 2.5
Transparency:



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Station Info**Observers:** Jonathan Kirsch, Stormy Haight**Date/Time:** 08/15/2011 9:11 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.65724	-147.03872	Coordinates	62.65724	-147.03872	62.66999	-147.10063

Elevation NED (m)(ft): 708 2323**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 2315 **Embeddedness:** Moderate

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 (Vioreck 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 Spruce-White Spruce Forest	22	Closed Tall Alder-Willow Shrub	4
5 - 10	Closed Black Spruce-White Spruce Forest	22	Closed Black Spruce-White Spruce Forest	20
10 - 20	Closed Black Spruce-White Spruce Forest	22	Closed Black Spruce-White Spruce Forest	20
20 - 30	Closed Black Spruce-White Spruce Forest	22	Closed Black Spruce-White Spruce Forest	20

Key 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 **Mean:** 325 **Median:** 317
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
Total Fish Count: 44 **Fish Measured:** 7 **Fork Lengths (mm)** **Min:** 64 **Max:** 150 **Mean:** 82 **Median:** 107
Sampling Method (No. of fish): BEF (7) VOB (37)
Comments:

Species: burbot **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): VOB (1)
Comments:

Species: round whitefish	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 7	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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:						
Species: longnose sucker	Life Stage: adult	Life History: Resident				
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				
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 level	Channel Depths: graduated wading rod
Stream Velocity: GPS Float	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofischer: Smith-Root GPP 2.5
Water Quality: YSI 556	Transparency:



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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 confluent 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 Turbidity **Turbidity (NTU):** 242.00 **Thalweg Velocity (m/s)(ft/s):** 1.33 4.36**Stream Channel****Stream Gradient (%):** 0.75 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 243 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	16.0		14.2	Subdominant Substrate 1: Gravel
Thalweg Depth	0.70		0.40	Subdominant Substrate 2: Sand

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	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
Total Fish Count: 3 **Fish Measured:** 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 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **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:

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/Time:** 08/16/2011 10:59 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.67820	-152.79501	Coordinates	61.67820	-152.79501	61.67951	-152.79761

Elevation NED (m)(ft): 609 1998**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek C-8**Legal Description (MTRS):** S018N019W06**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HY87. Short stream, sample site located approximately 1km before creek becomes very steep, with large boulders. Unnamed tributary to the Skwentna River.**Visit Comments:** Channel widths were estimated excessive depth.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 1.68 **DO (mg/L):** 13.05 **DO (%):** 93.40 **Conductivity (µS/cm):** 40 **pH:** 6.86**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 433.00 **Thalweg Velocity (m/s)(ft/s):** 1.85 6.07**Stream Channel****Stream Gradient (%):** 1.25**Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 146**Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	52.0		23.0	Subdominant Substrate 1: Boulder
Thalweg Depth	0.95		0.42	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	Unvegetated		Fireweed	0.4
5 - 10	Unvegetated		Fireweed	0.4
10 - 20	Unvegetated		Fireweed	0.4
20 - 30	Unvegetated		Fireweed	0.4

Key To Fish Sampling Methods**Estimated reach length (m):** 305

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 15 **Fish Measured:** 7 **Fork Lengths (mm)** **Min:** 104 **Max:** 182 **Mean:** 140 **Median:** 143**Sampling Method (No. of fish):** PEF (7) VOG (8)**Comments:****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:**



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Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/16/2011 12:26 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.81662	-152.71891	Coordinates	61.81557	-152.71549	61.81662	-152.71891

Elevation NED (m)(ft): 435 1427**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-8**Legal Description (MTRS):** S020N019W22**Waterbody Name:** Black and Tan Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HY110**Visit Comments:** Thalweg too fast and deep to wade, channel widths estimated.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 1.95 **DO (mg/L):** 13.91 **DO (%):** 100.40 **Conductivity (µS/cm):** 81 **pH:** 7.17**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 235.00 **Thalweg Velocity (m/s)(ft/s):** 1.85 6.07**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 92 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	29.0		16.0	Subdominant Substrate 1: Boulder
Thalweg Depth	0.88		0.40	Subdominant Substrate 2: Gravel

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Unvegetated	Mixed Herbs	0.1
5 - 10 Unvegetated	Mixed Herbs	0.1
10 - 20 Unvegetated	Mixed Herbs	0.1
20 - 30 Mixed Herbs	0.1 Mixed Herbs	0.1

Key To Fish Sampling Methods**Estimated reach length (m):** 266

(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:** **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:** 68 **Max:** 68 **Mean:** 68 **Median:** 68**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:** Visual estimate**Turbidity:** LaMotte 2020e turbidimeter**Electrofisher:** Smith-Root LR-24**Water Quality:** YSI 556**Transparency:**



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FSS1113C030459.jpg



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Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/16/2011 2:09 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.86274	-152.73219	Coordinates	61.86228	-152.73510	61.86274	-152.73219

Elevation NED (m)(ft): 389 1276**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-8**Legal Description (MTRS):** S021N019W34**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** This creek is a small tributary flowing into main channel of Skwentna River on river left. This creek parallels muddy creek which is a target stream with a barrier to fish passage.**Visit Comments:** This sample site has a steep stream flowing off of the hillside approximately 1 km upriver from the confluence with Skwentna River. Excellent rearing habitat until stream reaches hillside.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 4.82	DO (mg/L): 11.40	DO (%): 88.80	Conductivity (µS/cm): 83	pH: 5.42
Water Color: Clear	Turbidity (NTU): 1.90	Thalweg Velocity (m/s)(ft/s): 0.52 1.71		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 10 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Silt/Clay
Width	8.0		4.9	Subdominant Substrate 1: Gravel
Thalweg Depth	0.80		0.50	Subdominant Substrate 2: Boulder

Rosgen Class: B5 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck 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	21	Unvegetated	
5 - 10	Closed Spruce-Paper Birch Forest	21	Unvegetated	
10 - 20	Closed Spruce-Paper Birch Forest	21	Unvegetated	
20 - 30	Closed Spruce-Paper Birch Forest	21	Fireweed	0.3

Key To Fish Sampling Methods**Estimated reach length (m):** 255

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 30	Fish Measured: 16	Fork Lengths (mm) Min: 89 Max: 203 Mean: 141 Median: 146
Sampling Method (No. of fish): PEF (16) VOG (14)		

Comments:

Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 37 Max: 37 Mean: 37 Median: 37
Sampling Method (No. of fish): PEF (1)		

Comments:

Species: sockeye salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 5	Fish Measured: 2	Fork Lengths (mm) Min: 34 Max: 37 Mean: 35 Median: 35
Sampling Method (No. of fish): PEF (2) VOG (3)		

Comments:

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				
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 35	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	Electrofischer: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1113C040464.jpg



FSS1113C040465.jpg



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FSS1113C040468.jpg

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:** Moderately Entrenched**Catchment Area(sq. km):** 1286 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Fireweed	0.3	Closed Tall Willow Shrub	8
5 - 10	Fireweed	0.3	Closed Tall Willow Shrub	8
10 - 20	Open Tall Willow Shrub	5	Closed Tall Willow Shrub	8
20 - 30	Unvegetated		Closed Tall Willow Shrub	8

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
Total Fish Count: 307	Fish Measured: 7	Fork Lengths (mm) Min: 33 Max: 36 Mean: 33 Median: 34
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:		

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:
Water Quality: YSI 556	Transparency:



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FSS1113C050472.jpg



FSS1113C050474.jpg



FSS1113C050480.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/16/2011 4:11 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.98745	-152.69463	Coordinates	61.98716	-152.69457	61.98810	-152.69252

Elevation NED (m)(ft): 541 1775**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-8**Legal Description (MTRS):** S022N019W23**Waterbody Name:** Portage Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3205-4120**Geographic Comments:** HY57**Visit Comments:** This site is upstream of an exploratory mining camp. Access roads are being built parallel to creek using corrugated timber construction for large machinery to cross wetland areas next to stream. Photos and waypoint for this activity are documented under 13C08.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 7.32	DO (mg/L): 10.95	DO (%): 90.08	Conductivity (µS/cm): 56	pH: 6.99
Water Color: Clear	Turbidity (NTU): 4.21	Thalweg Velocity (m/s)(ft/s): 1.06 3.48		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 147 **Embeddedness:** High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	33.9		23.4	Subdominant Substrate 1: Gravel
Thalweg Depth	0.49		0.33	Subdominant Substrate 2: Sand

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	35	Unvegetated	0.3
5 - 10	Open White Spruce Forest	35	Fireweed	0.3
10 - 20	Open White Spruce Forest	35	Open Low Willow Shrub	0.7
20 - 30	Open White Spruce Forest	35	Open Low Willow Shrub	0.7

Key To Fish Sampling Methods**Estimated reach length (m):** 175

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 10 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 112 **Max:** 117 **Mean:** 114 **Median:** 114
Sampling Method (No. of fish): PEF (2) VOG (8)
Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 62 **Fish Measured:** 24 **Fork Lengths (mm)** **Min:** 33 **Max:** 56 **Mean:** 44 **Median:** 44
Sampling Method (No. of fish): PEF (24) VOG (38)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 12 **Fish Measured:** 12 **Fork Lengths (mm)** **Min:** 30 **Max:** 71 **Mean:** 43 **Median:** 50
Sampling Method (No. of fish): PEF (12)
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:



FSS1113C060486.jpg



FSS1113C060487.jpg



FSS1113C060488.jpg



FSS1113C060491.jpg



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	61.89682	-152.53152	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****Stream Gradient (%):** 1 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 37 **Embeddedness:** Moderate

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
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Unvegetated	Open Low Willow Shrub	0.4
5 - 10 Unvegetated	Open Low Willow Shrub	0.4
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**Total Fish Count:** 6 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 128 **Max:** 165 **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**Turbidity:** LaMotte 2020e turbidimeter**Electrofisher:** Smith-Root LR-24**Water Quality:** YSI 556**Transparency:**



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FSS1113C070501.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/16/2011 3:31 PM

Sample	Latitude	Longitude
Coordinates	61.96524	-152.57996

Elevation NED (m)(ft): 323 1060**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-7**Legal Description (MTRS):** S022N018W28**Waterbody Name:** Skwentna River**Anadromous Waters Catalog Number:** 247-41-10200-2053-3205**Geographic Comments:** This waypoint was created at a large mining camp on the Skwentna River (fly-by only).**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):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck 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
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:



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Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/16/2011 11:59 AM

Sample	Latitude	Longitude
Coordinates	61.80640	-152.74854

Elevation NED (m)(ft): 537 1762**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-8**Legal Description (MTRS):** S020N019W20**Waterbody Name:** Emerald Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Waterfall at site waypoint, approximately .5 km upstream of confluence with Skwentna River.**Visit Comments:** There is a waterfall on this target stream (HY139), approximately .5 km from confluence with Skwentna River.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Joe Giefer**Date/Time:** 08/16/2011 11:19 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.59757	-149.07303	Coordinates	62.59899	-149.06262	62.57173	-149.15877

Elevation NED (m)(ft): 441 1447**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts C-5**Legal Description (MTRS):** S029N002E15**Waterbody Name:** Talkeetna River**Anadromous Waters Catalog Number:** 247-41-10200-2370**Geographic Comments:** At Prairie Creek mouth.

Visit Comments: Electrofished along right bank starting at Prairie Creek mouth. Habitat transect located 500 m downstream of Prairie Creek mouth, but water quality (temp, cond, pH, turb, DO) sampled at put-in on left bank just upstream of Prairie Creek mouth.

Wildlife Comments:**Water Quality \ Stream Flow****Water Temp (C):** 7.24 **DO (mg/L):** 13.49 **DO (%):** 111.80 **Conductivity (µS/cm):** 95 **pH:** 7.43**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 32.00 **Thalweg Velocity (m/s)(ft/s):** 2.10 6.89**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 1826 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	52.0		47.0	Subdominant Substrate 1: Gravel
Thalweg Depth	1.73		1.10	Subdominant Substrate 2: Sand

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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-White Spruce Forest	9	Closed White Spruce Forest	16
5 - 10	Open Black Spruce-White Spruce Forest	9	Closed White Spruce Forest	16
10 - 20	Open Black Spruce-White Spruce Forest	9	Closed White Spruce Forest	16
20 - 30	Open Black Spruce-White Spruce Forest	9	Closed White Spruce Forest	16

Key To Fish Sampling Methods**Estimated reach length (m):** 7500 **Total Electrofishing Time (s):** 3449

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 72 **Fish Measured:** 30 **Fork Lengths (mm)** **Min:** 83 **Max:** 403 **Mean:** 179 **Median:** 243
Sampling Method (No. of fish): BEF (33) VOB (39)
Comments:

Species: round whitefish **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 12 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 282 **Max:** 305 **Mean:** 291 **Median:** 293
Sampling Method (No. of fish): BEF (5) VOB (7)
Comments:

Species: coho salmon **Life Stage:** adult **Life History:** Anadromous
Total Fish Count: 18 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 540 **Max:** 545 **Mean:** 542 **Median:** 542
Sampling Method (No. of fish): BEF (2) VOB (16)
Comments:

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	Mean: 57	Median: 59	
Sampling Method (No. of fish): BEF (11) VOB (42)							
Comments:							
Species: Chinook salmon	Life Stage: adult spawning	Life History: Anadromous					
Total Fish Count: 11	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (11)							
Comments:							
Species: Pacific salmon-unspecified	Life Stage: adult	Life History: Anadromous					
Total Fish Count: 4	Fish Measured:	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					
Total Fish Count: 96	Fish Measured: 3	Fork Lengths (mm)	Min: 79	Max: 82	Mean: 80	Median: 80	
Sampling Method (No. of fish): BEF (14) VOB (82)							
Comments:							
Species: round whitefish	Life Stage: adult	Life History: Resident					
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 331	Max: 331	Mean: 331	Median: 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					
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:	
Sampling Method (No. of fish): VOB (2)							
Comments: ~350 mm.							
Species: slimy sculpin	Life Stage: adult	Life History: Resident					
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 74	Max: 76	Mean: 75	Median: 75	
Sampling Method (No. of fish): BEF (2)							
Comments:							
Species: slimy sculpin	Life Stage: juvenile	Life History: Resident					
Total Fish Count: 7	Fish Measured: 7	Fork Lengths (mm)	Min: 43	Max: 50	Mean: 46	Median: 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 level
Stream Velocity: GPS Float
Turbidity: LaMotte 2020e turbidimeter
Water Quality: YSI 556

Channel Depths: graduated wading rod
Channel Widths: handheld laser rangefinder
Electrofisher: Smith-Root GPP 2.5
Transparency:

-continued-



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FSS1114A010559.jpg



FSS1114A010563.jpg



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FSS1114A010566.jpg



FSS1114A010567.jpg



FSS1114A010568.jpg



FSS1114A010569.jpg

Station Info**Observers:** Jonathan Kirsch, Stormy Haight**Date/Time:** 08/16/2011 10:28 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.66908	-147.86698	Coordinates	62.66908	-147.86698	62.66764	-147.90938

Elevation 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****Water Temp (C):** 9.86 **DO (mg/L):** 11.50 **DO (%):** 98.00 **Conductivity (µS/cm):** 64 **pH:** 6.94**Water Color:** Clear **Turbidity (NTU):** 6.80 **Thalweg Velocity (m/s)(ft/s):** 0.28 0.92**Stream Channel****Stream Gradient (%):** 0.1 **Entrenchment:** Slightly Entrenched**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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Low Willow Shrub	0.9 Closed Low Willow Shrub	0.8
5 - 10 Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	0.9 Closed Low Willow Shrub	0.8
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

Key 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:****Species:** Arctic grayling**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 9 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 350 **Max:** 425 **Mean:** 388 **Median:** 387**Sampling Method (No. of fish):** BEF (9)**Comments:**

Species: round whitefish	Life Stage: adult	Life History: Resident
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 335 Max: 450 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 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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FSS1114B010386.jpg



FSS1114B010387.jpg



FSS1114B010388.jpg



FSS1114B010389.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/17/2011 9:41 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.54074	-151.51735	Coordinates	62.54048	-151.52004	62.54074	-151.51735

Elevation NED (m)(ft): 430 1411**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna C-4**Legal Description (MTRS):** S028N012W04**Waterbody Name:** Cripple Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HY 130 Approximately 1000 meter, downstream of 4 velocity barriers, 1000 meters upstream of Chelatna Lake photos 509-510.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.10 **DO (mg/L):** 11.79 **DO (%):** 94.80 **Conductivity (µS/cm):** 9 **pH:** 5.49**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 80.00 **Thalweg Velocity (m/s)(ft/s):** 1.40 4.59**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 79 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	20.2		13.7	Subdominant Substrate 1: Boulder
Thalweg Depth	0.68		0.55	Subdominant Substrate 2: Gravel

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

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

Key To Fish Sampling Methods**Estimated reach length (m):** 203

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 11 **Fish Measured:** 4 **Fork Lengths (mm) Min:** 85 **Max:** 161 **Mean:** 114 **Median:** 123
Sampling Method (No. of fish): PEF (4) VOG (7)
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: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 6 **Fish Measured:** 6 **Fork Lengths (mm) Min:** 55 **Max:** 81 **Mean:** 72 **Median:** 68
Sampling Method (No. of fish): PEF (6)
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:



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FSS1114C010505.jpg



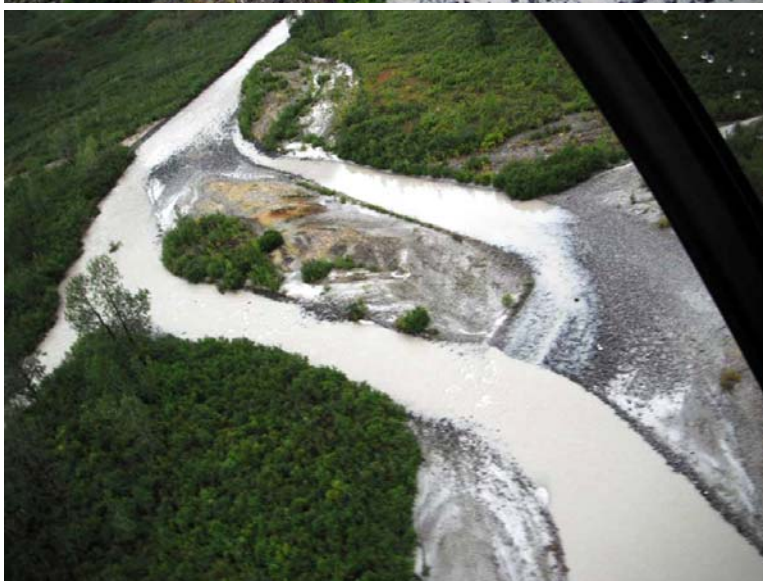
FSS1114C010506.jpg



FSS1114C010507.jpg



FSS1114C010508.jpg



FSS1114C010511.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/17/2011 12:11 PM

Sample	Latitude	Longitude
Coordinates	62.54359	-151.53232

Elevation NED (m)(ft): 443 1453**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna C-4**Legal Description (MTRS):** S028N012W05**Waterbody Name:** Cripple Creek**Anadromous Waters Catalog Number:****Geographic Comments:** This is a waterfall waypoint.**Visit Comments:** A sampling event took place downstream of this site (14C01). This site is a waterfall/barrier to fish passage.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



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Station Info**Observers:** Raye Ann Neustel, Raye Ann Neustel**Date/Time:** 08/17/2011 10:28 AM

Sample	Latitude	Longitude
Coordinates	62.51562	-151.47255

Elevation NED (m)(ft): 421 1381**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna C-3**Legal Description (MTRS):** S028N012W15**Waterbody Name:** Coffee Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3170-4088**Geographic Comments:****Visit Comments:** This creek was not a target stream but aerial surveyed.**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): 50	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 1500	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (1500)		
Comments:		

Instruments

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



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FSS1114C030515.jpg



FSS1114C030517.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/17/2011 12:12 PM

Sample	Latitude	Longitude
Coordinates	62.39438	-151.32061

Elevation NED (m)(ft): 414 1358**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna B-3**Legal Description (MTRS):** S027N011W28**Waterbody Name:** Lake Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** This was a visual observation from a helicopter. No 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):** 234**Embeddedness:****Channel Dimensions (m):** Bankfull OHW Wetted**Dominant Substrate:**

Width

Subdominant Substrate 1:

Thalweg Depth

Subdominant Substrate 2:**Rosgen Class:****Riparian Vegetation Communities (Vioreck 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

(VOH) Visual Observation, Helicopter

Fish Observations**Species:** Pacific salmon-unspecified**Life Stage:** adult**Life History:** Anadromous**Total Fish Count:** 15**Fish Measured:****Fork Lengths (mm) Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOH (15)**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 1:56 PM

Sample	Latitude	Longitude
Coordinates	61.87301	-151.95566

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): 77	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
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	61.82133	-152.18743	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**Catchment Area(sq. km):** 385 **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)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed 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:**



FSS1114C070521.jpg



FSS1114C070522.jpg



FSS1114C070523.jpg



FSS1114C070524.jpg



FSS1114C070527.jpg



FSS1114C070528.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/17/2011 4:33 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.92752	-152.28233	Coordinates	61.92740	-152.28527	61.92752	-152.28233

Elevation NED (m)(ft): 356 1168**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-7**Legal 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 sampling event. Actual start time: 1348.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.32 **DO (mg/L):** 12.50 **DO (%):** 101.30 **Conductivity (µS/cm):** 153 **pH:** 7.57**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 29.30 **Thalweg Velocity (m/s)(ft/s):** 1.77 5.81**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Entrenched**Catchment Area(sq. km):** 57 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	82.0		13.2	Subdominant Substrate 1: Boulder
Thalweg Depth	1.05		0.65	Subdominant Substrate 2: Gravel

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed Tall Willow Shrub	35	Unvegetated	
5 - 10	Closed Tall Willow Shrub	35	Unvegetated	
10 - 20	Closed Tall Willow Shrub	35	Unvegetated	
20 - 30	Open Balsam Poplar (Black Cottonwood) Forest	35	Unvegetated	

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: 13 **Fish Measured:** 4 **Fork Lengths (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 **Life History:** Anadromous
Total Fish Count: 27 **Fish Measured:** 6 **Fork Lengths (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/adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 208 **Max:** 208 **Mean:** 208 **Median:** 208
Sampling Method (No. of fish): PEF (1)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 27 **Fish Measured:** 27 **Fork Lengths (mm)** **Min:** 31 **Max:** 64 **Mean:** 46 **Median:** 47
Sampling Method (No. of fish): PEF (27)
Comments:

-continued-

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

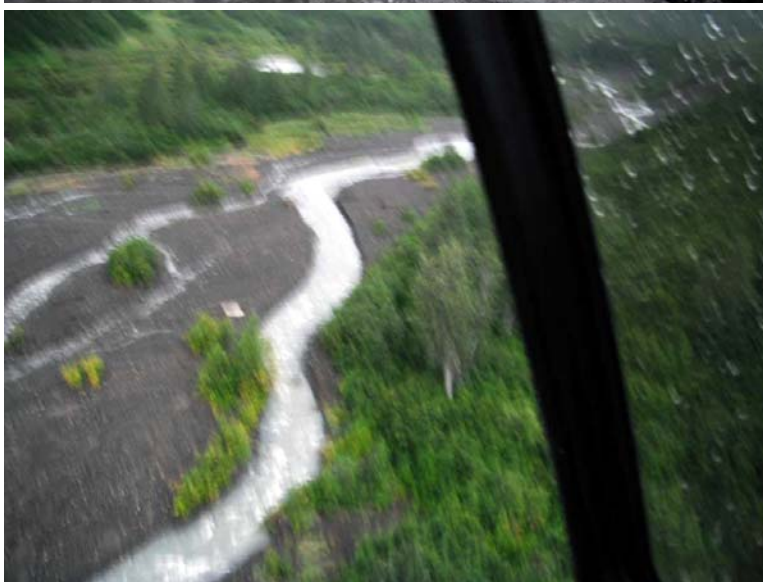
Transparency:



FSS1114C080531.jpg



FSS1114C080532.jpg



FSS1114C080534.jpg



FSS1114C080535.jpg

Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/17/2011 5:47 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude
Coordinates	62.08061	-152.71710	Coordinates	62.08162	-152.71817

Elevation NED (m)(ft): 568 1864**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna A-6**Legal Description (MTRS):** S023N019W14**Waterbody Name:** Squaw Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3205-4112-5045**Geographic Comments:** Puntilla Lake upstream approximately 500m.**Visit Comments:** Transect site located approximately 500m downriver from Puntilla Lake. Visual observation only as salmon spawning behavior observed. This site was sampled due to no-fly conditions. Accessed site by hiking a four wheeler trail downriver from lake. Many salmon redds observed within sample reach.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 9.14	DO (mg/L): 10.91	DO (%): 94.70	Conductivity (µS/cm): 92	pH: 7.43
Water Color: Clear	Turbidity (NTU): 8.70	Thalweg Velocity (m/s)(ft/s): 0.74 2.43		

Stream Channel**Stream Gradient (%):** 0.25 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 32 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	10.9		9.2	Subdominant Substrate 1: Cobble
Thalweg Depth	0.74		0.30	Subdominant Substrate 2: Sand

Rosgen Class: C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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	35	Closed White Spruce Forest	38

Key To Fish Sampling Methods**Estimated reach length (m):** 468

(DIP) Dip Net

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown			
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:
Sampling Method (No. of fish): VOG (4)					Median:
Comments:					

Species: Chinook salmon	Life Stage: carcass	Life History: Anadromous			
Total Fish Count: 2	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:
Sampling Method (No. of fish): VOG (2)					Median:
Comments: photo # 765					

Species: sockeye salmon	Life Stage: adult spawning	Life History: Anadromous			
Total Fish Count: 110	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:
Sampling Method (No. of fish): VOG (110)					Median:
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	Channel Depths: graduated wading rod
Stream Velocity: transparent velocity head rod	Channel Widths: measuring tape
Turbidity: LaMotte 2020e turbidimeter	Electrofisher:
Water Quality: YSI 556	Transparency:



FSS1114C090540.jpg



FSS1114C090542.jpg



FSS1114C090544.jpg



FSS1114C090545.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/18/2011 11:40 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.21695	-148.67786	Coordinates	61.21695	-148.67786	61.25587	-148.62461

Elevation NED (m)(ft): 107 351**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage A-5**Legal Description (MTRS):** S013N004E14**Waterbody Name:** Lake Fork Knik River**Anadromous Waters Catalog Number:** 247-50-10200-2160**Geographic Comments:** IM18. Habitat transect and upper end of reach just downstream of a left-bank tributary mouth alluvial fan. Upper Lake George is drained. Lake Fork Knik River flows, braided, over the former lake bed.**Visit Comments:** Photos 594-602 were taken of Knik glacier and Lake George, just below the sample reach.**Wildlife Comments:****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 **Turbidity (NTU):** 112.00 **Thalweg Velocity (m/s)(ft/s):** 2.10 6.89**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 386 **Embeddedness:** High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width	75.0		55.0	Subdominant Substrate 1: Cobble
Thalweg Depth	2.50		1.50	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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 Alder-Willow Shrub	1.6	Closed Tall Alder-Willow Shrub	3
5 - 10	Open Tall Alder-Willow Shrub	1.6	Closed Black Cottonwood Forest	14.5
10 - 20	Open Tall Alder-Willow Shrub	1.6	Closed Black Cottonwood Forest	14.5
20 - 30	Closed Black Cottonwood Forest	14.5	Closed Black Cottonwood Forest	14.5

Key To Fish Sampling Methods**Estimated reach length (m):** 6600 **Total Electrofishing Time (s):** 4147

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

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): BEF (1)
Comments:

Species: general fish observation, no s **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: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 3 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 202 **Max:** 215 **Mean:** 208 **Median:** 208
Sampling Method (No. of fish): BEF (2) VOB (1)
Comments:

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					
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 109	Max: 109	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	Electrofischer: 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 (put-
in).



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**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/18/2011 5:33 PM

Sample	Latitude	Longitude
Coordinates	61.40919	-148.42451

Elevation NED (m)(ft): 299 981**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-4**Legal Description (MTRS):** S015N006E08**Waterbody Name:** Glacier Fork Knik River**Anadromous Waters Catalog Number:****Geographic Comments:** Fly-by only. Slot canyon (photos 613-614) appears to be a fish-passage barrier. Photo 615 shows Grasshopper Valley upstream of the canyon.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:



FSS1115A020613.jpg



FSS1115A020615.jpg

Station Info**Observers:** Jonathan Kirsch, Stormy Haught**Date/Time:** 08/18/2011 9:20 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.48641	-148.46815	Coordinates	61.48641	-148.46815	61.47360	-148.47881

Elevation NED (m)(ft): 261 856**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-4**Legal Description (MTRS):** S016N005E12**Waterbody Name:** Metal Creek**Anadromous Waters Catalog Number:****Geographic Comments:** IM33**Visit Comments:** Very swift and muddy, continuous whitewater.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 4.71 **DO (mg/L):** 12.78 **DO (%):** **Conductivity (µS/cm):** 215 **pH:** 7.62**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 350.00 **Thalweg Velocity (m/s)(ft/s):** 3.75 12.30**Stream Channel****Stream Gradient (%):** 2 **Entrenchment:** Entrenched**Catchment Area(sq. km):** 209 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	18.0		10.0	Subdominant Substrate 1: Boulder
Thalweg Depth	1.65		0.75	Subdominant Substrate 2: Sand

Rosgen Class: G3 Entrenched "gully" step/pool and low width/depth ratio on moderate gradients.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
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 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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FSS1115B010393.jpg



FSS1115B010394.jpg

FSS1115B010395.jpg



Station Info**Observers:** Raye Ann Neustel, Bob Powers**Date/Time:** 08/18/2011 9:00 PM

Sample	Latitude	Longitude
Coordinates	62.09073	-152.73372

Elevation NED (m)(ft): 572 1877**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna A-6**Legal Description (MTRS):** S023N019W10**Waterbody Name:** Puntilla Lake**Anadromous Waters Catalog Number:** 247-41-10200-2053-3205-4112-5045-0010**Geographic Comments:****Visit Comments:** No habitat data collected. This is a lake site that was sampled only by visual observation due to spawning sockeye salmon.**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):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 200	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (200)		
Comments:		

Instruments

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



FSS1115C011508.jpg



FSS1115C011509.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/19/2011 10:45 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.11377	-148.84763	Coordinates	62.11377	-148.84763	62.11847	-148.84909

Elevation NED (m)(ft): 616 2021**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-4**Legal Description (MTRS):** S023N003E02**Waterbody Name:** Sheep River**Anadromous Waters Catalog Number:****Geographic Comments:** IM17

Visit Comments: ph reading unstable (slowly drifting up), after soaking 10 minutes. Reach was not safely raftable. We floated through 4 subreaches (560m), electrofishing continuously, but saw no fish and decided to stop for our safety.

Wildlife Comments:**Water Quality \ Stream Flow****Water Temp (C):** 3.37 **DO (mg/L):** 12.42 **DO (%):** 93.20 **Conductivity (µS/cm):** 44 **pH:** 6.88**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 100.00 **Thalweg Velocity (m/s)(ft/s):** 3.90 12.79**Stream Channel****Stream Gradient (%):** 3**Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 234**Embeddedness:** Negligible**Channel Dimensions (m):** **Bankfull OHW Wetted** **Dominant Substrate:** Cobble**Width** 54.0 **Subdominant Substrate 1:** Boulder**Thalweg Depth** 3.40 **Subdominant Substrate 2:** Sand**Rosgen Class:** D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	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 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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FSS1116A010622.jpg



FSS1116A010629.jpg



FSS1116A010630.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/19/2011 9:04 AM

Sample	Latitude	Longitude
Coordinates	61.94485	-149.12354

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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



FSS1116A020616.jpg



FSS1116A020618.jpg

Station Info**Observers:** Raye Ann Neustel, Stormy Haught**Date/Time:** 08/19/2011 11:31 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.76017	-149.45406	Coordinates	61.76017	-149.45406	61.76271	-149.48494

Elevation NED (m)(ft): 677 2221**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-7**Legal Description (MTRS):** S019N001W04**Waterbody Name:** Willow Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Mining activity approximately 100m upstream at confluence of Willow and Canyon Creeks.**Visit Comments:** Fast water due to steep gradient. No photos taken. No turbidity taken. Stream velocity calculated from TVHR readings is 1.62 m/s although 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): 6.50	DO (mg/L): 10.10	DO (%): 82.10	Conductivity (µS/cm): 57	pH: 7.17
Water Color: Clear	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s): 2.30 7.54	

Stream Channel**Stream Gradient (%):** 0.75 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 54 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	19.8		15.9	Subdominant Substrate 1: Cobble
Thalweg Depth	1.50		0.80	Subdominant Substrate 2: Sand

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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 Alder-Willow Shrub	10
5 - 10	Closed Tall Willow Shrub	2	Closed Tall Alder-Willow Shrub	10
10 - 20	Closed Tall Willow Shrub	2	Closed Tall Alder-Willow Shrub	10
20 - 30	Closed Tall Willow Shrub	2	Closed Tall Alder-Willow Shrub	10

Key To Fish Sampling Methods**Estimated reach length (m):** 1600 **Total Electrofishing Time (s):** 450

(BEF) Boat-Mounted Electrofisher

Fish Observations

Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 61 Max: 61 Mean: 61 Median: 61
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:**

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/19/2011 9:50 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.09351	-148.74177	Coordinates	61.09351	-148.74177	61.09459	-148.73762

Elevation NED (m)(ft): 352 1155**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage A-5**Legal Description (MTRS):** S012N004E33**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HM21. Unnamed tributary to Lake Fork Knik River.**Visit Comments:** pH sensor may have been malfunctioning. Stream was too deep and swift to wade, so depth was estimated.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 1.17 **DO (mg/L):** 14.63 **DO (%):** 103.50 **Conductivity (µS/cm):** 29 **pH:** 4.50**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 300.00 **Thalweg Velocity (m/s)(ft/s):** 3.61 11.84**Stream Channel****Stream Gradient (%):** 3 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 45 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	28.0		13.0	Subdominant Substrate 1: Cobble
Thalweg Depth	2.90		0.85	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 (Vioreck 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	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 level**Channel Depths:****Stream Velocity:** Orange Float**Channel Widths:** handheld laser rangefinder**Turbidity:** LaMotte 2020e turbidimeter**Electrofisher:** Smith-Root LR-24**Water Quality:** YSI 556**Transparency:**



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FSS1116C010550.jpg



FSS1116C010551.jpg



FSS1116C010552.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/19/2011 11:32 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.17384	-148.62821	Coordinates	61.17367	-148.62780	61.17438	-148.63077

Elevation NED (m)(ft): 170 558**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage A-5**Legal Description (MTRS):** S013N005E31**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HM84. Unnamed tributary to Lake Fork Knik River.**Visit Comments:** pH sensor may have been malfunctioning.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 2.58 **DO (mg/L):** 13.86 **DO (%):** 101.90 **Conductivity (µS/cm):** 24 **pH:** 5.32**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 300.00 **Thalweg Velocity (m/s)(ft/s):** 1.68 5.51**Stream Channel****Stream Gradient (%):** 2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 11 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	30.0		8.0	Subdominant Substrate 1: Boulder
Thalweg Depth	2.40		0.70	Subdominant Substrate 2: Gravel

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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**Estimated reach length (m):** 206

(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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FSS1116C020556.jpg



FSS1116C020557.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/19/2011 12:38 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.31829	-148.53246	Coordinates	61.31829	-148.53246	/	61.31822 -148.53826

Elevation NED (m)(ft): 106 348**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S014N005E10**Waterbody Name:** Fourteen Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HM131**Visit Comments:** Very little current, and much of channel was nearly stagnant.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 8.58 **DO (mg/L):** 12.50 **DO (%):** 107.10 **Conductivity (µS/cm):** 90 **pH:** 6.59**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 150.00 **Thalweg Velocity (m/s)(ft/s):** 0.03 0.10**Stream Channel****Stream Gradient (%):** 0.05 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 134 **Embeddedness:** Very High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Silt/Clay
Width	25.0		22.0	Subdominant Substrate 1:
Thalweg Depth	0.90		0.85	Subdominant Substrate 2:

Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 length (m):** 320

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**Total Fish Count:** 18 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 125 **Max:** 260 **Mean:** 204 **Median:** 192**Sampling Method (No. of fish):** PEF (6) VOG (12)**Comments:****Species:** sockeye salmon**Life Stage:** adult**Life History:** Anadromous**Total Fish Count:** 2 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 550 **Max:** 550 **Mean:** 550 **Median:** 550**Sampling Method (No. of fish):** PEF (1) VOG (1)**Comments:****Species:** slimy sculpin**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 1014 **Fish Measured:** 14 **Fork Lengths (mm)** **Min:** 53 **Max:** 68 **Mean:** 59 **Median:** 60**Sampling Method (No. of fish):** PEF (14) VOG (1000)**Comments:****Species:** slimy sculpin**Life Stage:** adult**Life History:** Resident**Total Fish Count:** 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 70 **Max:** 71 **Mean:** 70 **Median:** 70**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:** 37 **Max:** 37 **Mean:** 37 **Median:** 37
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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FSS1116C030560.jpg



FSS1116C030561.jpg



FSS1116C030562.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/19/2011 2:22 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.71464	-148.80986	Coordinates	61.71443	-148.80947	61.71415	-148.81208

Elevation NED (m)(ft): 148 486**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:** Small tributary to Matanuska River just upstream of Sutton on River Left. Sampled Channel within Matanuska River flood plain.**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 (NTU):** 70.00 **Thalweg Velocity (m/s)(ft/s):** 1.36 4.46**Stream Channel****Stream Gradient (%):** 0.2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 32 **Embeddedness:** Low**Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Gravel**Width** 12.0 **Subdominant Substrate 1:** Sand**Thalweg Depth** 0.55 **Subdominant Substrate 2:** Cobble**Rosgen Class:** C4 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Tall Willow Shrub	2.1 Open Tall Willow Shrub	2
5 - 10 Closed Paper Birch Forest	18 Unvegetated	
10 - 20 Closed Paper Birch Forest	18 Unvegetated	
20 - 30 Closed Paper Birch Forest	18 Unvegetated	

Key To Fish Sampling Methods**Estimated reach length (m):** 282

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 20 **Fish Measured:** 10 **Fork Lengths (mm)** **Min:** 35 **Max:** 82 **Mean:** 48 **Median:** 58
Sampling Method (No. of fish): PEF (10) VOG (10)
Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 5 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 59 **Max:** 66 **Mean:** 62 **Median:** 62
Sampling Method (No. of fish): PEF (2) VOG (3)
Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 49 **Max:** 74 **Mean:** 61 **Median:** 61
Sampling Method (No. of fish): PEF (2)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 204 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 55 **Max:** 65 **Mean:** 58 **Median:** 60
Sampling Method (No. of fish): PEF (4) VOG (200)
Comments:

-continued-

Species: slimy sculpin	Life Stage: adult		Life History: Resident			
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 100	Max: 100	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			
Total Fish Count: 8	Fish Measured: 8	Fork Lengths (mm)	Min: 85	Max: 195	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	Electrofischer: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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FSS1116C040565.jpg



FSS1116C040566.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/20/2011 12:00 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.07210	-148.19923	Coordinates	62.07210	-148.19923	62.04891	-148.21075

Elevation NED (m)(ft): 732 2402**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-3**Legal Description (MTRS):** S023N007E20**Waterbody Name:** Chickaloon River**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Continued spot electrofishing for another 8 km (719 seconds total) downstream of reach (approaching Moss Creek), and observed only Dolly Varden.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.34 **DO (mg/L):** 11.16 **DO (%):** 88.20 **Conductivity (µS/cm):** 75 **pH:** 7.66**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 41.00 **Thalweg Velocity (m/s)(ft/s):** 2.80 9.18**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 283 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	18.0		14.0	Subdominant Substrate 1: Boulder
Thalweg Depth	2.00		0.80	Subdominant Substrate 2: Bedrock

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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 Low Alder Shrub	1.3	Closed Tall Alder-Willow Shrub	2
5 - 10	Open Low Alder Shrub	1.3	Closed Paper Birch Forest	7.6
10 - 20	Open Low Alder Shrub	1.3	Closed Paper Birch Forest	7.6
20 - 30	Open Low Alder Shrub	1.3	Closed Paper Birch Forest	7.6

Key To Fish Sampling Methods**Estimated reach length (m):** 3000 **Total Electrofishing Time (s):** 962

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations**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:** Dolly Varden**Life Stage:** juvenile**Life History:** Unknown**Total Fish Count:** 25 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOB (25)**Comments:****Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**Total Fish Count:** 160 **Fish Measured:** 19 **Fork Lengths (mm)** **Min:** 104 **Max:** 215 **Mean:** 138 **Median:** 159**Sampling Method (No. of fish):** BEF (19) VOB (141)**Comments:** Event NN Dolly Varden suspect spawning aggregation and 2 fish greater than 250 mm.

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: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



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FSS1117A010650.jpg



FSS1117A010651.jpg



FSS1117A010652.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/20/2011 11:06 AM

Sample	Latitude	Longitude
Coordinates	61.95751	-148.29615

Elevation NED (m)(ft): 544 1785**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-4**Legal Description (MTRS):** S022N006E35**Waterbody Name:** Chickaloon River**Anadromous Waters Catalog Number:****Geographic Comments:** This site represents Hotel Rock. No data were collected.**Visit Comments:** This site represents Hotel Rock. 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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Raye Ann Neustel, Stormy Haight**Date/Time:** 08/20/2011 9:48 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.86244	-148.20206	Coordinates	61.86244	-148.20206	61.85721	-148.23699

Elevation NED (m)(ft): 823 2700**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-4**Legal Description (MTRS):** S021N007E32**Waterbody Name:** Boulder Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** ATV tracks were observed parallel to the river. The thalweg was unwadeable, so channel widths were estimated.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.16 **DO (mg/L):** 8.82 **DO (%):** 71.20 **Conductivity (µS/cm):** 253 **pH:** 7.85**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 146.00 **Thalweg Velocity (m/s)(ft/s):** 1.50 4.92**Stream Channel****Stream Gradient (%):** 0.5 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 212 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	41.3		18.1	Subdominant Substrate 1: Gravel
Thalweg Depth	2.10		1.40	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D4 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
0 - 5	Open Tall Willow Shrub	3	Open Tall Willow Shrub	3
5 - 10	Open Tall Willow Shrub	3	Open Tall Willow Shrub	3
10 - 20	Open Tall Willow Shrub	3	Open Tall Willow Shrub	3
20 - 30	Open Tall Willow Shrub	3	Closed Tall Alder-Willow Shrub	12

Key To Fish Sampling Methods**Estimated reach length (m):** 2500 **Total Electrofishing Time (s):** 2344

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: rainbow trout **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 91 **Fish Measured:** 51 **Fork Lengths (mm)** **Min:** 107 **Max:** 270 **Mean:** 156 **Median:** 188
Sampling Method (No. of fish): BEF (51) VOB (40)
Comments:

Species: rainbow trout **Life Stage:** juvenile **Life History:** Resident
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 Stage:** 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:

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: Visual estimate

Electrofisher: Smith-Root GPP 2.5

Transparency:



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FSS1117b010408.jpg



FSS1117b010409.jpg



FSS1117b010411.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/20/2011 9:21 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.26995	-148.43368	Coordinates	62.26874	-148.42949	62.26943	-148.43561

Elevation NED (m)(ft): 838 2749**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts B-3**Legal Description (MTRS):** S025N006E07**Waterbody Name:** Upper Talkeetna River**Anadromous Waters Catalog Number:****Geographic Comments:** HU86**Visit Comments:** Thalweg unwadeable--channel widths estimated.**Wildlife Comments:** A caribou was observed near the site.**Water Quality \ Stream Flow****Water Temp (C):** 4.70 **DO (mg/L):** 12.09 **DO (%):** 93.70 **Conductivity (µS/cm):** 68 **pH:** 7.57**Water Color:** Glacial, Low Turbidity **Turbidity (NTU):** 11.00 **Thalweg Velocity (m/s)(ft/s):** 3.33 10.92**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 134 **Embeddedness:** Low**Channel Dimensions (m):** **Bankfull OHW Wetted** **Dominant Substrate:** Boulder**Width** 13.0 8.0 **Subdominant Substrate 1:** Cobble**Thalweg Depth** 1.10 0.52 **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 Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Closed Tall Alder-Willow Shrub	4	Closed Tall Alder-Willow Shrub	4
5 - 10	Closed Tall Alder-Willow Shrub	4	Closed Tall Alder-Willow Shrub	4
10 - 20	Closed Tall Alder-Willow Shrub	4	Closed Tall Alder-Willow Shrub	4
20 - 30	Closed Tall Alder-Willow Shrub	4	Closed Tall Alder-Willow Shrub	4

Key To Fish Sampling Methods**Estimated reach length (m):** 400

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**Total Fish Count:** 12 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 162 **Max:** 190 **Mean:** 177 **Median:** 176**Sampling Method (No. of fish):** PEF (5) VOG (7)**Comments:****Species:** slimy sculpin**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 7 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 39 **Max:** 51 **Mean:** 45 **Median:** 45**Sampling Method (No. of fish):** PEF (3) VOG (4)**Comments:****Instruments****Stream Gradient:** handheld abney level**Channel Depths:** graduated wading rod**Stream Velocity:** Orange Float**Channel Widths:** Visual estimate**Turbidity:** LaMotte 2020e turbidimeter**Electrofisher:** Smith-Root LR-24**Water Quality:** YSI 556**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	62.14367	-148.29662	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 Turbidity **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):** 68 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	10.2		5.2	Subdominant Substrate 1: Boulder
Thalweg Depth	1.10		0.50	Subdominant Substrate 2: Gravel

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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/Time:** 08/20/2011 1:00 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.02034	-148.27693	Coordinates	62.02060	-148.27962	/ 62.01954	-148.27574

Elevation NED (m)(ft): 637 2090**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-3**Legal Description (MTRS):** S022N006E01**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HM128. Unnamed tributary to the Chickaloon River.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.56 **DO (mg/L):** 11.80 **DO (%):** 96.20 **Conductivity (µS/cm):** 108 **pH:** 7.99**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** 8.00 **Thalweg Velocity (m/s)(ft/s):** 1.40 4.59**Stream Channel****Stream Gradient (%):** 1.2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 54 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	9.8		6.8	Subdominant Substrate 1: Cobble
Thalweg Depth	1.00		0.42	Subdominant Substrate 2: Gravel

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	Closed Spruce-Paper Birch Forest	16.5	Closed Tall Alder Shrub	2.1
5 - 10	Closed Spruce-Paper Birch Forest	16.5	Closed Tall Alder Shrub	2.1
10 - 20	Closed Spruce-Paper Birch Forest	16.5	Closed Tall Alder Shrub	2.1
20 - 30	Closed Paper Birch Forest	10	Closed Tall Alder Shrub	2.1

Key To Fish Sampling Methods**Estimated reach length (m):** 295

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**Total Fish Count:** 535 **Fish Measured:** 35 **Fork Lengths (mm)** **Min:** 85 **Max:** 205 **Mean:** 130 **Median:** 145**Sampling Method (No. of fish):** PEF (35) VOG (500)**Comments:****Species:** Dolly Varden**Life Stage:** juvenile**Life History:** Unknown**Total Fish Count:** 6 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 48 **Max:** 73 **Mean:** 65 **Median:** 60**Sampling Method (No. of fish):** PEF (6)**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, Stormy Haight**Date/Time:** 08/23/2011 11:33 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.89332	-148.61595	Coordinates	61.89332	-148.61595	61.87209	-148.61048

Elevation NED (m)(ft): 612 2008**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-5**Legal Description (MTRS):** S021N005E19**Waterbody Name:** Kings River**Anadromous Waters Catalog Number:****Geographic Comments:** IM38 Small cabin approximately 20m from bankfull on river left. We put-in at this point.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.21 **DO (mg/L):** 12.47 **DO (%):** 98.20 **Conductivity (µS/cm):** 79 **pH:** 7.54**Water Color:** Glacial, Low Turbidity **Turbidity (NTU):** 21.00 **Thalweg Velocity (m/s)(ft/s):** 2.60 8.53**Stream Channel****Stream Gradient (%):** 1.25 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 124 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	49.5		22.4	Subdominant Substrate 1: Gravel
Thalweg Depth	0.94		0.62	Subdominant Substrate 2: Sand

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	Foliose and Fruticose Lichen	0.1	Closed Tall Willow Shrub	12

Key To Fish Sampling Methods**Estimated reach length (m):** 3000 **Total Electrofishing Time (s):** 6975

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 238 **Fish Measured:** 71 **Fork Lengths (mm) Min:** 91 **Max:** 261 **Mean:** 151 **Median:** 176
Sampling Method (No. of fish): BEF (71) VOB (167)
Comments:

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): 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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FSS1120B010444.jpg



FSS1120B010450.jpg



FSS1120B010451.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/20/2011 2:26 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.88255	-148.60060	Coordinates	61.88501	-148.59934	61.88255	-148.60060

Elevation NED (m)(ft): 576 1890**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-5**Legal Description (MTRS):** S021N005E30**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HM51 at confluence with HM 69. Unnamed tributary to Kings River, near the confluence.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.40 **DO (mg/L):** 11.62 **DO (%):** 96.50 **Conductivity (µS/cm):** 105 **pH:** 7.87**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** 12.00 **Thalweg Velocity (m/s)(ft/s):** 1.71 5.61**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 126 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	19.6		10.2	Subdominant Substrate 1: Cobble
Thalweg Depth	1.50		0.75	Subdominant Substrate 2: Gravel

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	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**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:** 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**Total Fish Count:** 4 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 72 **Max:** 76 **Mean:** 74 **Median:** 74**Sampling Method (No. of fish):** PEF (4)**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:



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FSS1117C040583.jpg



FSS1117C040584.jpg

FSS1117C040585.jpg



Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/20/2011 3:43 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.77470	-148.84056	Coordinates	61.77470	-148.84056	61.77200	-148.84100

Elevation NED (m)(ft): 366 1201**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-5**Legal Description (MTRS):** S020N003E36**Waterbody Name:** Granite Creek**Anadromous Waters Catalog Number:** 247-50-10220-2105**Geographic Comments:** HM61**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.69 **DO (mg/L):** 12.27 **DO (%):** 100.40 **Conductivity (µS/cm):** 85 **pH:** 7.62**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** 8.00 **Thalweg Velocity (m/s)(ft/s):** 2.03 6.66**Stream Channel****Stream Gradient (%):** 2 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 137 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	28.0		9.8	Subdominant Substrate 1: Boulder
Thalweg Depth	1.80		0.75	Subdominant Substrate 2: Cobble

Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Closed Paper Birch Forest	12 Closed Paper Birch Forest	10
5 - 10 Closed Paper Birch Forest	12 Closed Paper Birch Forest	10
10 - 20 Closed Paper Birch Forest	6 Closed Black Cottonwood Forest	20
20 - 30 Closed Paper Birch Forest	6 Closed Black Cottonwood Forest	20

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
Total Fish Count: 219 **Fish Measured:** 19 **Fork Lengths (mm) Min:** 85 **Max:** 201 **Mean:** 149 **Median:** 143
Sampling Method (No. of fish): PEF (19) VOG (200)
Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 7 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 57 **Max:** 60 **Mean:** 58 **Median:** 58
Sampling Method (No. of fish): PEF (2) VOG (5)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 9 **Fish Measured:** 9 **Fork Lengths (mm) Min:** 35 **Max:** 48 **Mean:** 43 **Median:** 41
Sampling Method (No. of fish): PEF (9)
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:



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FSS1117C050588.jpg



FSS1117C050591.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/20/2011 11:11 AM

Sample	Latitude	Longitude
Coordinates	62.23235	-148.43828

Elevation NED (m)(ft): 1049 3442**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-3**Legal Description (MTRS):** S025N005E25**Waterbody Name:** Talkeetna River**Anadromous Waters Catalog Number:****Geographic Comments:** This site represents a waterfall barrier below target stream points HU107 and HU26. No sampling occurred.**Visit Comments:** No habitat or fish 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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/20/2011 11:27 AM

Sample	Latitude	Longitude
Coordinates	62.17316	-148.33479

Elevation NED (m)(ft): 1305 4281**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-3**Legal Description (MTRS):** S024N006E15**Waterbody Name:** Chickaloon River**Anadromous Waters Catalog Number:****Geographic Comments:** This site represents a waterfall barrier below target stream point HU7. No sampling occurred.**Visit Comments:** No habitat or fish 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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/21/2011 8:55 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.78461	-147.40798	Coordinates	61.78461	-147.40798	61.79078	-147.48864

Elevation NED (m)(ft): 673 2208**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-2**Legal Description (MTRS):** S020N011E35**Waterbody Name:** South Fork Matanuska River**Anadromous Waters Catalog Number:****Geographic Comments:** IM11.

Visit Comments: Station marked at waters edge, left-bank, just upstream of left-bank tributary confluence. Stream is braided with 2 channels at habitat transect. Measurements reflect primary channel only. Left-bank vegetation at station disturbed by tributary delta. Sample reach ended just below East Fork Matanuska confluence. Right bank white spruce forest exhibiting bark beetle killed trees.

Wildlife Comments:**Water Quality \ Stream Flow****Water Temp (C):** 2.28 **DO (mg/L):** 12.90 **DO (%):** 94.00 **Conductivity (µS/cm):** 86 **pH:** 7.54**Water Color:** Glacial, High Turbidity **Turbidity (NTU):** 280.00 **Thalweg Velocity (m/s)(ft/s):** 3.00 9.84**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 339 **Embeddedness:** Moderate**Channel Dimensions (m):** **Bankfull OHW Wetted** **Dominant Substrate:** Cobble**Width** 132.0 15.0 **Subdominant Substrate 1:** Gravel**Thalweg Depth** 2.05 1.10 **Subdominant Substrate 2:** Sand**Rosgen Class:** D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	Unvegetated		Open Low Alder-Willow Shrub	1
5 - 10	Unvegetated		Open Low Alder-Willow Shrub	1
10 - 20	Unvegetated		Open Low Alder-Willow Shrub	1
20 - 30	Unvegetated		Closed White Spruce Forest	15

Key To Fish Sampling Methods**Estimated reach length (m):** 5000 **Total Electrofishing Time (s):** 2195

(BEF) Boat-Mounted Electrofisher

(VOB) Visual Observation, Boat

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 7 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 71 **Max:** 81 **Mean:** 76 **Median:** 76
Sampling Method (No. of fish): BEF (2) VOB (5)
Comments:

Species: Dolly Varden **Life Stage:** adult **Life History:** Unknown
Total Fish Count: 8 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOB (8)
Comments: Suspect Dolly Varden are spawning in side channel pools.

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 19 **Fish Measured:** 12 **Fork Lengths (mm) Min:** 92 **Max:** 302 **Mean:** 205 **Median:** 197
Sampling Method (No. of fish): BEF (12) VOB (7)
Comments:

Species: Arctic grayling

Life Stage: juvenile

Life History: Resident

Total Fish Count: 2

Fish Measured: 2

Fork Lengths (mm)

Min: 110

Max: 113

Mean: 111

Median: 111

Sampling Method (No. of fish): BEF (2)

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: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



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FSS1118A010679.jpg



FSS1118A010682.jpg



FSS1118A010684.jpg



FSS1118A010687.jpg



FSS1118A010688.jpg

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	61.74872	-147.93613	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		20.5	Subdominant Substrate 1: Boulder
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 Bank (m)	<u>Left Bank Vegetation Type</u>	Canopy Height(m)	<u>Right Bank Vegetation Type</u>	Canopy Height(m)
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
20 - 30	Bluejoint-Herb	0.3	Closed Tall Shrub Birch-Willow Shrub	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
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: 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	62.37193	-148.87375	62.37458	-148.87835

Elevation NED (m)(ft): 907 2976**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 86 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	2.2	Closed Tall Willow Shrub	3
5 - 10	Willow Dwarf Shrub Tundra	0.1	Closed Tall Willow Shrub	3
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

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/adult **Life History:** Unknown
Total Fish Count: 1030 **Fish Measured:** 30 **Fork Lengths (mm)** **Min:** 100 **Max:** 220 **Mean:** 162 **Median:** 160
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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FSS1118C010594.jpg



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	62.28859	-148.94569	62.29068	-148.95028

Elevation NED (m)(ft): 720 2362**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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****Water Temp (C):** 5.66 **DO (mg/L):** 11.97 **DO (%):** 95.50 **Conductivity (µS/cm):** 65 **pH:** 7.50**Water Color:** Glacial, Low Turbidity **Turbidity (NTU):** 20.70 **Thalweg Velocity (m/s)(ft/s):** 1.59 5.22**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 168 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	2.1	Closed Tall Alder-Willow Shrub	6
5 - 10	Open Tall Willow Shrub	2.1	Closed Tall Alder-Willow Shrub	3
10 - 20	Open Tall Willow Shrub	2.1	Closed Tall Alder-Willow Shrub	3
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
Total Fish Count: 10 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOG (10)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 65 **Max:** 82 **Mean:** 72 **Median:** 73
Sampling Method (No. of fish): PEF (3)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 103 **Max:** 103 **Mean:** 103 **Median:** 103
Sampling Method (No. of fish): PEF (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:



FSS1118C020598.jpg



FSS1118C020599.jpg



FSS1118C020600.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	62.10772	-149.05437	/	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**Catchment Area(sq. km):** 109 **Embeddedness:** Moderate**Channel Dimensions (m):** **Bankfull OHW Wetted** **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 (Vioreck 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 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

Key To Fish Sampling Methods**Estimated reach length (m):** 360

(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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FSS1118C030604.jpg



FSS1118C030605.jpg



FSS1118C030606.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/21/2011 1:49 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.02947	-149.27531	Coordinates	62.02935	-149.27206	62.02939	-149.27525

Elevation NED (m)(ft): 618 2028**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-5**Legal Description (MTRS):** S022N001E04**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 (%):** 95.20 **Conductivity (µS/cm):** 28 **pH:** 6.97**Water Color:** Clear **Turbidity (NTU):** 4.80 **Thalweg Velocity (m/s)(ft/s):** 1.68 5.51**Stream Channel****Stream Gradient (%):** 0.8 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 79 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	16.0		6.2	Subdominant Substrate 1: Sand
Thalweg Depth	1.10		0.52	Subdominant Substrate 2: Boulder

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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

Key To Fish Sampling Methods**Estimated reach length (m):** 259

(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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FSS1118C040609.jpg



FSS1118C040610.jpg



FSS1118C040611.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/21/2011 2:44 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.56700	-148.61168	Coordinates	61.56754	-148.60704	61.56700	-148.61168

Elevation NED (m)(ft): 854 2802**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-5**Legal Description (MTRS):** S017N005E18**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** HM60. Unnamed tributary to Friday Creek.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.94 **DO (mg/L):** 11.71 **DO (%):** 94.10 **Conductivity (µS/cm):** 168 **pH:** 7.46**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 227.00 **Thalweg Velocity (m/s)(ft/s):** 1.36 4.46**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 44 **Embeddedness:** Moderate**Channel Dimensions (m):** **Bankfull** **OHW** **Wetted** **Dominant Substrate:** Gravel**Width** 9.0 **Subdominant Substrate 1:** Cobble**Thalweg Depth** 0.85 **Subdominant Substrate 2:** Sand**Rosgen Class:** B4 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
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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FSS1118C050614.jpg



FSS1118C050615.jpg

FSS1118C050616.jpg



Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/21/2011 3:11 PM

Sample	Latitude	Longitude
Coordinates	61.81101	-149.00016

Elevation NED (m)(ft): 726 2382**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-6**Legal Description (MTRS):** S020N002E24**Waterbody Name:** Moose Creek**Anadromous Waters Catalog Number:****Geographic Comments:** No landing zone was identified on target stream HM90. No collection effort.**Visit Comments:** No sampling 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):	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/22/2011 12:00 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.78645	-148.20603	Coordinates	61.78645	-148.20603	61.78771	-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	492.0		43.0	Subdominant Substrate 1: Gravel
Thalweg Depth	2.76		1.50	Subdominant Substrate 2: Sand

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck 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	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**Estimated reach length (m):** 8100 **Total Electrofishing Time (s):** 4896

(BEF) Boat-Mounted Electrofisher

(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. of fish):** VOB (13)**Comments:** Event BB salmonids were approximately 150-200 mm. Event FF were probably Dolly Varden.**Species:** sockeye salmon **Life Stage:** adult **Life History:** Anadromous**Total Fish Count:** 33 **Fish Measured:** 3 **Fork Lengths (mm) Min:** 500 **Max:** 610 **Mean:** 570 **Median:** 555**Sampling Method (No. of fish):** BEF (3) VOB (30)**Suspected Spawning:** Yes**Comments:** Color of sockeye throughout reach ranged from chrome to blush to very red. Sockeye adults in sub-6 were all (e**Species:** sockeye salmon **Life Stage:** adult spawning **Life History:** Anadromous**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 Stage:** juvenile **Life History:** Unknown**Total Fish Count:** 20 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOB (20)**Comments:**

Species: slimy sculpin		Life Stage: juvenile/adult		Life History: Resident		
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 63	Max: 63	Mean: 63	Median: 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: 2	Fork Lengths (mm)	Min: 540	Max: 540	Mean: 540	Median: 540
Sampling Method (No. of fish): BEF (2)						
Comments:						
Species: slimy sculpin		Life Stage: adult		Life History: Resident		
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 81	Max: 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, right-bank side channel mouth at downstream end of reach.



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	61.74201	-148.65976

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:
Catchment Area(sq. km): 1.5	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	Width
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

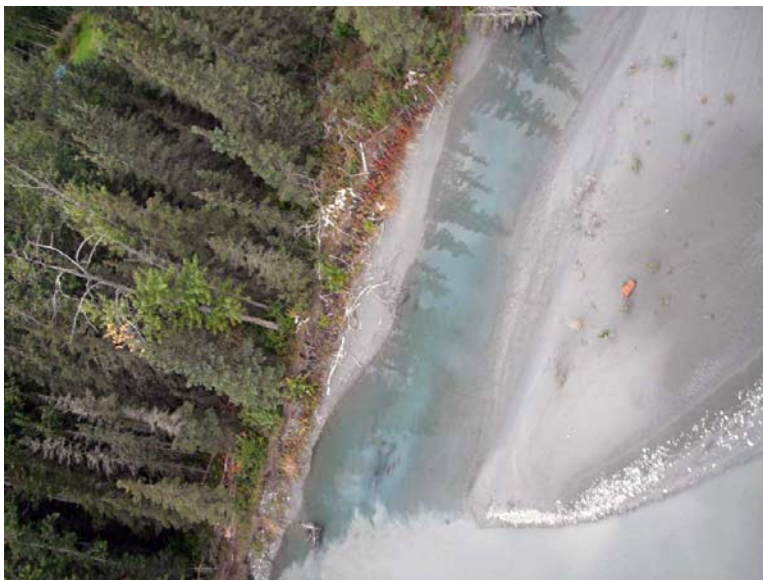
(VOH) Visual Observation, Helicopter

Fish Observations

Species: sockeye salmon	Life Stage: adult spawning	Life History: Anadromous
Total Fish Count: 50	Fish Measured:	Fork Lengths (mm)
Sampling Method (No. of fish): VOH (50)	Min:	Max:
Comments: See photos 723-724.	Mean:	Median:

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofischer:
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 Neustel, Stormy Haught**Date/Time:** 08/22/2011 9:45 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.73664	-147.79153	Coordinates	61.73664	-147.79153	61.78731	-147.80632

Elevation NED (m)(ft): 546 1791**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-3**Legal Description (MTRS):** S019N009E15**Waterbody Name:** Glacier Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** Very fast, cold, turbid water. Stream velocity calculated from TVHR readings is 1.25 m/s, although 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):** 2.83 **DO (mg/L):** 11.11 **DO (%):** 82.20 **Conductivity (µS/cm):** 159 **pH:** 7.63**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 233.00 **Thalweg Velocity (m/s)(ft/s):** 2.86 9.38**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 129 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	49.1		19.2	Subdominant Substrate 1: Gravel
Thalweg Depth	0.88		0.48	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
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:** 08/22/2011 9:31 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.20223	-149.63863	Coordinates	62.20308	-149.63455	62.20241	-149.63941

Elevation NED (m)(ft): 586 1923**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna Mts A-6**Legal Description (MTRS):** S024N002W03**Waterbody Name:** South Fork Montana Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HM63**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 6.73	DO (mg/L): 11.65	DO (%): 95.40	Conductivity (µS/cm): 47	pH: 6.43
Water Color: Clear	Turbidity (NTU): 0.07	Thalweg Velocity (m/s)(ft/s): 1.56 5.12		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 59 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	12.2		6.6	Subdominant Substrate 1: Gravel
Thalweg Depth	0.91		0.43	Subdominant Substrate 2: Boulder

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	25	Closed Tall Alder Shrub	2.8
5 - 10	Closed Tall Alder Shrub	25	Open Balsam Poplar (Black Cottonwood) Forest	24
10 - 20	Closed Spruce-Paper Birch Forest	14	Open Balsam Poplar (Black Cottonwood) Forest	24
20 - 30	Closed Spruce-Paper Birch Forest	14	Open Balsam Poplar (Black Cottonwood) Forest	24

Key To Fish Sampling Methods**Estimated reach length (m):** 285

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown				
Total Fish Count: 23	Fish Measured: 3	Fork Lengths (mm)	Min: 85	Max: 122	Mean: 108	Median: 103
Sampling Method (No. of fish): PEF (3) VOG (20)						
Comments:						
Species: slimy sculpin	Life Stage: juvenile/adult	Life History: Resident				
Total Fish Count: 7	Fish Measured: 1	Fork Lengths (mm)	Min: 52	Max: 52	Mean: 52	Median: 52
Sampling Method (No. of fish): PEF (1) VOG (6)						
Comments:						
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown				
Total Fish Count: 9	Fish Measured: 9	Fork Lengths (mm)	Min: 30	Max: 72	Mean: 48	Median: 51
Sampling Method (No. of fish): PEF (9)						
Comments:						

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)
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:**



FSS1119C010618.jpg



FSS1119C010619.jpg



FSS1119C010620.jpg

FSS1119C010621.jpg



Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/22/2011 10:56 AM

Sample	Latitude	Longitude
Coordinates	61.91236	-149.52512

Elevation NED (m)(ft): 736 2415**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-7**Legal Description (MTRS):** S021N001W18**Waterbody Name:** Little Willow Creek**Anadromous Waters Catalog Number:****Geographic Comments:** No landing zone was identified on target stream HM118. No sampling occurred.**Visit Comments:** No habitat data was 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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



FSS1119C020622.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/22/2011 11:05 AM

Sample	Latitude	Longitude
Coordinates	61.85954	-149.45580

Elevation NED (m)(ft): 659 2162**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-7**Legal Description (MTRS):** S021N001W33**Waterbody Name:** Peters Creek**Anadromous Waters Catalog Number:****Geographic Comments:** No landing zone was identified on target stream # HM31.**Visit Comments:** No 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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:



FSS1119C030623.jpg

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	61.83564	-149.37660	/ 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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 17 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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 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**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 **Mean:** 105 **Median:** 105**Sampling Method (No. of fish):** PEF (1) VOG (6)**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****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:**



FSS1119C040625.jpg



FSS1119C040626.jpg



FSS1119C040627.jpg



FSS1119C040628.jpg

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	61.75957	-149.43460	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 31 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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 Willow Shrub	1.2
5 - 10	Closed Tall Willow Shrub	4	Closed Tall Willow Shrub	1.2
10 - 20	Closed Tall Willow Shrub	4	Closed Tall Willow Shrub	1.2
20 - 30	Closed Tall Willow Shrub	4	Closed Tall Willow Shrub	1.2

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
Total Fish Count: 10 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 126 **Max:** 161 **Mean:** 143 **Median:** 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
Total Fish Count: 3 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 67 **Max:** 75 **Mean:** 71 **Median:** 71
Sampling Method (No. of fish): PEF (3)
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): PEF (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:



FSS1119C050630.jpg



FSS1119C050631.jpg



FSS1119C050632.jpg



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	61.67941	-148.55547	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 Turbidity **Turbidity (NTU):** 80.70 **Thalweg Velocity (m/s)(ft/s):** 1.65 5.41**Stream Channel****Stream Gradient (%):** 1.2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 52 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck 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	1.8	Closed Tall Alder-Willow Shrub	5.5
5 - 10	Open Tall Willow Shrub	1.8	Closed Tall Alder-Willow Shrub	5.5
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**Total Fish Count:** 7**Fish Measured:****Fork Lengths (mm)****Min:****Max:****Mean:****Median:****Sampling Method (No. of fish):** VOG (7)**Comments:****Species:** Dolly Varden**Life Stage:** juvenile/adult**Life History:** Unknown**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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FSS1119C060637.jpg



FSS1119C060638.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/22/2011 1:56 PM

Sample	Latitude	Longitude
Coordinates	61.78856	-149.14443

Elevation NED (m)(ft): 661 2169**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-6**Legal Description (MTRS):** S020N002E29**Waterbody Name:** Little Susitna River**Anadromous Waters Catalog Number:****Geographic Comments:** No landing zone was observed on target stream # HM145. No data were collected.**Visit Comments:** No sampling 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):	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

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	62.29761	-148.99991	62.30381	-149.04293

Elevation NED (m)(ft): 661 2169**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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 Turbidity **Turbidity (NTU):** 14.00 **Thalweg Velocity (m/s)(ft/s):** 2.10 6.89**Stream Channel****Stream Gradient (%):** 1.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 183 **Embeddedness:** Negligible

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 (Vioreck 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	Closed Tall Alder-Willow Shrub	2
5 - 10	Closed Tall Alder Shrub	2	Closed Paper Birch Forest	4
10 - 20	Closed Tall Alder Shrub	2	Closed Paper Birch Forest	4
20 - 30	Closed Tall Alder Shrub	2	Closed Paper Birch Forest	4

Key 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
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOB (4)		
Comments: Event DD Dolly Varden approximately 350mm.		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 30	Fish Measured: 9	Fork Lengths (mm) Min: 134 Max: 431 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
Total Fish Count: 10	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOB (10)		
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: handheld laser rangefinder

Electrofisher: Smith-Root GPP 2.5

Transparency:



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FSS1120A010729.jpg



FSS1120A010732.jpg



FSS1120A010733.jpg



FSS1120A010734.jpg



FSS1120A010736.jpg



FSS1120A010737.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/23/2011 9:34 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.81971	-147.37338	Coordinates	61.82095	-147.36887	61.81927	-147.37443

Elevation NED (m)(ft): 764 2507**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-1**Legal Description (MTRS):** S020N011E13**Waterbody Name:** East Fork Matanuska River**Anadromous Waters Catalog Number:****Geographic Comments:** HM62**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.48 **DO (mg/L):** 12.01 **DO (%):** 95.20 **Conductivity (µS/cm):** 163 **pH:** 7.29**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** 24.00 **Thalweg Velocity (m/s)(ft/s):** 1.56 5.12**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 138 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	12.1		8.6	Subdominant Substrate 1: Boulder
Thalweg Depth	0.99		0.51	Subdominant Substrate 2: Sand

Rosgen Class: B3 Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Open Tall Alder Shrub	1.8 Closed Paper Birch Forest	9
5 - 10 Open Tall Alder Shrub	1.8 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 length (m):** 430

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 31 **Fish Measured:** 11 **Fork Lengths (mm)** **Min:** 90 **Max:** 134 **Mean:** 105 **Median:** 112
Sampling Method (No. of fish): PEF (11) VOG (20)
Comments:

Species: rainbow trout **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 5 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 118 **Max:** 121 **Mean:** 119 **Median:** 119
Sampling Method (No. of fish): PEF (2) VOG (3)
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): VOG (2)
Comments:

Species: rainbow trout **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 38 **Max:** 101 **Mean:** 69 **Median:** 69
Sampling Method (No. of fish): PEF (2)
Comments:

-continued-

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			
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm)	Min: 89	Max: 90	Mean: 89	Median: 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	Electrofischer:	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 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.81139	-147.71274	Coordinates	61.81359	-147.71596	/	61.81139 -147.71274

Elevation NED (m)(ft): 590 1936**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-2**Legal Description (MTRS):** S020N010E19**Waterbody Name:** Caribou Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HM82, pretty steep canyon**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 6.35 **DO (mg/L):** 12.11 **DO (%):** 98.40 **Conductivity (µS/cm):** 370 **pH:** 8.16**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 134.00 **Thalweg Velocity (m/s)(ft/s):** 1.30 4.26**Stream Channel****Stream Gradient (%):** 0.3 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 743 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	50.0		14.5	Subdominant Substrate 1: Sand
Thalweg Depth	2.20		0.80	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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	14 Closed Black Cottonwood Forest	26
20 - 30 Closed Paper Birch Forest	14 Closed Black Cottonwood Forest	26

Key To Fish Sampling Methods**Estimated reach length (m):** 315

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 12 **Fish Measured:** 2 **Fork Lengths (mm) Min:** 115 **Max:** 144 **Mean:** 129 **Median:** 129
Sampling Method (No. of fish): PEF (2) VOG (10)
Comments:

Species: Arctic grayling **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 30 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOG (30)
Comments:

Species: slimy sculpin **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 50 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**
Sampling Method (No. of fish): VOG (50)
Comments:

Species: Arctic grayling **Life Stage:** juvenile **Life History:** Resident
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm) Min:** 100 **Max:** 159 **Mean:** 126 **Median:** 129
Sampling Method (No. of fish): PEF (5)
Comments:

-continued-

Species: slimy sculpin	Life Stage: adult	Life History: Resident
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm) Min: 72 Max: 110 Mean: 93 Median: 91
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 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 LR-24

Transparency:



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Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/23/2011 12:46 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.66955	-147.79768	Coordinates	61.66920	-147.79760	61.67076	-147.79739

Elevation NED (m)(ft): 808 2651**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-3**Legal Description (MTRS):** S018N009E10**Waterbody Name:** Glacier Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HM43. There is a glacier about a half mile upstream of site.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 0.45 **DO (mg/L):** 13.38 **DO (%):** 92.40 **Conductivity (µS/cm):** 160 **pH:** 7.14**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 248.00 **Thalweg Velocity (m/s)(ft/s):** 1.47 4.82**Stream Channel****Stream Gradient (%):** 1.3 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 35 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	35.0		6.0	Subdominant Substrate 1: Sand
Thalweg Depth	1.92		0.42	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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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/Time:** 08/23/2011 1:56 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.70482	-148.29855	Coordinates	61.70405	-148.29390	61.70475	-148.29957

Elevation NED (m)(ft): 709 2326**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-4**Legal Description (MTRS):** S019N006E25**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 (µS/cm):** 240 **pH:** 8.09**Water Color:** Glacial, High Turbidit **Turbidity (NTU):** 83.40 **Thalweg Velocity (m/s)(ft/s):** 1.89 6.20**Stream Channel****Stream Gradient (%):** 2 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 79 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	60.0		5.5	Subdominant Substrate 1: Gravel
Thalweg Depth	1.20		0.38	Subdominant Substrate 2: Silt/Clay

Rosgen Class: D3 Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from		Canopy		Canopy
Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Height(m)</u>
0 - 5	Closed Tall Alder Shrub	6	Unvegetated	
5 - 10	Closed Tall Alder Shrub	6	Unvegetated	
10 - 20	Closed Tall Alder Shrub	6	Unvegetated	
20 - 30	Closed Tall Alder Shrub	6	Open Tall Alder Shrub	5.5

Key To Fish Sampling Methods**Estimated reach length (m):** 460

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations**Species:** Dolly Varden**Life Stage:** adult**Life History:** Unknown**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/adult**Life History:** Unknown**Total Fish Count:** 12 **Fish Measured:** 12 **Fork Lengths (mm)** **Min:** 106 **Max:** 215 **Mean:** 189 **Median:** 160**Sampling Method (No. of fish):** PEF (12)**Comments:****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 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 LR-24

Transparency:



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FSS1120C040657.jpg



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	61.60997	-148.39397	61.60818	-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****Stream Gradient (%):** 2.75 **Entrenchment:** Moderatley Entrenched**Catchment Area(sq. km):** 62 **Embeddedness:** Moderate

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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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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	-148.71049

Elevation 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): 28	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 30	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (30)		Suspected Spawning: Yes
Comments:		

Instruments

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



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FSS1121A010772.jpg



FSS1121A010773.jpg



FSS1121A010774.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/24/2011 11:46 AM

Sample	Latitude	Longitude
Coordinates	61.46990	-148.68604

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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (100)		
Comments:		

Instruments

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



FSS1121A020776.jpg



FSS1121A020777.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/24/2011 12:30 PM

Sample	Latitude	Longitude
Coordinates	61.52175	-148.81443

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**

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): 10	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 11	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): MTR (11)		
Comments: around 100 mm.		
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 3	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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:
Catchment Area(sq. km): 4	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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: Mean: Median:
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:



FSS1121A040810.jpg



FSS1121A040811.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/24/2011 1:39 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.82932	-149.49916	Coordinates	61.82973	-149.49645	61.82932	-149.49916

Elevation NED (m)(ft): 670 2198**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage D-7**Legal Description (MTRS):** S020N001W17**Waterbody Name:** Purches Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Appears moderately entrenched upstream of station.**Visit Comments:** Thalweg was too deep to wade, so TVHR was measured along the fringe. Actual velocity is higher than reported here.**Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 8.20	DO (mg/L): 10.80	DO (%): 91.70	Conductivity (µS/cm): 18	pH: 6.88
Water Color: Clear	Turbidity (NTU): 1.13	Thalweg Velocity (m/s)(ft/s): 1.29 4.23		

Stream Channel**Stream Gradient (%):** 2 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 52 **Embeddedness:** Negligible

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Boulder
Width	13.0		11.0	Subdominant Substrate 1: Cobble
Thalweg Depth	1.43		0.75	Subdominant Substrate 2:

Rosgen Class: C2 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Open White Spruce Forest	10	Closed Tall Alder-Willow Shrub	1.5
5 - 10	Open White Spruce Forest	10	Crowberry Dwarf 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**Estimated reach length (m):** 260

(PEF) Backpack Electrofisher

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 9 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 33 **Max:** 77 **Mean:** 46 **Median:** 55
Sampling Method (No. of fish): PEF (9)
Comments:

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

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 5 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 84 **Max:** 126 **Mean:** 109 **Median:** 105
Sampling Method (No. of fish): PEF (5)
Comments:

-continued-

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:

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:



FSS1121A050778.jpg



FSS1121A050779.jpg



FSS1121A050780.jpg



FSS1121A050782.jpg



FSS1121A050785.jpg



FSS1121A050786.jpg

Station Info**Observers:** Joe Buckwalter, Heidi Zimmer**Date/Time:** 08/24/2011 5:08 PM

Sample	Latitude	Longitude
Coordinates	61.53677	-148.85368

Elevation NED (m)(ft): 28 92**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-5**Legal Description (MTRS):** S017N003E26**Waterbody Name:****Anadromous Waters Catalog Number:** 247-50-10200-2081-3041**Geographic Comments:** Left bank Jim Creek tributary. Site is seasonally inundated by Leaf Lake.**Visit Comments:** Visual observations only--no habitat data or fish were collected. Appears to be spring-fed.**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): 1	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 spawning	Life History: Anadromous
Total Fish Count: 30	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOH (30)		
Comments:		

Instruments

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



FSS1121A060812.jpg
Sockeye salmon spawning.



FSS1121A060813.jpg
Sockeye salmon spawning.

Station Info

Observers: Joe Buckwalter, Heidi Zimmer, Stormy Hought, 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	61.32198	-148.47993	61.32294	-148.48040

Elevation NED (m)(ft): 106 348

Coordinate Determination Method: Non-Differential GPS Field Measurement **Datum:** WGS84

USGS Quadrangle: 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 (Vioreck 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	0.5	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
20 - 30	Fresh Sedge Marsh	0.5	Fresh Sedge Marsh	0.5

Key To Fish Sampling Methods**Estimated reach length (m):** 140

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

(MTR) Minnow Trap

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 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:



FSS1121B010454.jpg



FSS1121B010455.jpg
Looking down Fourteen Creek
from habitat transect.



FSS1121B010456.jpg
Right bank.



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	61.46628	-148.65442	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): 23	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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 Mean: 186 Median: 186
Sampling Method (No. of fish): PEF (2) VOG (10)		
Comments:		

Species: coho salmon	Life Stage: juvenile	Life History: Anadromous				
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				
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm)	Min: 70	Max: 70	Mean: 70	Median: 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 Haight**Date/Time:** 08/24/2011 2:23 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.85726	-149.46468	Coordinates	61.85787	-149.46252	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****Stream Gradient (%):** 0.5 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 52 **Embeddedness:** Moderate

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 (Vioreck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Fireweed	0.3	Closed Tall Alder Shrub	2
5 - 10	Closed Low Alder-Willow Shrub	0.4	Closed Tall Alder Shrub	2
10 - 20	Closed Low Alder-Willow Shrub	0.4	Closed Tall Alder Shrub	2
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
Total Fish Count: 19 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 60 **Max:** 113 **Mean:** 82 **Median:** 86
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:**



FSS1121B030470.jpg



FSS1121B030471.jpg



FSS1121B030472.jpg



FSS1121B030473.jpg



FSS1121B030474.jpg



FSS1121B030475.jpg

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	61.96469	-147.99289	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 Turbidity **Turbidity (NTU):** 7.97 **Thalweg Velocity (m/s)(ft/s):** 0.96 3.15**Stream Channel****Stream Gradient (%):** 0.75 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 50 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	8.2		6.1	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 (Vioreck 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	6	Open Low Willow Shrub	0.3
5 - 10	Closed Tall Willow Shrub	6	Open Low Willow Shrub	0.3
10 - 20	Closed Tall Willow Shrub	6	Closed Tall Willow Shrub	5.5
20 - 30	Closed Tall Willow Shrub	3	Closed Low Willow Shrub	0.4

Key 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**Total Fish Count:** 3 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:****Sampling Method (No. of fish):** VOG (3)**Comments:****Species:** rainbow trout**Life Stage:** juvenile/adult**Life History:** Resident**Total Fish Count:** 7 **Fish Measured:** 7 **Fork Lengths (mm)** **Min:** 221 **Max:** 265 **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:**



FSS1121C010666.jpg



FSS1121C010667.jpg



FSS1121C010668.jpg

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	61.88324	-148.16087	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 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 50 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	6.8		5.0	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 (Vioreck 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	3	Unvegetated	
5 - 10	Closed Spruce-Paper Birch Forest	18	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
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 135 **Max:** 142 **Mean:** 138 **Median:** 138
Sampling Method (No. of fish): PEF (2)
Comments:

Species: rainbow trout **Life Stage:** juvenile/adult **Life History:** Resident
Total Fish Count: 2 **Fish Measured:** 2 **Fork Lengths (mm)** **Min:** 245 **Max:** 255 **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**Electrofisher:** Smith-Root LR-24**Water Quality:** YSI 556**Transparency:**



FSS1121C020671.jpg



FSS1121C020672.jpg



FSS1121C020673.jpg



FSS1121C020674.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/24/2011 11:40 AM

Sample	Latitude	Longitude
Coordinates	61.71344	-148.80788

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**

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): 32	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm) Min: 118 Max: 130 Mean: 122 Median: 124
Sampling Method (No. of fish): PEF (3)		
Comments:		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality:	Transparency:



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FSS1121C030677.jpg

Station Info**Observers:** Jonathan Kirsch, Bob Powers**Date/Time:** 08/24/2011 3:27 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.67777	-149.04030	/ 61.67299	-149.03728

Elevation 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): 136	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 **Mean:** 63 **Median:** 63
Sampling Method (No. of fish): PEF (3) VOG (5)
Comments:

Species: Chinook salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 14 **Fish Measured:** 4 **Fork Lengths (mm)** Min: 56 **Max:** 64 **Mean:** 59 **Median:** 60
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:** **Mean:** **Median:**
Sampling Method (No. of fish): VOG (6) **Suspected Spawning:** Yes
Comments:

Species: pink 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) **Suspected Spawning:** Yes
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)		Suspected Spawning: Yes
Comments:		

Instruments

Stream Gradient:

Stream Velocity:

Turbidity:

Water Quality:

Channel Depths:

Channel Widths:

Electrofisher: Smith-Root LR-24

Transparency:

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/01/2011 8:20 AM

Sample	Latitude	Longitude
Coordinates	62.42975	-151.39777

Elevation NED (m)(ft): 422 1385**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna B-3**Legal Description (MTRS):** S027N011W18**Waterbody Name:** Lake Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3170**Geographic Comments:** Sampled at mouth of small tributary flowing into lake from wetlands area.

Visit Comments: No water quality data collected. This sample site is on the south end of Chelatna Lake where float plane traffic lands. Tributary coming from wetlands area has ATV tracks crossing creek. Picture 519 was from a fuel stop at the same site on 08/17/2011. The entirety of this stream was floated by cataraft and sampling was done by angling, minnow trap 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): 1.10	3.61

Stream Channel

Stream Gradient (%):	Entrenchment: Slightly Entrenched
Catchment Area(sq. km): 213	Embeddedness: Negligible
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	Subdominant Substrate 1: Silt/Clay
OHW	Subdominant Substrate 2:
Wetted	
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck 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	10	Open Paper Birch-Balsam Poplar-Spruce Forest	24
5 - 10	Closed Tall Alder-Willow Shrub	10	Open Paper Birch-Balsam Poplar-Spruce Forest	24
10 - 20	Closed Tall Alder-Willow Shrub	10	Open Paper Birch-Balsam Poplar-Spruce Forest	24
20 - 30	Closed Tall Alder-Willow Shrub	10	Open Paper Birch-Balsam Poplar-Spruce Forest	24

Key To Fish Sampling Methods

(ANG) Angling

(MTR) Minnow Trap

(VOG) Visual Observation, Ground

Fish Observations

Species: sockeye salmon	Life Stage: adult spawning	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
Total Fish Count: 35	Fish Measured: 12	Fork Lengths (mm) Min: 40 Max: 47 Mean: 43 Median: 43
Sampling Method (No. of fish): MTR (12) VOG (23)		
Comments:		
Species: sockeye salmon	Life Stage: carcass	Life History: Anadromous
Total Fish Count: 1	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (1)		
Comments: photo # 519		

Instruments

Stream Gradient:

Stream Velocity: GPS Float

Turbidity:

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 Quadrangle:** 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 confluent 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**Channel Dimensions (m):** Bankfull OHW Wetted **Dominant Substrate:** Gravel**Width****Subdominant Substrate 1:** Cobble**Thalweg Depth****Subdominant Substrate 2:** Silt/Clay**Rosgen Class:****Riparian Vegetation Communities (Vioreck 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	18	Closed Tall Alder-Willow Shrub	22
5 - 10	Closed Tall Alder-Willow Shrub	18	Closed Tall Alder-Willow Shrub	22
10 - 20	Closed Tall Alder-Willow Shrub	18	Closed Tall Alder-Willow Shrub	22
20 - 30	Closed Tall Alder-Willow Shrub	18	Closed Tall Alder-Willow Shrub	22

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 **Max:** 85 **Mean:** 62 **Median:** 67
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	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
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:	Channel Depths:
Stream Velocity: GPS Float	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	Transparency:



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FSS1123C011481.jpg

Station Info**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**

Water Temp (C):	DO (mg/L):	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
Catchment Area(sq. km): 731	Embeddedness: Negligible
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull	Subdominant Substrate 1: Cobble
OHW	Subdominant Substrate 2:
Wetted	
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:			
Species: coho salmon	Life Stage: adult	Life History: Anadromous	
Total Fish Count: 3	Fish Measured: 2	Fork Lengths (mm) Min: 491 Max: 611 Mean: 551	Median: 551
Sampling Method (No. of fish): ANG (2) VOG (1)			
Comments:			

Species: sockeye salmon

Life Stage: adult

Life History: Anadromous

Total Fish Count: 5 **Fish Measured:** 3 **Fork Lengths (mm)** **Min:** 476 **Max:** 492 **Mean:** 484 **Median:** 484

Sampling Method (No. of fish): ANG (3) VOG (2)

Comments:

Instruments

Stream Gradient:

Channel Depths:

Stream Velocity: GPS Float

Channel Widths:

Turbidity:

Electrofisher:

Water Quality:

Transparency:



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FSS1124C011484.jpg



FSS1124C011495.jpg

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/03/2011 1:33 PM

Sample	Latitude	Longitude
Coordinates	62.22231	-151.10507

Elevation NED (m)(ft): 303 994**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna A-3**Legal Description (MTRS):** S025N010W27**Waterbody Name:** Lake Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3170**Geographic Comments:**

Visit Comments: No habitat data collected. The entirety of this stream was floated by cataraft. Beaver complex at this site on river left has created an off channel where adult sockeye salmon were observed holding. Spawning suspected, though substrate was not ideal.

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): 2.40	7.87

Stream Channel

Stream Gradient (%):	Entrenchment: Slightly Entrenched
Catchment Area(sq. km): 805	Embeddedness: Low
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 55	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (55)		Suspected Spawning: Yes
Comments:		

Instruments

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

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/03/2011 3:55 PM

Sample	Latitude	Longitude
Coordinates	62.16824	-151.05487

Elevation NED (m)(ft): 278 912**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna A-3**Legal Description (MTRS):** S024N010W14**Waterbody Name:** Lake Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** No sampling data collected. This entire river was floated via cataraft and this was a fish observation waypoint.**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): 832	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right 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	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)		
Comments:		

Instruments

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

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/04/2011 10:34 AM

Sample	Latitude	Longitude
Coordinates	62.13811	-150.99935

Elevation NED (m)(ft): 223 732**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna A-2**Legal Description (MTRS):** S024N009W30**Waterbody Name:** Lake Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3170**Geographic Comments:****Visit Comments:** Minnow traps placed in a side-channel habitat with hyporheic pools also connected to this side-channel.
No habitat 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):	

Stream Channel

Stream Gradient (%):	Entrenchment: Slightly Entrenched
Catchment Area(sq. km): 851	Embeddedness: High
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull OHW	Subdominant Substrate 1: Silt/Clay
Wetted	Subdominant Substrate 2:
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(MTR) Minnow Trap

(VOG) Visual Observation, Ground

Fish Observations

Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 42	Fish Measured: 39	Fork Lengths (mm) Min: 42 Max: 65 Mean: 51 Median: 53
Sampling Method (No. of fish): MTR (39) VOG (3)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 22	Fish Measured: 14	Fork Lengths (mm) Min: 40 Max: 82 Mean: 52 Median: 61
Sampling Method (No. of fish): MTR (14) VOG (8)		
Comments:		

Instruments

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

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/04/2011 11:50 AM

Sample	Latitude	Longitude
Coordinates	61.95709	-150.90675

Elevation NED (m)(ft): 56 184**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-3**Legal Description (MTRS):** S022N009W34**Waterbody Name:** Lake Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3170**Geographic Comments:****Visit Comments:** No habitat data collected. Waypoint 24C03 suspected spawning sockeye salmon activity observed also, approximately 1 km downriver. Adults holding in side channel habitat.**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): 2.50 8.20	

Stream Channel**Stream Gradient (%):** **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 1053 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width				Subdominant Substrate 1: Cobble
Thalweg Depth				Subdominant Substrate 2: Silt/Clay

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right 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	Life Stage: adult	Life History: Anadromous
Total Fish Count: 60	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOB (60)		Suspected Spawning: Yes
Comments:		

Instruments

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

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/04/2011 12:00 PM

Sample	Latitude	Longitude
Coordinates	61.94425	-150.91135

Elevation NED (m)(ft): 45 148**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:****Geographic Comments:****Visit Comments:** This entire river was floated by cataraft. This was just a fish observation and no water quality data was 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): 1060	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right 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	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)		Suspected Spawning: Yes
Comments:		

Instruments

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

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/04/2011 8:01 AM

Sample	Latitude	Longitude
Coordinates	61.93593	-150.91383

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 confluent 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 confluent 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:
Water Color: Clear		Turbidity (NTU):	Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%):	Entrenchment: Slightly Entrenched
Catchment Area(sq. km): 1062	Embeddedness: Moderate
Channel Dimensions (m):	Dominant Substrate: Silt/Clay
Bankfull OHW	Subdominant Substrate 1: Gravel
Wetted	Subdominant Substrate 2: Cobble
Width	
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofischer:
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	62.28301	-152.65319	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 Turbidity **Turbidity (NTU):** 4.78 **Thalweg Velocity (m/s)(ft/s):** 1.43 4.69**Stream Channel****Stream Gradient (%):** 1.75 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 148 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	Left Bank Vegetation Type	Canopy Height(m)	Right Bank Vegetation Type	Canopy Height(m)
0 - 5	Unvegetated		Open Tall Alder-Willow Shrub	16
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

Key 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
Total Fish Count: 29 **Fish Measured:** 13 **Fork Lengths (mm)** **Min:** 37 **Max:** 76 **Mean:** 56 **Median:** 56
Sampling Method (No. of fish): PEF (13) VOG (16)
Comments:

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 9 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 85 **Max:** 98 **Mean:** 91 **Median:** 91
Sampling Method (No. of fish): PEF (9)
Comments:

Species: slimy sculpin **Life Stage:** adult **Life History:** Resident
Total Fish Count: 1 **Fish Measured:** 1 **Fork Lengths (mm)** **Min:** 77 **Max:** 77 **Mean:** 77 **Median:** 77
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:** 61 **Max:** 61 **Mean:** 61 **Median:** 61
Sampling Method (No. of fish): PEF (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:



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FSS1126C000685.jpg



FSS1126C000686.jpg

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 09/05/2011 10:50 AM

Sample	Latitude	Longitude
Coordinates	61.90602	-150.91483

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**Catchment Area(sq. km):** 1075**Embeddedness:** Moderate

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 (Vioreck 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	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	Life Stage: adult spawning	Life History: Anadromous	
Total Fish Count: 75	Fish Measured:	Fork Lengths (mm)	Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (75)			
Comments:			
Species: chum salmon	Life Stage: adult spawning	Life History: Anadromous	
Total Fish Count: 250	Fish Measured:	Fork Lengths (mm)	Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (250)			
Comments:			
Species: chum salmon	Life Stage: carcass	Life History: Anadromous	
Total Fish Count: 100	Fish Measured:	Fork Lengths (mm)	Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (100)			
Comments:			
Species: pink salmon	Life Stage: adult spawning	Life History: Anadromous	
Total Fish Count: 500	Fish Measured:	Fork Lengths (mm)	Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (500)			
Comments:			

Species: pink salmon	Life Stage: carcass	Life History: Anadromous				
Total Fish Count: 100	Fish Measured:	Fork Lengths (mm)	Min:	Max:	Mean:	Median:
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:	Channel Depths:
Stream Velocity: GPS Float	Channel Widths:
Turbidity:	Electrofisher:
Water Quality:	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	62.28451	-152.58579	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 Turbidity **Turbidity (NTU):** 28.80 **Thalweg Velocity (m/s)(ft/s):** 1.22 4.00**Stream Channel****Stream Gradient (%):** 1.25 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 92 **Embeddedness:** High

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 (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 69 **Fish Measured:** 14 **Fork Lengths (mm) Min:** 98 **Max:** 374 **Mean:** 214 **Median:** 236
Sampling Method (No. of fish): PEF (14) VOG (55)
Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
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
Total Fish Count: 18 **Fish Measured:** **Fork Lengths (mm) Min:** **Max:** **Mean:** **Median:**
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:

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				
Total Fish Count: 3	Fish Measured: 3	Fork Lengths (mm)	Min: 82	Max: 91	Mean: 87	Median: 86
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	Electrofischer: Smith-Root LR-24
Water Quality: YSI 556	Transparency:



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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	62.23833	-152.41885	62.23873	-152.41435

Elevation NED (m)(ft): 291 955**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** 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**Stream Gradient (%):** 1 **Entrenchment:** Moderately Entrenched**Catchment Area(sq. km):** 53 **Embeddedness:** Very High

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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	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**Estimated reach length (m):** 280

(PEF) Backpack Electrofisher

Fish Observations

Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous				
Total Fish Count: 5	Fish Measured: 5	Fork Lengths (mm)	Min: 46	Max: 63	Mean: 55	Median: 54
Sampling Method (No. of fish): PEF (5)						
Comments:						
Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 34	Max: 43	Mean: 39	Median: 38
Sampling Method (No. of fish): PEF (4)						
Comments:						
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown				
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm)	Min: 126	Max: 189	Mean: 166	Median: 157
Sampling Method (No. of fish): PEF (4)						
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

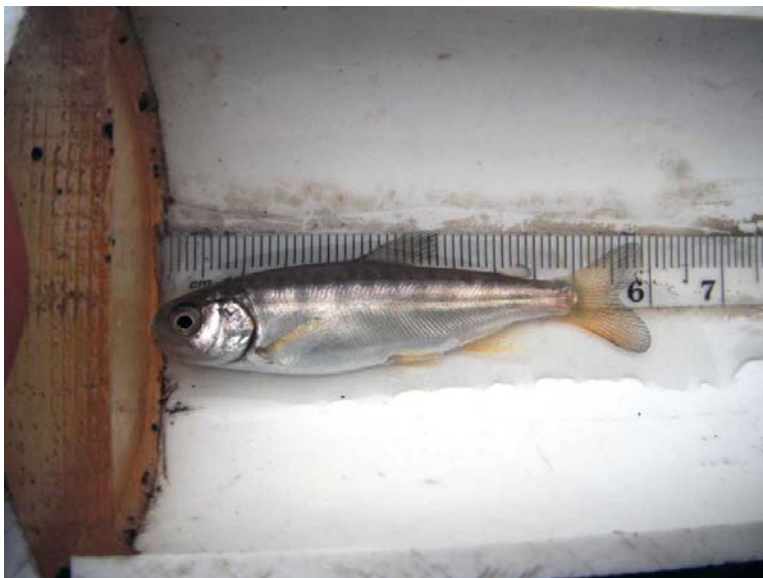
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Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/12/2011 4:51 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	62.22437	-152.90687	Coordinates	62.22703	-152.90688	62.22437	-152.90687

Elevation NED (m)(ft): 724 2375**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Talkeetna A-6**Legal Description (MTRS):** S025N020W25**Waterbody Name:** Three Mile Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Approximately 5 km upriver of Puntilla Lake. HY143.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow**

Water Temp (C): 4.17	DO (mg/L): 12.24	DO (%): 94.00	Conductivity (µS/cm): 261	pH: 7.15
Water Color: Clear	Turbidity (NTU): 0.32	Thalweg Velocity (m/s)(ft/s): 0.91 2.98		

Stream Channel**Stream Gradient (%):** 0.5 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 47 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	20.0		9.0	Subdominant Substrate 1: Gravel
Thalweg Depth	0.93		0.38	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 (Vioreck 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

Key To Fish Sampling Methods**Estimated reach length (m):** 368

(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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FSS1126C040706.jpg



FSS1126C040707.jpg

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel, Doug Hill**Date/Time:** 09/13/2011 9:51 AM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.37645	-150.34211	Coordinates	61.37559	-150.34455	61.37645	-150.34211

Elevation NED (m)(ft): 10 33**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek B-1**Legal Description (MTRS):** S015N006W22**Waterbody Name:** Maguire Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HM93**Visit Comments:** Velocity was nearly zero and much of the stream was stagnant.**Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 9.71 **DO (mg/L):** 7.70 **DO (%):** 68.50 **Conductivity (µS/cm):** 63 **pH:** 5.83**Water Color:** Feric **Turbidity (NTU):** 8.69 **Thalweg Velocity (m/s)(ft/s):** 0.06 0.20**Stream Channel****Stream Gradient (%):** 0.1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 23 **Embeddedness:** Very High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Silt/Clay
Width	5.0		4.0	Subdominant Substrate 1:
Thalweg Depth	1.25		0.70	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 (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
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 length (m):** 268

(PEF) Backpack Electrofisher

Fish Observations

Species: ninespine stickleback **Life Stage:** juvenile/adult **Life History:** Resident

Total Fish Count: 4 **Fish Measured:** 4 **Fork Lengths (mm)** **Min:** 43 **Max:** 52 **Mean:** 47 **Median:** 47

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

Comments:

Species: ninespine stickleback **Life Stage:** juvenile **Life History:** Resident

Total Fish Count: 6 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 33 **Max:** 40 **Mean:** 36 **Median:** 36

Sampling Method (No. of fish): PEF (6)

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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FSS1127C010729.jpg



Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/13/2011 12:49 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.75670	-152.01937	Coordinates	61.75597	-152.02131	61.75670	-152.01937

Elevation NED (m)(ft): 263 863**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-6**Legal Description (MTRS):** S019N015W08**Waterbody Name:** Trimble River**Anadromous Waters Catalog Number:****Geographic Comments:** HY100

Visit Comments: Reach was sampled entirely within a trib fed side channel of the trimble River. Rosgan code (C5) reflects only the variables associated with the trib. fed side channel and does not take into account variables associated with the main stem Trimble River flood plain.

Wildlife Comments:**Water Quality \ Stream Flow****Water Temp (C):** 3.72 **DO (mg/L):** 11.80 **DO (%):** 89.40 **Conductivity (µS/cm):** 36 **pH:** 6.39**Water Color:** Glacial, Low Turbidit **Turbidity (NTU):** 12.30 **Thalweg Velocity (m/s)(ft/s):** 1.14 3.74**Stream Channel****Stream Gradient (%):** 0.3 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 40 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Sand
Width	14.0		5.0	Subdominant Substrate 1: Cobble
Thalweg Depth	1.10		0.70	Subdominant Substrate 2:

Rosgen Class: C5 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Unvegetated	Closed Tall Alder Shrub	18
5 - 10 Unvegetated	Closed Tall Alder Shrub	18
10 - 20 Unvegetated	Closed Tall Alder Shrub	18
20 - 30 Unvegetated	Closed Tall Alder Shrub	18

Key To Fish Sampling Methods**Estimated reach length (m):** 180

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden **Life Stage:** juvenile/adult **Life History:** Unknown
Total Fish Count: 17 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 102 **Max:** 199 **Mean:** 148 **Median:** 150
Sampling Method (No. of fish): PEF (6) VOG (11)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 9 **Fish Measured:** 9 **Fork Lengths (mm)** **Min:** 53 **Max:** 68 **Mean:** 60 **Median:** 60
Sampling Method (No. of fish): PEF (9)
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:**



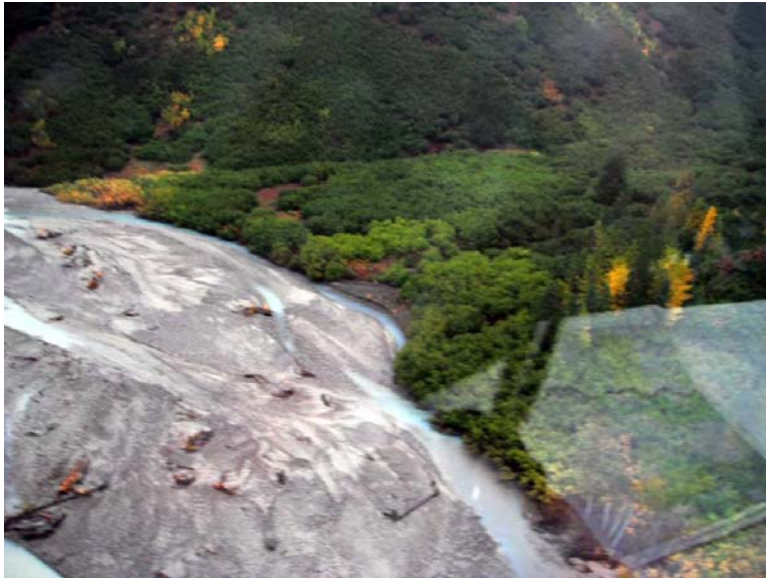
FSS1127C020712.jpg



FSS1127C020713.jpg



FSS1127C020714.jpg



FSS1127C020715.jpg

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/13/2011 2:29 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.80046	-151.71907	Coordinates	61.79909	-151.72275	61.80067	-151.71890

Elevation NED (m)(ft): 423 1388**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-5**Legal Description (MTRS):** S020N014W25**Waterbody Name:** Canyon Creek**Anadromous Waters Catalog Number:** 247-41-10200-2053-3205-4067**Geographic Comments:** HY70**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 5.77 **DO (mg/L):** 11.64 **DO (%):** 92.90 **Conductivity (µS/cm):** 23 **pH:** 6.26**Water Color:** Clear **Turbidity (NTU):** 0.86 **Thalweg Velocity (m/s)(ft/s):** 1.53 5.02**Stream Channel****Stream Gradient (%):** 1.3 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 63 **Embeddedness:** Moderate

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	22.0		9.0	Subdominant Substrate 1: Boulder
Thalweg Depth	1.40		0.65	Subdominant Substrate 2: Gravel

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck 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	19
5 - 10	Closed Tall Willow Shrub	19	Closed Tall Willow Shrub	19
10 - 20	Closed Tall Willow Shrub	19	Closed Tall Willow Shrub	19
20 - 30	Fireweed	0.4	Closed Tall Willow Shrub	19

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
Total Fish Count: 25 **Fish Measured:** 8 **Fork Lengths (mm) Min:** 53 **Max:** 61 **Mean:** 56 **Median:** 57
Sampling Method (No. of fish): PEF (8) VOG (17)
Comments:

Species: coho salmon **Life Stage:** juvenile **Life History:** Anadromous
Total Fish Count: 22 **Fish Measured:** 11 **Fork Lengths (mm) Min:** 42 **Max:** 58 **Mean:** 50 **Median:** 50
Sampling Method (No. of fish): PEF (11) VOG (11)
Comments:

Species: Dolly Varden **Life Stage:** juvenile **Life History:** Unknown
Total Fish Count: 25 **Fish Measured:** 7 **Fork Lengths (mm) Min:** 34 **Max:** 45 **Mean:** 39 **Median:** 39
Sampling Method (No. of fish): PEF (7) VOG (18)
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:



FSS1127C030717.jpg



FSS1127C030718.jpg



FSS1127C030719.jpg



FSS1127C030720.jpg

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/13/2011 5:33 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.78528	-151.78989	61.78630	-151.78473

Elevation NED (m)(ft): 509 1670**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek D-5**Legal Description (MTRS):** S020N014W34**Waterbody Name:** Canyon Creek**Anadromous Waters Catalog Number:****Geographic Comments:****Visit Comments:** No habitat data collected as this site was electrofished to extend catalogued anadromous fish upriver of actual transect site 27C03.**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): 21	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods**Estimated reach length (m):** 320

(PEF) Backpack Electrofisher

(VOG) Visual Observation, Ground

Fish Observations

Species: Dolly Varden	Life Stage: juvenile	Life History: Unknown
Total Fish Count: 29	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): PEF (12) VOG (17)		
Comments: The Dolly Varden captured at this site were not measured, but rather identified and released.		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 70	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): PEF (25) VOG (45)		
Comments: The Dolly Varden captured at this site were not measured, but rather identified and released.		

Instruments

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



FSS1127C040722.jpg

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/13/2011 3:13 PM

Station	Latitude	Longitude	Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.68766	-151.53762	Coordinates	61.68734	-151.53946	61.68774	-151.53726

Elevation NED (m)(ft): 250 820**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek C-5**Legal Description (MTRS):** S019N013W36**Waterbody Name:** Friday Creek**Anadromous Waters Catalog Number:****Geographic Comments:** HY104. Waterfall upriver approximately 2 kilometers at waypoint 27C05BAR. Tributary approximately 10 m below transect site on river left at waypoint 27C06.**Visit Comments:****Wildlife Comments:****Water Quality \ Stream Flow****Water Temp (C):** 7.60 **DO (mg/L):** 11.85 **DO (%):** 99.10 **Conductivity (µS/cm):** 19 **pH:** 6.46**Water Color:** Clear **Turbidity (NTU):** 1.73 **Thalweg Velocity (m/s)(ft/s):** 1.40 4.59**Stream Channel****Stream Gradient (%):** 1 **Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 62 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Cobble
Width	20.0		11.0	Subdominant Substrate 1: Boulder
Thalweg Depth	1.20		0.70	Subdominant Substrate 2: Gravel

Rosgen Class: C3 Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well-defined floodplains.**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from Bank (m)	<u>Left Bank Vegetation Type</u>	<u>Canopy Height(m)</u>	<u>Right Bank Vegetation Type</u>	<u>Canopy Height(m)</u>
0 - 5	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	35	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	38
5 - 10	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	35	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood Forest)	38
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**Total Fish Count:** 3 **Fish Measured:** 2 **Fork Lengths (mm)** Min: 41 Max: 49 Mean: 45 Median: 45**Sampling Method (No. of fish):** PEF (2) 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:



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FSS1127C050725.jpg



FSS1127C050727.jpg



FSS1127C050760.jpg

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/13/2011 2:06 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.68820	-151.53772	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 this 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): 11	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 Mean: 63 Median: 67
Sampling Method (No. of fish): PEF (4)		
Comments:		

Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 2	Fish Measured: 2	Fork Lengths (mm) Min: 41 Max: 49 Mean: 45 Median: 45
Sampling Method (No. of fish): PEF (2)		
Comments:		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality:	Transparency:

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/13/2011 5:44 PM

Sample	Latitude	Longitude
Coordinates	61.69237	-151.57397

Elevation NED (m)(ft): 312 1024**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Tyonek C-5**Legal Description (MTRS):** S019N013W35**Waterbody Name:** Friday Creek**Anadromous Waters Catalog Number:****Geographic Comments:** Waterfalls.**Visit Comments:** Fly-by only. This site represents a waterfall fish barrier.**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
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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:	Electrofischer:
Water Quality:	Transparency:

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 12:01 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.50695	-148.99816	/ 61.50861	-148.99543

Elevation NED (m)(ft): 115 377**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-6**Legal Description (MTRS):** S016N003E06**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** Unnamed Creek flows through culvert under E. Knik River Road approximately 400 m upstream of confluence with Knik River.**Visit Comments:** No habitat data collected. ATV tracks through creek where juvenile coho and sockeye were caught. Culvert approximately 400 m upstream of confluence with Knik River, with perch at upriver end. Barrier to juvenile fish passage.**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): 10	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	
Width	Subdominant Substrate 1:
Thalweg Depth	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods**Estimated reach length (m):** 298

(PEF) Backpack Electrofisher

(MTR) Minnow Trap

Fish Observations

Species: sockeye salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 19	Fish Measured: 10	Fork Lengths (mm) Min: 32
		Max: 84
		Mean: 51
		Median: 58
Sampling Method (No. of fish): MTR (9) PEF (10)		
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 13	Fish Measured: 5	Fork Lengths (mm) Min: 52
		Max: 100
		Mean: 81
		Median: 76
Sampling Method (No. of fish): MTR (8) PEF (5)		
Comments:		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality:	Transparency:

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 12:01 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.50379	-148.96735	61.50594	-148.96949

Elevation NED (m)(ft): 42 138**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-6**Legal Description (MTRS):** S016N003E05**Waterbody Name:****Anadromous Waters Catalog Number:****Geographic Comments:** This unnamed stream flows into a wetlands area and through a culvert approximately 400 m above confluence with Knik River.**Visit Comments:** This site was generated to support AWC data in Knik River drainage. Access was by road and inflatable canoe.**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):	Dominant Substrate:
Bankfull OHW Wetted	
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)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 18	Fish Measured: 18	Fork Lengths (mm) Min: 60 Max: 106 Mean: 100 Median: 83
Sampling Method (No. of fish): MTR (18)		
Comments: All coho salmon caught at this site were second year with the exception of one young of the year. Coho were ca		
Species: threespine stickleback	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 4	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): MTR (4)		
Comments:		

Instruments

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



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FSS1128C020736.jpg

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 12:41 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.49554	-148.92853	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):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 51	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): MTR (51)		
Comments:		

Instruments

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

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 1:14 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.48813	-148.90285	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**

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): 0.2	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull	OHW
Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 6	Fish Measured: 6	Fork Lengths (mm) Min: 38 Max: 82 Mean: 56 Median: 60
Sampling Method (No. of fish): MTR (6)		
Comments:		
Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 7	Fish Measured: 7	Fork Lengths (mm) Min: 83 Max: 108 Mean: 95 Median: 95
Sampling Method (No. of fish): MTR (7)		
Comments:		

Instruments

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

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 1:46 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.46914	-148.86883	61.46876	-148.86922

Elevation NED (m)(ft): 47 154**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.**Visit Comments:** ATV tracks in river and parallel to river. This site sampled via East Knik River Road using minnow traps.**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): 1	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5		
5 - 10		
10 - 20		
20 - 30		

Key To Fish Sampling Methods

(MTR) Minnow Trap

Fish Observations

Species: Dolly Varden	Life Stage: juvenile/adult	Life History: Unknown
Total Fish Count: 4	Fish Measured: 4	Fork Lengths (mm) Min: 84 Max: 105 Mean: 90 Median: 94
Sampling Method (No. of fish): MTR (4)		
Comments:		

Instruments

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

Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 2:10 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.46192	-148.85933	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:
Catchment Area(sq. km): 8	Embeddedness:
Channel Dimensions (m):	Dominant Substrate:
Bankfull OHW Wetted	Subdominant Substrate 1:
Width	Subdominant Substrate 2:
Thalweg Depth	

Rosgen Class:**Riparian Vegetation Communities (Viereck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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
Total Fish Count: 14	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (14)		Suspected Spawning: Yes
Comments:		
Species: coho salmon	Life Stage: juvenile	Life History: Anadromous
Total Fish Count: 13	Fish Measured: 6	Fork Lengths (mm) Min: 55 Max: 59 Mean: 57 Median: 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)		
Comments:		

Instruments

Stream Gradient:

Stream Velocity:

Turbidity:

Water Quality:

Channel Depths:

Channel Widths:

Electrofisher:

Transparency:



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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	61.45689	-148.84026	/ 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**

Water Temp (C):	DO (mg/L):	DO (%):	Conductivity (µS/cm):	pH:
Water Color: Humic		Turbidity (NTU):	Thalweg Velocity (m/s)(ft/s):	

Stream Channel**Stream Gradient (%):****Entrenchment:** Slightly Entrenched**Catchment Area(sq. km):** 5**Embeddedness:** High

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate:
Width				Subdominant Substrate 1:
Thalweg Depth				Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 Mean: 44	Median: 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 Max: 95 Mean: 68	Median: 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: Mean:	Median:
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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Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 3:45 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.43869	-148.81521	/ 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:
Catchment Area(sq. km): 180	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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 Stage: adult spawning	Life History: Anadromous
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 Mean: 100 Median: 102
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 Mean: 95 Median: 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 Median: 362
Sampling Method (No. of fish): PEF (2)		
Comments:		

Instruments

Stream Gradient:	Channel Depths:
Stream Velocity:	Channel Widths:
Turbidity:	Electrofisher: Smith-Root LR-24
Water Quality:	Transparency:



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Station Info**Observers:** Jonathan Kirsch, Raye Ann Neustel**Date/Time:** 09/14/2011 4:20 AM

Sample	Latitude	Longitude
Coordinates	61.56450	-149.04299

Elevation NED (m)(ft): 44 144**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage C-6**Legal Description (MTRS):** S017N002E14**Waterbody Name:****Anadromous Waters Catalog Number:** 247-50-10200-2071-3023**Geographic Comments:** This is slack water (ditch) beside Old Glenn Highway approximately 5 km south of Palmer.**Visit Comments:** No habitat data collected at this site. This site was recorded due to visual observation of adult sockeye spawning from Old Glenn Highway.**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): 2	Embeddedness:
Channel Dimensions (m):	Bankfull OHW Wetted
Width	Dominant Substrate:
Thalweg Depth	Subdominant Substrate 1:
	Subdominant Substrate 2:

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
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: 75	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (75)		
Comments:		

Instruments

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

Station Info**Observers:** Jonathan Kirsch, Joe Buckwalter, Raye Ann Neustel**Date/Time:** 09/19/2011 4:30 PM

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**Waterbody Name:** Goat Creek**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.**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**

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 (%): 2	Entrenchment: Moderately Entrenched
Catchment Area(sq. km): 40	Embeddedness: Low
Channel Dimensions (m):	Dominant Substrate: Cobble
Bankfull OHW Wetted	Subdominant Substrate 1: Gravel
Width	Subdominant Substrate 2: Boulder
Thalweg Depth	

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 Electrofisher

(MTR) Minnow Trap

(VOG) Visual Observation, Ground

Fish Observations

Species: coho 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): PEF (3)		
Comments:		
Species: Chinook salmon	Life Stage: carcass	Life History: Anadromous
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/adult	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:			
Species: Chinook salmon	Life Stage: juvenile	Life History: Anadromous	
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	
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: Dolly Varden	Life Stage: juvenile	Life History: Unknown	
Total Fish Count: 6	Fish Measured: 6	Fork Lengths (mm) Min: 43 Max: 77	Mean: 53 Median: 60
Sampling Method (No. of fish): MTR (3) PEF (3)			
Comments:			
Species: slimy sculpin	Life Stage: adult	Life History: Resident	
Total Fish Count: 1	Fish Measured: 1	Fork Lengths (mm) Min: 100 Max: 100	Mean: 100 Median: 100
Sampling Method (No. of fish): PEF (1)			
Comments:			

Instruments

Stream Gradient:

Stream Velocity:

Turbidity:

Water Quality:

Channel Depths:

Channel Widths:

Electrofischer: Smith-Root LR-24

Transparency:

Station Info**Observers:** Raye Ann Neustel**Date/Time:** 10/15/2011 2:14 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.44225	-148.77010	61.45410	-148.77542

Elevation NED (m)(ft): 30 98**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S016N004E29**Waterbody Name:** Hunter Creek**Anadromous Waters Catalog Number:** 247-50-10200-2140**Geographic Comments:** Hunter Creek tributary at interface with Knik River braid plain. Large beaver dam complex.

Visit Comments: No water quality data collected. This sample site was accessed from East Knik River Road, then packrafted (photo 956) to sample site on Hunter Creek delta (955,792). Several diverse habitats sampled within close proximity to this site, including beaver ponds, springbrooks. 61.44345, -148.77139 represents the third pool that is connected to a small river channel with approximately 30 juvenile sockeye salmon caught using a seine net. We observed adult coho (suspected spawning) in a small river channel next to pool containing juvenile sockeye, partial habitat data collected here.

Wildlife Comments:**Water Quality \ Stream Flow**

Water Temp (C):	DO (mg/L):	DO (%):	Conductivity (µS/cm):	pH:
Water Color: Glacial, High Turbidit	Turbidity (NTU):		Thalweg Velocity (m/s)(ft/s):	

Stream Channel

Stream Gradient (%):	Entrenchment: Slightly Entrenched
Catchment Area(sq. km): 197	Embeddedness: Low
Channel Dimensions (m):	Dominant Substrate: Gravel
Bankfull OHW	Subdominant Substrate 1: Cobble
Wetted	Subdominant Substrate 2: Silt/Clay
Width	
Thalweg Depth	

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	Unvegetated		Unvegetated	
5 - 10	Unvegetated		Unvegetated	
10 - 20	Closed Tall Alder-Willow Shrub	5	Unvegetated	
20 - 30	Unvegetated		Unvegetated	

Key To Fish Sampling Methods

(SEI) Seine

(VOG) Visual Observation, Ground

Fish Observations

Species: sockeye salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 32	Fish Measured: 2	Fork Lengths (mm) Min: 502 Max: 511 Mean: 506 Median: 506
Sampling Method (No. of fish): SEI (2) VOG (30)		Suspected Spawning: Yes
Comments:		
Species: coho salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 20	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (20)		
Comments:		
Species: coho salmon	Life Stage: adult	Life History: Anadromous
Total Fish Count: 50	Fish Measured:	Fork Lengths (mm) Min: Max: Mean: Median:
Sampling Method (No. of fish): VOG (50)		Suspected Spawning: Yes
Comments: photo 951 & 952		

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:

Instruments

Stream Gradient:

Channel Depths:

Stream Velocity:

Channel Widths:

Turbidity:

Electrofisher:

Water Quality:

Transparency:



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FSS1130E010955.jpg



Station Info**Observers:** Raye Ann Neustel**Date/Time:** 10/16/2011 2:35 PM

Sample	Latitude	Longitude	Latitude	Longitude
Coordinates	61.45478	-148.70688	61.46728	-148.70637

Elevation NED (m)(ft): 33 108**Coordinate Determination Method:** Non-Differential GPS Field Measurement **Datum:** WGS84**USGS Quadrangle:** Anchorage B-5**Legal Description (MTRS):** S016N004E27**Waterbody Name:** Knik River**Anadromous Waters Catalog Number:** 247-50-10200**Geographic Comments:** Springbrook in Knik River active braid plain. Likely inundated by mainstem Knik River at high flows.**Visit Comments:** Sample site was accessed via East Knik River Road and then packrafted down Hunter Creek. We hiked across Knik River floodplain to hyporheic and side-channel habitats (photos 771-772, 768) Numerous ATV tracks through pools of rearing and adult sockeye salmon.**Wildlife Comments:** Large number of birds of prey. Observed 1 coyote. Brown bear tracks surrounding clear water pools containing adult and juvenile salmon.**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:** Slightly Entrenched**Catchment Area(sq. km):** 0.5 **Embeddedness:** Low

Channel Dimensions (m):	Bankfull	OHW	Wetted	Dominant Substrate: Gravel
Width				Subdominant Substrate 1: Cobble
Thalweg Depth				Subdominant Substrate 2: Silt/Clay

Rosgen Class:**Riparian Vegetation Communities (Vioreck et al. 1992)**

Dist. from	Canopy	Canopy
Bank (m)	Height(m)	Height(m)
<u>Left Bank Vegetation Type</u>	<u>Right Bank Vegetation Type</u>	
0 - 5 Unvegetated	Unvegetated	
5 - 10 Unvegetated	Unvegetated	
10 - 20 Unvegetated	Unvegetated	
20 - 30 Unvegetated	Unvegetated	

Key To Fish Sampling Methods

(SEI) Seine

(VOG) Visual Observation, Ground

Fish Observations

Species: coho salmon **Life Stage:** adult **Life History:** Anadromous

Total Fish Count: 40 **Fish Measured:** **Fork Lengths (mm)** **Min:** **Max:** **Mean:** **Median:**

Sampling Method (No. of fish): VOG (40) **Suspected Spawning:** Yes

Comments: Seining was attempted to catch coho, pool was too deep and wide, fish swam under net.

Species: sockeye salmon **Life Stage:** juvenile **Life History:** Anadromous

Total Fish Count: 22 **Fish Measured:** 6 **Fork Lengths (mm)** **Min:** 41 **Max:** 49 **Mean:** 45 **Median:** 45

Sampling Method (No. of fish): SEI (6) VOG (16)

Comments:

Species: sockeye salmon **Life Stage:** adult **Life History:** Anadromous

Total Fish Count: 205 **Fish Measured:** 5 **Fork Lengths (mm)** **Min:** 482 **Max:** 509 **Mean:** 497 **Median:** 495

Sampling Method (No. of fish): SEI (5) VOG (200) **Suspected Spawning:** Yes

Comments: photos 778-780, 782-784

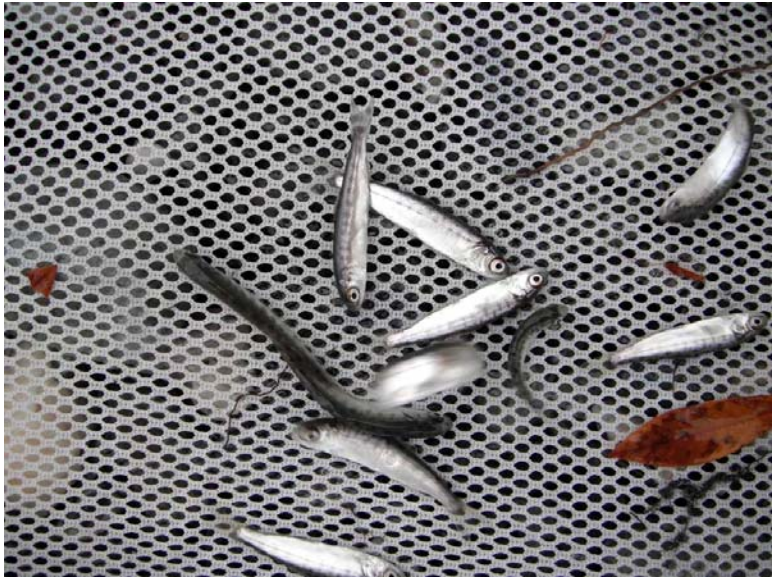
Species: chum salmon		Life Stage: adult		Life History: Anadromous			
Total Fish Count: 30	Fish Measured:	Fork Lengths (mm)		Min:	Max:	Mean:	Median:
Sampling Method (No. of fish): VOG (30)		Suspected Spawning: Yes					
Comments: Most chum salmon observed were dead and at bottom of clear pools.							

Instruments

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



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