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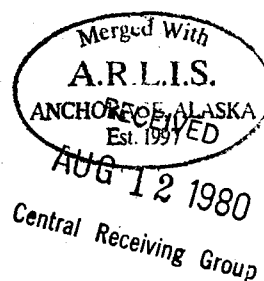
**A compendium of present knowledge of  
fisheries resources in waterbodies along the  
Northwest Alaskan Pipeline route**

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PART IV

A COMPENDIUM OF PRESENT KNOWLEDGE OF FISHERIES RESOURCES  
IN WATERBODIES ALONG THE NORTHWEST ALASKAN GAS PIPELINE ROUTE

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## INTRODUCTION

A compendium is presented that integrates all available historical information and data generated during 1979 field surveys to summarize knowledge of fish use at 492 waterbody crossings or near crossings potentially affected by the proposed gas pipeline. For each waterbody crossing documentation of fish presence, fish use and sources of fisheries information are provided on a seasonal basis. Waterbody names follow those in Alaska Place Names (Ref. 121) or Rockwell and Johnson (Ref. 11). Waterbody location and identification numbers are abbreviated in the compendium as follows:

NPSI	- Northwest Pipeline Stream Identification number
NPAS	- Northwest Pipeline Alignment Sheet (Ref. 42)
NPMP	- Northwest Pipeline Milepost as indicated in Fluor 1979 alignment sheet series (Ref. 42)
AHMP	- Alaska Highway Milepost
USGS Map	- United States Geological Survey maps are the 1:250,000 scale series. Township, range, and section number of specific stream crossings are indicated

Documented fish presence (i.e. capture or visual observation) and utilization for each waterbody crossing or near crossing is presented in a tabular format by season. For the purpose of this report the seasons spring, summer, fall and winter have been defined by the following time periods:

Spring	1 May - 30 June
Summer	1 July - 31 August
Fall	1 September - 31 October
Winter	1 November - 30 April

Utilization of habitat by fish includes spawning, wintering, migrating and rearing. Definition of the fish uses for the purpose of this report are:

- |               |  |
|---------------|--|
| Spawning (S)  | - spawning habitat has been identified by the presence of young-of-the-year or pre-spawning, ripe or post spawning adults                |
| Wintering (W) | - wintering is the utilization of habitat by fish, including egg incubation during some part of the winter period from November to April |
| Migrating (M) | - migrating is the utilization of aquatic habitat for moving between seasonal use areas and/or habitats                                  |
| Rearing (R)   | - all waterbodies containing fish are considered rearing areas   |

The lack of seasonal documentation for fish presence and/or utilization in the compendium does not negate the possibility for fish utilization of an area. In some cases, documentation is lacking because no investigations were conducted. When investigations were conducted but found no fish, habitat quality is discussed in the assessment. Good and marginal habitat as discussed in waterbody assessments are generally described as follows:

Good fish habitat--generally has an adequate water depth (15-20 cm minimum), measurable flow (at least 0.1-0.3 m<sup>2</sup>/sec or 0.5-1 fps), and high dissolved oxygen concentration (5 mg/l minimum). These sites are typically characterized by a pH range of 6.5 to 8.5, adequate cover and no major barriers to fish movement.

Marginal fish habitat--generally has water depths less than 15-20 cm with negligible or intermittent flow and potential barriers to fish movements and dissolved oxygen concentrations of 5 mg/l or less.

Abbreviations of fish species follow those in Rockwell and Johnson (Ref. 11) and are as follows:

- |    |   |
|----|---|
| AB | Alaska blackfish ( <i>Dallia pectoralis</i> ) |
| AC | Arctic char ( <i>Salvelinus alpinus</i> )     |
| AL | Arctic lamprey ( <i>Lampetra japonica</i> )   |
| BB | Burbot ( <i>Lota lota</i> )                   |
| BW | Broad whitefish ( <i>Coregonus nasus</i> )    |
| CA | Arctic cisco ( <i>Coregonus autumnalis</i> )  |
| CD | Sculpin ( <i>Cottus</i> sp.)                  |



CI	Cisco ( <i>Coregonus</i> sp.)
CN	Slimy sculpin ( <i>Cottus cognatus</i> )
CS	Least cisco ( <i>Coregonus sardinella</i> )
DS	Chum salmon ( <i>Oncorhynchus keta</i> )
DV	Dolly Varden ( <i>Salvelinus malma</i> )
GR	Arctic grayling ( <i>Thymallus arcticus</i> )
HW	Humpback whitefish ( <i>Coregonus pidschian</i> )
IN	Inconnu ( <i>Stenodus leucichthys</i> )
KS	King salmon ( <i>Oncorhynchus tshawytscha</i> )
LC	Lake chub ( <i>Couesius plumbeus</i> )
LS	Longnose sucker ( <i>Catostomus catostomus</i> )
LT	Lake trout ( <i>Salvelinus namaycush</i> )
NP	Northern pike ( <i>Esox lucius</i> )
PS	Pink salmon ( <i>Oncorhynchus gorbuscha</i> )
RW	Round whitefish ( <i>Prosopium cylindraceum</i> )
SB	Stickleback (Family <i>Gasterosteidae</i> )
SS	Coho Salmon ( <i>Oncorhynchus kisutch</i> )
S9	Ninespine stickleback ( <i>Pungitius pungitius</i> )
TP	Trout-perch ( <i>Percopsis omiscomaycus</i> )
WF	Whitefish ( <i>Coregonus</i> or <i>Prosopium</i> sp.)
X	Fish present but species not identified

Physical descriptions of the 492 waterbody crossings include available information from literature reviewed, site-specific observations from 1979 seasonal field investigations and professional or personal knowledge of the region. These are general descriptions and do not attempt to detail seasonal variations and fluctuations of the waterbody system.

All available aquatic information has been reviewed and synthesized to provide a concise overview of the fisheries resources for each waterbody crossing or encroachment. This overview summarizes documented and reported fish habitat, fish use and atypical stream conditions that might require special considerations to mitigate impacts of construction.

**WATERBODY**Waterbody Unnamed Creek 1222.2Main Drainage Scottie Creek Tributary to Unnamed Creek 1222.6NPSI 6-227.03 NPAS 131 NPMP 738.7 AHMP 1222.2USGS Map Reference Nabesna, Ak. T 10N R 23E Sec. 25**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1222.2 is a small humic-stained stream that originates from a low muskég area near the proposed pipeline route. It flows across the Alaska Highway into a shallow lake less than 100 m downstream of the highway crossing. The outlet of this lake drains into Scottie Creek.

Unnamed Creek 1222.2 provides potential fish habitat only downstream of the Alaska Highway and has little or no potential for fish use at the pipeline crossing. Sampling efforts in the spring of 1978 and 1979 confirmed the absence of fish in this area (Refs. 2 and 54). However, in the shallow lake downstream of the Alaska Highway, numerous unidentified fish were observed. The lake is a likely spawning and rearing area for northern pike and a rearing area for humpback whitefish. Instream construction activities could indirectly affect the fisheries resources of this shallow lake.

# WATERBODY

Waterbody Unnamed Creek 1222.6

Main Drainage Chisana River Tributary to Scottie Creek

NPSI 6-227.02 NPAS 131 NPMP 738.3 AHMP 1222.6

USGS Map Reference Nabesna, Ak. T 10N R 23E Sec. 24

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>HW,LS</u>	<u>M,R</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>HW,NP</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>79</u>

Unnamed Creek 1222.6 is a slow flowing, humic-stained stream which meanders through a large marshland before emptying into Scottie Creek. *Carex* is abundant along its low banks and throughout the marsh areas. Willows line the outer margins of the flood plain. This stream is not crossed by the proposed pipeline but is within 50 m of the current alignment. Therefore, the potential exists for impact by construction and/or operation of the proposed pipeline. No fisheries information was available prior to the 1979 field investigations.

Unnamed Creek 1222.6 provides good fish habitat throughout the open water months and is a migration route for fish during spring and fall. Humpback whitefish, longnose sucker and northern pike captured during 1979 spring and/or fall field investigations indicate that this stream is an important rearing area. Humpback whitefish were especially abundant in the shallow pond and inundated shelf areas associated with this stream. This stream and associated wetlands appear to be excellent northern pike spawning habitat although no direct evidence (young-of-the-year, pre-spawning or post-spawning adult northern pike) supports this inference. This stream is reported to be anoxic during winter and provides no winter habitat for fish (Ref. 79).

## WATERBODY

Waterbody Unnamed Pond 1223.4Main Drainage Chisana River Tributary to Scottie CreekNPSI 6-227.01NPAS 131NPMP 737.5AHMP 1223.4USGS Map Reference Nabesna, Ak.T 10N R 23E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB</u>	<u>R</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Pond 1223.4 is a shallow, humic-stained pond of approximately 250 m, which is bisected by the Haines Products Pipeline and is adjacent to the Alaska Highway. The pond is about 30 m from Scottie Creek and is separated only by high stream banks. Aquatic vegetation and invertebrates were reported to be abundant in the spring (Ref. 54).

Although Unnamed Pond 1223.4 was a rearing area for burbot during spring 1979 (Ref. 54), fish can only enter the pond during high water periods in Scottie Creek. Unless high water levels are repeated in Scottie Creek prior to freeze-up, fish undoubtedly become trapped in the pond and perish during winter, since this waterbody has little to no overwintering potential due to its small size and shallow nature (150 cm deep; Ref. 2).

## WATERBODY

Waterbody Scottie CreekMain Drainage Tanana River Tributary to Chisana RiverNPSI 6-227 NPAS 131 NPMP 737.5 AHMP 1223.4USGS Map Reference Nabesna, Ak. T 10N R 23E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB</u>	<u>M,R</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>6</u>
Fall	<u>BB,LS</u>	<u>M,R</u>	<u>57</u>
Winter	<u>BB,HW,NP</u>	<u>W</u>	<u>9,55,77</u>

Scottie Creek is a deep, slow-meandering stream 15-20 m wide. Its earthen banks are steep and grassy and are lined with willow, alder and spruce. The channel is relatively uniform in size above and below the proposed pipeline route and sunken logs and debris are abundant.

Although numerous references now exist on fish utilization of Scottie Creek, many (Refs. 5, 8, 9 and 10) refer to the original report of Van Hyning (Ref. 7). This report contains information from local residents which indicates that grayling, humpback whitefish and northern pike are present in Scottie Creek (Ref. 7) and that large runs of grayling and humpback whitefish occur in spring and fall (Ref. 6). While numerous reports refer to Scottie Creek, few studies have actually been performed on the stream.

Direct and indirect evidence indicate that Scottie Creek is utilized by a variety of fish and that some species may occur near the pipeline crossing on a year round basis. The presence of excellent spring spawning and rearing habitat and fish in upstream reaches of the drainage suggests that Scottie Creek is an important migration route. For example, in 1979 humpback whitefish, longnose suckers and northern pike were captured in Unnamed Creek 1222.6 in spring and/or fall (Refs. 54 and 57). Unnamed Creek 1222.6 is a small upstream tributary to Scottie Creek with little or no overwintering habitat (Ref. 79). It is therefore reasonable to assume that at least some of the fish found in such upstream regions of the drainage utilize Scottie Creek for spring and fall migrations.

## FISHERIES ASSESSMENT (CON'T)

## Scottie Creek

Studies to date have documented winter fish use of Scottie Creek near the pipeline but actual duration of use is uncertain. Late winter studies in 1979 (Ref. 55) revealed substantial amounts of free water; however, little flow was detected and dissolved oxygen was low (1.6 mg/l). Fishing efforts did not reveal the presence of fish. In contrast, burbot, northern pike and humpback whitefish were captured in early winter 1979 (Ref. 77). Dissolved oxygen concentrations were again relatively low (2.6 mg/l) but fish utilization appeared to be high. It is possible that fish leave the area as conditions deteriorate during the winter but it is also possible that late winter fishing efforts in 1979 failed to capture fish that were present. The presence of burbot young-of-the-year in Unnamed Pond 1223.4 in spring 1979 (Ref. 54) strongly suggests that suitable overwintering conditions exist in Scottie Creek in the vicinity of the pipeline. (See also assessment of Unnamed Pond 1223.4 in present report).

In summary, Scottie Creek appears to be of considerable importance to fish populations in the region. This area will require special attention to ensure that potential adverse impacts to fish populations are avoided.

**WATERBODY**Waterbody Desper CreekMain Drainage Chisana River Tributary to Scottie CreekNPSI 6-226 NPAS 130 NPMP 735.6 AHMP 1225.6USGS Map Reference Nabesna, Ak. T 10N R 23E Sec. 11**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>.</u>	<u>5,6,7,10,54</u>
Summer	<u>None</u>	<u></u>	<u>10</u>
Fall	<u>NP</u>	<u>R</u>	<u>5,6,7,10,57</u>
Winter	<u>None</u>	<u>None</u>	<u>6,9,55</u>

Desper Creek is a moderately deep slow-flowing stream with a channel width of 5.7 m. Its humic-stained waters flow from Island Lake to Scottie Creek, approximately 2.5 km below the Alaska Highway. Steep banks are lined with willow, alder and small spruce. Leaf debris, snags and aquatic vegetation are abundant in the channel and provide adequate cover for fish.

Investigations conducted during the fall of 1979 indicate that Desper Creek is a rearing area for northern pike probably throughout the open water season (Ref. 57). Local residents report that grayling and whitefish are also present (Refs. 5, 6, 7, 10 and 26), but no specific biological data are available for these species. Visual observations and/or sampling efforts throughout the year (Refs. 6, 7, 54 and 55) had failed to verify fish use of Desper Creek prior to the 1979 fall survey (Ref. 57). Desper Creek probably serves as a spring and fall migration route for species present. During a 1979 winter study the stream was frozen solid with the exception of one site where stagnant, anoxic water was found (Ref. 55). Other studies have also found the stream to be dry or frozen to the bottom during winter (Refs. 6 and 9).

# WATERBODY

Waterbody Unnamed Creek 1232.1

Main Drainage Desper Creek Tributary to Island Lake

NPSI 6-225.01 NPAS 129 NPMP 730.6 AHMP 1232.1

USGS Map Reference Nabesna, Ak. T 11N R 23E Sec. 29

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline crossing, this small stream seeps through muskeg vegetation or follows poorly defined channels between tussocks. In this area, water accumulates in several pools with a maximum depth of 60 cm and a total surface area of approximately 60 m<sup>2</sup>. One and one-half km upstream from the pipeline route, the stream is crossed by the Alaska Highway. At this point, it flows rapidly down a steep gradient making fish use unlikely.

Fish use in the vicinity of the proposed pipeline is unlikely during the open water season although some pools may offer suitable habitat. No fish were seen or captured during 1978 and 1979 spring investigations (Refs. 2 and 54). It is doubtful that fish from Island Lake are able to penetrate the 1.5 km of muskeg necessary to reach the pipeline crossing. It has been suggested that fish habitat may be present in regions downstream of the proposed pipeline crossing (Ref. 2).

Although studies have not been conducted on winter fish use of Unnamed Creek 1232.1, physical data collected during spring investigations indicate that this stream dries up or freezes to the bottom during this period (Refs. 2 and 54).



## WATERBODY

Waterbody Sweetwater CreekMain Drainage Tanana River Tributary to Chisana RiverNPSI 6-225 NPAS 129 NPMP 728.4 AHMP 1234.2USGS Map Reference Nabesna, Ak. T 11N R 22E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54,59</u>
Summer	<u>None</u>	<u>None</u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>9,55</u>

Sweetwater Creek is a small muskeg drainage which is crossed near its headwaters by the proposed pipeline. The slightly humic-stained water flows through muskeg vegetation, tussocks and willow in an often poorly defined channel. Stream substrate is primarily mud and detritus but some gravel occurs near the Alaska Highway (~150 m downstream of the pipeline). A number of small pools are present between the highway and the pipeline crossing.

Fish utilization of Sweetwater Creek in the vicinity of the proposed pipeline crossing is low to non-existent year round. No fish were observed or captured in this stream during numerous investigations and it freezes to the bottom during winter (Refs. 2, 9, 54, 55, 57, 59 and 72).

# WATERBODY

Waterbody Unnamed Creek 1234.7

Main Drainage Chisana River Tributary to Sweetwater Creek

NPSI 6-224 NPAS 129 NPMP 728.0 AHMP 1234.7

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec. 12

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1234.7 is a small, slightly stained stream which drains a low lying muskeg area through a poorly defined channel. This drainage forms a small pond approximately 400 m<sup>2</sup> in surface area just above the Alaska Highway. It then crosses the highway and the proposed pipeline route before joining Sweetwater Creek. The poorly defined channel and pond margins contain primarily *Carex* and *Equisetum*. Stream and pond bottoms are composed of mud and detritus.

Unnamed Creek 1234.7 provides marginal fish habitat and 1978 and 1979 spring studies indicate that fish use is non-existent (Refs. 2 and 54). Low stream flow may impede fish passage through the Alaska Highway culvert (Ref. 54). Although fall and winter studies have not been conducted, low water levels observed during spring surveys indicate that Unnamed Creek 1234.7 dries up and/or freezes to the bottom during these periods.

# WATERBODY

Waterbody Unnamed Creek 1235.9 #1

Main Drainage Chisana River Tributary to Sweetwater Creek

NPSI 6-223 NPAS 129 NPMP 726.8 AHMP 1235.9

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec. 2

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1235.9 crosses the Alaska Highway and flows southwest to Sweetwater Creek through a low muskeg and tussock area. Its narrow, poorly defined channel is bordered by willow and dwarf birch. This shallow, slightly stained stream has a mud and detritus bottom with very little aquatic vegetation. In the vicinity of the proposed pipeline, the creek flows through a series of small ponds, probably the product of thermal erosion resulting from previous construction activities. These ponds provide the only significant accumulations of water on this section of the stream.

(Another very small drainage approximately 80 m north of Unnamed Creek 1235.9 was noted during spring 1979 (Ref. 54). Only minor seepage was observed at the pipeline crossing. Apparently, this is the second crossing of Unnamed Creek 1235.9 mentioned by Ref. 2.)

Fisheries data collected during spring 1978 and 1979 (Ref. 2 and 54) suggest that Unnamed Creek 1235.9 provides little or no fish habitat the year-round. This stream was assessed as unlikely fish habitat in 1978 and poor fish habitat in 1979. Low discharge and a poorly defined channel in the proposed pipeline area may act as an effective block to upstream fish migration.

# WATERBODY

Waterbody Unnamed Creek 1235.9 #2

Main Drainage Chisana River Tributary to Sweetwater Creek

NPSI 6-223 NPAS 129 NPMP 726.8 AHMP 1235.9

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec. 2

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

This proposed crossing is through a very small drainage located approximately 80 m north of another branch of Unnamed Creek 1235.9. In this region the stream is narrow and has a poorly defined channel that is bordered by willow and dwarf birch. This creek was assessed to be unlikely fish habitat during 1978 and 1979 spring surveys (Refs. 2 and 54) due to the small drainage size, negligible flow and a poorly defined channel that could act as an effective block to fish migration. No fish were captured in the spring of 1979 (Ref. 54). This stream provides little or no fish habitat the year round.

## WATERBODY

Waterbody Unnamed Creek 1236.3Main Drainage Chisana RiverTributary to Sweetwater CreekNPSI 6-222NPAS 129NPMP 726.5AHMP 1236.3USGS Map Reference Nabesna, Ak.T 11N R 22E Sec. 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Unnamed Creek 1236.3 is a shallow, slightly humic-stained stream that flows with intermittent ponding, southwest into Sweetwater Creek through a poorly defined channel. Mud substrate is dominated by thick growths of aquatic vegetation. Dwarf birch, willow, grass and sedge are predominant in surrounding low lying areas while spruce and poplar are found on adjoining hillsides.

Evidence to date suggests that Unnamed Creek 1236.3 may be only occasionally utilized by fish. Spring investigations in June 1978 found fair fish habitat but fishing efforts were without success (Ref. 2). Fish use of this stream during a 1979 spring survey was considered to be low to non-existent due to low discharge, small drainage size, failure to capture fish and a poorly defined channel which could hinder fish movement (Ref. 54). Fall 1979 sampling efforts, however, yielded young-of-the-year grayling, indicating that at least the stream is used for rearing (Ref. 57). The presence of young-of-the-year grayling during fall makes the spring fish use status of this stream suspect. This stream provides no overwintering habitat for fish (Ref. 55).

# WATERBODY

Waterbody Gardiner Creek

Main Drainage Tanana River

Tributary to Chisana River

NPSI 6-219

NPAS 127

NPMP 716.8

AHMP 1246.7

USGS Map Reference Nabesna, Ak.

T 12N R 21E Sec. 3

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS</u>	<u>M,R,S</u>	<u>7,10,54,59</u>
Summer	<u>CN</u>	<u>R</u>	<u>6,7,10</u>
Fall	<u>GR,LS</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>8,9,55</u>

Gardiner Creek is a deep, darkly-stained, slow-flowing stream that drains a large bog and marsh area northeast of the Alaska Highway and meanders southwesterly to the Chisana River (~4 km from the Alaska Highway). Steep banks of silt and sand are vegetated with willow, spruce, birch and aspen. Stream substrate is mud and detritus although gravel and cobble are found immediately downstream of the Alaska Highway. Good cover is provided by sunken logs and long, deep pools provide excellent habitat. The macroinvertebrate fauna of Gardiner Creek includes black flies, mayflies and crane fly larvae (Ref. 6).

Gardiner Creek is utilized by a variety of fish during the open water season. Young-of-the-year and adult grayling captured during 1979 spring and fall investigations indicate that this stream is an important grayling spawning and rearing area (Refs. 54, 57 and 58), as well as a rearing area for longnose sucker and slimy sculpin (Refs. 6 and 54). Other species reported to be present include northern pike and round and humpback whitefish (Ref. 6). Winter studies indicate that Gardiner Creek freezes to the bottom in some locations (Ref. 9) and, where free water is present, extremely low dissolved oxygen concentrations prevail (Refs. 9 and 55). Therefore, winter use of this stream is unlikely and major upstream and downstream migrations of the aforementioned species must occur in spring and fall (Refs. 54, 55 and 57).

## WATERBODY

Waterbody Tenmile CreekMain Drainage Tanana RiverTributary to Chisana RiverNPSI 6-218NPAS 126NPMP 710.7AHMP 1252.8USGS Map Reference Nabesna, Ak.T 13N R 20E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>2,5,54</u>
Summer	<u>None</u>	<u></u>	<u>6,10</u>
Fall	<u>None</u>	<u></u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>9,55</u>

Tenmile Creek is a small, humic-stained stream that flows southwest through a low lying muskeg area, but, in the vicinity of the proposed crossing, the stream is shallow, narrow and swift (Refs. 2 and 57). This stream is a tributary to the Chisana River and supports a number of macroinvertebrates including baetid mayflies, veliids and amphipods (Ref. 6). The mud channel is choked with *Equisetum*, *Carex* and other emergent vegetation and gradually sloping banks support spruce and dense willow.

To date fisheries investigations conducted during the open water period have failed to detect fish in Tenmile Creek, although habitat was considered good (Refs. 2, 6, 54 and 57). A previous investigator suggests that Tenmile Creek may serve as a spawning area and migration pathway for northern pike (Ref. 6). Another study indicated that regions of fast water may inhibit fish movement (Ref. 2). Winter use of Tenmile Creek is non-existent as this stream is either dry or frozen to the bottom during this period (Refs. 9 and 55). Open water fish use remains uncertain but it is obvious that large numbers of fish do not utilize the stream near the proposed crossing and its importance to fish is marginal.

## WATERBODY

Waterbody Silver CreekMain Drainage Tanana RiverTributary to Chisana RiverNPSI 6-217NPAS 125NPMP 704.8AHMP 1258.7USGS Map Reference Nabesna, Ak.T 14N R 20E Sec. 17 and 20

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>2,54,59</u>
Summer	<u>NP</u>	<u>R</u>	<u>6</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>9,73</u>

Silver Creek is a small, humic-stained stream that flows south into Eliza Lake near the Chisana River. Near the pipeline crossing, the narrow channels of this stream are heavily vegetated with aquatic flora and the low to non-existent banks are bordered by bunch grass, willow, dwarf birch and spruce. This stream is reported to support numerous aquatic invertebrates (Ref. 6).

Fish utilization of Silver Creek appears to be low during the open water season (Refs. 6 and 54). Juvenile northern pike were caught in July 1976, indicating use of Silver Creek as a rearing area during summer (Ref. 6). The same study suggested that Silver Creek is a probable migration route for a few whitefish and northern pike in spring and fall. These species have been reported to be present by local residents (Ref. 6). No fish were caught during a 1979 spring survey although sampling efforts were limited by access restrictions (Ref. 54). During summer 1979 the Alaska Highway culvert (downstream from the proposed pipeline crossing) was clogged with roadfill and rip rap (Ref. 60).

Silver Creek provides no winter habitat for fish as this stream was frozen to the bottom in April 1978 and November 1979 (Refs. 9 and 73). Further investigations would be necessary to clarify the importance of Silver Creek if pipeline construction would proceed in the open water season. Access restrictions at the time of sampling prevented a complete survey of the waterbody.



## WATERBODY

Waterbody Unnamed Creek 1262.3 #1Main Drainage Tanana RiverTributary to Chisana RiverNPSI 6-216.01NPAS 124NPMP 701.9AHMP 1262.3USGS Map Reference Tanacross, Ak.T 14N R 19E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1262.3 is a small, slightly humic-stained tributary to the Chisana River. The pipeline route crosses this creek twice approximately 300 m upstream of the Alaska Highway. During 1979 spring investigations, no water was present in the stream channel except at the outfall of the highway culvert where small pools had formed (Ref. 54). Terrestrial vegetation, including willow, birch and spruce, borders these small pools. Where visible, the stream channel is less than 0.2 m wide with mud substrate.

Fish use of Unnamed Creek 1262.3 is considered to be non-existent and fish habitat marginal or absent year-round due to limited discharge or the absence of water. The poorly defined channel probably acts as a barrier to fish passage when water is present. In addition to these habitat limitations, the upstream end of the highway culvert was found to be clogged with highway fill during spring 1979 (Ref. 54).

## WATERBODY

Waterbody Unnamed Creek 1262.3 #2Main Drainage Tanana RiverTributary to Chisana RiverNPSI 6-216.01NPAS 124NPMP 701.9AHMP 1262.3USGS Map Reference Tanacross, Ak.T 14N R 19E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1262.3 is a small, slightly humic-stained tributary to the Chisana River. The pipeline route crosses this creek twice approximately 300 m upstream of the Alaska Highway. Spring investigations found water only in small pools at the outfall of the highway culvert (Ref. 54). Terrestrial vegetation, including willow, birch and spruce, borders the pools. Where Visible, the mud channel is less than 0.2 m with mud substrate.

Fish use of Unnamed Creek 1262.3 is extremely unlikely. No fish were observed or captured during spring surveys conducted in 1978 and 1979 (Refs. 2 and 54). This stream provides very poor fish habitat year-round due to limited discharge or absence of water. The poorly defined channel would also act as a barrier to fish movement when water is present (Ref. 54).

## WATERBODY

Waterbody Unnamed Creek 1266.5Main Drainage Tanana River Tributary to Chisana RiverNPSI 6-216 NPAS 124 NPMP 699.2 AHMP 1266.5USGS Map Reference Tanacross, Ak. T 15N R 19E Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Unnamed Creek 1266.5 is a small (0.3-2 m wide) stream confined by heavily vegetated banks to 2 m high. Vegetation includes dead willow in or across the stream channel, birch and dwarf spruce. Its humic-stained waters flow over mud substrate and occasional patches of fine gravel. At the proposed pipeline crossing a series of shallow pools and riffles are present. Eight hundred meters downstream of the crossing a perched (3 m high) Alaska Highway culvert presents an effective barrier to fish movement.

To date, fisheries investigations during the open water period have failed to detect fish either above or below the Alaska Highway, although habitat was considered good (Ref. 2 and 54). Due to the fish block at the Alaska Highway, upstream regions including the pipeline crossing are presumably non-fish areas. The fisheries status of the stream below the Alaska Highway is uncertain. Winter fish use is non-existent as this stream either dries up or freezes to the bottom during this period (Ref. 55).

## WATERBODY

Waterbody Beaver CreekMain Drainage Yukon RiverTributary to Tanana RiverNPSI 6-215NPAS 124NPMP 697.4AHMP 1268.0USGS Map Reference Tanacross, Ak.T 15NR 19ESec. 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LS,RW</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>GR,RW</u>	<u>R</u>	<u>6</u>
Fall	<u>GR,LS</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>9,55</u>

Beaver Creek is a small stream that flows southwest to its confluence with the Tanana River. This slow-flowing stream is a series of shallow riffles and pools (to 1.5 m deep) with sand and small gravel substrate. It flows through a gorge with incised, mud banks 2-3 m high. The channel is bordered by stands of willow, birch and spruce and accumulated fallen logs and snags provide a considerable cover for fish.

During the open water period, Beaver Creek provides important habitat for fish and is used by a number of species in the vicinity of the proposed crossing. This creek serves as a rearing area for grayling, longnose sucker and round whitefish (Refs. 5, 6, 26, 54, and 57). Numerous young-of-the-year grayling and longnose sucker were captured during 1979 fall sampling efforts, indicating that spawning occurs in this stream (Ref. 57). Northern pike may also use Beaver Creek as a spawning and rearing area (Ref. 6), although to date this species has not been captured or observed. Spring and fall migration of fish undoubtedly occurs in Beaver Creek. Winter investigations conducted in 1977 and 1979 indicate that the stream freezes to the bottom and provides no fish habitat during this period (Ref. 9 and 55).

## WATERBODY

Waterbody Unnamed Creek 1270.4Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-214.01 NPAS 123 NPMP 695.2 AHMP 1270.4USGS Map Reference Tanacross, Ak. T 15N R 18E Sec. 24

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1270.4 is a very small drainage which flows south across the Alaska Highway and into the Tanana River. This stream had no defined channel and negligible flow in June 1979 (Ref. 54). The only significant concentration of water observed in the vicinity of the proposed crossing was a small pool approximately 90 cm deep located below the Alaska Highway culvert. Dissolved oxygen was notably low in this pool (Ref. 54).

Fish were not seen or captured during spring investigations in 1978 and 1979 (Refs. 2 and 54) and summer and fall information is not available. Fish utilization during the open water period appears to be low to non-existent. Winter fish use is unlikely as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Unnamed Creek 1273.0

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-213.01 NPAS 123 NPMP 692.8 AHMP 1273.0

USGS Map Reference Tanacross, Ak. T 15N R 18E Sec. 10 and 15

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>59</u>
Summer	<u>None</u>	<u></u>	<u>2,60</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1273.0 is a small stream that flows southwest into the Tanana River. No fishing efforts have been performed near the proposed crossing, but the area was reported to be good fish habitat in the summer of 1978, especially below the highway culvert, which is probably a block to fish passage (Refs. 2 and 59).

It is not likely that this stream offers fish habitat during winter, due to its similarity to other streams in the area that have been surveyed and found to be dry or freeze solid in early winter.

## WATERBODY

Waterbody Unnamed Creek 1278.3

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-213 NPAS 122 NPMP 688.3 AHMP 1278.3

USGS Map Reference Tanacross, Ak. T 16N R 18E Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,9</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1278.3 is a small stream that flows south to the Tanana River through a 0.5-1.5 m wide channel bordered by willow and spruce. The stream bottom consists primarily of mud.

When surveyed in April 1978 the stream was dry (Ref. 9). Another investigation in June of 1978 found Unnamed Creek 1278.3 to have negligible flow and the stream was assessed as unlikely fish habitat (Ref. 2). A May 1979 investigation of Unnamed Creek 1278.3 noted waterfalls up to 1.0 m high immediately upstream of the proposed crossing. These falls and other small log jams further upstream were considered partial fish blocks (Ref. 59).

Available data indicate that this stream flows for a very limited time in the spring and is dry for the remainder of the year. Such conditions are unsuitable for fish use.

**WATERBODY**

Waterbody Bitters Creek

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-212 NPAS 122 NPMP 686.5 AHMP 1280.2

USGS Map Reference Tanacross, Ak. T 16N R 17E Sec. 24

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS,RW</u>	<u>M,R,S</u>	<u>54,69</u>
Summer	<u>CN,GR,NP,WF</u>	<u>R</u>	<u>6,10,69</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>9</u>

Bitters Creek is a small stream which flows through a steep gorge and into the Tanana River approximately 1.6 km downstream of the Alaska Highway. Its channel is 2-3 m wide with sand and gravel substrate. Large boulders, snags and debris litter the channel downstream from the Alaska Highway providing excellent cover for fish. The stream gradient is steep, but pools are numerous.

Bitters Creek provides excellent fish habitat during the open water season, although no fish have been found upstream of the Alaska Highway in the vicinity of the proposed pipeline route. A perched (35-40 cm) culvert with low water levels and rapid flow probably impedes upstream movement of fish.

Downstream of the Alaska Highway, grayling, longnose sucker, northern pike, round whitefish and slimy sculpin have been captured or observed in Bitters Creek throughout the open water season (Refs, 6, 10, 54, 57 and 69). This stream provides a feeding and rearing area for the aforementioned species. Numerous unidentified fry were captured approximately 1.0 km downstream of the Highway in July 1979 (Ref. 69). The presence of fry is direct evidence of utilization by spring spawning species. Spring and fall migrations undoubtedly occur as 1977-78 winter investigations found Bitters Creek dry and winter fish habitat non-existent (Ref. 55). Although fish have not been reported near the proposed crossing, instream activities could indirectly affect fish found downstream of the Highway.



## WATERBODY

Waterbody Unnamed Creek 1283.2Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-210.02 NPAS 121 NPMP 683.9 AHMP 1283.7USGS Map Reference Tanacross, Ak. T 16N R 17E Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2</u>
Summer	<u>None</u>	<u></u>	<u>2</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1283.2 is a small stream that flows south to the Tanana River through a 0.4-2.0 m wide channel bordered by low grassy banks. The bottom consists primarily of mud and water depths range from 20-120 cm.

Very little information is available for this stream. One study conducted in summer of 1978 assessed the area to be fair fish habitat, but no fish were captured or observed at that time (Ref. 2). Fish use appears to be non-existent for this crossing during the open water period. Winter use is highly unlikely as streams of this size and nature have been found to freeze solid or to be dry soon after freeze-up.

## WATERBODY

Waterbody Unnamed Creek 1285.4Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-210.01 NPAS 121 NPMP 681.8 AHMP 1285.4USGS Map Reference Tanacross, Ak. T 17N R 17E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>2</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1285.4 is a small stream that meanders south to the Tanana River. Low banks vegetated with shrubs and grasses confine the 0.4-1.5 m wide channel and the bottom consists primarily of mud.

Very little information is available for this stream. An investigation in the summer of 1978 assessed the stream to be fair fish habitat, but no fish were captured or observed during the study (Ref 2). Winter fish use is considered extremely unlikely, as streams similar to this in size and nature have been found to be dry or freeze solid soon after freeze-up.

## WATERBODY

Waterbody Unnamed Creek 1296.7Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-210 NPAS 119 NPMP 671.0 AHMP 1296.7USGS Map Reference Tanacross, Ak. T 17N R 15E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>2</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1296.7 is a small (0.4-3 m wide) stream that flows approximately 2.5 km from the proposed pipeline crossing to a small lake lying adjacent to the Tanana River floodplain. Its banks are grassy and low (30-150 cm) and channel substrate is mud.

Fish use of Unnamed Creek 1296.7 is low to non-existent the year round. Fisheries investigations conducted in June 1978 indicated that fish habitat was fair; however, no fish were captured (Ref. 2). During these same investigations the culvert at the Alaska Highway crossing was noted to be a fish block. This block is downstream of the proposed crossing and probably prevents fish from utilizing upstream areas.

## WATERBODY

Waterbody Unnamed Creek 1297.9

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-209 NPAS 119 NPMP 669.9 AHMP 1297.9

USGS Map Reference Tanacross, Ak. T 17N R 15E Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,59,60</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1297.9 flows southwest toward the Tanana River from foothills overlooking the Tetlin Indian Reservation. This small stream is crossed by the Alaska Highway approximately 200 m downstream of the proposed pipeline crossing and then flows into a small lake adjacent to the Tanana River floodplain. Flow is intermittent and dependent upon periods of high runoff or snow melt. Incised banks are vegetated with sedges, willows and alders and stream substrate consists of sod, detritus and moss.

Intermittent flow and the presence of fish blocks within the stream preclude the possibility of fish use in the vicinity of the proposed pipeline crossing. Results of a survey in May 1979 indicate that sod ledges in the stream bottom and a perched culvert at the Alaska Highway act as barriers to fish movement (Ref. 59). This stream was dry at the Alaska Highway 28 June 1979 and electrofishing efforts in spring 1978 failed to capture any fish above or below the Alaska Highway (Ref. 2 and 60).

## WATERBODY

Waterbody Tanana River at TokMain Drainage Yukon River Tributary to Yukon RiverNPSI 6-207A,B NPAS 118 NPMP 664.3 AHMP 1303.3USGS Map Reference Tanacross, Ak. T 18N R 14E Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,CN,HW,LC,LS,NP,RW</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>6</u>
Fall	<u>BB,CN,GR,HW,LC,LS,NP,RW</u>	<u>M,R,S</u>	<u>57</u>
Winter	<u>BB</u>	<u>R,W</u>	<u>55</u>

The Tanana River is a large, braided, glacial river formed by the junction of the Chisana and Nabesna rivers near the Alaska/Canada border. The Tanana River is crossed by the Alaska Highway at AHMP 1303.3 and flows northwest into central Alaska where it joins the Yukon River.

Relatively little is known about the fishery resource of the Tanana River near the proposed crossing. It was previously thought that few fish were able to tolerate its highly turbid waters, especially during summer months (Ref. 6); consequently, few attempts have been made to sample the Tanana River. Based on recent findings, it appears that the Tanana River is an important fish stream year round.

The Tanana River at Tok is a rearing area for northern pike, burbot, long-nose sucker, lake chub, slimy sculpin, round whitefish and humpback whitefish (Refs. 54 and 57). It is also a nursery area for humpback whitefish, longnose sucker, lake chub, grayling and slimy sculpin fry (Refs. 54 and 57). Spring and fall 1979 investigations indicate that this area could be a spawning area for humpback whitefish in the fall and may also be used by spring spawning species (Refs. 54 and 57).

The Tanana River near Tok is an important migration route for fish moving to and from overwintering areas in the river (Refs. 54 and 57). Investigations conducted during 1979 (Refs. 54, 55 and 57) indicate that the Tanana River at Tok

## FISHERIES ASSESSMENT (CON'T)

## Tanana River at Tok

is a wintering area for burbot and probably for other species as well (Ref. 55). Although salmon utilize downstream portions of the Tanana River, salmon have not been captured in the river near the proposed pipeline crossing.

## WATERBODY

Waterbody Tanana River Alternate #1

Main Drainage Yukon River Tributary to Yukon River

NPSI 6-207C NPAS 118 NPMP 664.3 AHMP 1303.3

USGS Map Reference Tanacross, Ak. T 18N R 14E Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,CN,HW,LC,LS,NP,RW</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>6</u>
Fall	<u>BB,CN,GR,HW,LC,LS,NP,RW</u>	<u>M,R,S</u>	<u>57</u>
Winter	<u>BB,LS</u>	<u>R,W</u>	<u>9,55</u>

The Tanana River is a large braided glacial river formed by the junction of the Nabesna and Chisana rivers near the Alaska/Canada border. The Tanana River is crossed by the Alaska Highway at AHMP 1303.3 and flows northwest into central Alaska where it joins the Yukon River. The Tanana River at the present crossing is separated into 2 channels. The present one is approximately 1.4 km downstream of the Alaska Highway bridge.

At Alternate Crossing #1, the stream channel width is approximately 100 m, and the floodplain width is approximately 460 m. Banks are generally high on the northeast and low and heavily wooded on the southeast.

Fish species reported to be present in the Tanana River include: grayling, round whitefish, humpback whitefish, lake whitefish, northern pike, burbot, slimy sculpin, longnose sucker, lake chub, least cisco, sheefish, Dolly Varden, coho salmon, chum salmon and king salmon (Refs. 5, 11, 26 and 76). Some of these species (e.g. coho, chum and king salmon, sheefish) have not been reported in the Tanana as far upstream as the Alaska Highway, however.

Relatively little is known about the fishery resource of the Tanana River near the present crossing. It was previously thought that few fish were able to tolerate its highly turbid waters, especially during summer months (Ref. 6); consequently, few attempts have been made to sample the Tanana River. Based on recent findings it appears that the Tanana River is an important fish stream, year round.

## FISHERIES ASSESSMENT (CON'T)

## Tanana River Alternate #1

The Tanana River is a rearing area for northern pike, burbot, longnose sucker, lake chub, slimy sculpin, round whitefish and humpback whitefish (Refs. 54 and 57). It is also a nursery area for humpback whitefish, longnose sucker, lake chub, grayling and slimy sculpin fry (Refs. 54 and 57). Spring and fall 1979 investigations indicate that this region could be a spawning area for humpback whitefish in the fall and may also be used by spring spawning species (Refs. 54 and 57).

The Tanana River is an important migration route for fish moving to and from overwintering locations in the river (Refs. 54 and 57). Investigations conducted during 1979 (Refs. 54, 55 and 57) indicate that the Tanana River at Tok provides a wintering area for burbot and probably provides suitable winter habitat for other species as well (Ref. 55).



## WATERBODY

Waterbody Tanana River Alternate #2Main Drainage Yukon River Tributary to Yukon RiverNPSI 6-208 NPAS 118 NPMP 664.3 AHMP 1303.3USGS Map Reference Tanacross, Ak. T 18N R 14E Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,CN,HW,LC,LS,NP,RW</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>6</u>
Fall	<u>BB,CN,GR,HW,LC,LS,NP,RW</u>	<u>M,R,S</u>	<u>57</u>
Winter	<u>BB,LS</u>	<u>R,W</u>	<u>9,55</u>

The Tanana River is a large braided glacial river formed by the junction of the Nabesna and Chisana rivers near the Alaska/Canada border. The Tanana River is crossed by the Alaska Highway at AHMP 1303.3 and flows northwest into central Alaska where it joins the Yukon River. The Tanana River at the present crossing consists of 2 main channels. The present one is approximately 2.0 km downstream of the Alaska Highway bridge.

At Alternate Crossing #2, banks are incised and approximately 2 m in height and heavily wooded on both sides of the river. The floodplain is approximately 460 m in width and divided by an island which is wooded only below the crossing.

Fish species reported to be present in the Tanana River include: grayling, round whitefish, humpback whitefish, lake whitefish, northern pike, burbot, slimy sculpin, longnose sucker, lake chub, least cisco, sheefish, Dolly Varden, coho salmon, chum salmon and king salmon (Refs. 5, 11, 26 and 76). Some of these species (e.g. coho, chum and king salmon, sheefish) have not been reported in the Tanana as far upstream as the Alaska Highway, however.

Relatively little is known about the fishery resource of the Tanana River near the present crossing. It was previously thought that few fish were able to tolerate its highly turbid waters, especially during summer months (Ref. 6); consequently, few attempts have been made to sample the Tanana River. Based on recent findings presented herein it appears that the Tanana River is an important fish stream, year round.

## FISHERIES ASSESSMENT (CON'T)

## Tanana River Alternate #2

The Tanana River is a rearing area for northern pike, burbot, longnose sucker, lake chub, slimy sculpin, round whitefish and humpback whitefish (Refs. 54 and 57). It also provides a nursery area for humpback whitefish, longnose sucker, lake chub, grayling and slimy sculpin fry (Refs. 54 and 57). Spring and fall 1979 investigations indicate that this region could be a spawning area for humpback whitefish in the fall and may also be used by spring spawning species (Refs. 54 and 57).

The Tanana River is an important migration route for fish moving to and from overwintering locations in the river (Refs. 54 and 57). Investigations conducted during 1979 (Refs. 54, 55 and 57) indicate that the Tanana River at Tok provides a wintering area for burbot and probably provides suitable winter habitat for other species as well (Ref. 55).

## WATERBODY

Waterbody Tok RiverMain Drainage Yukon River Tributary to Tanana RiverNPSI 6-205 NPAS 117 NPMP 658.2 AHMP 1309.4USGS Map Reference Tanacross, Ak. T 18N R 13E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,CN,GR,LC,LS,RW,WF</u>	<u>M,R,S</u>	<u>6,10,54</u>
Summer	<u>None</u>	<u></u>	<u>69</u>
Fall	<u>CN,GR,RW</u>	<u>M,R</u>	<u>8,57</u>
Winter	<u>None</u>	<u>None</u>	<u>7,8,9,55</u>

The Tok River is a semi-glacial stream that crosses the Alaska Highway about five miles east of Tok and flows northeast into the Tanana River. This stream is 25-40 m wide, about 95 km long and originates in the Alaska Range. Its waters are clearer than entirely glacial streams due to contributions by springs and clear water tributaries.

The Tok River is important to a variety of fish species throughout the open water season. It serves as a rearing area for round whitefish, longnose sucker, grayling, burbot and slimy sculpin (Refs. 6, 10, 54 and 57). Little is known of grayling spawning in this region. Important grayling spawning grounds have been identified in the Little Tok River, a tributary of the Tok River (Ref. 39). The presence of grayling and round whitefish fry indicates fish use of the lower reaches of the Tok River near the pipeline route as a nursery area and there is increasing evidence that grayling also use this area for spawning (Refs. 54 and 57). Whitefish fry captured during 1979 spring investigations probably migrated downstream from the more stable areas within the Tok River Drainage (Ref. 54). The Tok River in the vicinity of the pipeline crossing is either dry or frozen to the bottom in winter (Refs. 7, 8, 9 and 55) and does not provide overwinter habitat for the eggs of fall spawning species.

The Tok River is a major migration pathway for many species during spring and fall since most of this stream freezes solid during winter months. It remains unknown, however, if the important major grayling populations found in

## FISHERIES ASSESSMENT (CON'T)

## Tok River

the Tok overflow and Little Tok River (upstream tributaries of the Tok River) migrate downstream into the Tanana River or remain upstream to overwinter. Other fish species known to be present in the Tok River include northern pike and lake chub (Refs. 6 and 10).

The presence of a State campground at the Alaska Highway bridge has created a high public use area not far upstream from the proposed crossing. A well traveled path follows the stream bank downstream to the crossing, but most activity is concentrated in the immediate vicinity of the campground.

## WATERBODY

Waterbody Crystal Slough CreekMain Drainage Yukon RiverTributary to Tanana RiverNPSI 6-203.03NPAS 114NPMP 639.0AHMP 1328.2USGS Map Reference Tanacross, Ak.T 18N R 10E Sec. 11 and 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS</u>	<u>M,R,S</u>	<u>2,54,60</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>CN,GR,NP,X</u>	<u>M,R</u>	<u>9,57</u>
Winter	<u>None</u>	<u></u>	<u>55</u>

Crystal Springs originates, in part, from an upwelling source which flows north across the Alaska Highway and joins additional springs near the Tanana River. Between the proposed crossing and the Alaska Highway, its 1-3 m wide channel flows through a large muskeg area vegetated with willow, dwarf birch and scattered spruce. Crystal Springs is relatively shallow (usually less than 0.5 m deep), clear, and in some areas remains open year round. The stream channel is well-defined but often hidden from view by overhanging vegetation.

Crystal Springs is a rearing area during the open water season for grayling, longnose sucker, slimy sculpin and northern pike (Refs. 2, 54, 57 and 60). Young-of-the-year and adult grayling were present during 1979 fall surveys indicating that spawning occurs in Crystal Springs (Ref. 57). Fair numbers of adult grayling in spawning condition were reported to have been caught at the Alaska Highway in early June 1978 (Ref. 2). Other species indigenous to the Tanana River may also frequent Crystal Springs.

Crystal Springs provides good fish habitat in winter and should be considered a potential wintering area. Although water quality was good and potential food abundant, fish use of Crystal Springs was found low to non-existent during a 1979 winter survey (Ref. 55). Careful consideration should be given to this area, however. Crystal Springs may be an important water source for fish wintering areas downstream from the Alaska Highway (Crystal Springs Slough and the Tanana River) (Ref. 55).

# WATERBODY

Waterbody Unnamed Creek 1328.2

Main Drainage Tanana River Tributary to Crystal Springs

NPSI 6-203.02 NPAS 114 NPMP 638.8 AHMP 1328.2

USGS Map Reference Tanacross, Ak. T 18N R 10E Sec. 11

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1328.2 is a small, slightly humic-stained stream which crosses the Alaska Highway and then flows along the Haines Products Pipeline to its confluence with Crystal Springs. Its channel is poorly defined and variable in width from 0.3-1.0 m. The waters of the stream are ponded on both sides of the Alaska Highway culvert and intermittently along the Haines Products Pipeline. This stream drains a large area of low-lying muskeg and tundra.

Fish habitat is poor to non-existent and fish use of the stream is unlikely year round. No fish were seen or captured in this stream near the Alaska Highway during 1979 spring investigations (Ref. 54). There is no defined channel south of the Alaska Highway and it is unlikely that fish could penetrate the low, wet muskeg as far upstream as the proposed pipeline crossing. Winter fish use of Unnamed Creek 1328.2 is considered to be impossible since this small stream would freeze to the bottom during this period.

Three Alaska Highway culverts are situated between Milepost 1328.2 and 1328.6. Only standing water was present at these culverts in the spring of 1979 (Ref. 54).

# WATERBODY

Waterbody Unnamed Creek 1329.5

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-203.01 NPAS 113 NPMP 637.6 AHMP 1329.5

USGS Map Reference Tanacross, Ak. T 18N R 10E Sec. 10

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1329.5 is a small, very steep gradient stream in the vicinity of the proposed pipeline crossing. It flows approximately 200 m downstream from the crossing to the Alaska Highway and into a low-lying wetland adjacent to the Tanana River flood plain. Flow is intermittent and the stream is typically dry except during periods of high runoff or snow melt.

The physical nature of this stream precludes fish utilization in the vicinity of the proposed crossing. The steep gradient provides little or no habitat and results in numerous small falls and water velocity barriers to fish passage. These factors combined with the ephemeral flow of this stream would prevent fish from ascending into this portion of the stream.

Studies conducted between 30 May and 12 June 1978 found no fish by electro-fishing above and below the Alaska Highway culvert. The culvert was also described as a fish block (Ref. 2).

## WATERBODY

Waterbody Unnamed Creek 1330.5

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-203 NPAS 113 NPMP 636.5 AHMP 1330.5

USGS Map Reference Tanacross, Ak. T 18N R 10E Sec. 4 and 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1330.5 flows northerly about 2 km from the proposed crossing to its confluence with the Tanana River. This is a small stream, 2-3 m wide, which is dry except during periods of high runoff. The gradient is very steep and water velocities are high. The substrate is typical of steep, high runoff channels, consisting predominantly of large boulders (0.5-1.5 cm), cobble and some gravel. Mud and humus banks up to 1 m high are well-vegetated with mosses, grasses, alder and wild roses and are bordered by a mixed stand of birch, aspen and spruce.

This stream provides no fish habitat in the proximity of the pipeline route. Spring surveys in 1979 found that the intermittent nature of the water flow, steep gradient and accumulation of sticks and debris in the channel, prevent fish from reaching the crossing (Ref. 54). On 23 June 1979 the stream was found to be dry with some evidence of flow during the recent spring breakup. The lower reaches of this stream may provide fish habitat nearer its confluence with the Tanana River (Ref. 2).



## WATERBODY

Waterbody Moon Lake Tributary #1Main Drainage Yukon RiverTributary to Tanana RiverNPSI 6-202NPAS 113NPMP 635.2AHMP 1331.9USGS Map Reference Tanacross, Ak.T 18N R 10E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Moon Lake Tributary is a small, steep gradient stream which divides into two distinct channels at the proposed pipeline crossing. The two channels are also crossed by the Alaska Highway before emptying into Moon Lake. Flow is infrequent in the channels and is dependent on high runoff or snow melt. Bottom substrates are boulders and cobble.

Moon Lake Tributary provides no fish habitat near the proposed pipeline crossing. This stream is described as 'ephemeral' (Ref. 6) and both channels were dry at the Alaska Highway in June 1978 (Ref. 2).

## WATERBODY

Waterbody Moon Lake Tributary #2Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-202 NPAS 113 NPMP 635.2 AHMP 1331.9USGS Map Reference Tanacross, Ak. T 18N R 10E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Moon Lake Tributary is a small, steep gradient stream which divides into two distinct channels at the proposed pipeline crossing. The two channels are also crossed by the Alaska Highway before emptying into Moon Lake. Flow is infrequent in the channels and is dependent on high runoff or snow melt. Bottom substrates are boulders and cobble.

Moon Lake Tributary provides no fish habitat near the proposed pipeline crossing. This stream is described as 'ephemeral' (Ref. 6) and both channels were dry at the Alaska Highway in June 1978 (Ref. 2).

## WATERBODY

Waterbody Yerrick Creek

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-201 NPAS 113 NPMP 633.0 AHMP 1333.7

USGS Map Reference Tanacross, Ak. T 19N 9E 36  
18N 9E Sec. 1

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV,GR</u>	<u>M,R</u>	<u>54,64</u>
Summer	<u>CN,DV,GR,RW</u>	<u>R</u>	<u>6,10,68,69</u>
Fall	<u>GR,RW</u>	<u>M,R</u>	<u>57</u>
Winter	<u>GR</u>	<u>W</u>	<u>55</u>

Yerrick Creek is a swift, clear water stream flowing northerly from the Alaska Range to its confluence with the Tanana River. The 10-15 m wide and sometimes braided channel follows a steep gradient floodplain consisting of boulders, cobble and gravel. Gravel, sand and mud banks up to 2.5 m high are vegetated by alder, cottonwood and aspen. A larger volume of water has been reported approximately 1.5 km upstream of the pipeline crossing than at the Alaska Highway, which indicates the presence of some subterranean flow (Ref. 6).

Yerrick Creek provides important fish habitat for a variety of fish species throughout the year. It offers potential spring spawning habitat for grayling, (Ref. 54) and serves as a rearing area for Dolly Varden, grayling, slimy sculpin and round whitefish during the open water period (Refs. 5, 6, 10, 54, 57, 64, 68 and 69). The lower reaches of Yerrick Creek near its confluence with the Tanana River are suspected to also contain northern pike, lake chub and longnose sucker (Refs. 6, 7 and 10).

Yerrick Creek should be considered a potential overwintering stream in the vicinity of the pipeline route. Good early winter fish habitat was available throughout this region in late November 1979 and a single grayling was observed in an open water area downstream of the proposed crossing (Ref. 55).

# WATERBODY

Waterbody Unnamed Creek 1336.9 #1

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-200.01 NPAS 112 NPMP 630.8 AHMP 1336.9

USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 33

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54,69</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route there are two branches of Unnamed Creek 1336.9. The present crossing is on the branch that flows northeasterly. The other crossing is on the branch that flows northwesterly. Fish habitat in both branches is very similar; therefore the assessments are the same for both crossings. Near the proposed crossing the channel of the stream is poorly defined. Waters are slightly stained and flow through a few small, 1.5 m deep pools bordered by willow, aspen and cottonwood. The stream bottom consists of mud and banks are up to 1 m high.

Surveys conducted during the open water period of 1978 and 1979 found fish habitat to be poor in the vicinity of the pipeline route due to low discharge and a poorly defined channel (Ref. 2 and 54). An investigation conducted in June 1979 found the stream channel dry (Ref. 69).

The Alaska Highway crosses Unnamed Creek 1336.9 about 800 m downstream of the pipeline route. In this area there is a deep pool along the edge of a material site which empties into the Tanana River approximately 600 m downstream. Investigations conducted during the spring of 1978 and 1979 failed to capture any fish in this area; however, it was considered good fish habitat (Refs. 2 and 54). The outlet of this pool is a weed choked channel which may restrict fish movement into the pool area during low water periods (Ref. 54). This stream provides no winter fish habitat.

## WATERBODY

Waterbody Unnamed Creek 1336.9 #2Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-200 NPAS 112 NPMP 630.7 AHMP 1336.9USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54,69</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route there are two branches of Unnamed Creek 1336.9. The present crossing is on the branch that flows northwesterly. The other crossing is on the northeasterly flowing branch. Fish habitat in both branches is very similar; therefore the assessments for both crossings are the same. Near the pipeline the channel of the stream is poorly defined. Waters are slightly stained and flow through a few small 1.5 m deep pools bordered by willow, aspen and cottonwood. The stream bottom consists of mud and banks are up to 1 m high.

Surveys conducted during the open water period of 1978 and 1979 found fish habitat to be poor in the vicinity of the proposed pipeline route due to low discharge and a poorly defined channel (Refs. 2 and 54). An investigation conducted in June 1979 found the stream channel dry (Ref. 69).

The Alaska Highway crosses Unnamed Creek 1336.9 about 800 m downstream of the pipeline route. In this area there is a deep pool along the edge of a material site which empties into the Tanana River approximately 600 m downstream. Investigations conducted during spring of 1978 and 1979 failed to capture any fish in this area; however, it was considered good fish habitat (Refs. 2 and 54). The outlet of this pool is a weed choked channel which may restrict fish movement into the pool area during low water periods (Ref. 54). This stream provides no winter fish habitat.

## WATERBODY

Waterbody Cathedral Rapids Creek #1Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-199 NPAS 112 NPMP 629.2 AHMP 1338.1USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>60</u>
Summer	<u>None</u>	<u>None</u>	<u>68,69</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~ 300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high water runoff.

# WATERBODY

Waterbody Cathedral Rapids Creek #2

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-198 NPAS 112 NPMP 628.6 AHMP 1338.7

USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 31

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,60</u>
Summer	<u>None</u>	<u>None</u>	<u>68,69</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~ 300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high runoff.

## WATERBODY

Waterbody Cathedral Rapids Creek #3Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-197B NPAS 112 NPMP 628.6 AHMP 1338.7USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 31

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,60</u>
Summer	<u>None</u>	<u>None</u>	<u>60,68,69</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~ 300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high runoff.



## WATERBODY

Waterbody Cathedral Rapids Creek #4Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-197A NPAS 112 NPMP 628.5 AHMP 1338.8USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 31

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>59</u>
Summer	<u>None</u>	<u>None</u>	<u>68,69</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~ 300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high runoff.

# WATERBODY

Waterbody Cathedral Rapids Creek #5

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-197 NPAS 112 NPMP 628.4 AHMP 1338.9

USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 31

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u>None</u>	<u>68,69</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~ 300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high runoff.

## WATERBODY

Waterbody Cathedral Rapids Creek #6Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-196 NPAS 112 NPMP 628.2 AHMP 1339.0USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 31

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,59,60</u>
Summer	<u>None</u>	<u>None</u>	<u>68</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~ 300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high runoff.

# WATERBODY

Waterbody Cathedral Rapids Creek #7

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-195 NPAS 112 NPMP 628.0 AHMP 1339.2

USGS Map Reference Tanacross, Ak. T 19N R 9E Sec. 31

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>59,60</u>
Summer	<u>None</u>	<u>None</u>	<u>68,69</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Cathedral Rapids Creek is divided into seven channels. The seven channels are actually formed by three drainages that flow northerly from the Alaska Range and subdivide near the proposed pipeline. The channels have been channelized by bulldozers in the vicinity of the Alaska Highway crossings (~300 to 400 m downstream of the proposed pipeline route) to facilitate flood-stage runoff. Water flow in all channels is sporadic and depends on high runoff.

## WATERBODY

Waterbody Unnamed Creek 1339.8

Main Drainage Yukon River Tributary to Tanana River

NPSI 6-193.01 NPAS 112 NPMP 627.5 AHMP 1339.8

USGS Map Reference Tanacross, Ak. T 19N R 8E Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>*LC,NP,RW</u>	<u>R</u>	<u>54</u>
Summer	<u>*GR,LC,LS,NP,RW</u>	<u>R</u>	<u>2,6,10,69</u>
Fall	<u>None</u>		<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

\*See assessment -- no fish recorded in immediate vicinity of pipeline.

In the vicinity of the pipeline crossing, Unnamed Creek 1339.8 flows northwesterly through a heavily vegetated, low bog area. Precipitation and runoff in spring 1979 caused ponding at the crossing with no inward or outward exchange of water (Ref. 54). Other surveys in summer and fall have found the area to be dry (Ref. 2, 57 and 69). From the pipeline crossing to 30 m below the Alaska Highway, the stream channel is undefined and flow or seepage intermittent (Refs. 54 and 57). At the Alaska Highway crossing, the wooden culvert is perched (~0.6 m) and would impede fish movement to upstream regions. The above conditions combine to make fish utilization of the stream in areas closely adjacent to the proposed pipeline crossing extremely unlikely.

Approximately 30 m downstream of the highway, Unnamed Creek 1339.8 is transformed into a slough-like backwater of the Tanana River. This slough is turbid and has a mud/silt bottom. It provides good fish habitat whenever water levels of the Tanana River cause inundation and during these periods many species indigenous to the Tanana River are likely to frequent this slough. Lake chub, round whitefish, northern pike, longnose sucker and grayling have been found to utilize this waterbody as a rearing or nursery area during spring and summer (Refs. 6, 10 and 54). Although no northern pike fry have been captured, this slough is considered good spawning habitat for this species. Fish probably enter this slough immediately after breakup but it is highly unlikely that they are able to proceed upstream to the proposed pipeline crossing during any time of year. This backwater area provides no winter habitat for fish (Ref. 55).

## WATERBODY

Waterbody Unnamed Creek 1340.5Main Drainage Yukon River Tributary to Tanana RiverNPSI 6-192.01 NPAS 111 NPMP 626.2 AHMP 1340.5USGS Map Reference Tanacross, Ak. T 19N R 8E Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

From above the proposed pipeline crossing downstream to the Alaska Highway, the channel of Unnamed Creek 1340.5 is poorly defined through a spruce and willow forest. Below the Alaska Highway, the channel is narrow (0.3-1.1 m), well-defined and has a steep gradient.

Fish use of this stream near the pipeline crossing is unlikely at any time of the year due to absence of appropriate habitat. The stream channel was dry during 1978 and 1979 spring investigations. In addition, the Alaska Highway culvert is a barrier to upstream fish migration due to a 1.0 m drop at its outfall.

## WATERBODY

Waterbody Sheep CreekMain Drainage Yukon River Tributary to Tanana RiverNPSI 6-191 NPAS 111 NPMP 625.1 AHMP 1342.2USGS Map Reference Tanacross, Ak. T 19N R 8E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>7,54</u>
Summer	<u>None</u>	<u>None</u>	<u>6,10,68,69</u>
Fall	<u>None</u>	<u>None</u>	<u>8</u>
Winter	<u>None</u>	<u>None</u>	<u>8</u>

Sheep Creek is a small stream (1-2 m wide) that drains a northern portion of the Alaska Range and flows northeast to its confluence with the Tanana River. The water of this intermittently flowing stream is slightly turbid (glacial). Substrate consists primarily of gravel with numerous sand and silt deposits. Downstream of the proposed pipeline crossing, 1-2 m high banks are heavily vegetated with willow and alder. Upstream the floodplain widens to approximately 175 m and substrates are mainly cobble and boulder.

Available data indicate that fish use of Sheep Creek in the pipeline area is minimal or non-existent. A 1979 spring field survey found good fish habitat near the pipeline crossing, but no fish were captured or observed during this investigation (Ref. 54). Other investigators have also failed to document fish use of this stream (Refs. 6, 7, 8, 10, 68, and 69).

## WATERBODY

Waterbody Unnamed Creek 1343.7Main Drainage Yukon River Tributary to Tanana RiverNPSI 5-190 NPAS 111 NPMP 623.5 AHMP 1343.7USGS Map Reference Tanacross, Ak. T 19N R 8E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1343.7 flows northeast to the Tanana River through a series of small ponds and areas of low-lying muskeg. The narrow channel, less than 1 m wide, is bordered by low banks vegetated with sedges, willow and spruce. Terrestrial vegetation, including grasses and willows, is abundant within the stream channel which suggests only occasional or intermittent flow. The stream bottom consists primarily of mud with some areas of cobble substrate.

Approximately 90 m upstream of the Alaska Highway the pipeline route bisects a pond approximately 250 m<sup>2</sup>. Sedges are dominant in and around this shallow (0.3 m) standing waterpond. A poorly defined outlet with only seepage flow in the spring makes fish passage into the pond from downstream unlikely (Ref. 54). In addition, the Alaska Highway culvert is perched and has created a 0.3 m vertical drop. This would block or impede upstream fish movements.

Fish use of Unnamed Creek 1343.7 is unlikely year round due to poor fish habitat, the perched highway culvert and the intermittent nature of this stream (Refs. 2 and 54).



## WATERBODY

Waterbody Robertson River

Main Drainage Yukon River Tributary to Tanana River

NPSI 5-187 NPAS 110 NPMP 619.6 AHMP 1347.6

USGS Map Reference Tanacross, Ak. T 20N R 8E Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,WF</u>	<u>M,R</u>	<u>9,54</u>
Summer	<u>None</u>	<u></u>	<u>6,10</u>
Fall	<u>GR,LC</u>	<u>M,R</u>	<u>8,57,75</u>
Winter	<u>None</u>	<u>None</u>	<u>7,8,9,55,77</u>

The Robertson River is a large braided glacial stream which originates in the Alaska Range and flows northeast into the Tanana River. The waters of the Robertson River are highly turbid during spring and summer but are clear by late fall. High turbidity from glacial silt during summer months had been reported to preclude residence of aquatic life in the Robertson River (Ref. 6); however, recent 1979 investigations indicate that this is not wholly true. The Robertson River has two major clearwater tributaries which are known to contain fish. These feeder streams enter the Robertson approximately 10-13 km above the Alaska Highway and are reported to contain round whitefish, grayling and Dolly Varden (Ref. 6).

The Robertson River is a rearing area for a variety of species in spring and fall (Refs. 54, 57 and 75). Spawning probably does not occur in the mainstem of the Robertson River near the proposed pipeline crossing. But fish likely migrate through the region to and from upstream spawning areas.

Winter fish use in the Robertson River is non-existent as this river provides unsuitable habitat (Refs. 7, 8, 9, 55, and 77). Winter investigations have found water confined to thin lenses in the ice or very narrow fast flowing channels (Ref. 77). These channels are constricted by accumulations of anchor ice that shift and cause overflow water. This continues throughout the winter covering the entire floodplain with aufeis to 2.35 m thick (Ref. 55).

## WATERBODY

Waterbody Unnamed Creek 1350.1Main Drainage Yukon River Tributary to Tanana RiverNPSI 5-185.03 NPAS 110 NPMP 617.2 AHMP 1350.1USGS Map Reference Tanacross, Ak. T 20N R 8E Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1350.1 is a very small drainage with no defined channel. Its waters seep from a tundra/muskeg area, cross the Alaska Highway and the pipeline route about 80 m downstream from the highway. The only significant concentrations of water were just above and below the Alaska Highway culvert and at the pipeline crossing in spring 1979 (Ref. 54). Flow was intermittent between these locations.

It is unlikely that this drainage in the area of the pipeline route supports fish at any time of year due to poor habitat (Ref. 54). The stream was seined in June 1978 without results (Ref. 2). A perched culvert (1 m drop at outfall) at the Alaska Highway is also a barrier to fish passage.

## WATERBODY

Waterbody Unnamed Creek 1350.2

Main Drainage Yukon River Tributary to Tanana River

NPSI 5-185.02 NPAS 110 NPMP 617.0 AHMP 1350.2

USGS Map Reference Tanacross, Ak. T 20N R 8E Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2.54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1350.2 is a very small drainage which appears to seep from a tundra/muskeg area south of the Alaska Highway. The only body of water found during a 1979 spring survey was a small pool just upstream from the Alaska Highway culvert (Ref. 54). This poorly defined channel is overgrown with spruce and willow and was dry at the pipeline crossing in June 1979 (Ref. 54).

Unnamed Creek 1350.2 does not provide fish habitat and it is extremely unlikely that fish utilize this drainage in the area of the pipeline route at any time of year (Ref. 54). The stream was also considered marginal habitat at the pipeline crossing and was electrofished without result in June 1978 (Ref. 2).

## WATERBODY

Waterbody Unnamed Creek 1352.3

Main Drainage Yukon River Tributary to Tanana River

NPSI 5-185.01 NPAS 109 NPMP 615.1 AHMP 1352.3

USGS Map Reference Tanacross, Ak. T 21N R 8E Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1352.3 is a small drainage that seeps from a large muskeg area south of the Alaska Highway. Its poorly defined channel disappears not far upstream and downstream from the highway and there is no definable channel at the proposed pipeline crossing. The only significant concentrations of water found during a 1979 spring survey were small pools on either end of the wooden highway culvert (Ref. 54).

Unnamed Creek 1352.3 is not a fish stream in the vicinity of the pipeline route. No fish were observed or captured during surveys conducted during the spring of 1978 or 1979 (Refs. 2 and 54).

## WATERBODY

Waterbody Bear CreekMain Drainage Yukon River Tributary to Tanana RiverNPSI 5-185 NPAS 109 NPMP 609.9 AHMP 1357.3USGS Map Reference Tanacross, Ak. T 21N R 7E Sec. 11,12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>10,54</u>
Summer	<u>CN,DV,GR,LS</u>	<u>R</u>	<u>6,10</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>7,8,9,55,73,77</u>

Bear Creek is a glacial stream 6-12 m in width which originates in the Alaska Range. It's main tributary flows from Fish Lake and contributes slightly humic-stained water to the main stem 18 km above the Alaska Highway. The stream bottom is composed primarily of gravel and cobble with some scattered boulders. Benthic periphyton is abundant on these substrates in summer.

At the pipeline crossing, Bear Creek provides good fish habitat and is used by a variety of fish as a spring and fall migration route and a rearing area during the open water period. Adult and young-of-the-year grayling captured in Bear Creek indicate spawning use of this stream (Refs. 54 and 57). Longnose sucker, slimy sculpin, and Dolly Varden have also been captured or observed in Bear Creek throughout the open water season (Refs. 6, 10, 54 and 57).

Winter use of Bear Creek at the pipeline crossing is non-existent. Investigations conducted to date report the stream to be dry during winter (Refs. 7, 8, 9, 55, and 77). The upper reaches of Bear Creek are known to support Dolly Varden and slimy sculpin throughout the winter season (Ref. 9). This suggests year round flow in that area and subterranean flow in the area of the pipeline crossing.

# ATERBODY

dy Chief Creek

rainage Tanana River Tributary to Bear Creek

5-184 NPAS 108 NPMP 608.6 AHMP 1358.6

Map Reference Mt. Hayes, Ak. T 21N R 7E Sec. 2

## -FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
ing	<u>None</u>	<u>None</u>	<u>7</u>
mer	<u>GR</u>	<u>R</u>	<u>6,10,60</u>
1	<u>None</u>	<u>None</u>	<u>57</u>
ter	<u>None</u>	<u>None</u>	<u>8,9</u>

Chief Creek is a small humic-stained stream which drains a portion of Knob  
 lge and flows north across the Alaska Highway into Bear Creek. Chief Creek  
 reported to be fed by an occasional spring (Ref. 10) but depends primarily  
 surface runoff to sustain its flow. Flow is seasonal and intermittent;  
 extreme fluctuations occur throughout the open water months. The stream  
 is 1.5-5 m wide at the time of the 1979 fall survey and ice was forming in  
 sl areas. The bottom is composed of gravel and silt. Shallow banks (0.2-2 m)  
 are vegetated with willow, alder and grass.

Evidence to date indicates that fish utilization of Chief Creek is low to  
 non-existent near the proposed pipeline. Although habitat appeared to be fair  
 1979 spring and fall investigations, no fish were captured (Ref. 54 and 57).  
 No fish or macroinvertebrates were found during stream surveys in July 1976  
 (Ref. 6). However, one grayling was caught in the stream in June of 1963  
 (Ref. 10). The paucity of fish is probably due largely to intermittent flow,  
 stream characteristic highly unfavorable for continued use through the  
 open water season. Winter use of Chief Creek is non-existent as this stream  
 is dry during this time (Refs. 8 and 9).

## WATERBODY

Waterbody Unnamed Creek 1361.7Main Drainage Yukon River Tributary to Tanana RiverNPSI 5-183 NPAS 108 NPMP 605.4 AHMP 1361.7USGS Map Reference Mt. Hayes, Ak. T 22N R 7E Sec 20 and 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>		<u>None</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>		<u>None</u>

Unnamed Creek 1361.7 is a small muskeg drainage which flows east from the proposed pipeline crossing and is crossed by the Alaska Highway before emptying into Dot Lake. The slow-flowing humic-stained water is contained in a channel that rarely exceeds 1.0 m in width. The stream is bordered by tussocks of willow and dwarf birch, *Equisetum*, *Eriophorum* and small spruce. Along the pipeline route and at the Alaska Highway the channel forms a number of ponds up to 1.5 m deep.

Although northern pike and grayling have been reported in Dot Lake (Refs. 10 and 26) and these species could utilize the lowermost reaches of Unnamed Creek 1361.7 downstream from the Alaska Highway, this stream provides poor fish habitat near the pipeline crossing and fish use in this area is unlikely year round. No fish were seen or captured during 1979 spring field investigations (Ref. 54) and the Alaska Highway culvert was noted to be a potential barrier to upstream fish movement, especially during periods of low flow (Ref. 54). This stream likely freezes to the bottom and provides no winter habitat for fish.

## WATERBODY

Waterbody Unnamed Creek 1362.0Main Drainage Yukon River Tributary to Tanana RiverNPSI 5-182 NPAS 108 NPMP 605.2 AHMP 1362.0USGS Map Reference Mt. Hayes, Ak. T 22N R 7E Sec. 21, 28  
and 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1362.0 is a small, low-lying muskeg drainage with little or no flow and a few isolated pools near the pipeline corridor. A distinct channel was not visible between the proposed crossing and the highway. This stream drains the same muskeg area as 1361.7

This stream does not support fish in the vicinity of the crossing. Fish access to infrequently ponded water is prevented by the absence of connecting channels between the Tanana and areas upstream near the crossing. Spring 1978 and 1979 investigations (Refs. 2 and 54) substantiate these findings.



## WATERBODY

Waterbody Unnamed Creek 1364.4Main Drainage Yukon RiverTributary to Tanana RiverNPSI 5-181NPAS 107NPMP 603.1AHMP 1364.4USGS Map Reference Mt. Hayes, Ak.T 22N R 6E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>73</u>

Unnamed Creek 1364.4 is a small (1-4 m wide) stream which forms two large ponds; one 20 m downstream from the pipeline crossing and the other just downstream from the Alaska Highway. These ponds are approximately 350 m<sup>2</sup> in surface area and 1.5 m deep. Aquatic vegetation is abundant in the ponds as well as the stream channel. Sunken logs and organic debris further contribute to potential fish cover. The presence of a 72" corrugated metal pipe (cmp) and a 48" cmp at the highway may indicate periodically high flow.

Fish use of this stream during the open water period appears to be low to non-existent although habitat was considered good (Ref. 54). Previous fisheries investigations gave similar results (Ref. 2). Fish access to this area may be impeded by log jams and debris downstream of the highway and by perched (0.1 m) culverts at the Alaska Highway (Ref. 54).

Unnamed Creek 1364.4 does not provide any overwintering habitat. Investigations in early November 1979 found the stream to be dry under ice 7-10 cm thick (Ref. 73).

## WATERBODY

Waterbody Sam CreekMain Drainage Yukon RiverTributary to Tanana RiverNPSI 5-180NPAS 107NPMP 601.6AHMP 1365.9USGS Map Reference Mt. Hayes, Ak.T 22N R 6E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>7,54</u>
Summer	<u>None</u>	<u>None</u>	<u>6,10</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>9,10,55</u>

Sam Creek is a small stream that originates from springs and ponds in a large marsh area north of the Alaska highway. Sam Creek crosses the Alaska Highway at milepost 1365.9 and then parallels the highway and the Haines Products Pipeline for several miles before emptying into the Tanana River. However, Sam Creek no longer has an active stream channel at the Alaska Highway. Only vague remnants of a previous drainage exist in the pipeline area and there are no drainage structures at the Alaska Highway. Sam Creek was also reported to have a dry stream bed at the Alaska Highway in June 1976 (Ref. 6).

Sam Creek at the proposed pipeline crossing is not a fish stream (Refs. 6, 54 and 55), although grayling, northern pike, round whitefish and longnose sucker are reported further downstream (Refs. 5, 6, 7, 9 and 10).

## WATERBODY

Waterbody Unnamed Creek 1369.1

Main Drainage Tanana River Tributary to Sam Creek

NPSI 5-179 NPAS 106 NPMP 598.4 AHMP 1369.1

USGS Map Reference Mt. Hayes, Ak. T 22N R 6E Sec. 17

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>*CN,GR</u>	<u>R</u>	<u>54</u>
Summer	<u>*CN,GR,LS,RW</u>	<u>R</u>	<u>6,10</u>
Fall	<u>*CN,GR,RW</u>	<u>R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,73</u>

\*See assessment -- fish species not present in immediate vicinity of pipeline crossing.

Unnamed Creek 1369.1 is a small, humic-stained stream which drains the north face of Knob Ridge and empties into Sam Creek north of the Alaska Highway. Its channel is 1-3 m wide and the bottom is composed primarily of mud and silt. Its banks are steep, 1.5-2.5 m high, and well vegetated. *Equisetum* is common near the water's edge while willow, birch and spruce line the banks. This stream crosses the Alaska Highway through a perched wooden culvert that probably serves as an effective fish block year round. The spill distance from the bottom of the culvert to the stream surface is 1.0 m.

Between the Alaska Highway and the proposed pipeline crossing Unnamed Creek 1369.1 provides good fish habitat but is not used by fish at any time due to the aforementioned fish block (Refs. 54 and 57). Winter fish use is non-existent as this stream dries up or freezes to bottom substrate at this time (Refs. 55 and 73).

Downstream from the Alaska Highway, the stream is a rearing area for grayling, round whitefish, longnose sucker and slimy sculpin (Refs. 6, 10, 54 and 57). Large numbers of fish were captured in the culvert outfall pool in July of 1976 but no information as to whether these fish were fry, juveniles, or adults was apparently recorded (Ref. 6). In general, little is known about this stream below the Alaska Highway because previous investigations have

## FISHERIES ASSESSMENT (CON'T)

Unnamed Creek 1369.1

emphasized only this pool and upstream areas and present investigations were limited to the same area by access restrictions.

## WATERBODY

Waterbody Berry CreekMain Drainage Tanana River Tributary to Johnson SloughNPSI 5-178 NPAS 106 NPMP 596.2 AHMP 1371.4USGS Map Reference Mt. Hayes, Ak. T 22N R 5E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS,RW</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>BB,CN,DV,GR,LS,RW</u>	<u>R</u>	<u>6,10</u>
Fall	<u>CN,GR,LS</u>	<u>M,R</u>	<u>8,57</u>
Winter	<u>CN,DV</u>	<u>W</u>	<u>8,9,55,77</u>

Berry Creek originates from glaciers behind the Macomb Plateau and flows northerly across the Alaska Highway into Johnson Slough. Fed primarily by springs and summer runoff, the flow of this olive green, slightly turbid stream is seasonal, with little winter flow (Refs. 10 and 55). Berry Creek flows over a cobble, gravel and pebble bottom through an 8-13 m wide channel. The channel is bordered by 1-2 m high banks. Stream bank vegetation includes willow, alder and spruce. The benthic macroinvertebrate fauna of Berry Creek is extremely rich (Ref. 6) and numerous deep pools and shallow riffles provide excellent fish habitat.

Berry Creek provides important fish habitat throughout the open water season and is a rearing area for a number of species (Refs. 6,10,54 and 57). The presence of grayling fry observed during a 1979 spring (Ref. 54) survey strongly indicates spawning use of this stream. Longnose sucker may also spawn in Berry Creek (Ref. 57). No evidence of spawning was apparent in early October 1979 (Ref. 57). Berry Creek is also a migration route during spring and fall for species indigenous to the stream.

In 1979, early winter fish habitat was found to be good in the vicinity of the pipeline crossing. Slimy sculpin were observed or captured in each of the small open water areas surveyed (Ref. 77). However, it is suspected that over-wintering in this area deteriorates as winter progresses. During February and March of 1978, attempts to locate water at or downstream of the Alaska

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FISHERIES ASSESSMENT (CON'T)

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## Berry Creek (cont'd)

Highway bridge were unsuccessful (Ref. 9). Other late winter investigations in March 1979 found that the only water present was confined to fast flowing lenses within the ice column (Ref. 55).

## WATERBODY

Waterbody Sears Creek

Main Drainage Tanana River Tributary to Johnson Slough

NPSI 5-177 NPAS 106 NPMP 593.1 AHMP 1374.4

USGS Map Reference Mt. Hayes, Ak. T 22N R 5E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LS</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>GR</u>	<u>R</u>	<u>6,10</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>W</u>	<u>9,55,77</u>

Sears Creek is a small humic-stained stream which flows north from the foothills of the Macomb Plateau to its confluence with Johnson Slough. Channel width varies from 3-5 m. It is a predominantly shallow, slow-flowing stream with gravel substrates in riffle areas and sand, mud and detritus in pools. Banks are 0.5-1.5 m high and are bordered by alder and willow.

The Sears Creek channel contains numerous log jams that may impede fish movement within the stream. A beaver dam built during the summer of 1979 is located about 5 m downstream of the Alaska Highway bridge and appears to be a major obstacle to upstream and downstream fish movement.

Sears Creek is a documented rearing area for grayling and longnose sucker during spring and for grayling during summer and fall. Other fish species such as sculpin, round whitefish and Dolly Varden may use this stream as well, but none has been caught (Refs. 6, 9 and 10). Grayling young-of-the-year were captured during fall 1979 indicating that the stream may be used for spawning in spring (Ref. 57). Minor in and out migrations probably occur during spring and fall.

Sears Creek appears to provide suitable winter habitat for fish; however, it is unknown to what extent fish utilize this habitat. A minnow trap set overnight on 26 February 1978 caught no fish (Ref. 9). Overwintering habitat was considered marginal 27 March 1979 due to excessive aufeis depths; however, free

## FISHERIES ASSESSMENT (CON'T)

## Sears Creek

water under the aufeis could have been present (Ref. 55). Recent investigations (23-26 November 1979) have identified winter fish habitat near the proposed pipeline crossing as a result of the recently constructed beaver dam. No fish were captured during these investigations but sampling efforts were limited to minnow traps as beaver activity and ice conditions prevented the use of gillnets (Ref. 77). Although data is scant and inconclusive, Sears Creek is believed to provide winter habitat for fish.



## WATERBODY

Waterbody Unnamed Creek 1377.0Main Drainage Tanana River Tributary to Johnson SloughNPSI 5-176.01 NPAS 105 NPMP 590.6 AHMP 1377.0USGS Map Reference Mt. Hayes, Ak. T 14S R 16E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>2,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 1377.0 flows north to Johnson Slough through a narrow (1 m wide) channel bordered by low banks heavily vegetated with overhanging willow. The bottom is mud and detritus with numerous riffle areas of gravel and sand.

Unnamed Creek 1377.0 was dry during 1979 spring investigations and showed no signs of recent flow (Ref. 54). It is likely that this stream contains water only during periods of high spring runoff and fish use during any time of the year is unlikely.

## WATERBODY

Waterbody Dry CreekMain Drainage Tanana River Tributary to Johnson SloughNPSI 5-176 NPAS 105 NPMP 589.5 AHMP 1378.1USGS Map Reference Mt. Hayes, Ak. T 14S R 16E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>7,54,59,60</u>
Summer	<u>None</u>	<u>None</u>	<u>6,10,69</u>
Fall	<u>None</u>	<u>None</u>	<u>8,9,57</u>
Winter	<u>None</u>	<u>None</u>	<u>9</u>

Dry Creek flows north into Johnson Slough through a 6-15 m wide channel bordered by steep, incised, well-vegetated banks 2-3 m high. The bottom consists primarily of gravel with occasional sand bar deposits. At the proposed pipeline crossing, flow in Dry Creek is intermittent, restricted to those periods of high spring runoff and heavy rain. Dry Creek is reported to flow year-round farther upstream (Ref. 9), and may support a resident population of fish (Ref. 6).

Fish use of Dry Creek in the vicinity of the proposed pipeline is unlikely at any time of year due to the intermittent nature of the stream flow in this area (Refs. 6, 7, 8, 9, 10, 54, 57, 59, 60 and 68).

## WATERBODY

Waterbody Johnson RiverMain Drainage Yukon RiverTributary to Tanana RiverNPSI 5-175NPAS 104NPMP 587.0AHMP 1380.5USGS Map Reference Mt. Hayes, Ak.T 14SR 16ESec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>6,10</u>
Fall	<u>GR,LC,RW</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>9,55,77</u>

The Johnson River is a large, braided, glacial stream originating from the Johnson Glacier in the Alaska Range and flowing northward into the Tanana River. Its waters are highly turbid during summer, moderately turbid during spring and fall, and clear in winter. The stream bottom is primarily gravel while the floodplain is composed of sand and silt. The Johnson River is bounded by steep banks 20-30 m high at the proposed crossing.

Prior to 1979 fall fisheries investigations, fish use of the mainstem of the Johnson River had not been documented despite numerous efforts (Refs. 6, 9, 54 and 55). However, previous surveys had identified feeder streams (5-7 km upstream of the Alaska Highway) as being utilized by whitefish, grayling and Dolly Varden (Ref. 6). Fall field investigations in 1979 documented fish use in the Johnson River at the proposed pipeline crossing for the first time and later early winter investigations helped to clarify the winter fish use status of this stream.

Fish utilization of the Johnson River during spring appears to be low. No fish were seen or captured during spring fisheries investigations 12 May and 26 June 1979 (Ref. 54). Fish use is also believed to be low during summer months when its glacial waters are extremely swift and turbid. A previous investigator failed to capture fish in July and concluded that its silty waters were not suitable for fish (Ref. 6). The Johnson River is a rearing area during fall for grayling, round whitefish and lack chub (Ref. 57) and a probable migration route during spring and fall for fish moving to and from productive feeder streams.

## FISHERIES ASSESSMENT (CON'T)

## Johnson River

Although 1979 late winter investigations indicated the presence of potential overwintering habitat near the pipeline crossing, winter fish use of the Johnson River is believed to be low to non-existent in this area. Results of winter (1979) investigations indicated that winter habitat was poor due to abundant anchor ice and narrow ice-constricted channels which cause high water velocities. In addition, no fish have been captured during the winter period (Refs. 9, 55 and 77).

## WATERBODY

Waterbody Little Gerstle RiverMain Drainage Yukon River Tributary to Tanana RiverNPSI 5-174 NPAS 103 NPMP 579.3 AHMP 1388.4USGS Map Reference Mt. Hayes, Ak. T 13S R 15E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS,RW</u>	<u>M,R,S</u>	<u>6,7,10,54</u>
Summer	<u>CN,GR,LS,RW</u>	<u>R</u>	<u>6,7,10</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>8,9,55</u>

The Little Gerstle River is a medium size (8-10 m wide) stream of moderate gradient flowing northeast into the Tanana River. The greenish, glacially-turbid water of this stream flows through an often braided channel bordered by 1 m high sand and gravel banks vegetated with alders and willow. The stream bottom is primarily cobble mixed with areas of sand and gravel. In the area of the proposed pipeline the 100 m wide floodplain is bordered by cottonwood and aspen trees.

The Little Gerstle River is a rearing area for grayling, slimy sculpin, longnose sucker and round whitefish during spring and summer and probably fall, although information regarding fall fish use is unavailable. Dolly Varden are also reported to be present (Refs. 5, 6, 7 and 10) but none has been caught. The Little Gerstle River provides spawning habitat for grayling during spring and serves as a nursery area for grayling young-of-the-year during late spring and summer. The stream does not provide winter habitat for fish (Refs. 9 and 55) and is therefore an important migration route for indigenous species moving upstream in spring and downstream prior to freeze-up.

## WATERBODY

Waterbody Gerstle RiverMain Drainage Yukon River Tributary to Tanana RiverNPSI 5-172 NPAS 102 NPMP 575.0 AHMP 1393.0USGS Map Reference Mt. Hayes, Ak. T 13S R 15E Sec. 6

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>7,54</u>
Summer	<u>None</u>	<u></u>	<u>6</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>8,9,55</u>

The Gerstle River is a large, braided, glacial stream that originates at the Gerstle and Riley creek glaciers, high in the Alaska Range. Although the floodplain is approximately 600 m in width, the glacially-turbid water is confined to multiple small channels with cobble, gravel, sand and silt substrates. The absence of standing vegetation and presence of scattered deadwood within the floodplain is indicative of the magnitude of flooding and ice scouring that occurs. Outside the active floodplain, the primary vegetation consists of poplar and alder intermixed with tundra and spruce forest.

The Gerstle River is a rearing area for grayling in fall (Ref. 57), although fish use of this river appears to be low and may be limited to periods of low water when turbidity is reduced. Grayling were captured during 1979 fall investigations (Ref. 57), but prior studies had not documented fish use of this river (Refs. 6, 7 and 54). Local residents believe that Dolly Varden may also be present periodically (Ref. 6). Upstream tributaries provide poor fish habitat (Ref. 6) and major fish migrations to these areas are unlikely. The Gerstle River is not a wintering area for fish at or near the proposed pipeline crossing (Refs. 8, 9 and 55).

Available data indicate that the Gerstle River near the proposed crossing is of limited importance to fish and only during the open water season.

**WATERBODY**Waterbody Sawmill CreekMain Drainage Tanana River Tributary to Clearwater CreekNPSI 5-171 NPAS 100 NPMP 563.8 AHMP 1403.9USGS Map Reference Mt. Hayes, Ak. T 12S R 13E Sec. 5**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>7,54</u>
Summer	<u>None</u>	<u>None</u>	<u>6,10</u>
Fall	<u>None</u>	<u>None</u>	<u>8</u>
Winter	<u>None</u>	<u>None</u>	<u>9</u>

Sawmill Creek is a small, intermittent stream that flows northeast across the Alaska Highway to its confluence with Clearwater Creek. It is reported to go subterranean some 4 km above the Alaska Highway crossing (Ref. 6). During aerial surveys in 1979, flowing water was found in an area extending from approximately 5 km upstream of the Alaska Highway to a point approximately 18 km farther upstream, near the foothills.

Fish use of Sawmill Creek at the proposed pipeline crossing is probably non-existent due to intermittent flow and resultant unstable habitat. This creek was found to be dry at the pipeline crossing by numerous investigators (Refs. 6, 7, 8, 9 and 54) and appears to contain water only during high spring runoff and heavy rain (Refs. 6 and 54).

## WATERBODY

Waterbody Rhoads CreekMain Drainage Sawmill Creek Tributary to Granite CreekNPSI 5-170 NPAS 100 NPMP 560.1 AHMP 1407.6USGS Map Reference Mt. Hayes, Ak. T 11S R 12E Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u>None</u>	<u>6,10</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>9</u>

Rhoads Creek drains the north face of the Granite Mountains and flows northeast across the Alaska Highway and the proposed pipeline crossing to its confluence with Granite Creek. It is a small stream that contains water only during high spring runoff and heavy rains. This stream was not visible except at the highway culvert during aerial surveys conducted in June 1979 (Ref. 54).

Rhoads Creek, at the proposed pipeline crossing, should not be considered a fish stream at any time of year due to the absence of habitat. Several investigations have found the stream to be dry (Refs. 6, 9, 10 and 54).



## WATERBODY

Waterbody Granite Creek

Main Drainage Tanana River Tributary to Sawmill Creek

NPSI 5-169 NPAS 99 NPMP 558.4 AHMP 1409.2

USGS Map Reference Mt. Hayes, Ak. T 11S R 12E Sec. 22

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>7,54</u>
Summer	<u>None</u>	<u>None</u>	<u>6,10</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>9</u>

Granite Creek drains an area north and west of the Granite Mountains and flows north across the Alaska Highway into Sawmill Creek. Far above the highway (at least 5 km) stream discharge is reported to be considerable. The stream discharge was 5.182 m<sup>3</sup>/sec some 31 km upstream from the Alaska Highway in July 1976 (Ref. 6). No fish were encountered in the upper reaches of this stream but habitat appeared to be good and food abundant (Ref. 6).

Granite Creek becomes subterranean before reaching the Alaska Highway and fish utilization of the stream in the pipeline crossing area appears to be low or non existent throughout the year. In this area the stream is small and intermittent and flows above ground only during spring runoff and after heavy rains. Granite Creek was dry during investigations conducted throughout the open water period (Refs. 6, 7, 10 and 54), as well as, during winter (Ref. 9).

# WATERBODY

Waterbody Tanana River

Main Drainage Yukon River Tributary to Yukon River

NPSI 5-166 NPAS 96 NPMP 537.3 AHMP N/A

USGS Map Reference Big Delta, Ak. T 9S R 10E Sec. 5

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,CN,CS,DS,GR,HW KS,LC,LS,NP,RW,SS</u>	<u>M,R</u>	<u>11,15,16,30,32,33</u>
Summer	<u>KS</u>	<u>M</u>	<u>11</u>
Fall	<u>BB,BW,CI,DS,GR,HW,KS,LS,NP,SS</u>	<u>M,R,S</u>	<u>11,15,16,30,32,57</u>
Winter	<u>DS,GR,KS,SS</u>	<u>M,S,W</u>	<u>11,15,16,30,32,33,77</u>

The Tanana River is a large braided glacial river formed by the junction of the Chisana and Nabesna Rivers near the Alaska/Canada border. The Tanana River flows northwest into central Alaska where it joins the Yukon River. The proposed pipeline route crosses this river twice. The farthest downstream crossing (NPMP 537.3) is considered here.

The Tanana River at Delta Junction near the proposed pipeline crossing is utilized by a wide variety of fish species the year round. Most species indigenous to the Tanana River are likely to occur in this area but specific documentation regarding presence and timing for each species is often not available. This river is a major migration route for many fish species including king, coho and chum salmon. Adult salmon generally move into the proposed pipeline area from midsummer (king salmon) through November (coho and chum salmon). Out migrations of fry and juvenile salmon generally occur from April through June. The Tanana River near Delta Junction is a major chum salmon spawning area. Other major salmon spawning areas occur upstream in the Goodpaster River (king salmon) and the Delta Clearwater River (chum and coho salmon) and downstream in the lower Delta River (chum and coho salmon). Sub-permafrost springs or aquifers are located throughout this area of the Tanana River and provide excellent overwintering habitat for many species. The Tanana River is one of the largest and most important fish streams crossed by the pipeline.

## WATERBODY

Waterbody Tanana River Side ChannelMain Drainage Yukon River Tributary to Tanana RiverNPSI 5-165.01 NPAS 95 NPMP 536.7 AHMP NAUSGS Map Reference Big Delta, Ak. T 9S R 10E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>DS,GR,HW,LS</u>	<u>M,R,S</u>	<u>57</u>
Winter	<u>X</u>	<u>W</u>	<u>55,77</u>

The Tanana River Side Channel is located on the northeast side of the Tanana River approximately 500 m upstream of the confluence of the Delta and Tanana Rivers. This channel divides from the main channel and meanders for a distance of approximately 2.7 km before rejoining the river. Channel width varies from 20-60 m. Gently sloping sand and silt banks occur on the inside of meanders while actively eroding banks 2-3 m high occur on the outside of meanders. The banks are typically bordered by dense willows given way to mature stands of spruce and birch.

Although the Tanana River Side Channel has only been studied in fall and winter, a number of inferences can be made with available data. The large size and year-round flow of this channel suggest that most species indigenous to the Tanana River are likely to occur here (see Tanana River NPSI 5-166, this study). This area of the Tanana River serves as a migration route for numerous species year-round including king, chum and coho salmon. The south bank of the Tanana River opposite the Side Channel serves as a major chum spawning area. Data suggest that chum salmon also spawn within the Side Channel, as adults in spawning condition were captured there during fall investigations (Ref. 57). This also indicates winter use by incubating eggs and emergent fry. Various life stages of numerous species are likely to rear in this channel through the open water season, as well as in the winter. Other species present in the fall include: grayling, humpback whitefish and longnose sucker. One unidentified fish was observed in the channel in the winter (Ref. 77).

**FISHERIES ASSESSMENT (CON'T)****Tanana River Side Channel**

The Tanana River Side Channel is considered important to fish year round and should be given the same consideration as the Tanana River NPSI 5-166.

## WATERBODY

Waterbody Shaw CreekMain Drainage Yukon River Tributary to Tanana RiverNPSI 5-165 NPAS 93 NPMP 526.0 AHMP N/AUSGS Map Reference Big Delta, Ak. T 7S R 8E Sec. 36

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR,RW</u>	<u>M,R</u>	<u>57</u>
Winter	<u>BB,GR,HW,RW</u>	<u>W</u>	<u>11,55,77</u>

Shaw Creek is a deep, slow-flowing stream approximately 15 m wide shaded by overhanging mature spruce, birch and willow. Bottom substrate is mud, sand and sunken logs and banks are 2-3 m high.

Near the proposed pipeline crossing, Shaw Creek provides good fish habitat for grayling, round whitefish, humpback whitefish and burbot throughout most of the year. Fall investigations found grayling and round whitefish present in this area and one adult male grayling that appeared to have spawned in the spring (Ref. 57). Spring surveys in 1975 indicated that Shaw Creek appears to be a grayling spawning and nursery area (Ref. 11). Shaw Creek is probably an important migration route for the aforementioned species.

Investigations suggest that late winter use of Shaw Creek is marginal (Refs. 11 and 55). In November 1979 several species of fish were caught and winter habitat was determined to be good (Ref. 77). However, fish habitat deteriorates as winter progresses since previous winter studies reported no measurable flow or that the stream tends to freeze solid in winter (Refs. 11 and 55).

Shaw Creek should be considered to be important to fish in all seasons except late winter.

## WATERBODY

Waterbody Rosa Creek #1

Main Drainage Tanana River Tributary to Shaw Creek

NPSI 5-164 NPAS 93 NPMP 525.8 AHMP N/A

USGS Map Reference Big Delta, Ak. T 7S R 8E Sec. 25 and 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,WF</u>	<u>M,R,S</u>	<u>5,11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Rosa Creek originates in hills bordering the northern limits of Shaw Creek Flats. The stream flows southeast onto the flats and is crossed by the proposed pipeline route by crossing #1 approximately 300 m upstream of its confluence with Shaw Creek. This small, humic-stained, slow flowing stream is bordered by spruce, birch and willow.

This stream provides fish habitat in its lower reaches throughout the open water period. Grayling fry and fingerlings and whitefish have been reported in the vicinity of crossing #1 (Ref. 11). This strongly suggests that grayling spawn in the stream and rearing would likely continue through fall, with out-migration occurring prior to freeze up. It is suspected that this small stream would freeze solid and provide no fish habitat in the winter.

## WATERBODY

Waterbody West Branch Keystone CreekMain Drainage Tanana River Tributary to Shaw CreekNPSI 5-163 NPAS 93 NPMP 525.2 AHMP NAUSGS Map Reference Big Delta, Ak. T 7S R 8E Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>5,11</u>
Summer	<u>GR</u>	<u>R</u>	<u>5,11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

West Branch Keystone Creek drains the northwestern portion of Shaw Creek Flats and empties into Keystone Creek. This small, humic-stained stream is bordered by stands of spruce.

This stream provides excellent fish habitat (Ref. 11) throughout the open water period. Adult and juvenile grayling were observed in April 1975 and in August 1977. The presence of adult grayling suggests that spawning may occur in this stream. The small size of this stream suggests that it freezes to the bottom during winter and would provide no winter habitat.

# WATERBODY

Waterbody Rosa Creek #2

Main Drainage Tanana River Tributary to Shaw Creek

NPSI 5-162 NPAS 92 NPMP 519.8 AHMP N/A

USGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 33

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Rosa Creek is a small headwater drainage that flows southeast to its confluence with Shaw Creek. In the vicinity of Crossing #2, the small channel repeatedly splits and is lost where the flow percolates through tundra and bog areas.

The upper reaches of Rosa Creek near crossing #2 provide very poor habitat for fish. The limited flow and poorly defined stream channel create numerous fish blocks which impede fish movement into this area except during periods of very high runoff (Ref. 57). No fish were captured in this area in fall 1979 (Ref. 57). During the winter this small drainage is dry or completely frozen (Ref. 55).



## WATERBODY

Waterbody Rosa Creek #3Main Drainage Tanana River Tributary to Shaw CreekNPSI 5-162 NPAS 92 NPMP 519.2 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Rosa Creek is a small headwater drainage that flows southeast to its confluence with Shaw Creek. In the vicinity of crossing #3 the small channel repeatedly splits and is lost where the flow percolates through tundra and bog areas.

The upper reaches of Rosa Creek near crossing #3 provides very poor habitat for fish and available evidence indicates that this crossing is probably inaccessible to fish. Limited flow and numerous fish blocks would hinder fish movement up to Rosa Creek #3 except possibly during periods of very high runoff or snow melt (Ref. 57). During winter surveys in March 1979 this small drainage was found to be dry or completely frozen at crossings #2 and #3 (Ref. 55).

# WATERBODY

Waterbody Rosa Creek #4

Main Drainage Tanana River Tributary to Shaw Creek

NPSI 5-162 NPAS 92 NPMP 518.9 AHMP N/A

USGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 29

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Rosa Creek #4 is the farthest upstream crossing of this small headwater drainage. Rosa Creek flows southeast from here to its confluence with Shaw Creek. In the vicinity of the present crossing the poorly distinguished channel splits repeatedly and is lost amongst the tundra and bog vegetation through which it percolates.

The upper reaches of Rosa Creek provide poor to non-existent fish habitat. Available evidence indicates that this crossing #4 is inaccessible to fish. Limited flow and numerous fish blocks hinder fish movement up to Rosa Creek #2 (~1.6 km downstream from crossing #4) except during periods of very high runoff or snow melt (Ref. 57). Rosa Creek #4 provides no fish habitat in winter, as the stream was found to be dry or frozen solid at Crossing #2 and #3 during winter surveys in March 1979 (Ref. 55).

## WATERBODY

Waterbody South Fork Minton Creek #1Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 92 NPMP 518.0 AHMP NAUSGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

South Fork Minton Creek is a small clearwater stream that flows through tundra and muskeg areas and is overgrown by willow. Flow in this headwater drainage is heavily influenced by fluctuations in runoff and/or snow melt. Crossing #1 is the farthest upstream of seven crossings of the stream.

In the vicinity of crossing #1, South Fork Minton Creek provides little or no fish habitat throughout the open water period and is frozen solid through the winter (Refs. 55 and 66). Evidence from spring and fall surveys in 1979 suggests that low flow limits both access to and fish habitat in this section of the stream (Refs. 54 and 57). Fish passage across the TAPS workpad was not required above crossing #3, which is about 0.5 km downstream (Ref. 11). This section of the stream is not considered to be important to fish.

**WATERBODY**Waterbody South Fork Minton Creek #2Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 92 NPMP 517.4 AHMP NAUSGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 19**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

South Fork Minton Creek is a small clearwater stream that flows through tundra and muskeg areas and is overgrown by willow. Flow in this headwater drainage is substantially influenced by fluctuations in runoff and/or snow melt. Crossing #2 is one of the seven crossings of the South Fork and is located in the upper portion of the stream.

In the vicinity of crossing #2, South Fork Minton Creek provides little or no fish habitat throughout the open water period and is frozen solid through the winter (Refs. 55 and 66). Evidence from spring and fall surveys in 1979 suggests that low flow limits both access to and fish habitat in this section of the stream (Refs. 54 and 57). Fish passage across the TAPS workpad was not required above crossing #3 which is about 0.5 km downstream (Ref. 11). This section of the stream is not considered to be important to fish.

## WATERBODY

Waterbody South Fork Minton Creek #3Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 92 NPMP 517.0 AHMP NAUSGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>		<u>11</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

South Fork Minton Creek is a clearwater stream that flows through tundra and muskeg areas and is heavily overgrown by willows. Flow in this headwater drainage is substantially influenced by runoff and/or snow melt. Crossing #3 is one of seven crossings of the South Fork and occurs in the upper portion of the stream.

In the vicinity of crossing #3, South Fork Minton Creek provides little or no fish habitat. Evidence from spring and fall surveys in 1979 suggests that fish access to this area and the possibility of habitat are limited by the low flow (Refs. 54 and 57). Winter surveys found this stream frozen to the bottom (Refs. 55 and 66). Fish passage across the TAPS workpad was required up to crossing #3 but not in upper portions of the stream (Ref. 11). This section of the stream is not considered to be important to fish.

## WATERBODY

Waterbody South Fork Minton Creek #4Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 92 NPMP 516.3 AHMP NAUSGS Map Reference Big Delta, Ak. T 6S R 8E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

Crossing #4 of South Fork Minton Creek is located in the upstream region of the stream. In this area, the stream is small (1-2.5 m wide) and flows over a gravel and sand substrate. Flow is largely dependent upon runoff and/or snow melt.

In the vicinity of crossing #4, South Fork Minton Creek provides little fish habitat and fish access to the region would be possible only during periods of high runoff (Ref. 54). No fish were seen or captured during 1979 spring investigations (Ref. 54). Winter conditions preclude fish use at that time, as 1979 winter surveys found the stream frozen to the bottom (Refs. 55 and 66). Fish passage was required across the TAPS workpad at crossing #4 (Ref. 11), but present evidence indicates that this section of the stream is not important to fish.

## WATERBODY

Waterbody South Fork Minton Creek #5Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 92 NPMP 516.0 AHMP NAUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

South Fork Minton Creek near crossing #5 is a small stream that flows through tundra and muskeg areas and is characterized by incised banks overgrown with willow. Flow in this clearwater stream is strongly influenced by runoff and fluctuates throughout the open water period.

The vicinity of South Fork Minton Creek #5 provides little or no fish habitat year round. Although fish use is known to occur downstream near crossings #6 and #7 (Refs. 11 and 54), the upstream portions of South Fork Minton Creek have little or no fish use. It is possible that fish occur near Crossing #5, but such use is likely to be infrequent and restricted to periods of high runoff. Winter conditions preclude fish use of the stream near Crossing #5 since the stream freezes to the bottom (Refs. 55 and 66). This region of South Fork Minton Creek is considered to be of minimum importance to fish.

# WATERBODY

Waterbody South Fork Tributary to Minton Creek

Main Drainage McCoy Creek Tributary to Minton Creek

NPSI 5-161 NPAS 92 NPMP 515.8 AHMP NA

USGS Map Reference Big Delta, AK. T 6S R 7E Sec. 13

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

South Fork Tributary to Minton Creek is a headwater drainage that is crossed by the proposed pipeline route and then joins South Fork Minton Creek. This small stream drains a spruce/muskeg area; the flow fluctuates as a function of snow melt or runoff.

This stream provides little or no fish habitat throughout the open water period and is frozen solid through the winter (Refs. 55 and 66). The small size of the stream would prevent fish utilization except possibly during extended periods of high run-off. Previous studies have not reported fish in the upper portions of South Fork Minton Creek where the present stream is located. This stream is not considered to be important to fish.



## WATERBODY

Waterbody South Fork Minton Creek #6

Main Drainage Salcha River Tributary to McCoy Creek

NPSI 5-161 NPAS 92 NPMP 515.8 AHMP NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>54</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,66</u>

Crossing #6 of South Fork Minton Creek is in the lower region of the stream. In this area the stream is small (0.5 to 1.5 m wide) with incised banks vegetated with abundant willow and stunted spruce. The lower portion of South Fork Minton Creek is utilized by grayling in summer (Ref. 11). It is also suspected that grayling may use this area for spawning and rearing throughout the open water period. Spring surveys did not discover grayling at crossing #6, but they were present a short distance downstream at crossing #7 (Ref. 54). Winter investigations in 1979 found this stream frozen to the bottom indicating the absence of fish habitat throughout the winter (Ref. 55).

## WATERBODY

Waterbody South Fork Minton Creek #7

Main Drainage Salcha River Tributary to McCoy Creek

NPSI 5-161 NPAS 91 NPMP 515.5 AHMP NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	GR	M,R	54
Summer	GR	R	11
Fall	None		57
Winter	None	None	55,66

Crossing #7 is the farthest downstream of seven crossings of South Fork Minton Creek and is located approximately 200 m above the stream's confluence with North Fork Minton Creek. In this area the stream is small (0.5-1.5 m wide) and has heavily incised banks vegetated with willow and stunted black spruce.

The lower portions of South Fork Minton Creek, in the vicinity of the two downstream crossings (#6 and #7), are probably used by grayling in the open water period. Spring surveys in 1979 found grayling in this area (Ref. 55) and previous studies also indicated their presence during summer (Refs. 11, 30, and 76). Fall surveys failed to find fish in September 1979, although suitable habitat existed at that time (Ref. 57). Winter investigations in 1979 found this stream frozen to the bottom indicating the absence of fish habitat throughout the winter (Ref. 55).

## WATERBODY

Waterbody North Fork Minton Creek #1Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 91 NPMP 515.4 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>54</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

North Fork Minton Creek is a small shallow headwater drainage which flows easterly to its confluence with South Fork Minton Creek. Near crossing #1 the stream is small (0.3-1.0 m wide) with water depths less than 15 cm. The stream channel is heavily overgrown with willow and stunted spruce and is often not visible due to extensive braiding. Where the channel is clearly visible the substrate consists of mud and silt.

North Fork Minton Creek is probably utilized by fish throughout the open water period near crossing #1. Grayling have been observed in this area during the summers of 1975 and 1977 (Ref. 11), although spring investigations failed to capture fish at this crossing in June 1979 (Ref. 54). It is suspected that grayling enter the stream during or shortly after breakup and remain until freeze-up. Winter investigations indicate that this stream freezes to the bottom and provides no fish habitat during winter (Ref. 55).

## WATERBODY

Waterbody North Fork Minton Creek #2Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 91 NPMP 514.8 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>55</u>

The North Fork of Minton Creek in the vicinity of crossing #2 is a small (0.3-1.0 m wide) stream with water depths less than 10 cm. The stream channel is heavily overgrown with willow and stunted spruce and is often not visible due to extensive braiding. Where the channel is clearly visible, the substrate consists of mud and silt.

Although grayling have been reported in downstream portions of North Fork Minton Creek near crossing #1 (Ref. 11), the stream does not appear to be utilized by fish near the present crossing and fish habitat is poor. Spring investigations conducted in 1979 reported numerous waterfalls and brush piles as barriers to upstream fish movement and no fish were captured at that time (Ref. 54). This stream is frozen to the bottom during winter and provides no fish habitat from freeze-up to breakup (Ref. 55).

## WATERBODY

Waterbody North Fork Minton Creek #3Main Drainage Salcha River Tributary to McCoy CreekNPSI 5-161 NPAS 91 NPMP 514.5 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,76</u>

The stream channel of North Fork Minton Creek is heavily overgrown with willow and stunted spruce and the bottom substrate is predominantly mud and silt near crossing #3.

Fish use near this crossing is believed to be non-existent year round. Grayling have been reported in North Fork Minton Creek near crossing #1 (Ref. 11) but it is extremely unlikely that fish are able to ascend beyond that crossing. A number of fish blocks (waterfalls and brush piles) are present a short distance upstream from crossing #1 (Ref. 54). Winter investigations indicate that this stream provides no winter habitat for fish (Ref. 55).

## WATERBODY

Waterbody North Fork Minton Creek #4

Main Drainage Salcha River Tributary to McCoy Creek

NPSI 5-161 NPAS 91 NPMP 514.4 AHMP N/A

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,76</u>

The stream channel of North Fork Minton Creek is small, braided and heavily overgrown with willow and stunted spruce near crossing #4. The substrate is predominantly mud and silt where the channel is visible.

Fish use of this stream is believed to be non-existent year round in the vicinity of Crossing #4. Downstream of this crossing, fish access is blocked by a number of waterfalls and brush piles which prevent upstream fish movement. Late winter investigations in March 1979 found North Fork Minton Creek was frozen to the bottom (Ref. 55).

## WATERBODY

Waterbody Gold Run CreekMain Drainage Salcha River Tributary to McCoy CreekNPSI 5-160 NPAS 91 NPMP 512.7 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>11</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Gold Run Creek at the proposed pipeline crossing and the TAPS workpad is a small tundra stream 0.5-1.1 m wide. Stream substrate consists primarily of mud with submerged logs and debris. Log jams extend 0.3-0.4 m out of the water, thereby creating fish barriers.

Fish use of Gold Run Creek at the pipeline crossing is non-existent year round. Natural fish barriers and high stream velocity provide poor fish habitat and impede movement of fish to this area (Ref. 54). Grayling were caught 80 m below the crossing in September 1975 (Ref. 11). Winter surveys in 1979 indicate that Gold Run Creek does not provide suitable winter fish habitat as it freezes to the bottom (Ref. 55).

## WATERBODY

Waterbody Small CreekMain Drainage Salcha River Tributary to McCoy CreekNPSI 5-159.02 NPAS 91 NPMP 511.3 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>11,57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Small Creek is a narrow stream 0.4-0.6 m in width with a sand, cobble and gravel substrate. The proposed crossing is located in a high elevation region of Small Creek where stream gradient is steep. Waterfalls 0.3-0.4 m high are common in this area. Water velocities varied from an estimated 1-1.5 m<sup>3</sup>/sec between waterfalls in June 1979 (Ref. 54). Incised banks were generally 1.5-2.5 m high and covered with willow and birch.

Small Creek does not provide good fish habitat during the open water season due to waterfalls, high velocity water and log jams common in the crossing area. Electrofishing efforts during 1979 spring and 1975 and 1979 fall surveys did not detect fish in this stream (Ref. 11, 54 and 57). Although winter investigations have not been conducted, this stream probably dries up or freezes to bottom substrate during this period.



## WATERBODY

Waterbody Tributary to Small CreekMain Drainage McCoy Creek Tributary to Small CreekNPSI 5-159.01 NPAS 91 NPMP 510.7 AHMP N/AUSGS Map Reference Big Delta, Ak. T 6S R 7E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

This unnamed stream was not visible from the air or ground at the proposed pipeline crossing during 1979 spring surveys (Ref. 54). This crossing is approximately 0.4 km downstream of the drainage origin at an elevation of 460 m. This stream does not offer fish habitat at the crossing at any time of year.

## WATERBODY

Waterbody Redmond Creek

Main Drainage Tanana River Tributary to Salcha River

NPSI 5-159 NPAS 90 NPMP 505.7 AHMP N/A

USGS Map Reference Big Delta, Ak. T 5S R 6E Sec. 22

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>54</u>
Summer	<u>BB,RW</u>	<u>R</u>	<u>25</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11,57</u>
Winter	<u>None</u>	<u>None</u>	<u>25,55,77</u>

Redmond Creek is a meandering stream which flows into the Salcha River. The channel width varies from 3-6 m and has a silt, mud and gravel substrate. This stream has a good pool:riffle ratio and pools are deep providing good cover for fish.

In the vicinity of the proposed pipeline crossing Redmond Creek provides important habitat to several fish species during the open water period. Burbot, grayling and round whitefish use this stream as a rearing area (Refs. 25, 54 and 57). Adult (including a male that had recently spawned) and juvenile grayling found during spring 1979 (Ref. 54) and young-of-the-year were captured during the fall of 1979 (Ref. 57). This indicates that Redmond Creek is a spawning area for grayling. This stream is also reported to support spawning salmon in the fall (Ref. 11) but no salmon were found during 1979 fall surveys (Ref. 57). During the same survey a beaver dam was found to completely span Redmond Creek approximately 200 m upstream from its confluence with the Salcha River (Ref. 57). The permanency of the dam is unknown; however, it is an effective fish block to fish movement to and from the Salcha River.

Winter fish habitat in Redmond Creek is marginal and fish use at this time probably does not occur. The stream was found intermittently frozen to the bottom during 1974 and 1979 winter investigations and where free water was found, no flow could be detected; no fish were captured or observed (Refs. 25, 55 and 77).

## WATERBODY

Waterbody Unnamed Tributary to the Salcha RiverMain Drainage Tanana River Tributary to Salcha RiverNPSI 5-158.03 NPAS 89 NPMP 502.8 AHMP N/AUSGS Map Reference Big Delta, Ak. T 5S R 6E Sec. 18

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to the Salcha River is an old highwater channel which has been dry for many years. The Salcha River has migrated further to the west at this site which would reduce the possibility of this drainage being flooded. At the confluence with the Salcha River, a 1.5 m high cut bank would prevent fish from moving upstream. This area does not provide fish habitat (Ref. 54).

## WATERBODY

Waterbody TAPS SloughMain Drainage Tanana RiverTributary to Salcha RiverNPSI 4-158.02NPAS 89NPMP 501.9AHMP NAUSGS Map Reference Big Delta, Ak.T 5SR 5ESec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

TAPS slough is an old highwater channel of the Salcha River. The channel varies in width from 1-10 m and is overgrown with tall grass. A few pools in depressions at the lower end of the slough contained the only water found during a 1979 spring survey. A 1 m high bank at the confluence of the slough and the Salcha River is a barrier to fish except during extreme flood periods.

This drainage does not normally provide fish habitat at any time of year. Reference 11 indicates that this area is used by salmonids for spawning and rearing; however, recent 1979 surveys (Refs. 54, 55 and 57) strongly suggest that this information applies to Unnamed Slough since the aforementioned fish barrier would not allow fish to enter TAPS Slough.

## WATERBODY

Waterbody Unnamed Slough NPSI 4-158.01Main Drainage Tanana River Tributary to Salcha RiverNPSI 4-158.01 NPAS 89 NPMP 501.8 AHMP N/AUSGS Map Reference Big Delta, Ak. T 5S R 5E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Unnamed Slough is an old highwater channel of the Salcha River that cuts through a large oxbow. Fish habitat is poor and fish use non-existent in the immediate vicinity of the proposed pipeline route at any time of year due to the absence of flow or free water in this area (Refs. 55 and 57).

Two spring areas are located about 200 m downstream from the proposed crossing and water flows south into the Salcha River. Salmon fry have been observed in this area during 1976 spring surveys (Ref. 11) and winter studies conducted in 1979 have identified the lower 200 m as a wintering area for slimy sculpin (Ref. 55).

**WATERBODY**Waterbody Salcha RiverMain Drainage Yukon River Tributary to Tanana RiverNPSI 4-158 NPAS 89 NPMP 501.5 AHMP NAUSGS Map Reference Big Delta, Ak. T 5S R 5E Sec. 13**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AL,CN,DS,GR,KS,LS</u>	<u>M,R,S</u>	<u>14,25,32,35</u>
Summer	<u>BB,CN,DS,GR,KS,RW,SB</u>	<u>M,R,S</u>	<u>11,14,25,32,35,38</u>
Fall	<u>CN,DS,GR,KS,RW</u>	<u>R,S</u>	<u>14,25,32</u>
Winter	<u>BB,DS,KS</u>	<u>S,W</u>	<u>25,32,35</u>

The Salcha River originates in the Tanana Hills approximately 135 km east of Fairbanks and flows 200 km southwest to the Tanana River 55 km southeast of Fairbanks. This braided river forms a single channel at the pipeline crossing and is 30-60 m wide and 1-2 m deep. The river bottom is cobble and gravel with some sand and silt. The stream banks are vegetated with spruce, birch, willow and cottonwood (Refs. 11 and 38).

The Salcha River is important fish habitat to a wide variety of fish species. This river is particularly important to king and chum salmon and supports the largest known spawning populations of these salmon species in the Tanana River drainage. The average annual escapement into the Salcha River is approximately 1000 king salmon and 8000 chum salmon (Refs. 14 and 32). King salmon enter the Salcha beginning in early July and spawn through July and August throughout the lower 120 km of the river (Refs. 25 and 32). Most king salmon (82%) spawn upstream of the pipeline crossing; however, redds have been found at the crossing and in downstream regions (Refs. 14 and 32). King salmon emerge from the natal gravels in June and early July, overwinter in the river, and outmigrate the following spring during May and early June (Refs. 14, 25, 32, and 35). Chum salmon enter the Salcha in late July and early August and spawn in the area between the mouth of the Salcha River and Caribou Creek from August to mid-September. Although chum salmon spawning occurs downstream of the pipeline crossing, most (97%) occurs in upstream regions (Refs. 14 and 32). Chum salmon outmigrate soon after emergence from

## FISHERIES ASSESSMENT (CON'T)

## Salcha River

gravel in May (Refs. 25, 32 and 35).

Grayling are found throughout the Salcha River during open water periods and utilize all the main tributaries and the main river (Ref. 25) for spring spawning. Burbot and round whitefish are found throughout the lower reaches of the Salcha River. Burbot spawning occurs in winter under the ice (Ref. 25). Round whitefish also are reported to spawn in the river (Ref. 25).

Arctic lamprey, slimy sculpin, longnose sucker, northern pike, and stickleback are also known to be present in the river during the open water period but, the extent to which these species use the Salcha is not well understood or documented.

The Salcha River provides a major migration route for fish movement to and from tributaries of the river and in the mainstem.

## WATERBODY

Waterbody Oxbow SloughMain Drainage Tanana River Tributary to Salcha RiverNPSI 4-157.02 NPAS 89 NPMP 501.3 AHMP N/AUSGS Map Reference Big Delta, Ak. T 5S R 5E Sec. 12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Oxbow Slough is an old highwater channel of the Salcha River that is overgrown with tall grass and willow. Near the pipeline crossing, this drainage has a channel width varying from 0-5 m with grass covered banks. Abandoned beaver dams are visible downstream of the proposed crossing where Oxbow Slough is dry. This drainage would not have flowing water at the crossing except during periods of high floods and it should not be considered fish habitat at any time of year (Refs. 54 and 57). Approximately 800 m downstream of the crossing at the confluence with the Salcha, Oxbow Slough forms a small pool 25 m in length and 0.1-0.3 m in depth. This pool offers the only visible fish habitat throughout the length of the Slough (Ref. 54).



## WATERBODY

Waterbody Two-Nineteen CreekMain Drainage Tanana RiverTributary to Little Salcha RiverNPSI 4-157.01NPAS 88NPMP 497.6AHMP N/AUSGS Map Reference Big Delta, Ak.T 5SR 5ESec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Two-Nineteen Creek is a small beaded tundra stream 0.5-2 m in width and 0-15 cm in depth. Its highly stained water flows over unstable mud and sand substrates. The tundra banks vary from 0.5 to 1.5 m in height and are occasionally severely incised. Predominant vegetation includes dwarf spruce and willow intermixed with some birch.

Fish use in the vicinity of the pipeline crossing is unlikely at any time of year due to poor fish habitat. No fish were caught in this area during a 1979 spring survey (Ref. 54). Downstream areas provide fish habitat since grayling have been reported to be present in downstream reaches. Although no studies have been performed in winter, habitat at that time is very unlikely or non-existent since the stream probably freezes to the bottom.

## WATERBODY

Waterbody Little Salcha River

Main Drainage Yukon River Tributary to Tanana River

NPSI 4-157 NPAS 88 NPMP 496.5 AHMP NA

USGS Map Reference Big Delta, Ak. T 4E R 5S Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>54,83</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>30,57</u>
Winter	<u>None</u>	<u></u>	<u>55,77</u>

Little Salcha River is a bog-fed stream of variable width (4-8 m) and depth (0.1-2 m). During the summer, its waters are stained red/brown from leachates of surrounding tundra and muskeg. Viewed from the air, the stream is a series of alternating circular pools and narrower straight riffles. Substrate is gravel and sand in fast water and mud in pool or slow water areas. Banks are moderately high (1.8-2.4 m) and are heavily wooded with alder and spruce in the area of the pipeline crossing.

In the vicinity of the proposed pipeline crossing, the Little Salcha River provides important rearing habitat for grayling and slimy sculpin and possibly other species throughout the open water season (Refs. 11, 30, 54, 57, and 83). Grayling spawning has also been documented in this stream (Ref. 83). Migration undoubtedly occurs as fish move to and from wintering areas in spring and fall (Refs. 54, 57 and 83).

Surveys conducted in 1979 found that suitable winter fish habitat exists near the pipeline crossing but no fish were observed or captured (Refs. 55 and 77). Winter fish use of the Little Salcha River remains unknown. Previous studies conducted in 1953 by U.S. Fish and Wildlife Service reported chum salmon in this stream (Ref. 81). It is unlikely, however, that they move upstream as far as the proposed crossing.

## WATERBODY

Waterbody Tributary to Little Salcha RiverMain Drainage Tanana River Tributary to Little Salcha RiverNPSI 4-156.05 NPAS 88 NPMP 495.3 AHMP N/AUSGS Map Reference Big Delta, Ak. T 4S R 5E Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Tributary to the Little Salcha River is a small poorly-defined stream with a width of 0.1-0.5 m at the proposed pipeline crossing. Stream flow was negligible in June 1979 (Ref. 54), which indicates that this drainage may dry up frequently. Where visible, substrate is mud, sand and some gravel (near the TAPS workpad). This tributary is intermittent and disappears into bogs and tundra which would impede fish passage. The stream is considered to be poor fish habitat and fish utilization non-existent (Ref. 54).

Reference 11 indicates that areas further downstream contain grayling but that these fish are not found as far upstream as the pipeline route.

# WATERBODY

Waterbody Tributary to Million Dollar Creek

Main Drainage Tanana River Tributary to French Creek

NPSI 4-156.04 NPAS 88 NPMP 493.9 AHMP N/A

USGS Map Reference Big Delta, Ak. T 4S R 5E Sec. 19 and 24

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tributary to Million Dollar Creek is a shallow, muddy stream with a poorly-defined stream channel at the proposed crossing. This drainage frequently disappears into bogs and willow thickets which would impede fish movements during dry years.

Tributary to Million Dollar Creek is poor fish habitat due to its limited flow, the absence of defined channels in many locations, and unstable substrate. No fish were caught or seen during a 1979 spring survey (Ref. 54). Fish use, if any, of this stream would probably occur during high water and very infrequently. Department of Fish and Game personnel recommended removal of this creek from the fish stream list (8 June 1979, Ref. 31).

## WATERBODY

Waterbody Million Dollar Creek #1Main Drainage Tanana RiverTributary to French CreekNPSI 4-156.03NPAS 87NPMP 491.5AHMP NAUSGS Map Reference Big Delta, Ak.T 4S R 4E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R,S</u>	<u>30,31</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Million Dollar Creek Crossing #1 is the farthest upstream of four proposed pipeline crossings on Million Dollar Creek. This narrow stream flows through a muskeg area and is bordered by dense willows and occasional stunted spruce. In the proximity of the TAPS workpad the stream has been channelized for approximately 50 meters.

Fish utilization probably occurs from breakup to freeze-up in the vicinity of Million Dollar Creek #1. During spring this stream is utilized as a migration route and for grayling spawning (Refs. 30 and 31). Slimy sculpin young-of-the-year were captured at crossing #4 in fall (Ref. 57), indicating that this species also spawns in the stream. The lack of winter fish habitat (Ref. 55) suggests fall out-migration of fish prior to freeze-up.

## WATERBODY

Waterbody Million Dollar Creek #2Main Drainage Tanana RiverTributary to French CreekNPSI 4-156.02NPAS 87NPMP 491.2AHMP NAUSGS Map Reference Big Delta, Ak.T 4S R 4E Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Million Dollar Creek crossing #2 is one of four proposed pipeline crossings of this stream. This stream has been channalized for approximately 20 m in the vicinity of the TAPS workpad. In other areas, Million Dollar Creek is a beaded tundra stream with a narrow channel connecting a series of larger deep pools. These pools have incised banks 1.6 to 2.5 m in height. The stream is bordered by dense willows and flows through a low muskeg area. The water is dark humic-stained and flows over a gravel and mud substrate.

Although most site specific data are lacking for crossing #2, information obtained at crossings #1, #3 and #4 strongly suggests that fish utilize the stream near crossing #2 throughout the open water period. The presence of grayling and sculpin upstream near crossing #1 indicates that these fish migrate through the area of crossing #2 in spring and fall. Out-migration must occur since the stream provides no overwintering habitat (Ref. 55).

## WATERBODY

Waterbody Million Dollar Creek #3Main Drainage Tanana RiverTributary to French CreekNPSI 4-156.01NPAS 87NPMP 491.0AHMP NAUSGS Map Reference Big Delta, Ak.T 4S R 4E Sec. 2 and 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>30</u>
Fall	<u>CN</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Million Dollar Creek is crossed by the proposed pipeline route four times before it flows into French Creek. At crossing #3, except for the Alyeska workpad, artificial channelization has not occurred. The channel varies 1-3 m in width and banks to 1 m high are bordered by willow and spruce. Dark humic-stained water and mud substrate are typical of all the four crossings.

Fish use of the stream in the vicinity of crossing #3 very likely occurs throughout the open water period, although spring use is not well documented. Grayling and sculpin are found in upstream reaches and spring use must include migration into this area and to further upstream regions as well. Million Dollar Creek #3 is known to provide no fish habitat during winter (Ref. 55) and fish must undertake downstream migrations in the fall to more favorable winter habitat.

## WATERBODY

Waterbody Million Dollar Creek #4Main Drainage Tanana RiverTributary to French CreekNPSI 4-156NPAS 87NPMP 490.6AHMP NAUSGS Map Reference Big Delta, Ak.T 4SR 4ESec. 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,NP</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>30</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>30,57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Million Dollar Creek #4 is the farthest downstream of four proposed pipeline crossings of this stream. This small tundra stream (1-3 m wide) flows northwesterly to its confluence with French Creek. Near crossing #4, banks to 1 m high are well vegetated and bordered by willow and spruce. The substrate consists primarily of mud and detritus and the water is darkly stained. Upstream of the proposed crossing the channel is cluttered with numerous fallen logs. A downstream portion has been channelized and parallels the TAPS workpad for approximately 50 yards.

This stream provides fish habitat throughout the open water period (Refs. 30 and 57); however, winter conditions preclude fish use at that time (Ref. 55). During spring and fall the stream near crossing #4 is utilized as a migration route by fish moving into upstream spawning and rearing areas. Both grayling and slimy sculpin spawning occurs in this stream as evidenced by the presence of young-of-the-year, and rearing continues until just before freeze-up (Refs. 30 and 57). Northern pike are also reported to be present in spring (Ref. 30).



## WATERBODY

Waterbody French Creek #0

Main Drainage Tanana River Tributary to Moose Creek

NPSI 4-155 NPAS 87 NPMP 489.6 AHMP NA

USGS Map Reference Big Delta, Ak. T 3S R 4E Sec. 34

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,38</u>
Fall	<u>CN</u>	<u>M,R</u>	<u>31,57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,77</u>

\*See assessment - additional species present, but site specific data are lacking.

Crossing #0 is the farthest upstream of six proposed crossing on French Creek. This small tundra stream at crossing #0 is narrow (0.5-1.1 m) with depths ranging from 10-45 cm and occasionally deeper pools to 150 cm. The stream drains a muskeg/bog area and has a mud and detritus substrate. Grassy banks (0.1-3 m high) are bordered by willow, dwarf birch and scattered stands of spruce.

Fish utilization of French Creek very likely occurs from breakup to freeze-up, but site specific data for particular crossings are often lacking. Migration into French Creek probably occurs during or shortly after breakup. Young-of-the-year grayling and slimy sculpin have been found in French Creek which indicates that they probably spawn in the stream (Refs. 19 and 57). Rearing of these species continues until prior to freeze-up, at which time out migration occurs. Whitefish and northern pike also occur in the stream (Ref. 11), but no site specific information is available for these species. Winter fish use of French Creek, in general, is thought to be low to non-existent due to limited flow and low dissolved oxygen concentrations (Refs. 55 and 77). French Creek should be considered important to fish throughout the open water season.

## WATERBODY

Waterbody Knokanpeover CreekMain Drainage Tanana River Tributary to French CreekNPSI 4-154 NPAS 86 NPMP 486.4 AHMP N/AUSGS Map Reference Fairbanks, Ak. T 3S R 4E Sec. 20

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>30,31</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Knokanpeover Creek is a small stream (3-5 m wide) with depths to 150 cm. Its stained waters flow over firm sand and gravel substrate and through a series of pools and riffles. Numerous large trees which have fallen into the creek provide excellent cover for fish. Streamside vegetation consists of large mature spruce and birch among weed and willow.

Knokanpeover Creek is a grayling spawning stream and provides habitat for rearing grayling throughout the open water period. Since this stream provides no overwintering habitat (Ref. 55), major grayling migrations must occur in spring and fall. Other fish species may be present in this stream but none has been recorded.

## WATERBODY

Waterbody French Creek #1

Main Drainage Tanana River Tributary to Moose Creek

NPSI 4-153 NPAS 86 NPMP 483.7 AHMP NA

USGS Map Reference Fairbanks, Ak. T 3S R 4E Sec. 7

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>19,38,80</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,77</u>

\*See assessment - additional species present, but site specific data are lacking.

French Creek #1 is a second of six proposed crossings of this stream. Near crossing #1 the meandering channel is approximately 7 m wide with water depths up to 1 m. Banks are 1.5-2.5 m high and partially incised. The humic-stained stream is shaded by overhanging willows and alders and bordered by a stand of spruce.

Fish utilization of French Creek very likely occurs from breakup to freeze-up, but site specific data for particular crossings are often lacking. Migration into French Creek probably occurs during or shortly after breakup. Young-of-the-year grayling and slimy sculpin have been found in French Creek, which indicates that they probably spawn in the stream (Refs. 19 and 57). Rearing of these species continues until prior to freeze-up, at which time out migration occurs. Whitefish, northern pike, and burbot also occur in the stream (Ref. 11) but no site specific information is available for these species. Winter fish use of French Creek, in general, is thought to be low to non-existent due to limited flow and low dissolved oxygen concentrations (Refs. 55 and 77). French Creek should be considered important to fish throughout the open water season.

## WATERBODY

Waterbody French Creek #2

Main Drainage Tanana River Tributary to Moose Creek

NPSI 4-152 NPAS 86 NPMP 483.0 AHMP NA

USGS Map Reference Fairbanks, Ak. T 3S R 3E Sec. 1

## FISHERIES ASSESSMENT

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,19,38,80</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,77</u>

\*See assessment - additional species present, but site specific data are lacking.

French Creek #2 is the third of six proposed crossings of this stream. Near crossing #2 the channel is 6-8 m wide with steep banks (1.5-2.5 m high) which are bordered by willows, birch and spruce. Depths are to 1.5 m and substrate is mud.

Fish utilization of French Creek very likely occurs from breakup to freeze-up, but site specific data for particular crossings are often lacking. Migration into French Creek probably occurs during or shortly after breakup. Young-of-the-year grayling and slimy sculpin have been found in French Creek, which indicates that they probably spawn in the stream (Refs. 19 and 57). Rearing of these species continues until prior to freeze-up, at which time out migration occurs. Whitefish, northern pike, and burbot also occur in the stream (Ref. 11), but no site specific information is available for these species. Winter fish use of French Creek, in general, is thought to be low to non-existent due to limited flow and low dissolved oxygen concentrations (Refs. 55 and 77). French Creek should be considered important to fish throughout the open water season.

**WATERBODY**Waterbody French Creek #3Main Drainage Tanana River Tributary to Moose CreekNPSI 4-151 NPAS 86 NPMP 482.5 AHMP NAUSGS Map Reference Fairbanks, Ak. T 3S R 3E Sec. 1**FISHERIES ASSESSMENT**

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>19,38,80</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,77</u>

\*See assessment - additional species present, but site specific data are lacking.

French Creek #3 is one of six proposed crossings of this stream, which lies east of Eielson Air Force Base and flows northwesterly to the confluence with Moose Creek. Near crossing #3, the well defined, meandering channel is 6-9 m wide with banks 1.5-2.5 m high, bordered by overhanging willow and alder. Substrate is mud and detritus.

Fish utilization of French Creek very likely occurs from breakup to freeze-up, but site specific data for particular crossings are often lacking. Migration into French Creek probably occurs during or shortly after breakup. Young-of-the-year grayling and slimy sculpin have been found in French Creek, which indicates that they probably spawn in the stream (Refs. 19 and 57). Rearing of these species continues until prior to freeze-up, at which time out migration occurs. Whitefish and northern pike also occur in the stream (Ref. 11), but no site specific information is available for these species. Winter fish use of French Creek, in general, is thought to be low to non-existent due to limited flow and low dissolved oxygen concentrations (Refs. 55 and 77). French Creek should be considered important to fish throughout the open water season.

**WATERBODY**

Waterbody French Creek #4

Main Drainage Tanana River Tributary to Moose Creek

NPSI 4-150 NPAS 85 NPMP 482.2 AHMP NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec. 36

**FISHERIES ASSESSMENT**

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,19,38,80</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55,77</u>

\*See assessment - additional species present, but site specific data are lacking.

French Creek #4 is one of six proposed pipeline crossings of this stream, which lies east of Eielson Air Force Base and flows northwesterly to the confluence with Moose Creek. The well defined, meandering channel is 6-9 m wide with banks 1.5-2.5 m high, bordered by overhanging willow and alder. Substrate is mud and detritus.

Fish utilization of French Creek very likely occurs from breakup to freeze-up, but site specific data for particular crossings are often lacking. Migration into French Creek probably occurs during or shortly after breakup. Young-of-the-year grayling and slimy sculpin have been found in French Creek, which indicates that they probably spawn in the stream (Refs. 19 and 57). Rearing of these species continues until prior to freeze-up, at which time out migration occurs. Whitefish and northern pike also occur in the stream (Ref. 11), but no site specific information is available for these species. Winter fish use of French Creek, in general, is thought to be low to non-existent due to limited flow and low dissolved oxygen concentrations (Refs. 55 and 77). French Creek should be considered important to fish throughout the open water season.

## WATERBODY

Waterbody French Creek #5Main Drainage Tanana River Tributary to Moose CreekNPSI 4-149 NPAS 85 NPMP 480.4 AHMP NAUSGS Map Reference Fairbanks, Ak. T 2S R 3E Sec. 27

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,19,38,80</u>
Fall	<u>None</u>	<u></u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,77</u>

\*See assessment - other species reported, but site specific data are lacking.

French Creek #5 is the farthest downstream of six proposed pipeline crossings of the stream. French Creek drains a low-lying area east of Eielson Air Force Base and flows northwesterly to its confluence with Moose Creek. Near crossing #5 the stream follows a well defined channel (5-8 m wide) confined by banks to 2.5 m high. The grassy banks are bordered by willow and alder. The substrate in the vicinity of Crossing #5 consists primarily of mud with some gravel downstream of the TAPS workpad.

Fish utilization of French Creek very likely occurs from breakup to freeze-up, but site specific data for particular crossings are often lacking. Migration into French Creek probably occurs during or shortly after breakup. Young-of-the-year grayling and slimy sculpin have been found in French Creek which indicates that they probably spawn in the stream (Refs. 19 and 57). Rearing of these species continues until prior to freeze-up, at which time out migration occurs. Whitefish and northern pike also occur in the stream (Ref. 11), but no site specific information is available for these species. Winter fish use of French Creek, in general, is thought to be low to non-existent due to limited flow and low dissolved oxygen concentrations (Refs. 55 and 77). French Creek should be considered important to fish throughout the open water season.

## WATERBODY

Waterbody Bear Lake OutletMain Drainage Tanana RiverTributary to Moose CreekNPSI 4-148.01NPAS 85NPMP 480.2AHMP N/AUSGS Map Reference Fairbanks, Ak.T 2SR 3ESec. 27

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,54</u>
Summer	<u>None</u>		<u>11</u>
Fall	<u>None</u>	<u>None</u>	<u>11,57</u>
Winter	<u>None</u>		<u>None</u>

Bear Lake Outlet at the proposed pipeline crossing is a dry stream channel overgrown with grass and willow. The large quantity of vegetative growth indicates that water has not been flowing for a number of years. The culvert presently installed in the Alyeska workpad is perched and constitutes a barrier to fish movement, should flowing water be present in Bear Lake Outlet. Alaska Department of Fish and Game approved of this fish block to keep fish from entering Bear Lake (Ref. 11).

At the present time Bear Lake Outlet provides no suitable fish habitat year round. Species indigenous to Moose Creek could utilize Bear Lake Outlet only during severe flood periods. It should be noted that prior to TAPS construction (July 1975), slimy sculpin, least cisco, grayling, humpback whitefish, lake chub, longnose sucker, northern pike and round whitefish were reported to be present in Bear Lake Outlet (Refs. 11, 30 and 76).



**WATERBODY**

Waterbody Moose Creek Crossing #1

Main Drainage Yukon River Tributary to Tanana River

NPSI 4-148 NPAS 85 NPMP 479.3 AHMP NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec. 28

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	LS	M,R	54
Summer	None		None
Fall	GR,HW,WF	M,R,S	31,57
Winter	NP	W	55,77

Moose Creek is a moderate sized, deep, meandering stream that drains a low-lying tundra/muskeg area to the east of Eielson Air Force Base and flows into the Tanana River. Crossing #1 is the farthest upstream of three proposed crossings of the stream. Near crossing #1, the channel width is 10-15 m and depths exceed 2 m. Banks are 1.5-3.0 m high and heavily vegetated with willow, birch and grasses. The channel has a mud substrate which is littered with numerous sunken logs in the vicinity of this crossing.

Moose Creek #1 provides habitat for a number of fish species, some of which may occur in the area year round. This area serves as a migration route during spring and fall for species moving between the Tanana River and upstream areas of Moose Creek and its tributaries. Grayling, longnose suckers and humpback whitefish have been documented at this crossing during the open water period (Refs. 11, 30, 54 and 57). Other species known to occur in Moose Creek include northern pike, round whitefish and burbot (Refs. 54 and 77). It is likely that all of the above-mentioned species rear in the vicinity of Moose Creek #1 through the open water season. A northern pike was caught in the area during early winter investigations and stomach analysis produced the remains of a whitefish (possibly a humpback whitefish), suggesting winter use by both of these species (Ref. 77). A juvenile burbot was captured in early winter at a downstream crossing (Ref. 77). Since no physical barriers exist that would prevent fish movement between these crossings, it is probable that burbot also use the stream in winter near crossing #1. A previous study suggests that Moose Creek may be utilized by spawning whitefish during the late fall (Ref. 31). If this does occur,

**FISHERIES ASSESSMENT (CON'T)****Moose Creek Crossing #1**

eggs would be present throughout the winter months. Moose Creek was previously thought to provide poor winter habitat as a result of low dissolved oxygen levels (Ref. 55). During early winter investigations, fish were captured in this stream and dissolved oxygen levels were again low. Re-evaluation of available data suggests that suitable fish habitat probably exists throughout the winter (Ref. 77).

Moose Creek, near crossing #1, is considered important to fish the year-round.

## WATERBODY

Waterbody Moose Creek Crossing #2

Main Drainage Yukon River Tributary to Tanana River

NPSI 4-147 NPAS 85 NPMP 478.0 AHMP NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec. 20

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	GR,HW,RW	M,R	54
Summer	GR		31,38
Fall	BB,HW,RW	M,R	57
Winter	None		55,77

Moose Creek #2 is the second of three proposed crossings of this stream. The physical appearance of the stream is very similar at all three crossings which lie within a 3.5 km section of the stream. Moose Creek is a moderate sized, deep, meandering stream that drains a low-lying tundra/muskeg area to the east of Eielson Air Force Base and flows into the Tanana River. Near crossing #2 the channel width is 12-17 m and depths exceed 2 m. Banks to 2 m high are heavily vegetated with grasses, willow and birch.

Moose Creek #2 provides habitat for a number of species, some of which may occur on a year-round basis. This area serves as a migration route during spring and fall for species moving between the Tanana River and upstream areas of Moose Creek and its tributaries. Grayling, humpback whitefish and round whitefish have all been captured in the vicinity of this crossing during spring investigations and grayling were observed here in the summer (Refs. 31 and 54). During fall, burbot, humpback and round whitefish were captured (Ref. 57) and northern pike are also known to be present in this stream (Ref. 77). All of these species probably utilize this section of the stream for rearing during the open water period. Although no documentation of winter fish use exists for this crossing, a northern pike was caught upstream at crossing #1 and a burbot was caught downstream at crossing #3 (Ref. 77). Since no barriers were observed, it is possible that winter use by both of these species occurs at Moose Creek #2. Previous work suggests that Moose Creek may be utilized by spawning whitefish during the late fall (Ref. 31). If this is the case, eggs would be present throughout the winter months. Moose Creek was previously thought to provide poor

**FISHERIES ASSESSMENT (CON'T)****Moose Creek #2**

winter habitat as a result of low dissolved oxygen levels (Ref. 55). During early winter investigations, fish were captured in this stream and dissolved oxygen levels were again low. Re-evaluation of available data suggests that suitable fish habitat probably exists throughout the winter (Ref. 77).

Moose Creek near crossing #2 is considered to be important to fish the year round.

## WATERBODY

Waterbody Moose Creek Crossing #3

Main Drainage Yukon River Tributary to Tanana River

NPSI 4-146 NPAS 85 NPMP 477.3 AHMP NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec. 20

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	GR,LS	M,R	54
Summer	None		31
Fall	None		None
Winter	BB	W	55,77

Moose Creek #3 is the farthest downstream of three proposed crossings of this stream. The physical appearance of the stream is very similar at all three crossings which lie within a 3.5 km section of the stream. Moose Creek is a moderate sized, deep, meandering stream that drains a low-lying tundra/muskeg area to the east of Eielson Air Force Base and flows into the Tanana River. Near crossing #3, the channel width is 10-15 m with depths in excess of 2 m. Banks 0.5-1.5 m high are heavily vegetated with grasses, willow and alder.

Moose Creek #3 provides habitat for a number of fish species, some of which may occur here on a year-round basis. This area serves as a migration route during spring and fall for species moving between the Tanana River and upstream areas of Moose Creek and its tributaries. Grayling and longnose suckers were captured during spring investigations and other species known to be present in Moose Creek include northern pike, humpback whitefish, round whitefish and burbot (Refs. 54, 57 and 77). It is likely that all of these species utilize this stream during the open water period. In early winter a juvenile burbot was captured at crossing #3 and, farther upstream at crossing #1, a northern pike was captured (Ref. 77). Since no barriers were observed it is suspected that winter use by these species occurs at all of the three crossings. Previous work suggests that Moose Creek may be utilized by spawning whitefish in late fall (Ref. 31). If this does occur, eggs would be present throughout the winter months. Moose Creek was previously thought to provide poor winter habitat, as a result of low dissolved oxygen levels (Ref. 55). During early winter investigations, fish were captured in this stream and dissolved oxygen levels were again low. Re-evaluation

## FISHERIES ASSESSMENT (CON'T)

### Moose Creek Crossing #3

of available data suggests that suitable fish habitat probably exists throughout the winter (Ref. 77).

Moose Creek near crossing #3 is considered important to fish year round.

## WATERBODY

Waterbody Unnamed Creek NPSI 4-145.04

Main Drainage Tanana River Tributary to Unnamed Creek NPSI 4-145.03

NPSI 4-145.04 NPAS 84 NPMP 473.7 AHMP N/A

USGS Map Reference Fairbanks, Ak. T 2S R 2E Sec. 12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek NPSI 4-145.04 is apparently not a stream and drainage structures were not installed in the TAPS workpad. An unidentified local resident stated in June 1979 that water had not been present at this location for four to five years (Ref. 54).

## WATERBODY

Waterbody Unnamed Creek NPSI 4-145.03Main Drainage Tanana River Tributary to UnknownNPSI 4-145.03 NPAS 84 NPMP 473.5 AHMP N/AUSGS Map Reference Fairbanks, Ak. T 2S R 2E Sec. 12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,30,54,76</u>
Summer	<u>None</u>	<u>None</u>	<u>11,54,76</u>
Fall	<u>None</u>	<u>None</u>	<u>11,30,54,76</u>
Winter	<u>None</u>	<u>None</u>	<u>11,30,54,76</u>

This site is apparently not a stream. Drainage structures were not installed on the TAPS workpad. A local resident stated that water had not been present at this location for 4-5 years (Ref. 54). Investigations in past years have shown this site to provide no suitable fish habitat (Refs. 11, 30, 54 and 76).



## WATERBODY

Waterbody Ess Shaped Slough

Main Drainage Tanana River Tributary to Seventeen-twenty Slough

NPSI 4-145.02 NPAS 84 NPMP 471.9 AHMP NA

USGS Map Reference Fairbanks, Ak. T 1S R 2E Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Ess Shaped Slough, a tributary to Seventeen-twenty Slough, is a meandering channel that drains the lower Chena River flood plain east of Fairbanks.

Ess Shaped Slough was dry in August of 1975 (Ref. 31) and it has been reported that it is doubtful if fish have been present in Ess Shaped Slough in several decades, except during the flood of 1967 (Ref. 11). This area provides no fish habitat.

## WATERBODY

Waterbody Seventeen-Twenty SloughMain Drainage Chena RiverTributary to Seven-Thirty SloughNPSI 4-145-01NPAS 83NPMP 468.2AHMP NAUSGS Map Reference Fairbanks, Ak.T 1S R 2E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Seventeen-Twenty Slough was investigated in June 1979 (Ref. 54). At that time it was found to be a standing body of water 1.5-2.5 m wide with a soft mud bottom, no flow and low dissolved oxygen levels (2.6 mg/l). The banks are usually less than 1 m high and covered with grass and dwarf willow. In summer dense moss and algae growths are common and result in a dark green water color.

Seventeen-Twenty Slough drains into Seventeen-Thirty Slough 800 m downstream of the proposed crossing. Seventeen-Twenty Slough is not accessible to fish due to major barriers. Since Seventeen-Twenty Slough is a tributary to Seventeen-Thirty Slough, the material site on Nordale Road serves as a complete fish block to the system (see Seventeen-Thirty Slough assessment). In addition, the Alyeska culvert for Seventeen-Twenty Slough would be a stream block during low water (Ref. 54). In past investigations, grayling and longnose sucker have been reported present in Seventeen-Twenty Slough, but no specific data are available concerning year of capture (Refs. 11 and 30). Electrofishing 100 m of this stream near the proposed crossing failed to capture any fish (Ref. 54). Although this body of water harbored fish in the past, it is of no importance to fish at the present time.

## WATERBODY

Waterbody Seventeen-Thirty SloughMain Drainage Tanana River Tributary to Chena RiverNPSI 4-145 NPAS 83 NPMP 468.0 AHMP NAUSGS Map Reference Fairbanks, Ak. T 1S R 2E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Seventeen-Thirty Slough was studied in June 1979 (Ref. 54). At that time, it was found to be a standing body of water 2-8 m wide with mud substrate, no flow and low dissolved oxygen levels (2.6 mg/l). The banks are stable and do not show visible signs of scouring from flooding. Surrounding vegetation includes grasses, willow and black spruce. Water in summer is dark green/brown due to dense growths of algae and moss.

Seventeen-Thirty Slough in the area of the proposed crossing is not accessible to fish due to major barriers. At the point where Nordale Road crosses the stream, the channel has been completely obliterated by the construction of a material site. In past investigations, grayling and longnose sucker have been reported present in Seventeen-Thirty Slough (Refs. 11 and 30), but no specific information is available concerning year of capture. Electrofishing in 1979 near the proposed crossing failed to capture any fish (Ref. 54). Although this body of water harbored fish in the past it should not be considered to be of importance to fish at the present time.

# WATERBODY

Waterbody Isolated Slough

Main Drainage Tanana River Tributary to Chena River

NPSI 4-144.01 NPAS 83 NPMP 465.9 AHMP N/A

USGS Map Reference Fairbanks, Ak. T 1S R 2E Sec. 7

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>31,54</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Isolated Slough is an old high water channel of the Chena River which is located approximately 20 km east of Fairbanks. The slough is isolated from the Chena River by a drop of 1.5 m at its confluence. The narrow channel (2-3 m wide) was found to be dry and overgrown with tall grasses and willow upstream of the proposed crossing and standing water was present in depressions downstream of the crossing during spring investigations on 28 June 1979 (Ref. 54). Previous studies also indicate the presence of standing water during the summer of 1975 (Ref. 11).

Isolated Slough provides no fish habitat, except during flood periods in the Chena River.

## WATERBODY

Waterbody Chena RiverMain Drainage Yukon River Tributary to Tanana RiverNPSI 4-144 NPAS 83 NPMP 465.8 AHMP NAUSGS Map Reference Fairbanks, Ak. T 1S R 2E Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	BB,CN,DS,GR,IN,KS,NP,SK, SS,WF	M,R,S	11,30,39,76
Summer	AL,BB,BW,CN,CS,DS,GR,HW, IN,KS,LS,NP,RW,SS	M,R,S	11,39,76,96,97
Fall	BB,CN,DS,GR,IN,KS,NP,SK, SS,WF	M,R,S	11,39,76
Winter	BB,CN,DS,GR,IN,KS,NP,SK, SS,WF	M,S,W	11,39,76

The Chena River flows west from the White Mountains for approximately 240 km to where it enters the Tanana River just west of Fairbanks. The proposed pipeline crossing occurs 24 km east of Fairbanks. In this area, the channel is approximately 30 m wide and meanders through a partially developed agricultural area. The water is darkly stained in summer and fall and depths are 1-2 m. The banks are heavily vegetated by willows and alder and bordered by mature stands of spruce.

The Chena River provides important fish habitat throughout the year. Burbot, slimy sculpin, chum salmon, king salmon, silver salmon, grayling, sheefish, longnose suckers and round whitefish are all present in the vicinity of the pipeline crossing at various times and some are present on a year-round basis (Refs. 11 and 30). Additional species suspected to be present include Arctic lamprey, broad whitefish, least cisco, and humpback whitefish (Ref. 11). This area is utilized as a migration route by different species during all seasons. Rearing of various life stages of fish occurs throughout the open water season. Overwintering of burbot, slimy sculpin, grayling, king salmon, and unidentified whitefish is known to occur in the area (Ref. 11). The Chena River is of obvious importance to fish throughout the year.

## WATERBODY

Waterbody Steele Creek

Main Drainage Tanana River Tributary to Chena River

NPSI 4-143 NPAS 82 NPMP 463.6 AHMP N/A

USGS Map Reference Fairbanks, Ak. T 1N R 1E Sec. 35 and 36

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>		<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Steele Creek is a small, shallow stream which drains a muskeg area north-east of the Chena River. Its poorly defined channel is .5-1.0 m in width with water depths to 0.2 m near the proposed pipeline crossing. In this region the stream flows through dense alder and willow thickets growing on unstable, sloughing banks. Substrate consists primarily of mud and silt with an accumulation of sunken logs and debris.

During open water periods Steele Creek is considered poor fish habitat in the vicinity of the proposed crossing. Numerous log jams and bog areas located downstream probably impede fish movement and likely constitute complete fish blocks during low water years. No fish were caught or seen during investigations conducted in June 1979 and September 1979 (Refs. 54 and 57).

Steele Creek is not an overwintering site at or near the proposed pipeline crossing. Winter investigations conducted in March 1979 reported that Steele Creek was frozen to the bottom at all sites studied except one. Anaerobic conditions existed at the one site where free water was found (Ref. 55).

**WATERBODY**Waterbody Engineer CreekMain Drainage Chatanika River Tributary to Goldstream CreekNPSI 4-142 NPAS 81 NPMP 457.5 AHMP N/AUSGS Map Reference Fairbanks, Ak. T 1N R 1E Sec. 8**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>11,30,31,57,76</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Engineer Creek has cut a large V-channel 4-5 m deep through ice-rich, unstable tundra at the proposed pipeline crossing. At this location, the stream is a combination of shallow dish-like depressions (0.2-1.0 m wide) where water collects and then spills over 0.2-1.0 m waterfalls into the next depression. This morphology continues 3-4 km downstream of the proposed pipeline crossing. Substrate in the dish-like depressions is primarily silt and mud contributed by sloughing of ice-rich banks.

Fish utilization of Engineer Creek is low to non-existent. Fish access is blocked downstream of the proposed crossing by the culvert at the Steese Highway crossing. This culvert is perched 1 m above the natural level of stream flow and the entire discharge percolates through the highway road fill. This stream has previously been reported to support blackfish (Refs. 11, 30 and 76), although it is unlikely that they are present in the vicinity of the proposed crossing. The stream was considered not to support fish in 1975 (Ref. 31).

**WATERBODY**

Waterbody Goldstream Creek

Main Drainage Tanana River Tributary to Chatanika River

NPSI 4-141 NPAS 81 NPMP 454.7 AHMP NA

USGS Map Reference Fairbanks, Ak. T 1N R 1W Sec. 1

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Goldstream Creek originates approximately 32 km north of the proposed pipeline crossing and flows southerly through gold dredge tailings of the Fox Mining District before reaching the proposed crossing. As a result, the substrate of this stained, narrow (~3 m) stream consists of gravel and rocks with minimal accumulation of silt or mud. Stream channel configuration and banks are in their natural condition at the point of crossing. Banks (0.2-1.0 m high) consist of gravel, sand and some silt. Stream side vegetation is mature birch, willow and spruce.

Electrofishing in June 1979 upstream of TAPS failed to capture any fish in Goldstream Creek (Ref. 54), but grayling young-of-the-year were captured immediately downstream of the proposed crossing in September 1979 (Ref. 57). This indicates that Goldstream Creek, near the proposed crossing, provides suitable fish habitat during the open water period and is a possible spawning stream for grayling. Numerous species (including blackfish, burbot, least cisco, humpback whitefish, sheefish and northern pike) are reported to be present in Goldstream Creek (Ref. 11). However, it is unlikely that some of these species move upstream from the Minto Flats area, which is approximately 75 km downstream of the proposed crossing.

Winter surveys in the vicinity of the pipeline crossing found Goldstream Creek to be frozen to the bottom (Ref. 55) and it is extremely unlikely that Goldstream Creek provides any overwintering habitat near the proposed crossing.



## WATERBODY

Waterbody Treasure CreekMain Drainage Chatanika River Tributary to Vault CreekNPSI 4-140 NPAS 80 NPMP 448.6 AHMP N/AUSGS Map Reference Livengood, Ak. T 2N R 1W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>11,30,54</u>
Summer	<u>None</u>	<u>None</u>	<u>11,30</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Treasure Creek is a small tundra stream about 1 m wide with 0.3-1.5 m high banks. The silt and mud banks are occasionally incised and vegetated with birch, dwarf spruce and dwarf willow. Substrates consist primarily of soft mud with many sunken logs and an abundance of detritus. Upstream placer mining may account partially for the extensive mud and silt deposits and abundance of sunken logs.

Fish utilization appears non-existent in the vicinity of the proposed pipeline crossing of Treasure Creek. Although suitable habitat was present, no fish were captured or observed during spring and fall investigations conducted in 1979 (Ref. 54 and 57). The absence of fish is probably attributable to three active beaver dams, 800-1200 m downstream of the proposed crossing, which are complete stream blocks. The largest is 1.5 m in height. Fish are probably present downstream of these dams during open water seasons. No fish habitat occurs during the winter months as the stream was found to be frozen to the bottom at the pipeline crossing in the winter of 1979 (Ref. 55). Previous studies reported slimy sculpin and grayling to be present in the area (Ref. 11, 30 and 76); however, the lack of overwintering habitat and the beaver dams appear to preclude fish use of the stream near the pipeline crossing at the present time.

## WATERBODY

Waterbody Chatanika RiverMain Drainage Tanana RiverTributary to Tolovana RiverNPSI 4-139NPAS 79NPMP 444.5AHMP NAUSGS Map Reference Livengood, Ak.T 3NR 1WSec. 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AB,BB,CN,CS,DS,GR,HW,IN,LS, NP</u>	<u>M,R,S</u>	<u>11,84,89</u>
Summer	<u>AB,BB,CN,CS,DS,GR,HW,IN,KS, LS,NP,RW</u>	<u>M,R,S</u>	<u>11,81,84,89,113</u>
Fall	<u>BB,CN,CS,DS,GR,HW,IN,KS,LS, NP,RW</u>	<u>M,R,S</u>	<u>11,81,84,89,113</u>
Winter	<u>CS,DS,HW,IN,KS</u>	<u>W</u>	<u>11,84,113</u>

The Chatanika River flows southwesterly from the White Mountains and is paralleled by the Steese Highway and crossed by the Elliot Highway before joining the Tolovana River in the Minto Flats Area. The proposed pipeline crossing lies approximately 6 km downstream of the Elliot Highway crossing. The slow, meandering stream is about 15 m wide at the crossing. Banks are silty sand to 2 m high and bordered by alder, birch and mature spruce. The substrate in this area is predominantly gravel.

The Chatanika River is a very important fish stream year-round. The vicinity of the gas pipeline crossing is particularly sensitive as it is utilized by a number of species for spawning and as a rearing area for early life stages of these fish. Grayling spawning occurs around the time of breakup and most fry emerge in June (Refs. 11 and 84). Anadromous species including king salmon and chum salmon are known to spawn near the crossing. King salmon spawn from the middle of July to around 10 August while chum salmon spawn typically from late July through September (Ref. 88). Silver salmon are also reported to be present although specific documentation is lacking. Through September and October humpback whitefish, sheefish and least cisco also spawn within this area. Eggs of fall spawning species remain within the gravel and hatch the following spring.

## WATERBODY

Waterbody Shocker CreekMain Drainage Tanana River Tributary to Chatanika RiverNPSI 4-138 NPAS 79 NPMP 443.7 AHMP N/AUSGS Map Reference Livengood, Ak. T 3N R 1W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>30,54</u>
Summer	<u>CN,GR,RW</u>	<u>R</u>	<u>11,30</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>30,57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Shocker Creek is a small tundra stream 0.6-2 m in width with 1-1.5 m high banks. The banks are silt and are covered with tundra, willow, birch and berry bushes. This drainage is a braided tundra stream with highly stained water. Substrates consist of gravel and mud, and emergent grass is abundant in shallow water in summer.

Shocker Creek at the pipeline crossing is used by grayling, slimy sculpin and round whitefish during the open water period. In the spring, young-of-the-year and juvenile grayling were found, suggesting that grayling spawn near the crossing (Ref. 54). Grayling, slimy sculpin and round whitefish were present above and below the proposed crossing in late summer (Ref. 11). In fall, this section of Shocker Creek is a rearing area for young-of-the-year and juvenile grayling and a feeding area for sculpin. Shocker Creek has not been studied in winter, but it probably does not provide habitat for fish during this season due to its small size; however, the stream provides good habitat for fish throughout the open water season.

## WATERBODY

Waterbody Unnamed Tributary to Shocker Creek #1Main Drainage Tanana River Tributary to Chatanika RiverNPSI 4-137.06 NPAS 79 NPMP 443.5 AHMP N/AUSGS Map Reference Livengood, Ak. T 3N R 1W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Shocker Creek #1 is a small intermittent tundra stream with a channel width of 0-0.5 m. Where visible, the channel was completely choked with heavy grass in late June 1979 (Ref. 54) and the limited amount of surface water was highly stained. This particular crossing appears as a sheet flow culvert and would generally not provide fish habitat near the pipeline crossing.

Approximately 1000 m downstream of the proposed crossing, this drainage reaches its terminus at its confluence with Unnamed Tributary to Shocker Creek #2. Below this point, the drainage may offer limited habitat, particularly during high water years.

## WATERBODY

Waterbody Unnamed Tributary to Shocker Creek #2Main Drainage Tanana River Tributary to Chatanika RiverNPSI 4-137.05 NPAS 79 NPMP 443.4 AHMP N/AUSGS Map Reference Livengood, Ak. T 3N R 1W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The channel of Unnamed Tributary to Shocker Creek #2 was generally not visible in late June 1979 due to heavy growths of grass and tundra. It was dry in many areas above and below the proposed crossing (Ref. 54). Where present, water was highly stained but not measurably flowing. Tributary #2 does not provide suitable habitat for fish near the proposed pipeline crossing. Suitable habitat may be present, however, approximately 1000 m downstream below the confluence of Tributary #1 and #2, particularly during high water years.

## WATERBODY

Waterbody Unnamed Tributary to Shocker Creek #3Main Drainage Tanana River Tributary to Chatanika RiverNPSI 4-137.04 NPAS 79 NPMP 443.3 AHMP N/AUSGS Map Reference Livengood, Ak. T 3N R 2W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Shocker Creek #3 is a small tundra drainage confined to a 0.2-1.0 m wide channel. The substrate consists of gravel and mud with an abundance of emergent grasses. The primary vegetation includes dwarf willow, birch and black spruce with an abundance of blueberry and highbush cranberry. During spring sampling, this stream was cutting a new channel through willows at the pipeline crossing (Ref. 54).

Fish habitat is poor in this stream in spring. Habitat likely deteriorates during summer and in all probability the stream freezes to the bottom during winter if it is not dry by fall. Available data suggest that it is not a fish stream.

## WATERBODY

Waterbody Unnamed Tributary to Chatanika River #1

Main Drainage Tolovana River Tributary to Chatanika River

NPSI 4-137.03 NPAS 78 NPMP 441.7 AHMP NA

USGS Map Reference Livengood, Ak. T 3N R 2W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u>None</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Chatanika River #1 drains a small area ( $\sim 3.3 \text{ km}^2$ ) west of the Elliot Highway. This stream is braided near its origin where the proposed pipeline makes three crossings. The present crossing is the southernmost. From the pipeline, this tributary flows southwest and then south to the Chatanika River through low muskeg and stands of birch and spruce.

Although no fisheries investigations have been conducted in this stream, a fish block was reported downstream from the TAPS in 1975 (Ref. 11) and fish use of this small drainage is considered to be unlikely the year round.

## WATERBODY

Waterbody Unnamed Tributary to Chatanika River #2Main Drainage Tolovana River Tributary to Chatanika RiverNPSI 4-137.02 NPAS 78 NPMP 441.7 AHMP NAUSGS Map Reference Livengood, Ak. T 3N R 2W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u>None</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Chatanika River #2 drains a small area ( $3.3 \text{ km}^2$ ) west of the Elliott Highway. This stream is braided near its origin where the proposed pipeline makes three crossings. From the pipeline, this tributary flows southwest and then south to the Chatanika River through low muskeg and stands of birch and spruce.

Although no fisheries investigations have been conducted in this stream, a fish block was reported downstream from the TAPS in 1975 (Ref. 11) and fish use of this small drainage is considered unlikely the year round.



## WATERBODY

Waterbody Unnamed Tributary to Chatanika River #3Main Drainage Tolovana River Tributary to Chatanika RiverNPSI 4-137.01 NPAS 78 NPMP 441.7 AHMP NAUSGS Map Reference Livengood, Ak. T 3N R 2W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u>None</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Chatanika River #3 drains a small area ( $3.3 \text{ km}^2$ ) west of the Elliott Highway. This stream is braided near its origin where the proposed pipeline makes three crossings. The present crossing is the northernmost. From the pipeline, this tributary flows southwest and then south to the Chatanika River through low muskeg and stands of birch and spruce.

Although no fisheries investigations have been conducted in this stream, a fish block was reported downstream from the TAPS in 1975 (Ref. 11) and fish use of this small drainage is considered unlikely the year round.

## WATERBODY

Waterbody Washington CreekMain Drainage Tanana River Tributary to Tolovana RiverNPSI 4-137 NPAS 78 NPMP 438.2 AHMP N/AUSGS Map Reference Livengood, Ak. T 3N R 2W Sec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>30,11,54</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30,11,57</u>
Winter	<u>GR</u>	<u>W</u>	<u>30,55,77</u>

Washington Creek, in the vicinity of the pipeline crossing, is about 5-8 m wide with well defined banks 1.0-2.5 m in height. This stream meanders westerly through mature stands of birch and spruce and also muskeg areas. Washington Creek was clear and humic-stained in late September 1979. Substrates are gravel and sand with small amounts of mud or silt.

Near the proposed pipeline crossing, Washington Creek is a rearing area for grayling. It may also provide spawning and nursery habitat as well as a migration route to and from upstream areas.

Habitat is good throughout the winter (Ref. 55) and grayling have been captured in the area in December 1979 (Ref. 77). Washington Creek is known for its good grayling fishing and should be considered to be sensitive to disturbance year-round.

## WATERBODY

Waterbody Unnamed Tributary to Washington CreekMain Drainage Tanana River Tributary to Washington CreekNPSI 4-136.01 NPAS 78 NPMP 438.0 AHMP N/AUSGS Map Reference Livengood, Ak. T 4N R 2W Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Washington Creek is a small intermittent tundra stream which crosses the TAPS and the proposed pipeline approximately 0.3 km northwest of Washington Creek. The stream flows southwest through a muskeg area into Washington Creek approximately .8 km downstream from the pipeline crossing.

Due to the small size of this stream and its intermittent nature, fish use is considered to be low to non-existent. Reference 11 reports that there are probably no fish in this stream.

## WATERBODY

Waterbody South Fork Aggie Creek

Main Drainage Tanana River Tributary to Washington Creek

NPSI 4-136 NPAS 76 NPMP 430.9 AHMP N/A

USGS Map Reference Livengood, Ak. T 4N R 3W Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u>None</u>	<u>11,31</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>None</u>

South Fork Aggie Creek drains the southern face of Wickersham Dome and flows southwesterly approximately 15 km to its confluence with Washington Creek. The headwaters of this small clear water drainage are crossed by the Elliott Highway and by the proposed pipeline route, approximately 17 km farther downstream. The narrow channel varies in width (0.1 to 1.0 m) and flows through dense tundra and muskeg vegetation which in some areas completely conceals the stream from view. The steep gradient results in high water velocities and the substrate consists of gravel, sand and some detritus.

South Fork Aggie Creek provides little or no fish habitat in the vicinity of the pipeline crossing. Fish habitat is poor as a result of high water velocities and fish access into this area is very unlikely due to numerous small waterfalls through brush and willow and a 1.0 m high waterfall on the TAPS workpad. The South Fork probably freezes solid during the winter as is typical of small headwater drainages of this area. Although grayling have been reported to possibly occur in the South Fork of Aggie Creek (Ref. 11), spring and fall investigations in 1979 failed to produce fish (Refs. 54 and 57), as have previous studies from 1969 to 1977 (Refs. 11 and 31). It is possible that grayling are present in downstream regions of the drainage but suitable habitat appears to be quite far removed (5-7 km) from the proposed pipeline route.

## WATERBODY

Waterbody North Fork Aggie CreekMain Drainage Tanana River Tributary to Washington CreekNPSI 4-135 NPAS 76 NPMP 430.1 AHMP N/AUSGS Map Reference Livengood, Ak. T 4N R 3W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u>None</u>	<u>54</u>
Summer	<u>None</u>	<u>None</u>	<u>11,38</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u>None</u>	<u>None</u>

North Fork Aggie Creek drains the southern face of Wickersham Dome and flows southwesterly approximately 15 km to its confluence with Washington Creek. The headwaters of this small clear water drainage are crossed by the Elliott Highway and by the proposed pipeline route, approximately 1.5 km farther downstream. The stream is narrow (0.2-1.5 m wide) and flows through dense tundra and muskeg vegetation. In some regions the channel becomes extensively braided and is difficult to locate. Water velocities are high in the vicinity of the pipeline crossing as a result of the steep stream gradient in this area. Substrate near the TAPS workpad is gravel, with mud, sand and brush in other areas.

The North Fork Aggie Creek does not appear to provide fish habitat. The steep stream gradient, high water velocities, numerous natural waterfalls and areas of extensive braiding prevent fish access to, or utilization of, this portion of the stream. Although grayling have been reported to possibly occur in North Fork Aggie Creek (Ref. 11), fish were not reported during spring and fall surveys conducted in 1979 (Refs. 54 and 57) or in 1969 (Refs. 11 and 38). It is possible that grayling are present in downstream regions of the drainage but suitable habitat appears to be quite far removed (5-7 km) from the proposed pipeline crossing.

**WATERBODY**Waterbody Tributary to Little Globe CreekMain Drainage Globe Creek Tributary to Little Globe CreekNPSI 4-134.01 NPAS 76 NPMP 428.3 AHMP N/AUSGS Map Reference Livengood, Ak. T 5N R 3W Sec. 27**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

This Tributary to Little Globe Creek is a small stream that flows northwest through spruce and deciduous woodlands and crosses the proposed pipeline about 600 m upstream of the TAPS crossing. From the TAPS crossing, the stream flows for approximately 60 m before joining Little Globe Creek.

Fisheries investigations have not been conducted in this stream. Due to the small size of the stream, winter fish use is expected to be non-existent.

An effective fish block (perched culvert) was reported downstream on Little Globe Creek (Ref. 67). This block would prevent access to upstream portions of the drainage, including the present tributary; hence fish utilization of the present stream during any portion of the year is considered unlikely. Further investigations would be necessary to confirm these speculations.

## WATERBODY

Waterbody Little Globe CreekMain Drainage Tatalina River Tributary to Globe CreekNPSI 4-134 NPAS 76 NPMP 427.2 AHMP N/AUSGS Map Reference Livengood, Ak. T 5N R 3W Sec. 22

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>67</u>
Summer	<u>None</u>	<u></u>	<u>67</u>
Fall	<u>None</u>	<u></u>	<u>67</u>
Winter	<u>None</u>	<u></u>	<u>67</u>

Little Globe Creek is a small stream that flows north along the Elliott Highway for 6 km before its junction with Globe Creek. Vegetation in this area is characterized as a spruce-deciduous woodland. Drainage area above the TAPS is 2.6 km<sup>2</sup> and the average stream gradient is 5% (Ref. 11).

Fisheries related information is extremely limited for the crossing and no fish documentation is available to date. A perched culvert was reported at the Elliott Highway crossing in May 1979 which would effectively block upstream fish movement (Ref. 67). Due to its small size, Little Globe Creek is not believed to offer fish habitat during winter. The latter characteristic and the presence of the fish block makes it unlikely that fish could utilize the stream above the highway culvert near the gasline alignment during the open water period. However, the current state of the culvert is unknown and at least spring fisheries investigations would be necessary to confirm the above speculations.

## WATERBODY

Waterbody Unnamed Tributary to Little Globe CreekMain Drainage Globe Creek Tributary to Little Globe CreekNPSI 4-133.01 NPAS 76 NPMP 427.0 AHMP N/AUSGS Map Reference Livengood, Ak. T 5N R 3W Sec. 22

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Little Globe Creek is a small stream that meanders northeast through a spruce-deciduous woodland and crosses the proposed pipeline about 200 m above its junction with Little Globe Creek. This small tributary drains an area of 8.8 km<sup>2</sup> above the proposed pipeline (Ref. 11).

No information is available concerning fish use of this stream during any portion of the year. Winter use is considered very unlikely, as streams of this size and nature have been found to go dry or freeze solid shortly after freeze-up.

An effective fish block (perched culvert) was reported downstream on Little Globe Creek (Ref. 67). This block would prevent access to upstream portions of the drainage, including the present tributary. Therefore, fish utilization of the present stream during any portion of the year is considered unlikely. Further investigations would be necessary to confirm these speculations.



## WATERBODY

Waterbody Globe CreekMain Drainage Tolovana River Tributary to Tatalina RiverNPSI 4-133 NPAS .75 NPMP 423.8 AHMP N/AUSGS Map Reference Livengood, Ak. T 5N R 3W Sec. 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30,38</u>
Fall	<u>None</u>	<u></u>	<u>66</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Globe Creek is a lightly humic-stained stream that flows southwest to the Tatalina River through a channel about 12 m wide and 50-60 cm deep. Its banks are bordered by dense willow, alder and birch. The stream bottom is composed primarily of gravel and sand except in pool areas (pools average 15-30 m apart) where the bottom consists predominantly of sand and mud. Drainage area above the pipeline crossing is approximately 160 km<sup>2</sup>. A wide variety of benthic invertebrates (mayflies, stoneflies, simuliids and tubificids) have been reported from Globe Creek and the stream is reported to have excellent recreational potential (Ref. 38).

Globe Creek has been documented as a rearing area for grayling during summer. Although no actual fish documentation exists for this crossing during spring and fall, it is likely that the area offers good habitat during the entire open water period. Fish use of Globe Creek during winter is believed to be non-existent due to its small size. Due to the paucity of spring and fall fisheries data this stream should be further investigated if construction is anticipated during those periods.

## WATERBODY

Waterbody Unnamed Tributary to Globe CreekMain Drainage Tatalina River Tributary to Globe CreekNPSI 4-132.02 NPAS 75 NPMP 423.4 AHMP N/AUSGS Map Reference Livengood, Ak. T 5N R 3W Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>66</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to Globe Creek is a small stream that flows south across the pipeline route and continues for approximately 1 km to its junction with Globe Creek. This stream drains an area above the pipeline of approximately 3.2 km and surrounding vegetation is typical spruce-deciduous woodland (Ref. 11).

No fish documentation is available for this stream; however, grayling are suspected to be present in the pipeline area, which has been described as excellent habitat (Ref. 11). The possibility of winter fish use of this small stream is considered low to non-existent, but field investigations, especially in the spring, would be necessary to confirm fish utilization during the open water period.

## WATERBODY

Waterbody Unnamed Tributary to the Tatalina RiverMain Drainage Tanana River Tributary to Tatalina RiverNPSI 4-132.01 NPAS 74 NPMP 420.0 AHMP N/AUSGS Map Reference Livengood, Ak. T 6N R 4W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>11</u>

Unnamed Tributary to the Tatalina River flows west through spruce-deciduous woodland and crosses the proposed pipeline approximately 450 m below the TAPS crossing. Draining an area above the TAPS of approximately 1.2 km, this creek flows down a gradient of approximately 5% (Ref. 11).

Unnamed Tributary to the Tatalina River is reported to support fish during spring in its lower reaches; field studies have not been conducted but fish are not suspected to move upstream as far as the TAPS (Ref. 11).

This creek is not expected to provide suitable fish habitat during the fall or winter periods due to its small size.

**WATERBODY**Waterbody Tatalina RiverMain Drainage Tanana RiverTributary to Chatanika RiverNPSI 4-132NPAS 74NPMP 419.0AHMP NAUSGS Map Reference Livengood, Ak.T 6NR 4WSec. 26**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>BB,CI,GR,IN,NP,WF</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

The Tatalina River flows approximately 100 km from the western slopes of the White Mountains to where it joins the Chatanika River. The proposed crossing is approximately 30 km downstream of the headwaters of this river. Here the small, humic-stained stream (10-15 m wide) is a series of alternating riffles and shallow pools. Substrate is mud and gravel.

The Tatalina River is probably utilized by fish throughout the open water season. Numerous species are reported to be present in the Tatalina River all of which may occur at the pipeline crossing. These include burbot, grayling, sheefish, northern pike and unidentified whitefish and cisco (Refs. 11 and 30). This area serves as a migration route for fish moving to upstream spawning and rearing areas in spring and returning to downstream wintering areas in fall. Grayling may spawn near the proposed crossing during or following breakup and various life stages of all species may occur here between breakup and freeze-up. No overwintering fish habitat is available in the proximity of the crossing as a result of limited water, absence of flow and low dissolved oxygen levels (Ref. 55).

## WATERBODY

Waterbody Tributary to Slate CreekMain Drainage Chatanika River Tributary to Slate CreekNPSI 4-131.01 NPAS 73 NPMP 415.0 AHMP NAUSGS Map Reference Livengood, Ak. T 6N R 4W Sec. 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tributary to Slate Creek is an extremely small stream that flows west into Slate Creek approximately 70 m below the proposed pipeline crossing. Bordered by spruce, willow, alder and birch, the stream flows down a 5% gradient and drains an area less than 5 km<sup>2</sup> above the crossing (Ref. 11).

Information concerning fish use of this stream is lacking; however, streams of this size do not generally provide suitable winter habitat for fish.

## WATERBODY

Waterbody Slate CreekMain Drainage Chatanika River Tributary to Tatalina RiverNPSI 4-131 NPAS 73 NPMP 414.9 AHMP NAUSGS Map Reference Livengood, Ak. T 6N R 4W Sec. 5 and 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Slate Creek is a small humic-stained stream, 2.4-3.6 m wide and 10-30 cm deep, flowing over a gravel/cobble substrate. Bordered by spruce, alder, birch, rose and grasses, it drains an area of approximately 35 km<sup>2</sup> above the proposed crossing (Ref. 11).

Slate Creek is reported to serve as a rearing area for grayling during spring (Ref. 30), although no specific fish documentation for this crossing is available. Available information does not permit an assessment of its importance to fish during open water periods. However, streams of this size and nature freeze to the bottom and provide no habitat in winter.

## WATERBODY

Waterbody Ski Jump Ramp CreekMain Drainage Tatalina RiverTributary to Slate CreekNPSI 4-130NPAS 73NPMP 413.1AHMP N/AUSGS Map Reference Livengood, Ak.T 7NR 4WSec. 31

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Ski Jump Ramp Creek is a very small meandering stream that crosses the pipeline route and flows southeast approximately 2.4 km to Slate Creek. The stream bottom consists primarily of gravel and cobble (Ref. 29) and the bordering vegetation is typical spruce-deciduous woodland. Above the pipeline crossing, the creek drains an area approximately 2.1 km, flowing down a moderate gradient of 2.5% (Ref. 11).

No information is available concerning fisheries use at this crossing and open water investigations would be necessary to fill data gaps. The small size of the stream indicates that it would freeze to the bottom in winter and would provide no fish habitat at that time.

## WATERBODY

Waterbody Wilber CreekMain Drainage Tanana RiverTributary to Tolovana RiverNPSI 4-129NPAS 73NPMP 412.1AHMP NAUSGS Map Reference Livengood, Ak.T 7N R 4W Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wilber Creek is a small stream that flows northeast to the Tolovana River through a narrow channel bordered by typical spruce-deciduous vegetation. <sup>2</sup>Above the pipeline crossing, Wilber Creek drains an area of approximately 9.4 km<sup>2</sup> as it flows down a moderate gradient of approximately 1.7% (Ref. 11).

It is suspected that Wilber Creek serves as a rearing area for grayling during spring and summer; however, only spring fish use has been documented (Ref. 11) and no studies have been performed in other seasons. Wilber Creek does not offer suitable fish habitat during winter and this area is not believed to be utilized by fish for spawning. The small size of this stream would preclude fish overwintering in the vicinity of the proposed crossing.



## WATERBODY

Waterbody Tributary of Wilber Creek

Main Drainage Tolovana River Tributary to Wilber Creek

NPSI 4-128.04 NPAS 73 NPMP 410.6 AHMP N/A

USGS Map Reference Livengood, Ak. T 7N R 5W Sec. 25 and 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tributary of Wilber Creek is a very small stream that flows south to Wilber Creek, draining an area approximately 2 km above the pipeline route. Vegetation in the area is typically spruce-deciduous woodland.

No information is available on fish use of this stream. Its small size would appear to preclude fish use in winter and perhaps fall but it could be utilized by grayling in the spring.

## WATERBODY

Waterbody Shorty CreekMain Drainage Tanana River Tributary to Tolovana RiverNPSI 4-128.03 NPAS 72 NPMP 407.0 AHMP NAUSGS Map Reference Livengood, Ak. T 7N R 5W Sec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Shorty Creek is a small stream that flows west through spruce/deciduous woodlands. Shorty Creek is crossed by the pipeline route approximately 1.8 km upstream of its confluence with the Tolovana River, draining an area about 5.9 km<sup>2</sup> (Ref. 11).

An assessment of Shorty Creek cannot be made at the present time due to lack of information.

## WATERBODY

Waterbody Tributary of Shorty CreekMain Drainage Tolovana River Tributary to Shorty CreekNPSI 4-128.02 NPAS 72 NPMP 406.8 AHMP N/AUSGS Map Reference Livengood, Ak. T 7N R 5W Sec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

This tributary of Shorty Creek drains an area of about 1 km<sup>2</sup> and is a very small intermittent stream (Ref. 11). It is not considered to provide fish habitat at any time of the year.

# WATERBODY

Waterbody Tributary to Tolovana River

Main Drainage Tanana River Tributary to Tolovana River

NPSI 4-128.01 NPAS 72 NPMP 405.7 AHMP N/A

USGS Map Reference Livengood, Ak. T 7N R 5W Sec. 5

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tributary to Tolovana River flows southwest to the Tolovana River through a narrow meandering channel bordered by spruce, birch, willow and aspen. The stream flows down a gradient of approximately 2.5% and drains an area of approximately 6.6 km above the proposed crossing (Ref. 11).

No fisheries information is available for this stream but its small size would preclude fish use in winter.

## WATERBODY

Waterbody Tolovana River

Main Drainage Yukon River Tributary to Tanana River

NPSI 4-128 NPAS 72 NPMP 405.1 AHMP NA

USGS Map Reference Livengood, Ak. T 7N R 5W Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>GR</u>	<u>M,R,</u>	<u>30,31,57</u>
Winter	<u>None</u>	<u>None</u>	<u>55,74</u>

The Tolovana River drains the western slope of the White Mountains and flows southwesterly for approximately 130 km to where it joins the Tanana River. This medium sized, highly stained stream is crossed by the proposed gas pipeline route about 12 km south of Livengood. Here the meandering stream is 10-15 m wide with occasional pools in excess of 1 m deep. The substrate is predominately mud and silt with some gravel in occasional riffles. Mud and silt banks to 2 m high are vegetated with grasses and willows and are bordered by a mature stand of spruce. Erosion of these banks has caused numerous large trees to fall into or across the river channel. Extensive placer mining activity upstream results in heavy siltation of the stream for most of the open water period.

The vicinity of the proposed crossing of the Tolovana River provides fish habitat throughout the open water season. Many species are reported to occur in this stream (Ref. 11); however, the distribution of most of these is confined to lower reaches in the Minto Flats area. Fish which probably utilize the portion of the river near the proposed crossing include grayling, slimy sculpin, round whitefish, and northern pike. Young-of-the-year grayling have been caught during fall investigations, (Ref. 57) indicating use as a rearing and possibly spawning area by grayling. Fish use during late winter is unlikely as a result of very low dissolved oxygen levels and absence of flow (Ref. 55).

## WATERBODY

Waterbody Unnamed Tributary to the West Fork of the Tolovana River

Main Drainage Tanana River Tributary to West Fork Tolovana River

NPSI 4-127.01 NPAS 71 NPMP 402.0 AHMP NA

USGS Map Reference Livengood, Ak. T 8N R 6W Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Tributary to the West Fork of the Tolovana River crosses the pipeline approximately 700 m below the Haul Road and flows southwest to the West Fork of the Tolovana River. Draining an area approximately 4.3 km<sup>2</sup> above the crossing, the stream flows down a fairly steep gradient (5.5%), through an area characterized as a spruce/deciduous woodland (Ref. 11).

No information is available concerning fish use or fish habitat in this stream. Open water investigations would be necessary to clarify its importance to fish. Due to its small size this stream is not believed to provide winter habitat for fish.

## WATERBODY

Waterbody Lost Creek

Main Drainage Chatanika River Tributary to West Fork Tolovana River

NPSI 4-127 NPAS 71 NPMP 398.6 AHMP NA

USGS Map Reference Livengood, Ak. T 8N R 6W Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>X</u>	<u>R</u>	<u>11,31</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Lost Creek is a small lightly humic-stained stream that meanders south to the West Fork of the Tolovana River. The proposed pipeline crossing is located approximately 1.2 km upstream of the Haul Road crossing. Lost Creek flows down a 0.3% gradient and drains an area above the pipeline route of approximately 130 km<sup>2</sup> (Ref. 11). Near the crossing, Lost Creek is approximately 4-6 m wide and 30 cm deep. Its gravel banks are heavily vegetated with spruce, willow, alder, birch, and grass. The stream bottom consists primarily of gravel in riffle areas, and a sand gravel mix in the ponded areas.

Lost Creek has been reported to serve as a rearing area for slimy sculpin, grayling and whitefish during spring (Ref. 11), although there is no actual documentation for these species. Numerous unidentified small fish were observed in Lost Lake in 1975 and 1976 (Ref. 31). Lost Creek is suspected to contain fish in fall but not in winter, since it probably freezes to the bottom.

## WATERBODY

Waterbody Erickson Creek Tributary

Main Drainage Hess Creek Tributary to Erickson Creek

NPSI 4-126 NPAS 70 NPMP 394.3 AHMP N/A

USGS Map Reference Livengood, Ak. T 9N R 6W Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u>None</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Erickson Creek Tributary crosses the proposed pipeline route and flows north approximately 850 m to Erickson Creek. It drains an area of approximately 13 km above the pipeline and has a moderate gradient ( 0.6%) (Ref. 11). This narrow, slightly humic-stained stream is bordered by low banks vegetated with willow, alder and spruce.

It has been postulated that fish do not get upstream in Erickson Creek Tributary as far as the proposed pipeline crossing (Ref. 11); however, fisheries investigations have never been conducted in this area. Grayling are reported in Erickson Creek (Ref. 11) and it is possible that they occur in this tributary in spring and summer. Fish use of Erickson Creek Tributary during winter is expected to be low to non-existent due to its small size (Ref. 3).



## WATERBODY

Waterbody Erickson Creek #1

Main Drainage Yukon River Tributary to Hess Creek

NPSI 4-125 NPAS 69 NPMP 390.9 AHMP NA

USGS Map Reference Livengood, Ak. T 9N R 7W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LS</u>	<u>R,S</u>	<u>30</u>
Summer	<u>X</u>	<u>R</u>	<u>30,31</u>
Fall	<u>None</u>	<u></u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Erickson Creek near crossing #1 is a small humic-stained stream approximately 1.5 m wide and 15 cm deep. Bordered by low gravel banks which are well vegetated with spruce and alder, Erickson Creek flows down a moderate gradient (~0.6%). Drainage above crossing #1 is approximately 94 km<sup>2</sup> (Ref. 11).

Erickson Creek #1 has been documented to serve as a rearing and spawning area for grayling during spring, as well as a spring and summer rearing area for longnose sucker (Ref. 30). Fish documentation includes a July 1975 report when unidentified fish were observed. No information is available concerning fish use of Erickson Creek #1 during the fall. Fish probably migrate out of the stream at that time, since it likely freezes to the bottom in winter.

## WATERBODY

Waterbody Unnamed Lake Outlet NPSI 4-124.01Main Drainage Hess Creek Tributary to Erickson CreekNPSI 4-124.01 NPAS 69 NPMP 390.0 AHMP N/AUSGS Map Reference Livengood, Ak. T 9N R 7W Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Lake Outlet drains a small lake and flows westerly through spruce and birch woodland to its confluence with Erickson Creek. No fisheries data exist on Unnamed Lake Outlet and information during the open water period would be necessary to ascertain its importance to fish. It is strongly suspected that Unnamed Lake Outlet does not provide winter fish habitat due to its small size.

## WATERBODY

Waterbody Erickson Creek #2

Main Drainage Yukon River Tributary to Hess Creek

NPSI 4-124 NPAS 69 NPMP 389.1 AHMP NA

USGS Map Reference Livengood, Ak. T 9N R 7W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LS</u>	<u>R</u>	<u>30</u>
Summer	<u>X</u>	<u>R</u>	<u>30,31</u>
Fall	<u>None</u>	<u></u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Erickson Creek is a lightly humic-stained stream that crosses the pipeline route and flows north from crossing #2 for approximately 4.5 km to its confluence with Hess Creek. Near crossing #2 its gravel banks are vegetated with spruce and alder. The stream is approximately 1.5 m wide and 15 cm deep. Drainage area upstream of crossing #2 is approximately 208 km<sup>2</sup> (Ref. 11).

Although no site specific fisheries information is available for Erickson Creek at crossing #2, Erickson Creek at crossing #1 (about 300 m upstream) has been documented as a rearing and spawning area for grayling during the spring and summer. In addition, longnose suckers have also been documented to use the area for rearing (Ref. 30). Due to the close proximity of these two crossings, fish reports for crossing #1 have been applied to crossing #2. No information is available concerning fish use of Erickson Creek #2 during the fall. Fish probably migrate out of the stream at that time since it likely freezes to the bottom in winter.

## WATERBODY

Waterbody Hess Creek TributaryMain Drainage Yukon River Tributary to Hess CreekNPSI 4-123.05 NPAS 68 NPMP 385.5 AHMP N/AUSGS Map Reference Livengood, Ak. T 10N R 7W Sec. 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Hess Creek Tributary is actually an inactive oxbow of Hess Creek that the proposed pipeline crosses approximately 500 m south of Hess Creek. Based on examination of aerial photographs, the oxbow contains water, but probably receives inflow from Hess Creek only during periods of high water. No fisheries information is available for Hess Creek Tributary and further investigations would be necessary to determine its importance to fish.

## WATERBODY

Waterbody Hess Creek

Main Drainage Yukon River Tributary to Yukon River

NPSI 4-123A.04 NPAS 68 NPMP 385.2 AHMP NA

USGS Map Reference Livengood, Ak. T 10N R 7W Sec. 19 & 20

## FISHERIES ASSESSMENT

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>31</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

\*See assessment - additional species present but site specific data are lacking.

Hess Creek flows from the western slopes of the White Mountains to where it flows into the Yukon River. The proposed pipeline crossing is approximately 34 km upstream of its confluence with the Yukon River. This humic-stained stream varies from 15-30 m in width and gravel and sand banks are to 2 m in height. Alternating shallow pools and riffles are present and substrate is gravel and sand.

Hess Creek in the vicinity of the proposed pipeline provides important fish habitat from breakup to freeze-up. This section of the stream serves as a migration route for fish moving to upstream spawning and rearing areas in spring and returning to wintering areas in fall. Grayling and possibly sculpin may spawn in the vicinity of the pipeline during or shortly after breakup. Broad whitefish, humpback whitefish, round whitefish, Bering cisco, least cisco, slimy sculpin, grayling, sheefish, longnose sucker and northern pike are reported to be present in Hess Creek (Refs. 11 and 30), although no site specific documentation is available. Rearing of various life stages of those species listed above probably occurs near the pipeline during the open water season. Winter investigations conducted on 4 April 1979 found no suitable fish habitat in this area.

## WATERBODY

Waterbody Fish Creek

Main Drainage Yukon Tributary to Hess Creek

NPSI 4-123.03 NPAS 68 NPMP 385.0 AHMP NA

USGS Map Reference Livengood, Ak. T 10N R 7W Sec. 19 & 20

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Fish Creek is a medium stream that flows southwest through sparse stands of black spruce to Hess Creek some 90 m below the proposed pipeline. The stream bottom is composed primarily of cobble and gravel and the banks are occasionally incised and vegetated with willow and grasses.

Although information is scant, Fish Creek is likely a rearing area for grayling during the open water period. Fish must migrate downstream to overwintering habitat, since Fish Creek is not believed to provide suitable fish habitat during winter. Information concerning spawning in Fish Creek is not available.

**WATERBODY**Waterbody Unnamed Creek NPSI 4-123.02Main Drainage Hess Creek Tributary to Unnamed Creek 4-123NPSI 4-123.02 NPAS 68 NPMP 381.0 AHMP N/AUSGS Map Reference Livengood, Ak. T 10N R 8W Sec. 10**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 4-123.02 is a small stream that flows southwest to Unnamed Creek 4-123 (tributary to Hess Creek) through a narrow channel bordered by spruce, willow and grasses. This small stream has a relatively steep gradient (~ 5%) and drains an area approximately 1.6 km<sup>2</sup> (Ref. 11).

Fish use of this stream is expected to be low to non-existent, especially during winter due to its small size. However, no fisheries data are available to clarify its importance to fish.

## WATERBODY

Waterbody Unnamed Creek NPSI 4-123.01Main Drainage Hess Creek Tributary to Unnamed Creek NPSI 4-123NPSI 4-123.01 NPAS 68 NPMP 380.4 AHMP N/AUSGS Map Reference Livengood, Ak. T 10N R 8W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek NPSI 4-123.01 is a small stream that flows southwest into Unnamed Creek NPSI 4-123, a tributary to Hess Creek, 2.3 km below the proposed pipeline crossing. Its narrow channel is bordered by spruce, willow and grasses. This small stream has a relatively steep gradient and drains an area approximately 1.5 km<sup>2</sup> (Ref. 11).

Fish use of this stream is expected to be low to non-existent, especially during winter, due to its small size. However, no data are available to substantiate this speculation.



## WATERBODY

Waterbody Unnamed Creek NPSI 4-123Main Drainage Yukon River Tributary to Hess CreekNPSI 4-123 NPAS 67 NPMP 379.9 AHMP N/AUSGS Map Reference Livengood, Ak. T 10N R 8W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek NPSI 4-123 is a small tributary to Hess Creek that flows south through a narrow channel bordered by spruce and dense willow. Drainage area (13 km<sup>2</sup>), stream gradient (5%) and stream bottom composition (sand and gravel) are the only information available for this stream. Its small size suggests that it freezes to the bottom in winter.

**WATERBODY**

Waterbody Unnamed Creek NPSI 3-122.05

Main Drainage Yukon River Tributary to Hess Creek

NPSI 3-122.05 NPAS 67 NPMP 378.8 AHMP NA

USGS Map Reference Livengood, Ak. T 10N R 8W Sec. 4

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek (NPSI 3-122.05) is a small tributary of Hess Creek. Draining an area approximately 0.7 km<sup>2</sup> above the proposed pipeline crossing, this stream flows down a relatively steep gradient (~5%) through a narrow channel bordered by spruce and birch (Ref. 11).

Examination of aerial photographs taken on May 17, 1978 suggests that Unnamed Creek was dry at that time; however, field verification would be necessary to confirm habitat in the stream. Unnamed Creek (NPSI 3-122.05) is not expected to provide suitable fish habitat during late summer, fall or winter.

## WATERBODY

Waterbody Unnamed Creek NPSI 3-122.04Main Drainage Yukon River Tributary to Hess CreekNPSI 3-122.04 NPAS 67 NPMP 378.3 AHMP NAUSGS Map Reference Livengood, Ak. T10N, 11N R 8W, 8W Sec. 5, 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek NPSI 3-122.04 is a small stream with a drainage area above the proposed pipeline crossing of approximately 0.45 km<sup>2</sup> (Ref. 11). It flows south through spruce and willow vegetation into Hess Creek approximately 3.2 km below the proposed pipeline. No information is available regarding biological characteristics of this stream. Its small size suggests that it freezes to the bottom in winter.

## WATERBODY

Waterbody Hot Cat CreekMain Drainage Yukon River Tributary to Hess CreekNPSI 3-122.03 NPAS 67 NPMP 377.1 AHMP N/AUSGS Map Reference Livengood, Ak. T 11N R 8W Sec. 31

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Hot Cat Creek is a small stream (24 km<sup>2</sup> drainage area) that flows south into Hess Creek, crossing the proposed pipeline approximately 365 m above the Haul Road. It flows through a narrow channel of moderate gradient (2.5%) and is bordered by willow and spruce (Ref. 11).

Documentation of fish use in Hot Cat Creek is limited to summer, at which time grayling are reported to rear in the area. Although it has not been studied in spring or summer, it is logical to conclude that Hot Cat Creek must also serve as a migration pathway for fish moving in and out of the system, since it does not provide suitable fish habitat during winter due to its small size.

## WATERBODY

Waterbody Unnamed Creek NPSI 3-122.02Main Drainage Yukon River Tributary to Hot Cat CreekNPSI 3-122.02 NPAS 67 NPMP 374.7 AHMP NAUSGS Map Reference Livengood, Ak. T 11N R 9W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 3-122.02, is a small stream that flows south to Hot Cat Creek confined by banks vegetated with birch and small spruce. Examination of aerial photographs taken in fall of 1978 suggest that flow and fall fish habitat may be limited.

Fish use has not been investigated in this stream and an assessment cannot be made at this time. Fish species indigenous to Hot Cat Creek may use Unnamed Creek NPSI 3-122.02, as well. Winter fish use is probably non-existent as streams of this size and nature do not provide fish wintering habitat.

# WATERBODY

Waterbody Unnamed Creek NPSI 3-122.01

Main Drainage Yukon River Tributary to Hess Creek

NPSI 3-122.01 NPAS 66 NPMP 373.2 AHMP NA

USGS Map Reference Livengood, Ak. T 11N R 9W Sec. 22

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 3-122.01, is a small tributary to Hess Creek that flows south through low lying bog areas and small spruce. Examination of aerial photographs taken in the fall of 1978 indicates that flow in the stream is limited.

Unnamed Creek, NPSI 3-122.01, has not been investigated to date, therefore an assessment of fish use of the stream cannot be made. This creek may contain fish indigenous to Hess Creek during the open water season provided that suitable habitat is available. It is likely that this stream is not used as a wintering site as streams of this size and nature tend to dry up or freeze solid in winter.

## WATERBODY

Waterbody Isom Creek #1Main Drainage Yukon River Tributary to Yukon RiverNPSI 3-122 NPAS 66 NPMP 369.5 AHMP N/AUSGS Map Reference Livengood, Ak. T 11N R 9W Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Isom Creek is a slightly humic-stained stream which flows west into the Yukon River through a 0.5-1.5 m wide channel and ranges in depth from 10-30 cm. Bordered by spruce, willow, birch and cottonwood, Isom Creek drains an area above the proposed pipeline of approximately 26 km<sup>2</sup> (Ref. 11).

Isom Creek near crossing #1 (~ 240 m south of crossing #2) has been reported as a rearing area for grayling during spring, summer and fall (Refs. 11 and 76); however, specific fish documentation is not available to verify these reports. Field investigations would be necessary to clarify fish utilization during the open water periods. Isom Creek does not provide suitable fish habitat during the winter period.

## WATERBODY

Waterbody Isom Creek #2Main Drainage Yukon River Tributary to Yukon RiverNPSI 3-121.02 NPAS 66 NPMP 368.4 AHMP N/AUSGS Map Reference Livengood, Ak. T 11N R 9W Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Isom Creek is a slightly humic-stained stream which flows west into the Yukon River through a 0.5-1.5 m wide channel and ranges in depth from 10-30 cm. Bordered by spruce, willow, birch and cottonwood, Isom Creek drains an area above the proposed pipeline of approximately 26 km (Ref. 11).

Isom Creek near crossing #2 is reported to be a rearing area for grayling during spring, summer and fall (Refs. 11 and 76); however, only summer fish observations are actually documented (Ref. 30) and spring and fall use remain uncertain. Isom Creek near crossing #2 does not provide suitable winter fish habitat.



## WATERBODY

Waterbody Isom Creek #3

Main Drainage Yukon River Tributary to Yukon River

NPSI 3-121.01 NPAS 66 NPMP 369.4 AHMP NA

USGS Map Reference Livengood, Ak. T 11N R 9W Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>X</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Isom Creek is a slightly humic-stained stream that flows west into the Yukon River. This stream channel is bordered by spruce, willow, birch and cottonwood and drains an area above the pipeline crossing of approximately 26 km<sup>2</sup>. In the vicinity of crossing #3 Isom Creek is reported to be a rearing area during spring and summer for unidentified fish species (Ref. 76). Documentation of fish presence exists only for the summer season (Ref. 30). Due to its small size, Isom Creek #3 provides no winter habitat for fish but its utilization by fish in spring and fall remain uncertain.

## WATERBODY

Waterbody Tributary to Isom CreekMain Drainage Yukon RiverTributary to Isom CreekNPSI 3-121NPAS 66NPMP 368.8AHMP N/AUSGS Map Reference Livengood, Ak.T 11N R 10W Sec. 12

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tributary to Isom Creek is a small slightly humic-stained stream which crosses the proposed pipeline route about 90 m north of Isom Creek #3 and flows south into Isom Creek. Bordered by spruce, willow, birch and cottonwood, this small creek drains an area above the pipeline crossing approximately 2.8 km<sup>2</sup> (Ref. 11).

Grayling are suspected to use this area during the open water period (Ref. 11), but no information is available to substantiate fish usage. Further investigations would be necessary to clarify the importance of this stream to fish in the open water season. The small size of the stream strongly suggests that it freezes to the bottom in winter.

# WATERBODY

Waterbody Yukon River

Main Drainage Yukon River Tributary to Yukon River

NPSI 3-120 NPAS 64 NPMP 360.0 AHMP NA

USGS Map Reference Livengood, Ak. T 12N R 10W Sec. 7

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	AL,BB,CN,DS,GR,IN,KS,LC, LS,NP,RW,SS,TP	M,R,S	11,20,21,30,76
Summer	AL,BB,CN,DS,GR,IN,KS,LC, LS,NP,RW,SS,TP	M,R,S	11,20,21,30,76
Fall	AL,BB,CN,DS,GR,IN,KS,LC, LS,NP,RW,SS,TP	M,R,S,	11,30,76
Winter	AL,BB,CN,DS,GR,IN,KS,LC, LS,NP,RW,SS,TP	M,R,S,W	11,30,76

The Yukon River is the largest river in Alaska and flows more than 3700 km from headwater regions in Yukon Territory to the Bering Sea. The proposed pipeline crossing occurs approximately 30 km downstream of the Yukon Flats area. Here the river is bordered by steep hills which confine the turbid waters to a channel 750-800 m wide.

The Yukon River in the vicinity of the proposed gas pipeline route provides important fish habitat year-round. Numerous species are reportedly present in the Yukon River and 12 species have been documented to occur in the vicinity of the crossing (Ref. 20). Additional species suspected to be present in this area include Arctic lamprey, Bering cisco, broad whitefish, humpback whitefish, and least cisco (Ref. 21). Other species are reported in the Yukon River such as sockeye salmon, pink salmon, Arctic lamprey, Arctic cisco, pond smelt, rainbow smelt (Ref. 11). However, it is unlikely that these species ascend as far upstream as the proposed pipeline crossing. The river supports large runs of king, silver and chum salmon which provide an important economic contribution to the Yukon Basin. This section of the river is utilized for migration, spawning and rearing by different fish species throughout the year. This region is also a wintering area for many fish that descend from smaller tributaries and upstream regions to overwinter in the mainstem of the river.

The Yukon River is of great importance to fisheries resources in Alaska.

## WATERBODY

Waterbody Burbot CreekMain Drainage Yukon River Tributary to Yukon RiverNPSI 3-119 NPAS 64 NPMP 358.3 AHMP N/AUSGS Map Reference Livengood, Ak. T 12N R 10W Sec. 6  
T 12N R 11W Sec. 1

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>BB</u>	<u>R</u>	<u>11,20,21,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Burbot Creek drains a small lake and then flows southwesterly to its confluence with the Yukon River. Its waters are stained brown and confined to a small channel (0.3-1.2 m wide, 15-46 cm deep) (Refs. 11 and 21). Substrate is silt, grass and debris and stream bank vegetation is spruce, willow, alder and horsetail (Refs. 11 and 21).

In the vicinity of the proposed pipeline crossing, burbot use Burbot Creek for rearing and as a nursery area (Refs. 11, 20 and 21). The presence of burbot fry in the stream suggests spawning; however, spawning has not been reported in this area and spawning is more likely to occur in the small lake located approximately 1.2 km upstream of the proposed crossing (Refs. 11 and 21).

No information is available concerning use of Burbot Creek at the proposed crossing in spring or fall but it is possible that fish use the stream throughout the open water season. Winter use of the stream is unlikely since it is thought that free water would be absent in winter.

## WATERBODY

Waterbody Woodchopper CreekMain Drainage Yukon RiverTributary to Yukon RiverNPSI 3-118NPAS 63NPMP 357.2AHMP NAUSGS Map Reference Livengood, Ak.12N  
T 13N11W  
R 11W1 and 2  
Sec. 36

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>GR</u>	<u>R</u>	<u>11,20,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Woodchopper Creek is a small, darkly humic-stained stream approximately 1.2 m wide and approximately 90 cm deep which flows northwest across the proposed pipeline route to the Yukon River about 2.0 km downstream. Low banks are vegetated with spruce, alder and grasses. This stream flows down a slight gradient ( $\sim 0.8\%$ ) and drains an area approximately 35 km<sup>2</sup> above the pipeline (Ref. 11). The stream bottom consists primarily of silt.

Woodchopper Creek is reported to have deep pools, flowing water and good fish cover; however, a log jam at the pipeline crossing may act as a barrier to fish movement (Ref. 20). The stream has been reported to serve as a spring rearing area for sculpin, northern pike, grayling and whitefish (Ref. 11); however, actual fish documentation appears to be limited to spring observations of grayling (Ref. 30). Information concerning fish use of Woodchopper Creek during the summer and fall is not available but it is very likely used throughout the open water period. Winter fish use of this stream is thought to be low to non-existent.

## WATERBODY

Waterbody Phelps Creek

Main Drainage Yukon River Tributary to Ray River

NPSI 3-117 NPAS 62 NPMP 351.7 AHMP NA

USGS Map Reference Livengood, Ak. T 13N R 11W Sec. 17

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>R</u>	<u>11,30,64</u>
Winter	<u>None</u>	<u></u>	<u>11,30</u>

Phelps Creek is a moderate sized lightly humic-stained stream which meanders west to the Ray River and drains an area above the pipeline route of approximately 21 km. This stream flows down a relatively steep gradient (~5%) through an area characterized as a spruce-deciduous woodland (Ref. 11).

Phelps Creek has been reported to serve as a rearing area for grayling during the spring season (Ref. 11); however, actual fish observations are limited to summer and fall (Refs. 30 and 64). Phelps Creek probably freezes to the bottom in winter and fish use at that time would be low to non-existent. Available data suggest that the stream is important to grayling throughout the open water period.

## WATERBODY

Waterbody Unnamed Creek NPSI 3-112Main Drainage Yukon River Tributary to Ray RiverNPSI 3-112 NPAS 61 NPMP 344.3 AHMP N/AUSGS Map Reference Bettles, Ak. T 14N R 12W Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek NPSI 3-112 flows southwest, crossing the proposed pipeline alignment approximately 1 km upstream of its confluence with an old oxbow of the Ray River. This small reddish stained stream is 0.5-1 m wide and 20-30 cm deep. The channel is bordered by spruce, willow, alder and grasses. Drainage area above the pipeline is approximately 7.7 km (Ref. I1).

Grayling and sculpin are suspected to use this stream during some portion of the open water period (Refs. 11, 20 and 21); however, actual fish reports appear to be absent for all seasons. Open water investigations would be necessary to clarify the streams importance to fish. Unnamed Creek NPSI 3-112 is not expected to offer suitable fish habitat during the winter period, due to its small size.

## WATERBODY

Waterbody Fort Hamlin Hills Creek

Main Drainage Yukon River Tributary to Ray River

NPSI 3-111 NPAS 61 NPMP 342.9 AHMP N/A

USGS Map Reference Bettles, Ak. T 14N R 12W Sec. 17

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11,70</u>
Summer	<u>GR</u>	<u>R</u>	<u>20,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Fort-Hamlin Hills Creek is a moderate sized, darkly humic-stained stream that flows southwest to the Ray River. The stream is about 3 m wide and is up to 120 cm deep. The channel is bordered by spruce, willow, alder and grass (Refs. 11, 20 and 21). Draining an area of approximately 87 km<sup>2</sup> above the proposed alignment (Refs. 11) Fort Hamlin Hills Creek crosses the pipeline route approximately 360 m above the Haul Road Crossing.

Fort Hamlin Hills Creek has been reported to serve as a rearing area for grayling, and possibly sculpin and round whitefish during the spring and summer period (Refs. 11, 20, 30 and 70).

No information concerning fish use of this stream in fall is available, but fish are expected to outmigrate at that time since overwintering habitat in the stream is expected to be low to non-existent.



## WATERBODY

Waterbody Unnamed Creek NPSI 3-110.01Main Drainage Ray River Tributary to North Fork Ray RiverNPSI 3-110.01 NPAS 60 NPMP 340.0 AHMP N/AUSGS Map Reference Bettles, Ak. T 14N R 12W Sec. 6

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 3-110.01 is a small lightly stained stream that flows south-west and crosses the pipeline about 2.7 km upstream of its confluence with the North Fork of the Ray River. The stream is about 0.4-0.6 m wide and 20-30 cm deep. The channel is bordered by spruce, alder, willow and grasses. Drainage area above the pipeline crossing is about 19 km<sup>2</sup> (Ref. 11). In the vicinity of the proposed alignment, the stream bottom consists primarily of silt and grass (Refs. 20 and 21).

It has been reported that grayling and sculpin may be present in this stream and in the small lake approximately 760 m upstream of the pipeline crossing (Refs. 11, 20 and 21). However, no documentation appears to exist and open water studies would be necessary to clarify its importance to fish.

This stream is not expected to provide suitable fish habitat during winter.

**WATERBODY**

Waterbody North Fork Ray River

Main Drainage Yukon River Tributary to Ray River

NPSI 3-110 NPAS 59 NPMP 336.0 AHMP N/A

USGS Map Reference Bettles, Ak. T 15N R 12W Sec. 17

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LS</u>	<u>M,R,S</u>	<u>30,76</u>
Summer	<u>BB,CD,GR,LS,NP,RW</u>	<u>R</u>	<u>11,20,38,30,76</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>GR</u>	<u>W</u>	<u>55,77</u>

The North Fork Ray River is a slow-moving stream that meanders through dense stands of willow, birch and large spruce trees. Near the proposed pipeline route the stream channel varies in width from 9-15 m and averages 2-3 m in depth. Incised banks range in height from 3-8 m and substrate consists of mud and silt. Numerous dead trees fallen into the stream channel provide good cover for fish.

Grayling use the North Fork of the Ray River in the vicinity of the crossing for spawning in spring and early summer and probably as a rearing area through the fall open water season. Burbot, sculpin, longnose sucker, northern pike and round whitefish rear in the area in summer and are likely present during other seasons. Sheefish and lake chub are also reported to utilize this stream (Ref. 11) but their actual presence has not been documented. Early winter investigations in 1979 found grayling both upstream and downstream of the proposed crossing. Conditions at that time appeared favorable to support fish, although discharge was extremely low (Ref. 77). In late winter 1979 habitat was very poor or absent. The stream was frozen to the bottom or anoxic free water was found in the vicinity of the proposed pipeline (Ref. 55).

## WATERBODY

Waterbody Fed CreekMain Drainage Ray River Tributary to North Fork Ray RiverNPSI 3-109 NPAS 59 NPMP 332.0 AHMP N/AUSGS Map Reference Bettles, Ak. T 16N R 13W Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Fed Creek is a small slow-flowing humic-stained stream that meanders south-east across the proposed pipeline to its confluence with the North Fork of the Ray River. Crossing the Haul Road approximately 600 m upstream of the pipeline crossing, this stream flows down a moderate gradient ( 2.5%) and drains an area of approximately 14 km above the proposed alignment (Ref. 11). Vegetation in this area is typical spruce-deciduous woodlands.

Fed Creek has been reported to probably contain grayling and possibly sculpin during spring and summer (Ref. 11); however, no actual fish observations exist to verify these reports. Field investigations would be necessary to clarify the importance of Fed Creek to fish in the open water period. No winter fish use of the stream is expected due to its small size.

## WATERBODY

Waterbody South Branch of the West Fork of the Dall River

Main Drainage Dall River Tributary to West Fork Dall River

NPSI 3-108 NPAS 57 NPMP 324.3 AHMP NA

USGS Map Reference Bettles, Ak. T 17N R 13W Sec. 28

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11,30</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,20,21,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>1,11</u>

The South Branch of the West Fork of the Dall River flows northeast, crossing the pipeline about 3.5 km upstream of its confluence. The humic-stained stream is 1-3 m wide and depths are variable (about 20 cm in the riffle areas and up to 1.8 m in the pools). Stream banks are well vegetated with spruce, alder, willow and grasses and range from 3-5 m high. The stream bottom consists primarily of coarse gravel, with occasional accumulations of mud in the pooled areas. The stream drains an area of about 42 km<sup>2</sup> above the pipeline and flows down a relatively steep gradient (~5%) (Ref. 11). The proposed crossing is located approximately 240 m downstream of the Haul Road crossing.

Grayling, sheefish, whitefish and sculpin have been reported in this stream (Ref. 11); however, actual documentation appears to be limited to spring and summer records of grayling (Refs 11, 20, 21, and 30). No information concerning fall fish use is available for this stream, but fish are expected to out-migrate during this period since the stream does not provide suitable overwintering fish habitat (Ref. 1).

## WATERBODY

Waterbody Middle Branch of the West Fork of the Dall RiverMain Drainage Dall River Tributary to West Fork Dall RiverNPSI 3-107 NPAS 57 NPMP 321.9 AHMP NAUSGS Map Reference Bettles, Ak. T 17N R 13W Sec. 17

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>20,21,38</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>1</u>

The Middle Branch of the West Fork of the Dall River flows southeast, crossing the proposed pipeline route about 600 m upstream of its confluence. Draining an area of about 10.6 km<sup>2</sup> above the pipeline, this brown-stained stream is approximately 1.5 m wide and 40-45 cm deep. Its channel is bordered by spruce, willow and grasses.

The Middle Branch of the West Fork of the Dall River is reported to serve as a rearing area for grayling, sheefish, whitefish and possibly sculpin (Ref. 11); however, documentation appears to be restricted to spring use of the stream by grayling (Ref. 30). No fish were captured during summer investigations (Ref. 20). Data on fish use during fall is unavailable, but the stream does not provide suitable overwintering fish habitat (Ref. 1) and out migration must occur.

## WATERBODY

Waterbody Smoky CreekMain Drainage West Fork Dall River Tributary to Middle Branch West Fork Dall RiverNPSI 3-106.02 NPAS 57 NPMP 321.4 AHMP N/AUSGS Map Reference Bettles, Ak. T 17N R 13W Sec. 17

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11,20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Smoky Creek is a small, lightly humic-stained stream that flows southeast, crossing the proposed pipeline approximately 600 m above its confluence with the West Fork of the Dall River. The channel is about 0.5 m wide and water depths are approximately 20 cm; banks are bordered by spruce, willow and grasses (Ref. 20), and the stream bottom consists primarily of silt (Ref. 11). Drainage area above the pipeline route is approximately 4.2 km and the stream gradient is moderate (2.5%) (Ref. 11).

No actual fish documentation exists for Smoky Creek, although sculpin and grayling are suspected to be present during the open water period (Refs. 11 and 21). Information concerning winter conditions in Smoky Creek is unavailable; however, it is likely that fish utilization is low to non-existent due to the small size of the stream. A log jam at the Haul Road crossing may restrict fish movement (Ref. 20).

## WATERBODY

Waterbody Unnamed Creek NPSI 3-106.01Main Drainage West Fork Dall River Tributary to North Branch West Fork Dall RiverNPSI 3-106.01 NPAS 56 NPMP 319.7 AHMP N/AUSGS Map Reference Bettles, Ak. T 17N R 13W Sec. 6

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11,20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 3-106.01 flows northeast and crosses the pipeline approximately 1 km upstream of its confluence with the north branch of the west fork of the Dall River. This small, lightly stained stream is about 1 m wide and 20-30 cm deep. The channel is bordered by spruce, willow, alder and grass. The stream has a moderate gradient (4%), and drains an area above the proposed alignment of about 2.5 km (Ref. 11). In the vicinity of the pipeline, the stream bottom consists primarily of silt (Ref. 21).

Grayling and sculpin are suspected to be present in this stream during some portion of the open water season (Refs. 11, 20 and 21); however, no actual documentation appears to exist and further study in the open water season would be necessary to clarify fish use of the stream.

Unnamed Creek 3-106.01 is not expected to provide suitable overwintering fish habitat, since streams of this size and nature freeze to the bottom in winter.

## WATERBODY

Waterbody Finger Mountain Creek

Main Drainage West Fork Dall River Tributary to North Branch West Fork Dall River

NPSI 3-106 NPAS 56 NPMP 318.8 AHMP N/A

USGS Map Reference Bettles, Ak. T 18N R 14W Sec. 36

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>20</u>
Fall	<u>None</u>	<u></u>	<u>20</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Finger Mountain Creek flows east crossing the proposed pipeline approximately 1 km upstream of its confluence with the north branch of the West Fork of the Dall River. Draining an area of about 3.7 km<sup>2</sup> above the crossing, this lightly stained stream flows down a moderate gradient (~2%) through an area vegetated with spruce, willow, alder and grasses.

Finger Mountain Creek has been documented as a rearing area for grayling during spring (Ref. 11). A previous investigation conducted in July of 1971 found the stream devoid of suitable fish habitat, but it is suspected that such conditions exist only during years of extremely low water. Winter fish use of Finger Mountain Creek is expected to be low to non-existent since the size of the stream indicates that it would freeze to the bottom.



# WATERBODY

Waterbody Olson's Lake Creek

Main Drainage Koyukuk River Tributary to Kanuti River

NPSI 3-105 NPAS 55 NPMP 315.3 AHMP N/A

USGS Map Reference Bettles, Ak. T 18N R 14W Sec. 14

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,30,31,70</u>
Summer	<u>GR</u>	<u>R</u>	<u>31</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Olson's Lake Creek crosses the proposed pipeline route approximately 10-12 km south of Old Man Camp. This small stained creek flows north, through relatively open country with scattered spruce into Olson's Lake (Ref. 30). Stream banks are 1-3 m high and well vegetated with low brush and willow (Ref. 30).

Grayling have been reported several times to be present in Olson's Lake Creek along with sightings near the proposed pipeline 3 June 1977 and at its inlet to Olson's Lake 18 June 1979 (Refs. 11, 30, 31 and 70). Grayling likely use this stream during open water for migration and rearing. No information is available concerning fall fish use near the proposed pipeline crossing but it is likely that grayling are present throughout the open water season. Winter use of Olson's Lake Creek in the vicinity of the proposed crossing is unlikely as streams of this size tend to be dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Caribou Mountain CreekMain Drainage Koyukuk River Tributary to Kanuti RiverNPSI 3-104 NPAS 55 NPMP 312.9 AHMP N/AUSGS Map Reference Bettles, Ak. T 18N R 14W Sec. 4 & 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>31</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Caribou Mountain Creek drains an area of approximately 17 km<sup>2</sup> west of the proposed pipeline crossing (Ref. 11) and flows to the Kanuti River east of the pipeline route. The banks of this small tundra stream (2-3 m wide) are vegetated with birch, willow and some spruce.

Adult grayling are known to use Caribou Mountain Creek in June. No data exist for other seasons, but, due to its small size, Caribou Mountain Creek probably does not provide overwintering habitat for fish.

## WATERBODY

Waterbody Kanuti River

Main Drainage Yukon River Tributary to Koyukuk River

NPSI 3-103 NPAS 54 NPMP 309.7 AHMP NA

USGS Map Reference Bettles, Ak. T 19N R 14W Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,GR</u>	<u>M,R,S</u>	<u>20,30</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>20,21,30</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>31,57</u>

The Kanuti River drains the southern slopes of the Philip Smith Mountains and flows west across the Kanuti Flats before joining the Koyukuk River. The proposed pipeline crossing is approximately 2.3 km south of Old Man Camp. In this region, the meandering stream is 10-15 m wide with depths to 2 m. Banks are up to 2 m high. The river flows through tundra and is bordered by willow, dwarf birch and some spruce. The water is humic-stained and the substrate is primarily mud with gravel in riffle areas.

The Kanuti River in the proximity of the proposed crossing is likely utilized by fish throughout the open water season. This stream is reported to support a wide variety of species; however the distribution of many of these is limited to the lower section of the river which flows through the Kanuti Flats. Fish that are suspected to occur as far upstream as the proposed crossing include burbot, slimy sculpin, grayling, northern pike, round whitefish and possibly longnose suckers (Ref. 21). Species restricted to the lower river probably include Bering cisco, broad whitefish, least cisco, chum salmon, humpback whitefish, and sheefish (Refs. 11 and 30). Near the crossing, the river serves as a migration route in spring and fall for fish moving to and from upstream spawning and rearing areas. Grayling fry have been captured during July 1971 (Ref. 20) indicating use as a rearing area and possibly spawning area. During the open water period,

## FISHERIES ASSESSMENT (CON'T)

## Kanuti River

various life stages of all of those species listed on the previous page could rear in this area. Winter investigations indicate that little or no winter fish habitat is available in the vicinity of the proposed pipeline. This is due to limited flow or absence of flow and low dissolved oxygen concentrations (Refs. 31, 55, and 74).

## WATERBODY

Waterbody Netsch's Creek Tributary #1Main Drainage Koyukuk River Tributary to Kanuti RiverNPSI 3-102 NPAS 54 NPMP 307.7 AHMP NAUSGS Map Reference Bettles, Ak. T 19N R 15W Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Netsch's Creek Tributary is a very small headwater tributary to the Kanuti River. Crossing #1 of the proposed pipeline is approximately 0.5 km north of Old Man Camp. Vegetation typical of the area consists of willow and dwarf birch.

There have been no studies of fish use in Netsch's Creek Tributary near crossing #1, but fish have been observed in downstream areas (Ref. 11). No site specific documentation is available for these observations. Winter use near the crossing is unlikely, as streams of this size tend to be dry or freeze solid in winter.

# WATERBODY

Waterbody Netsch's Creek Tributary #2

Main Drainage Koyukuk River Tributary to Kanuti River

NPSI 3-101 NPAS 54 NPMP 307.4 AHMP NA

USGS Map Reference Bettles, Ak: T 19N R 15W Sec. 13

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Netsch's Creek Tributary is a very small headwater tributary to the Kanuti River. Crossing #2 of the proposed pipeline is approximately 0.5 km north of Old Man Camp. Vegetation typical of the area consists of willow and dwarf birch.

There have been no studies of fish use in Netsch's Creek Tributary near crossing #2, but fish have been observed in downstream areas (Ref. 11). No site specific documentation is available for these observations. Winter use near the crossing is unlikely, as streams of this size tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Netsch's Creek Tributary #3Main Drainage Koyukuk River Tributary to Kanutu RiverNPSI 3-100.01 NPAS 54 NPMP 307.0 AHMP NAUSGS Map Reference Bettles, Ak. T 19N R 15W Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Netsch's Creek Tributary is a very small headwater tributary to the Kanuti River. Crossing #3 of the proposed pipeline in approximately 0.5 km north of Old Man Camp. Vegetation typical of the area consists of willow and dwarf birch.

There have been no studies of fish use in Netsch's Creek Tributary near crossing #3, but fish have been observed in downstream areas (Ref. 11). No site specific documentation is available for these observations. Winter use near the crossing is unlikely, as streams of this size tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody South Fork Fish Creek

Main Drainage South Fork Koyukuk Tributary to Fish Creek

NPSI 3-100 NPAS 53 NPMP 304.1 AHMP N/A

USGS Map Reference Bettles, Ak. T 20N R 15W Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M.R.S</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>CN</u>	<u>W</u>	<u>77</u>

South Fork Fish Creek is a shallow, moderately fast-flowing stream approximately 2 m wide. Willow and grass vegetate occasionally incised banks (1-3 m high). Stream bottom consists primarily of cobble and gravel.

The fish species that are known to utilize South Fork Fish Creek in the vicinity of the crossing are grayling and slimy sculpin. Grayling spawn in the late spring and rearing grayling are probably found in the stream throughout the open water period (Refs. 11 and 50). Sculpin have been found near the proposed crossing in November (Ref. 77) but fish habitat appears to deteriorate in late winter and the stream freezes to the bottom in some years (Refs. 11 and 55).



## WATERBODY

Waterbody Middle Fork Fish CreekMain Drainage South Fork Koyukuk Tributary to Fish CreekNPSI 3-99 NPAS 53 NPMP 303.1 AHMP N/AUSGS Map Reference Bettles, Ak. T 20N R 15W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR,RW</u>	<u>M,R</u>	<u>11,30</u>
Fall	<u>GR,RW</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Middle Fork Fish Creek is a small stream with a channel 3-4.5 m wide. Near the pipeline a steep hill occurs on the north side of the stream, and flat topography on the south. Banks are up to 0.6 m high and are bordered by a climax spruce forest.

Middle Fork Fish Creek is a rearing area for grayling and round whitefish during summer and fall (Refs. 11 and 30). Although no fish documentation is available for spring, it is likely that fish utilize this area throughout the open water period. This stream was intermittently frozen to the bottom in April 1979 and provided no overwintering habitat for fish (Ref. 55). Consequently, this stream is a likely migration route for fish moving upstream during spring and downstream prior to freeze up.

## WATERBODY

Waterbody Fish CreekMain Drainage South Fork KoyukukTributary to Fish CreekNPSI 3-98NPAS 53NPMP 301.7AHMP N/AUSGS Map Reference Bettles, Ak.T 20N R 15W Sec. 22

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,RW</u>	<u>M,R,S</u>	<u>20</u>
Summer	<u>CD,GR,LS,RW,WF</u>	<u>R</u>	<u>11,30,69</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30,</u>
Winter	<u>None</u>	<u>None</u>	<u>21,55</u>

The main fork of Fish Creek is the largest of the three headwater creeks which form Fish Creek. The channel width varies from 6-15 m with 1.2-1.8 m high banks that are occasionally incised. Vegetative cover consists of tall spruce, willow, dwarf birch and berry bushes. Stream substrate is generally gravel and sand.

A variety of fish species are reported in Fish Creek in the vicinity of the proposed pipeline crossing, but actual fish use for many species is not well documented. It is utilized by grayling for spring spawning and rearing (Refs. 30 and 64). Chum salmon have also been reported in Fish Creek (Ref. 11) but not near the pipeline crossing. In the proximity of the proposed crossing the stream apparently freezes to the bottom during winter (Refs. 21 and 55) providing no overwintering habitat. Fish Creek is considered to provide good habitat for fish during the open water period. Since the creek lacks winter habitat, fish must undergo spring and fall migrations to and from the stream near the pipeline crossing.

## WATERBODY

Waterbody Alder Mountain CreekMain Drainage South Fork Koyukuk River Tributary to Fish CreekNPSI 3-97NPAS 53NPMP 300.0AHMP N/AUSGS Map Reference Bettles, Ak.T 20N R 15W Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Alder Mountain Creek drains 5 km<sup>2</sup> east of the proposed pipeline and flows west across the pipeline route into Fish Creek. This small tundra stream ranges from 3 to 4.5 m in width. Bank vegetation is composed of willow and alder.

Slimy sculpin are found in Alder Mountain Creek in summer and use the stream for rearing. Grayling and round whitefish are also believed to use this stream during the open water season (Ref. 11) but use by these species is not documented. Use of this stream by fish in fall and winter is not known but the stream probably does not provide overwintering habitat at the pipeline crossing due to its small drainage area.

# **WATERBODY**

Waterbody Pung's Crossing Creek #1

Main Drainage Fish Creek Tributary to Bonanza Creek

NPSI 3-96.01 NPAS 52 NPMP 296.5 AHMP N/A

USGS Map Reference Bettles, Ak. T 21N R 14W Sec. 30

# **FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R,S</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At the proposed pipeline route, Pung's Crossing Creek is divided into two channels and the two proposed crossings are approximately 30 m apart. Pung's Crossing Creek drains an area of approximately 26 km east of the pipeline route, flows west across the pipeline and continues south to Bonanza Creek. Near the crossings, the stream ranges from 1.5-3 m wide and from 12-30 cm deep. The bottom is composed primarily of sand and gravel and the banks are bordered by dense growths of willow and birch.

Grayling are known to utilize this stream in the late spring as a rearing and spawning area. Use by grayling through the rest of the open water season is not documented, but grayling are probably present through the summer and fall. Sculpin and round whitefish are also reported to use this stream (Ref. 11), but field documentation for these species is apparently lacking. Pung's Crossing Creek near Crossing #1 does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Pung's Crossing Creek #2

Main Drainage Fish Creek Tributary to Bonanza Creek

NPSI 3-96 NPAS 52 NPMP 296.5 AHMP N/A

USGS Map Reference Bettles, Ak. T 21N R 14W Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R,S</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Pung's Crossing Creek, at the proposed pipeline route, is divided into two channels and the two proposed crossings are approximately 30 m apart. Pung's Crossing Creek drains an area of approximately 26 km east of the pipeline route, flows west across the pipeline and continues south to Bonanza Creek. Near the crossings, the stream ranges from 1.5-3 m wide and from 12-30 cm deep. The bottom is composed primarily of sand and gravel and the banks are bordered by dense growths of willow and birch.

Although no fish have been reported from this channel of the stream, grayling are known to utilize Pung's Crossing Creek #1 as a spawning and rearing area during late spring (Ref. 30). Since these two channels are located close together, and join a short distance downstream, it is assumed that Pung's Creek #2 is also a rearing and spawning area for grayling. Grayling are probably found in this stream throughout the open water season, although this has not been confirmed by field observations. Sculpin and round whitefish are also reported to use Pung's Crossing Creek (Ref. 11) but these species are not well documented. Pung's Crossing Creek #2 probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody South Fork Bonanza Creek

Main Drainage South Fork Koyukuk Tributary to Bonanza Creek

NPSI 3-95 NPAS 52 NPMP 292.8 AHMP N/A

USGS Map Reference Bettles, Ak. T 21N R 14W Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,RW</u>	<u>M,S,R,</u>	<u>30,31,67</u>
Summer	<u>BB,CN,GR,LS,NP,RW</u>	<u>R</u>	<u>11,20,30</u>
Fall	<u>CN,GR,LS,RW</u>	<u>M,R</u>	<u>30,34</u>
Winter	<u>BB,CN,GR</u>	<u>W</u>	<u>55,76,77</u>

South Fork Bonanza Creek is a clear, mountain stream with alternating pools and riffles throughout the proposed construction area. Channel width varies from 10-15 m and the 1.5-2 m high mud banks are incised and bordered with willow, birch and spruce. At the TAPS workpad stream bottom consists primarily of gravel and the banks are boulder/cobble rip rap.

A number of fish species are found in the vicinity of the proposed pipeline crossing during the open water season. Young-of-the-year and mature grayling have been found in the stream in summer, which strongly suggests that spawning takes place in the area (Refs. 34, 30 and 76). Burbot, grayling and sculpin were present near the crossing in November 1979 (Ref. 77). In April 1979 late winter habitat was assessed to be marginal in the immediate vicinity of the crossing but habitat was present about 1260 m downstream (Ref. 55). One dead slimy sculpin was found at that location; no fish were captured at other sites. Chum salmon are reported to utilize the South Fork of Bonanza Creek near the mouth (Ref. 11) but none has been observed near the pipeline crossing.

Available evidence indicates that South Fork Bonanza Creek is of considerable importance to fish populations during all of the year with the possible exception of the late winter period in the immediate vicinity of the proposed pipeline route.

## WATERBODY

Waterbody Unnamed Bonanza Creek ChannelMain Drainage Bonanza Creek Tributary to South Fork Bonanza CreekNPSI 3-94.02 NPAS 52 NPMP 292.8 AHMP NAUSGS Map Reference Bettles, Ak. T 21N R 14W Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11,20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Bonanza Creek Channel is an old channel of South Fork Bonanza Creek. This small stream (1.8-2.5 m wide) flows through an area of large spruce and birch woodland until it rejoins the South Fork just below the point where both streams are crossed by the proposed pipeline (Ref. 11).

No documentation is available concerning fish use of Unnamed Bonanza Creek Channel in the area of the proposed pipeline crossing. Although the presence of fish has not been documented, other investigators indicated the possibility of fish movement into this stream by species present in South Fork Bonanza Creek (slimy sculpin, grayling, longnose sucker, northern pike and round whitefish) (Refs. 11, 20 and 21). Winter use of Unnamed Bonanza Creek Channel is unlikely as streams of this nature tend to be dry or freeze solid in winter.

# WATERBODY

Waterbody Oxbow Lake System

Main Drainage Bonanza Creek Tributary to North Fork Bonanza Creek

NPSI 3-94.01 NPAS 51 NPMP 292.3 AHMP N/A

USGS Map Reference Bettles, Ak. T 21N R 14W Sec. 6 and 7

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Oxbow Lake System is a series of small pckets of shallow water draining into Oxbow Pond at North Fork Bonanza Creek.

No information is available concerning fish use of this system. Grayling have been reported present in Oxbow Lake System; however, no information has been found to substantiate this sighting (Ref. 11).

It is unlikely Oxbow Lake System provides any usable winter habitat; shallow ponds such as this tend to freeze solid in winter.



## WATERBODY

Waterbody North Fork Bonanza CreekMain Drainage South Fork Koyukuk Tributary to Fish CreekNPSI 3-94 NPAS 51 NPMP 291.2 AHMP N/AUSGS Map Reference Bettles, Ak. T 22N R 14W Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR,LS,NP,RW</u>	<u>R</u>	<u>11,20,30,34</u>
Fall	<u>CN,GR,LS</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

North Fork Bonanza Creek is a small meandering creek with alternating pools and riffles. It flows through stands of large spruce and birch. Stream width varies from 7-15 m in summer and 2-5 m in winter. Substrate is primarily gravel and cobble.

The North Fork of Bonanza Creek in the vicinity of the pipeline crossing is used by a number of fish species in summer and fall (Refs. 20, 30 and 34). Fry and juvenile grayling have been observed near the crossing in July and August (Refs. 20 and 34) which suggests use of the stream for spawning. This stream does not provide winter habitat for fish as it was found to be frozen to the bottom in late winter (Ref. 55).

## WATERBODY

Waterbody South Fork of the Little Nasty

Main Drainage Bonanza Creek Tributary to The Little Nasty Creek

NPSI 3-93 NPAS 51 NPMP 289.0 AHMP NA

USGS Map Reference Bettles, Ak. T 22N R 14W Sec. 19 and 20

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

South Fork Little Nasty drains approximately 4 km<sup>2</sup> east of the proposed pipeline (Ref. 11) and flows west to Bonanza Creek west of the pipeline route. This small stream (1-3 m wide; 0.3-1 m deep) is characterized by pools with overhanging steep banks that are well vegetated with sedges, willow and bordered by occasional spruce.

Grayling are known to use this stream as a rearing area during the summer. Further studies would be required to ascertain the extend of fish use during the remainder of the year; however, the stream probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody The Little Nasty CreekMain Drainage Fish Creek Tributary to Bonanza CreekNPSI 3-92 NPAS 51 NPMP 288.8 AHMP N/AUSGS Map Reference Bettles, Ak. T 22N R 14W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,RW</u>	<u>R</u>	<u>30</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>20,21,30</u>
Fall	<u>RW</u>	<u>R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Little Nasty Creek drains approximately 21 km<sup>2</sup> east of the proposed pipeline (Ref. 11) and flows west to Bonanza Creek west of the pipeline route. This small stream (1-2 m wide; 0.5-2 m deep) flows within a sharply defined channel through a dense growth of sedges, willow and spruce. The water is light brown to clear in color and the bottom is composed of silt and pebbles.

This stream is used by grayling, round whitefish and sculpin as a rearing area during the open water season. Winter fish use is unknown but, due to its small size, the stream is unlikely to provide overwintering habitat.

# WATERBODY

Waterbody Prospect Creek

Main Drainage South Fork Koyukuk Tributary to Jim River

NPSI 3-91 NPAS 50 NPMP 284.0 AHMP NA

USGS Map Reference Bettles, Ak. T 23N R 14W Sec. 31

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS,RW</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>CN,GR,KS,NP,RW</u>	<u>R,S</u>	<u>21,21,30,34,38</u>
Fall	<u>CN</u>	<u>M,R</u>	<u>30</u>
Winter	<u>CN</u>	<u>W</u>	<u>55,77</u>

At the proposed pipeline crossing, Prospect Creek is a clear, shallow, fast-flowing stream of alternating pools and riffles varying in width from 6-15 m. The 2-3 m high banks of boulders and cobbles are bordered by willow and small spruce. Bottom substrate consists of cobble and gravel. Below the proposed pipeline crossing, Prospect Creek grades into a slower flowing stream that meanders through a dense stand of spruce.

During the open water period, in the vicinity of the proposed pipeline crossing, Prospect Creek is a major migration route and rearing area for several species of fish: slimy sculpin, grayling, longnose sucker, king salmon, northern pike and round whitefish. The presence of young-of-the-year grayling in the vicinity of the pipeline crossing indicates that grayling likely use this area for spawning (Ref. 34). The presence of adult king salmon in late summer (Refs. 31 and 34) confirms that salmon utilize Prospect Creek for spawning; however, available data indicate that spawning does not occur near the pipeline crossing. Perennial springs approximately 10-12 km upstream from the pipeline route are documented salmon spawning areas as they provide suitable overwintering habitat for eggs (Ref. 41).

Although sculpin were present in mid-November, 1979 at the proposed crossing, the area was extensively iced and it is likely that as winter progresses this region offers only marginal overwintering habitat (Refs. 55 and 77).

It is especially important that upstream summer and fall migrations of mature

**FISHERIES ASSESSMENT (CON'T)**

Prospect Creek

king salmon and downstream migration of smolts not be disrupted by construction activities.

## WATERBODY

Waterbody Little Piddler CreekMain Drainage South Fork Koyukuk River Tributary to Jim RiverNPSI 3-90.03 NPAS 49 NPMP 279.0 AHMP N/AUSGS Map Reference Bettles, Ak. T 23N R 14W Sec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Little Piddler Creek has a drainage area of approximately 6 km<sup>2</sup> east of the proposed pipeline route (Ref. 11) and flows west into the Jim River. The stream is small and slow flowing. Low banks are well vegetated with sedges, willows and spruces. The water is stained a light brown color and substrate is predominantly gravel.

Grayling are known to utilize the stream in the spring as a rearing area (Ref. 30). Use of this stream by fish in the remainder of the open water season is unknown. Little Piddler Creek probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Jim River Side Channel #1

Main Drainage South Fork Koyukuk Tributary to Jim River

NPSI 3-90.02 NPAS 49 NPMP 278.9 AHMP N/A

USGS Map Reference Bettles, Ak. T 23N R 14W Sec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,S</u>	<u>30</u>
Summer	<u>BB,CN,DS,GR,HW,KS,LS,NP,RW</u>	<u>M,R,S</u>	<u>11,64,30</u>
Fall	<u>GR,CN,KS</u>	<u>M,R,S</u>	<u>34,30</u>
Winter	<u>CN</u>	<u>W</u>	<u>55,30</u>

Crossing #1 of the Jim River Side Channel is 120 m upstream of where it flows into the main channel of the Jim River. Steep banks 1.2-1.8 m high are bordered by willow and spruce. The channel width varies from 5-10 m in a floodplain 10-15 m wide, which is primarily sand/cobble substrate.

This side channel of the Jim River near the proposed pipeline crossing is used for migration, spawning and rearing by a variety of fish species. Grayling spawn in the area in spring and are found in the region throughout the open water season. The side channel is used by chum and king salmon as a migration route and probably for spawning. Jim River Side Channel #1 is known to be an overwintering site for fish in the region of the pipeline crossing (Ref. 55) and the area is considered to be important to fish throughout the year. In early April 1979 an open water channel 60 m long was present about 90 m upstream of the pipeline route. This strongly suggests that there are springs in the area that provide good habitat throughout the winter.

This area should be considered sensitive to disturbance throughout the year.

## WATERBODY

Waterbody Jim River Side Channel #2

Main Drainage South Fork Koyukuk Tributary to Jim River

NPSI 3-90.01 NPAS 49 NPMP 278.0 AHMP N/A

USGS Map Reference Bettles, Ak. T 23N R 14W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>BB,CN,DS,GR,HW,KS,LS,NP,RW</u>	<u>M,R,S</u>	<u>11,30</u>
Fall	<u>KS</u>	<u>M,S</u>	<u>30</u>
Winter	<u>CN</u>	<u>W</u>	<u>77</u>

Jim River Side Channel #2 is a shallow, meandering stream near the proposed pipeline crossing. The stream is 5-8 m wide within a 15-20 m wide floodplain. Gravel banks are bordered by thick willow and spruce and the bottom consists primarily of gravel and sand.

This side channel of the Jim River is used by a number of fish species in the vicinity of the pipeline crossing. The entire Jim River between Prospect Camp upstream to above the last proposed crossing is known to be used by chum and king salmon for spawning in the fall. Both species have been observed in the vicinity of the present crossing in late summer and fall (Refs. 11, 30 and 76). Information to date suggests that overwintering habitat in the Jim River Side Channel near crossing #2 is more restricted than in the mainstream of the river or in the Side Channel near crossing #1, since the area becomes extensively iced and frozen to the bottom in some places. No fish were captured in the area in late winter 1979 (Ref. 55), but slimy sculpin were present in mid-November 1979 when approximately 75 m of open water was present (Ref. 77). No information is available on fish utilization near Crossing #2 in the spring, but it is probable that the area is used for spawning by grayling

This area should be considered sensitive to disturbance throughout the year.



## WATERBODY

Waterbody Douglas CreekMain Drainage South Fork Koyukuk River Tributary to Jim RiverNPSI 3-89NPAS 49NPMP 277.2AHMP N/AUSGS Map Reference Bettles, Ak. T 24N R 14W Sec. 34

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CD,GR</u>	<u>R</u>	<u>20,21,30</u>
Fall	<u>CD,GR</u>	<u>R</u>	<u>30,34</u>
Winter	<u>None</u>	<u></u>	<u>3</u>

Douglas Creek is stained light brown and meanders easterly until it intersects the proposed pipeline route, approximately 6-8 km north of Pump Station #5. The stream is approximately 6-9m wide and 30-90cm deep; substrate is sand, gravel and cobbles and streambank vegetation consists of spruce, willow and dwarf alder (Ref. 11).

In the vicinity of the proposed pipeline crossing, grayling and slimy sculpin have been documented in summer and fall (Refs. 20, 21, 30 and 34). This indicates these species use Douglas Creek for migration in spring and fall and rearing throughout the open water period. In the vicinity of the proposed pipeline crossing Douglas Creek is an area of extensive icing and is not likely to provide any overwintering habitat (Ref. 3).

## WATERBODY

Waterbody Dee CreekMain Drainage South Fork Koyukuk River Tributary to Jim RiverNPSI 3-88 NPAS 49 NPMP 275.8 AHMP N/AUSGS Map Reference Bettles, Ak. T 24N R 14W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,RW</u>	<u>M,R</u>	<u>30</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>20,30</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Dee Creek drains an area of approximately 1 km<sup>2</sup> east of the proposed pipeline route (Ref. 11) and flows west into the Jim River. Dee Creek is a small (1.5-3 m wide; 0.3-0.6 m deep) (Ref. 21), spring-fed (Ref. 62) stream. Dwarf alder, willow and a few spruce vegetate the banks of the stream and the substrate is predominantly sand and cobbles (Ref. 11).

Grayling, slimy sculpin and round whitefish use Dee Creek as a rearing area throughout the open water season (Refs. 20 and 30). Fish use of habitat during the winter is not documented; however, since this stream is spring fed it has a high potential to provide overwintering habitat. Until further information is available this stream should be considered important to fish year round.

## WATERBODY

Waterbody Beaver Springs #1Main Drainage South Fork Koyukuk Tributary to Jim RiverNPSI 3-87.02 NPAS 49 NPMP 275.5 AHMP NAUSGS Map Reference Bettles, Ak. T 24N R 14W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR,RW</u>	<u>M,R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>CN,GR,KS</u>	<u>W</u>	<u>11,55</u>

Beaver Springs is a small clear perennial spring located at Haul Road Station 2HR1557+06. The spring varies from 5-10 m in width and is known to be open during winter. Upstream of the Haul Road, Beaver Springs is a single long pool with mud, sand and gravel substrate.

King salmon have been found in Beaver Springs in late winter and the area is an important wintering and rearing area for this species. Spawning must also occur in the region. The spring is also used by grayling and sculpin as a rearing and wintering area. Although the currently proposed pipeline route does not cross Beaver Springs, it is within 30 m of the upper reaches. Beaver Springs should be considered sensitive to disturbance during the entire year.

## WATERBODY

Waterbody Beaver Springs #2Main Drainage South Fork Koyukuk Tributary to Jim RiverNPSI 3-87.01 NPAS 49 NPMP 275.5 AHMP NAUSGS Map Reference Bettles, Ak. T 24N R 14W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR,RW</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Beaver Springs #2 is located at Haul Road Station 2HR1565+32 upstream of Beaver Springs #1. This is a small clear spring varying from 2-3 m in width with mud, sand and gravel substrate.

This section of Beaver Springs is considered as an important rearing area for grayling and sculpin. Beaver Springs #2 is believed to contain wintering habitat, but this has not been documented. Although the currently proposed alignment does not cross Beaver Springs, it is within 30 m of the upper reaches and disturbance to the area should be avoided.

## WATERBODY

Waterbody Jim River #3

Main Drainage Koyukuk River Tributary to South Fork Koyukuk River

NPSI 3-87 NPAS 49 NPMP 274.9 AHMP N/A

USGS Map Reference Bettles, Ak. T 24N R 14W Sec. 23 and 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,S</u>	<u>31</u>
Summer	<u>BB,CN,DS,GR,HW,KS,LS,NP,RW</u>	<u>M,R,S</u>	<u>11,20,34</u>
Fall	<u>KS</u>	<u>M,R,S</u>	<u>30</u>
Winter	<u>CN</u>	<u>W</u>	<u>30,55</u>

Jim River #3 is a medium sized stream with a channel width of about 20 m in the area of the pipeline crossing. Two channels converge 30 m upstream of the crossing to form the main channel which lies in a floodplain about 40 m wide composed of large cobble and bordered by spruce.

In the vicinity of the proposed crossing the Jim River is important to a wide variety of fish species for spawning, rearing, migration and overwintering. Both king salmon and chum salmon have been observed spawning in the vicinity of the crossing in August (Ref. 11). This area is also considered to be excellent spawning habitat for grayling and grayling fry have been observed in the summer (Ref. 34). The only species that has been documented to be present in winter is slimy sculpin (Ref. 55) but successful spawning of king and chum salmon in the area would necessitate that eggs and larvae overwinter in the area.

This portion of the Jim River should be considered to be sensitive to disturbance on a year-round basis due to the variety, numbers and importance of the fish species that utilize the stream.

## WATERBODY

Waterbody Inlet to Grayling LakeMain Drainage South Fork Koyukuk River Tributary to Grayling Lake CreekNPSI 3-86.04 NPAS 47 NPMP 268.3 AHMP NAUSGS Map Reference Bettles, Ak. T 25N R 13W Sec. 27

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Inlet to Grayling Lake is a small (1 m wide), narrow (0.2 m deep) stream which flows southeast across the pipeline route and the Haul Road into the north end of Grayling Lake. This stream connects Grayling Lake with another small lake on the west side of the Haul Road. Grasses and willows overhang the bank and the bottom is composed of sand and silt.

Grayling are reported to use this stream as a rearing area in spring (Ref. 30). The stream is probably also used for movement between the two lakes. In winter, this small stream probably freezes solid and provides no overwintering habitat.

## WATERBODY

Waterbody Avoided Lake Inlet

Main Drainage South Fork Koyukuk Lake Tributary to Grayling Lake Creek

NPSI 3-86.03 NPAS 47 NPMP 267.7 AHMP NA

USGS Map Reference Bettles, Ak. T 25N R 13W Sec. 27

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Avoided Lake Inlet drains a small area west of the pipeline route and flows into Avoided Lake, a small lake located east of the pipeline route, but west of the Haul Road. This small stream flows through dense growths of willow and sedges. Due to the extremely small drainage area ( $\sim 0.5 \text{ km}^2$ ), water flow may be intermittent during the summer period.

There is little information available for Avoided Lake Inlet. Ref. 11 reported that during April no fish are present. This stream may be used sporadically by fish during the open water period when water is present. It is extremely unlikely that Avoided Lake Inlet provides winter habitat due to its small size.

## WATERBODY

Waterbody Grayling Lake CreekMain Drainage South Fork Koyukuk River Tributary to Grayling CreekNPSI 3-86.02NPAS 47NPMP 267.3AHMP N/AUSGS Map Reference Bettles, Ak. T 25N R 13W Sec. 26 and 27

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>21,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Grayling Lake Creek has a drainage area of approximately .6 km<sup>2</sup> west of the pipeline route (Ref. 11) and flows east into the northern end of a small lake that in turn drains into Grayling Lake. The stream near the proposed crossing is 1-1.3 m wide and 15-46 cm deep. Grasses and willows overhang the banks of the stream, and silt and sand cover the bottom.

Grayling Lake Creek is used by grayling as a rearing area during spring and summer and probably in fall as well. Slimy sculpin are also suspected to utilize this stream (Refs. 11 and 21) but this species' presence has not been confirmed. Due to the stream's small size, it probably freezes to the bottom and does not provide overwintering habitat.



## WATERBODY

Waterbody Unnamed Creek NPSI 3-86.01Main Drainage South Fork Koyukuk River Tributary to Abba-dabba CreekNPSI 3-86.01 NPAS 47 NPMP 266.7 AHMP NAUSGS Map Reference Bettles, Ak. T 25N R 13W Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek (NPSI 3-86.01) is a small stream which flows east and drains an area of 0.5 km<sup>2</sup> (Ref. 11). It crosses the proposed pipeline route and continues northeast to join Abba-dabba Creek. Bank vegetation includes grasses, sedges, and willows.

Grayling have been reported to utilize this stream in the spring. Information on fish use of this stream through the remainder of the year is lacking. The small size of Unnamed Creek 3-86.01 probably precludes existence of overwintering habitat.

## WATERBODY

Waterbody Abba-dabba Creek

Main Drainage Yukon River Tributary to South Fork Koyukuk River

NPSI 3-86 NPAS 47 NPMP 265.2 AHMP NA

USGS Map Reference Bettles, Ak. T 25N R 13W Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,64</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>CN</u>	<u>W</u>	<u>77</u>

Abba-dabba Creek is a shallow, spring-fed stream 2-5 m wide and is reported to contain open water year-round. It has a relatively steep gradient at the Haul Road that moderates slightly at the proposed crossing 150 m downstream. The 1-2 m high banks are heavily vegetated with willow and spruce and the stream bottom consists of gravel and cobble. Below the pipeline crossing, stream velocities decrease and the channel width increases to 8-10 m. The stream then meanders 3.7 km north to the South Fork of the Koyukuk River.

Abba-dabba Creek is used by grayling and sculpin as a rearing area (Refs. 11 and 64). Slimy sculpin have been found in this creek in early winter. High dissolved oxygen levels and close proximity of spring sources upstream of the Haul Road suggest that Abba-dabba Creek in the vicinity of the pipeline crossing may offer fish overwintering habitat throughout the winter season.

## WATERBODY

Waterbody South Fork Koyukuk RiverMain Drainage Yukon River Tributary to Koyukuk RiverNPSI 3-85 NPAS 46 NPMP 263.0 AHMP N/AUSGS Map Reference Wiseman, Ak. T 25N R 13W Sec. 6  
25N 13W 1

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R</u>	<u>20,30</u>
Summer	<u>CN,DS,GR,KS,SK,WF</u>	<u>M,R,S</u>	<u>11,21,30</u>
Fall	<u>WF</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u>W</u>	<u>None</u>

South Fork of the Koyukuk River flows west from a drainage area of approximately 1942 km<sup>2</sup> east of the pipeline route to the Koyukuk River. It is a medium sized (24-60 m wide; 0.3-2 m deep), somewhat braided clear water river. The banks are vegetated with willow, alder, spruce and aspen and the substrate is composed of rubble, gravel and sand.

South Fork of the Koyukuk River is an important fish stream. King salmon spawn in the area from Fish Creek to 8 km above the proposed pipeline crossing; chum salmon spawn from the mouth of the river to at least 8 km above the pipeline (Ref. 11). This area of the South Fork Koyukuk River is therefore critical to salmon during spring and summer as a migration route, a rearing area and as a spawning area later in the season. Overwintering of salmon eggs must also occur. Slimy sculpin, grayling, longnose sucker and whitefish also utilize this area as a rearing area during the open water season. The amount of overwintering habitat that is present is unknown; however, since salmon spawn in the area overwintering habitat must exist. This stream is considered important to fish year round.

## WATERBODY

Waterbody Crossroads Creek #1Main Drainage Middle Fork Koyukuk River Tributary to Chapman CreekNPSI 3-82.03NPAS 46NPMP 258.6AHMP N/AUSGS Map Reference Wiseman, Ak.T 26N R 13W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Cross Roads Creek flows northwesterly to its confluence with Chapman Creek and drains a small lake upstream from crossing #1. Its streambed is silt and grass and bank vegetation is low brush, alder and willow (Refs. 11 and 21).

Northern pike have been reported present in the lake upstream; however, no field investigations have been conducted in Cross Roads Creek. Study of the stream in the open water period would be necessary to clarify its importance to fish. Winter fish use at this location is unlikely as streams of this nature tend to be dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Crossroads Creek #2Main Drainage Middle Fork Koyukuk River Tributary to Chapman CreekNPSI 3-82.02NPAS 46NPMP 258.4AHMP N/AUSGS Map Reference Wiseman, Ak.T 26N R 13W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Cross Roads Creek flows northwesterly to its confluence with Chapman Creek and drains a small lake upstream from crossing #2. Its streambed is silt and grass and bank vegetation is low brush, alder and willow (Refs. 11 and 21).

Northern pike have been reported present in the lake upstream; however, no field investigations have been conducted in Cross Roads Creek. Study of the stream in the open water period would be necessary to clarify its importance to fish. Winter fish use at this location is unlikely as streams of this nature tend to be dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Crossroads Creek #3Main Drainage Middle Fork Koyukuk River Tributary to Chapman CreekNPSI 3-82.01 NPAS 46 NPMP 258.4 AHMP N/AUSGS Map Reference Wiseman, Ak. T 26N R 13W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Cross Roads Creek flows northwesterly to its confluence with Chapman Creek and drains a small lake upstream from crossing #3. Its streambed is silt and grass and bank vegetation is low brush, alder and willow (Refs. 11 and 21).

Northern pike have been reported present in the lake upstream; however, no field investigations have been conducted in Cross Roads Creek. Study of the stream in the open water period would be necessary to clarify its importance to fish. Winter fish use at this location is unlikely as streams of this nature tend to be dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Crossroads Creek #4Main Drainage Middle Fork Koyukuk River Tributary to Chapman CreekNPSI 3-82 NPAS 46 NPMP 258.4 AHMP N/AUSGS Map Reference Wiseman, Ak. T 26N R 13W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Cross Roads Creek flows northwesterly to its confluence with Chapman Creek and drains a small lake upstream from crossing #4. Its streambed is silt and grass and bank vegetation is low brush, alder and willow (Refs. 11 and 21).

Northern pike have been reported present in the lake upstream; however, no field investigations have been conducted in Cross Roads Creek. Study of the stream in the open water period would be necessary to clarify its importance to fish. Winter fish use at this location is unlikely as streams of this nature tend to be dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Chapman CreekMain Drainage Yukon RiverTributary to Middle Fork Koyukuk RiverNPSI 3-81NPAS 46NPMP 257.2AHMP N/AUSGS Map Reference Wiseman, Ak.T 26N R 13W Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>20,21,30</u>
Fall	<u>GR</u>	<u>R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Chapman Creek drains an area of approximately 40 km<sup>2</sup> east of the pipeline crossing. Upstream areas include several lakes containing fish (Ref. 11). This small beaded tundra stream (2.4-3 m wide; 0.2-1.2 m deep) flows into the Middle Fork Koyukuk River and a waterfall 1.2-2 m high is located a short distance from its mouth (Ref. 20). The stream banks are vegetated with willow and grasses and the bottom is composed of sand and pebbles.

Grayling are known to utilize Chapman Creek in the vicinity of the pipeline crossing as a rearing area in summer and fall. Northern pike and slimy sculpin are also reported in the stream (Refs. 20 and 21) but the presence of these species has not been confirmed. Chapman Creek probably does not provide overwintering habitat due to its small size.

It is not known if the aforementioned waterfall is a complete fish block; hence the origin of the fish that are present in the stream in the open water period is unknown. The lakes in upstream portions of the drainage are a possible source of fish.



## WATERBODY

Waterbody South Fork Windy Arm CreekMain Drainage Middle Fork Koyukuk River Tributary to North Fork Windy Arm CreekNPSI 3-80 NPAS 45 NPMP 256.3 AHMP NAUSGS Map Reference Wiseman, Ak. T 26N R 13W Sec. 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

South Fork Windy Arm Creek drains a low-lying muskeg area of approximately 23.3 km<sup>2</sup> east of the pipeline (Ref. 11) and flows west into North Fork Windy Arm Creek. The low banks are heavily vegetated with sedges and the stream bottom is composed of sand and cobbles.

Juvenile grayling have been observed in the vicinity of the pipeline during September, indicating that this species uses this part of the South Fork Windy Arm Creek as a rearing area (Refs. 11 and 30). Fish use during the remainder of the open water season is unknown. South Fork Windy Arm Creek probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody North Fork Windy Arm Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-79 NPAS 45 NPMP 254.9 AHMP NA

USGS Map Reference Wiseman, Ak. T 27N R 13W Sec. 26 and 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>R</u>	<u>11,21,30,64</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>GR</u>	<u>R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

North Fork Windy Arm Creek drains an area of about 11 km<sup>2</sup> east of the proposed pipeline route (Ref. 11) and flows west into the Middle Fork of the Koyukuk River. This small tundra stream, which is about 0.9-1.5 m wide and 10 to 50 cm deep, flows within an ill-defined channel through grass and willow (Ref. 20).

North Fork Windy Arm Creek is known to be a grayling rearing area during the open water season. Slimy sculpin are also found during spring (Ref. 30) and probably use the stream during the rest of the open water season. Open water has been observed flowing as late as mid-November in the vicinity of the pipeline crossing (Ref. 74); however, due to the stream's small size, it probably does not provide habitat throughout the winter.

## WATERBODY

Waterbody Unnamed Creek NPSI 3-78.01

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-78.01 NPAS 45 NPMP 254.1 AHMP N/A

USGS Map Reference Wiseman, Ak. T 27N R 13W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>20,21</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek 3-78.01 drains two lakes and flows northerly to its confluence with Middle Fork Koyukuk River. This stream's poorly defined channel is composed of silt and grass with grass, willow and alder vegetating the banks (Refs. 11, 20 and 21).

Previous investigations noted that grayling may be present in this stream (Refs. 11, 20 and 21), but no specific documentation appears to exist. A full assessment of the importance of this stream to fish cannot be made without additional information. Winter fish use of the stream is unlikely since streams of this nature tend to be dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Trent's Trickle

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-78 NPAS 45 NPMP 253.0 AHMP N/A

USGS Map Reference Wiseman, Ak. T 27N R 13W Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>20,21,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Trent's Trickle is a light brown stained stream which drains a small lake and flows northerly through wetlands to its confluence with Middle Fork Koyukuk River (Refs. 21 and 62). In the vicinity of the proposed pipeline crossing its channel is poorly defined with silt and grass in the streambed. Bank vegetation is grass and willow (Refs. 11, 20 and 21).

Grayling were abundant near the proposed crossing on 17 June 1971 (Refs. 20 and 21). Grayling are also likely to be present in summer and fall but no documentation exists for these periods. Winter use of this creek in the vicinity of the proposed crossing by fish is unlikely as streams of this nature tend to be dry or freeze solid in winter. Spring and fall fish migrations must therefore occur.

## WATERBODY

Waterbody Jackson Slough East Channel #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-77.02 NPAS 45 NPMP 252.2 AHMP NA

USGS Map Reference Wiseman, Ak. T 27N R 13W Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>CN,GR,RW</u>	<u>R</u>	<u>30,34,64</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30,64</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Crossing #1 of Jackson's Slough East Channel is the southernmost of three proposed crossings of the slough. The slough is variable in width, but averages about 3.5 m wide and 45 cm deep. The bottom is mud-silt to coarse gravel, and bank vegetation is spruce, aspen, willow, alder and grass (Ref. 34).

The presence of grayling during the entire open water period and grayling fry in July 1975 (Ref 34) indicates that grayling use the stream near crossing #1 for migration and rearing (Refs. 11, 30, 34 and 64). According to Hallberg 1975 (Ref. 34), construction activities in Jackson Slough resulted in blockage of some channels and creation of new man-made channels. Despite this disturbance, Jackson Slough continues to provide useable fish habitat and appears to be of considerable importance to fish in the open water season.

Winter use of Jackson's Slough at crossing #1 is unlikely, as water bodies of this nature tend to freeze solid in winter. Although not in the area of Jackson's Slough East Channel Crossing, Reference 11 reported a personal communication with Hallock, in which an overwintering area at TAPS pipeline station #573+00 was identified.

# WATERBODY

Waterbody Jackson Slough Cross Channel

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-77.01 NPAS 44 NPMP 252.0 AHMP NA

USGS Map Reference Wiseman, Ak. T 27N R 13W Sec. 14

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>CN,GR,RW</u>	<u>R</u>	<u>30,34</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Jackson Slough Cross Channel is approximately 0.4 km north of Crossing #1. The slough is approximately 3.5 m wide with much variation and 45 cm deep. The bottom is mud-silt to coarse gravel and bank vegetation is spruce, aspen, willow, alder and grass (Ref. 34).

The presence of grayling during the entire open water period and grayling fry in July 1975 (Ref. 34) indicates that grayling use this stream near the present crossing for migration, spawning and rearing (Refs. 11, 30, 34 and 64).

According to Hallberg 1975 (Ref. 34), construction activities in Jackson Slough have resulted in blockage of some channels and creation of new man-made channels. Despite this disturbance, Jackson Slough continues to provide useable fish habitat and appears to be of considerable importance to fish in the open water season. Winter use of Jackson Slough Cross Channel is unlikely, as water bodies of this nature tend to freeze solid in winter.

**WATERBODY**

Waterbody Jackson Slough East Channel #2

Main Drainage Middle Fork Koyukuk River Tributary to Jackson Slough Cross Channel

NPSI 3-77 NPAS 44,45 NPMP 251.9 AHMP NA

USGS Map Reference Wiseman, Ak. T 27N R 13W Sec. 14

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>CN,GR,RW</u>	<u>R</u>	<u>30,34</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>64</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Crossing #2 of Jackson Slough East Channel is the northernmost of three proposed crossings of the slough. The slough is approximately 3.5 m wide with much variation and 45 cm deep. The bottom is mud-silt to coarse gravel and bank vegetation is spruce, aspen, willow, alder and grass (Ref. 34).

The presence of grayling during the entire open water period and grayling fry in July 1975 (Ref. 34) indicates that grayling use this stream near crossing #2 for migration, spawning and rearing (Refs. 11, 30, 34 and 64). According to Hallberg 1975 (Ref. 34), construction activities at Jackson Slough have resulted in blockage of some old channels and creation of new man-made channels. Despite this disturbance, Jackson Slough continues to provide useable fish habitat and appears to be of considerable importance to fish in the open water season.

Winter use in the area of crossing #2 is unlikely, as water bodies of this nature tend to freeze solid in winter.

## WATERBODY

Waterbody Rosie Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-74 NPAS 44 NPMP 249.4 AHMP NA

USGS Map Reference Wiseman, Ak. T 27N R 12W Sec. 6

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CD,GR</u>	<u>M,R,S</u>	<u>21,30</u>
Summer	<u>CN,DV,GR,RW</u>	<u>R</u>	<u>20,30</u>
Fall	<u>CN,DV,GR,RW</u>	<u>M,R</u>	<u>30,34</u>
Winter	<u>GR</u>	<u>W</u>	<u>31,77</u>

Upstream of the Haul Road, Rosie Creek is a moderately swift clear-water stream confined to a 4 m wide channel within a floodplain approximately 10 m wide. Substrates are sand and gravel and gravel banks (0.3 m high) are bordered by dense willow and spruce. Downstream of the Haul Road, the flow of Rosie Creek meanders sluggishly through a dense stand of spruce.

Grayling utilize Rosie Creek as a migration route and rearing area throughout the open water period in the vicinity of the proposed crossing (Refs. 20, 21, 30, 31 and 76). Grayling fry were captured in September 1975, indicating that grayling use this area for spawning; however, no spawning has been documented in the immediate vicinity of the crossing (Ref. 31). Other species present in Rosie Creek during the open water period include slimy sculpin, burbot, Dolly Varden and round whitefish (Refs. 11, 20, 21, 30, 34 and 76). Although no fish were captured in the vicinity of the proposed crossing during early winter investigations, habitat was good and overwintering potential was judged to be high (Ref. 77). Grayling were observed through the ice in April 1977 approximately 600 m below the proposed pipeline route (Ref. 31). Available data suggest that Rosie Creek is used by fish year round.



**WATERBODY**Waterbody First Creek #1Main Drainage Middle Fork Koyukuk River Tributary to First Creek #2NPSI 3-72.06 NPAS 44 NPMP 247.3 AHMP NAUSGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 29**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R</u>	<u>20,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

First Creek drains an area of less than 2 km<sup>2</sup> east of the proposed pipeline route (Ref. 11). It is crossed twice by the gas pipeline before it flows west across the Haul Road and the TAPS into the Middle Fork of the Koyukuk River. This small tundra stream drains a small lake just east of the Haul Road. Near crossing #1 it flows through dense willow and sedges into First Creek #2 upstream of the Haul Road.

Grayling and slimy sculpin are known to use First Creek in the vicinity of the TAPS crossing as a rearing area in spring (Refs. 20 and 30). However, it is unclear from these references whether this stream was surveyed near the Haul Road crossing or near its confluence. The present crossing is located on a plateau above the Haul Road; hence previous reports may not apply to this area. The small lake drained by First Creek could also be a source of fish that utilize the stream in the open water season. First Creek is not expected to contain fish in winter due to its small size.

# WATERBODY

Waterbody First Creek #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-72.05 NPAS 44 NPMP 247.1 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 29

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

First Creek drains an area of less than 2 km<sup>2</sup> east of the proposed pipeline route (Ref. 11). It is crossed twice by the proposed pipeline route before it flows west across the Haul Road and the TAPS into the Middle Fork of the Koyukuk River. First Creek #2 is on the main channel of this small tundra stream which is 1-3 m wide and 5-30 cm deep in spring (Ref. 21). The low stream banks are densely covered with willow and grasses.

Grayling and slimy sculpin are known to use First Creek in the vicinity of the TAPS crossing as a rearing area in spring (Refs. 20 and 30). However, it is unclear from these references whether this stream was surveyed near the Haul Road crossing or near its confluence. The present crossing is located on a plateau above the Haul Road; hence previous reports may not apply to this area. The small lake drained by First Creek could also be a source of fish that utilize the stream in the open water season. First Creek is not expected to contain fish in winter due to its small size.

## WATERBODY

Waterbody East Fork Spring Slough

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-72.04 NPAS 44 NPMP 245.8 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Spring Slough has a drainage area of approximately 12 km<sup>2</sup> east of the proposed gas pipeline. East Fork Spring Slough is the southernmost of four crossings of Spring Slough between 3HR776+84 and 3HR797+60. This clear water stream is small (~0.5-1.5 m wide; 15-60 cm deep) and flows over a sand and gravel bottom through overhanging banks covered with willow and grasses (Ref. 21).

Grayling are known to utilize East Fork Spring Slough in spring but other data on fish use of this stream are lacking. The stream probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Spring Slough #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-72.03 NPAS 44 NPMP 245.5 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,21</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Spring Slough drains an area of approximately 12 km<sup>2</sup> east of the proposed pipeline. This stream is crossed by the proposed pipeline four times between 3HR776+84 and 3HR797+60. Near crossing #1, Spring Slough is a small (~0.5-1.5 m wide; 15-60 cm deep) clear water stream which flows over a sand and gravel bottom through overhanging banks vegetated with willow and grasses (Ref. 21).

Grayling are probably present in Spring Slough throughout the open water period although documentation is limited to spring and fall. Sculpin are suspected to occur also in this stream (Ref. 21). Further data on fish use of this stream are not available. Spring Slough near crossing #1 does not provide overwintering habitat in the vicinity of the proposed pipeline crossing due to its small size.

**WATERBODY**

Waterbody Spring Slough #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-72.02 NPAS 44 NPMP 245.4 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 21

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,21</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Spring Slough drains an area of approximately 12 km<sup>2</sup> east of the proposed pipeline. This stream is crossed by the proposed pipeline four times between 3HR776+84 and 3HR797+60. This clear water stream is small (~0.5-1.5 m wide; 15-60 cm deep) and flows over sand and gravel through overhanging banks covered with willow and grasses.

Grayling have been documented in Spring Slough in spring and fall and are probably present throughout the open water period. Sculpin are suspected to occur in this stream (Ref. 21). Spring Slough near crossing #2 probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Spring Slough #3

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-72.01 NPAS 43 NPMP 245.3 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 21

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>GR</u>	<u>M,R</u>	<u>11,21</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Spring Slough drains an area of approximately 12 km<sup>2</sup> east of the proposed pipeline. This stream is crossed by the pipeline four times between 3HR776+84 and 3HR797+60. This clear water stream is small (~0.5-1.5 m wide; 15-60 cm deep) and flows through overhanging grassy banks. The substrate is composed of sand and pebbles.

Grayling are known to use Spring Slough in spring and fall as a rearing area and are probably present throughout the open water period. Sculpin are also suspected to occur in this stream (Ref. 21). Due to the small size of Spring Slough, overwintering habitat is not likely.

**WATERBODY**Waterbody Slate CreekMain Drainage Yukon River Tributary to Koyukuk RiverNPSI 3-72 NPAS 43 NPMP 243.7 AHMP NAUSGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 15**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,DV,GR,RW</u>	<u>R</u>	<u>11,20,30,34,76</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>55</u>

Slate Creek is a small stream 1.5 to 3 m wide that originates in the elevated terrain east of the Haul Road. Bank vegetation includes spruce, willow, alder, aspen, birch and grasses. Substrate is composed of sand and gravel (Ref. 21).

All-age classes of grayling have been observed in Slate Creek during August near the proposed pipeline crossing (Ref. 34). This indicates that grayling may spawn, as well as rear in the stream. Information on the use of Slate Creek by Dolly Varden, slimy sculpin and round whitefish is scant, but these species have been observed during summer. No information exists for the stream in spring and fall, but scarcity of ice in the channel in April 1979 indicated that the stream was nearly dry when freeze-up began in 1978 (Ref. 55). Fish must therefore migrate annually to and from the stream in order to utilize the habitat during the open water period. King salmon have reportedly been observed in the stream from the Haul Road Bridge to 1.2 km from the stream's confluence with the Middle Fork of the Koyukuk River (Ref. 11). However, since no overwintering habitat appears to be present, use of this stream by king salmon for spawning is extremely uncertain.

## WATERBODY

Waterbody Calf Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-71 NPAS 43 NPMP 243.2 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11,30,31</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Calf Creek is a small (3-4.5 m wide; 0.2-.6 m deep) tundra stream which drains an area of approximately 5 km<sup>2</sup> east of the proposed pipeline route (Ref. 11). The banks of the stream are vegetated with grass and willow.

Grayling are known to utilize Calf Creek in spring from its confluence to well above the Haul Road crossing. Dolly Varden, round whitefish and sculpin are also reported to use this stream (Ref. 11); however, use by these species is not well documented. This stream was reported to be dry at the pipeline crossing on 6 May, but contained sufficient water by mid-June at which time many grayling were present (Ref. 11). This indicates that the stream does not contain habitat for fish in winter and early spring, and fish using this stream during the open water season must migrate in from other areas (i.e. the Koyukuk River).



## WATERBODY

Waterbody South Fork Clara Creek OverflowMain Drainage Middle Fork Koyukuk River Tributary to Clara Creek OverflowNPSI 3-70.01 NPAS 43 NPMP 243.0 AHMP NAUSGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>R</u>	<u>11,30,31</u>
Summer	<u>WF</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>		<u>None</u>

The South Fork of Clara Creek Overflow is a small braided stream with a silt bottom (Ref. 29). The stream has a slight gradient (~0.8%) and flows west, crossing the pipeline about 60 m upstream of its confluence with Clara Creek Overflow. The narrow channel is bordered by dense willow and grasses.

Although the stream was reported dry in June of 1977 (Ref. 31), other investigations have reported South Fork of Clara Creek Overflow to contain sculpin, grayling, whitefish and possibly Dolly Varden during the spring or summer (Ref. 11 and 30). However, the latter species has not actually been documented to occur in the stream. No information concerning fish utilization of this stream in fall is available, but it is likely that fish out migrate during the period, since suitable overwintering fish habitat in the stream is expected to be low to non-existent.

# WATERBODY

Waterbody Clara Creek Overflow

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-70 NPAS 43 NPMP 242.9 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 10

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11,30,31,64</u>
Summer	<u>GR,RW</u>	<u>R</u>	<u>11,30,31</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Clara Creek Overflow is a small braided stream (Ref. 29) that flows southwest, crossing the proposed pipeline about 1.8 km upstream of its confluence with the Middle Fork of the Koyukuk River. It drains an area of about 18 km<sup>2</sup> above the proposed alignment and flows down a moderate gradient (~1.0%), through a series of small deep pools and shallow riffles. The stream bottom in the vicinity of the pipeline is composed primarily of coarse gravel (Ref. 11).

Clara Creek Overflow has been documented to serve as a spring rearing area for grayling and a summer rearing area for both grayling and round whitefish (Refs. 11 and 30). Although fall fish documentation is not available for this crossing, the presence of grayling observed in late August (Ref. 11) suggests that this stream contains fish well into fall. Sculpin are also suspected to be present in this stream (Ref. 11) during the open water period; however, field investigations have failed to verify their presence. Suitable overwintering habitat in the vicinity of the proposed alignment is expected to be low to non-existent.

## WATERBODY

Waterbody Clara Creek #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-69.01 NPAS 43 NPMP 242.6 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,X</u>	<u>R</u>	<u>11,31</u>
Summer	<u>GR,X</u>	<u>R</u>	<u>31,34</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Clara Creek near crossing #1 is a small (1-1.2 m wide - 15 cm deep) slightly turbid stream which flows southwest down a moderate gradient (~ 2.0%) into the Middle Fork of the Koyukuk River. It drains an area approximately 18 km<sup>2</sup> above the pipeline and meanders through dense spruce, willow, and birch. The stream bottom consists primarily of sand and small gravel (Ref. 11).

This region of Clara Creek has been documented to serve as a rearing area for grayling and an unidentified species of fish during the spring and summer period. No information exists concerning fish use in fall, but it is likely that fish out migrate during this time, since winter use of this stream is considered unlikely.

## WATERBODY

Waterbody Clara Creek #2Main Drainage Middle Fork Koyukuk River Tributary to Clara Creek #1NPSI 3-69 NPAS 43 NPMP 242.6 AHMP NAUSGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,X</u>	<u>R</u>	<u>11,31</u>
Summer	<u>GR,X</u>	<u>R</u>	<u>31,34</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Clara Creek near crossing #2 is a small (1-1.2 m wide, 15 cm deep) slightly turbid stream which flows southwest down a moderate gradient (~2.0%). The stream drains an area of about 18 km<sup>2</sup> above the pipeline and meanders through dense spruce, willow, and birch. The stream bottom consists primarily of sand and small gravel (Ref. 11).

During spring and summer, grayling and unidentified fish have been observed in this region of Clara Creek. No information exists concerning fish use in fall, but it is likely that fish out migrate during this time, since winter use of this stream is considered unlikely.

## WATERBODY

Waterbody Equisetum Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-68 NPAS 43 NPMP 242.3 AHMP NA

USGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Equisetum Creek is a small (1-2 cfs at the crossing) spring-fed stream that flows west across the proposed pipeline route to the Middle Fork of the Koyukuk River (Ref. 11). Bank vegetation consists of willow, grasses and spruce.

Use of the stream by grayling is documented in summer, but other information is lacking. Since Equisetum Creek is spring-fed, limited fish habitat may be present throughout the year. Additional data are necessary to properly assess the importance of the stream.

## WATERBODY

Waterbody Organo CreekMain Drainage Middle Fork Koyukuk River Tributary to Texas SloughNPSI 3-67 NPAS 43 NPMP 242.2 AHMP NAUSGS Map Reference Wiseman, Ak. T 28N R 12W Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV,GR</u>	<u>M,R</u>	<u>11,31,34,70</u>
Summer	<u>DV,GR</u>	<u>M,R</u>	<u>11,34,64</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>		<u>None</u>

Organo Creek originates from a spring source midway between the pipeline and the Haul Road. It flows northwest through a swampy muskeg watershed to Texas Slough (Ref. 34). This stream averages about 1.2 m in width and 50-60 cm deep. The stream bottom is composed primarily of hard sand and detritus. Low stream banks are vegetated with willow, alder and heavy grasses (Ref. 34).

Organo Creek has been documented to serve as a rearing area for adult grayling and Dolly Varden from spring to late August, when out-migration to Texas Slough and the Middle Fork of the Koyukuk occurs (Ref. 34). This stream is apparently subject to intermittent flow during low water years since it was dry in June 1976 (Ref. 31). Organo Creek does not offer suitable overwintering fish habitat.

# WATERBODY

Waterbody Unnamed Creek NPSI 3-65.01

Main Drainage Middle Fork Koyukuk Tributary to 1079 Slough

NPSI 3-65.01 NPAS 43 NPMP 240.8 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 35

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 3-65.01, is a very small stream that flows west across the Haul Road and continues downstream about 120 m to the proposed pipeline crossing. Vegetation in the area is predominately spruce, willow and grasses.

No information exists for this stream concerning fish use during the open water period. Open water investigations would be necessary to clarify its importance to fish. Streams of this size and nature freeze to the bottom and provide no suitable habitat for fish in winter.

**WATERBODY**Waterbody South Fork Mary Angel CreekMain Drainage Middle Fork Koyukuk River Tributary to Mary Angel CreekNPSI 3-65NPAS 43NPMP 240.4AHMP NAUSGS Map Reference Wiseman, Ak.T 29N R 12W Sec. 26 and 35**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>R</u>	<u>11,30,31</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30,31</u>
Fall	<u>None</u>	<u></u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

South Fork Mary Angel Creek flows southwest crossing the pipeline route about 400 m upstream of its confluence with Mary Angel Creek. The area is characterized by marsh heavily vegetated with tall grass and willow. The stream flows down a moderate (2.5%) gradient and drains an area of approximately 0.6 km<sup>2</sup> above the pipeline (Ref. 11). In the vicinity of the pipeline, South Fork Mary Angel Creek flows through several large pools creating 600-800 m of productive habitat (Ref. 11).

This stream has been documented as a rearing area for grayling and sculpin during spring and summer (Ref. 11, 30 and 31). Spawning is likely to occur in this stream, however this has not been verified. South Fork Mary Angel Creek is likely to contain fish during fall considering its size and its close proximity to Mary Angel Creek (known to contain fish in fall). Winter fish use of this stream is considered low to non-existent, similar streams in this area do not provide suitable winter habitat.



## WATERBODY

Waterbody Mary Angel Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-63.04 NPAS 43 NPMP 240.3 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11,30,70</u>
Summer	<u>BB,CN,GR,LS,RW</u>	<u>R</u>	<u>11,30,34,64,70</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>		<u>74</u>

Mary Angel Creek crosses the proposed pipeline and flows southwest for about 610m to its confluence with a side channel of the Middle Fork of the Koyukuk River. Flowing through an area characterized as a partly wooded, swampy muskeg, this stream is about 1.2m wide and is partially shrouded by dense high grass and willow. The stream bottom is reported to consist primarily of hardpan and sand with some detritus (Ref. 34). Numerous pools, described as deep-scoured depressions (Ref. 34), were noted at many of the stream bends throughout the system. Mary Angel Creek flows down a moderate gradient (~2.5%) and drains an area above the pipeline of approximately 3km<sup>2</sup>.

Mary Angel Creek is a rearing area for burbot, sculpin, grayling, longnose sucker, and round whitefish during the summer season (Ref 11 and 34). It is likely that some or all of the species present in summer also occupy this stream during spring and fall; however, spring and fall documentation is limited to rearing grayling. Winter fish use of this stream is thought to be low to non-existent as the stream was reported completely frozen over and snow covered in mid-November (Ref. 74), suggesting that it probably freezes solid and provides no habitat in winter. Spawning is likely to occur in the stream, as all age classes of grayling have been reported and marginal spawning habitat is present (Ref. 34).

# WATERBODY

Waterbody South Fork Sharon Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-63.03 NPAS 43 NPMP 239.8 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 26

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

South Fork Sharon Creek is a small stream that flows southwest across the pipeline route to the Middle Fork of the Koyukuk River about 760 m from the proposed pipeline. The stream has a relatively steep gradient (~5.0%) and flows through spruce deciduous woodland.

Information regarding fish use of the stream, is limited to a spring observation of 40-50 grayling at the Haul Road crossing (Ref. 11). Available information does not permit an assessment of the value of this stream to fish in summer or fall or as spring spawning habitat. Due to the size and nature of this stream, suitable winter habitat is expected to be low to non-existent.

## WATERBODY

Waterbody Sharon Creek #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-63.02 NPAS 43 NPMP 239.7 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11,31,61</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Sharon Creek flows southwest across the proposed pipeline route to a side channel of the Middle Fork of the Koyukuk River. The area is characterized by spruce-deciduous woodland. This stream has a relatively steep gradient (~ 5.0%) (Ref. 11).

Sharon Creek was not flowing in July of 1976 (Ref. 31) and is not expected to provide suitable fish habitat during the summer, fall or winter. No data are available concerning fish use in spring. However, the temporary nature of the stream suggests that fish utilization would be low.

## WATERBODY

Waterbody Sharon Creek #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-63.01 NPAS 42 NPMP 239.4 AHMP NA

USGS Map Reference Wisewan, Ak. T 29N R 12W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11,31,61</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Sharon Creek flows down a relatively steep gradient (~ 5%) through spruce-deciduous woodland. Sharon Creek crossing #2 is approximately 300 m north of crossing #1.

This stream was reported not to be flowing in July of 1976 (Ref. 31) and is not expected to provide suitable habitat during the summer, fall or winter. No data is available concerning fish use in spring. However, the temporary nature of this stream suggests that fish utilization would be low.

## WATERBODY

Waterbody Marion Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-63 NPAS 42 NPMP 239.3 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CD,DV,GR</u>	<u>M,R,S</u>	<u>11,20,21,30,31</u>
Summer	<u>CD,GR</u>	<u>R</u>	<u>11,30,34</u>
Fall	<u>None</u>	<u></u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>74</u>

Marion Creek is a moderate sized (~10-15 m wide, 10-50 cm deep) clear water stream that flows west across the pipeline route to the Middle Fork of the Koyukuk River. The stream is partly shaded by overhanging vegetation, which includes spruce, birch, alder, willow and aspen (Ref. 34). Substrate consists primarily of sand and gravel. Marion Creek drains an area above the proposed pipeline of approximately 120 km<sup>2</sup>. Watershed type in the area ranges from spruce-muskeg to flat rolling tundra (Ref. 34).

During spring and summer, Marion Creek is a rearing area for a number of fish species. All age classes of grayling and sculpin have been reported in Marion Creek and good spawning habitat is present (Ref. 34). This indicates that spawning could occur near the proposed crossing. Round whitefish are also suspected to use this stream during the open water period (Refs. 11 and 21), but to date field collections have not verified their presence. Spring migrations up Marion Creek may be hindered at the Haul Road crossing, since water velocities in the three existing culverts become extremely high during periods of heavy run-off. {A waterfall ~2.4 km upstream of the Haul Road is reported to be a complete fish block (Ref. 11).} No information is available for fall, but slimy sculpin and Dolly Varden were present in mid-August (Ref. 34). It is likely that fish utilize this stream throughout the open water period and make annual spring and fall migrations. Winter use of Marion Creek is expected to be low or non-existent.

## WATERBODY

Waterbody North Marion Creek Overflow #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-62.04 NPAS 42 NPMP 239.2 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

North Marion Creek Overflow is a small high water run-off channel which crosses the proposed pipeline about 135 m north of the Marion Creek crossing.

No fisheries information is available for this stream near crossing #1. It is suspected to contain water only during periods of high run-off, but open water investigations would be necessary to clarify its importance to fish.

## WATERBODY

Waterbody North Marion Creek Overflow #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-62.03 NPAS 42 NPMP 239.2 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

North Marion Creek Overflow is a small high water run-off channel, which crosses the proposed pipeline about 180 m north of the Marion Creek crossing.

No fisheries information is available for this stream near crossing #2. It is suspected to contain water only during periods of high run-off, but open water investigations would be necessary to clarify its importance to fish.

**WATERBODY**

Waterbody North Marion Creek Overflow #3

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-62.02 NPAS 42 NPMP 239.0 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 23

**FISHERIES ASSESSMENT**SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

North Marion Creek Overflow is a small high water run-off channel, which crosses the proposed pipeline about 550 m north of the Marion Creek crossing.

No fisheries information is available for this stream near crossing #3. It is suspected to contain water only during periods of high run-off, but open water investigations would be necessary to clarify its importance to fish.



## WATERBODY

Waterbody Pence's Pond Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-62.01 NPAS 42 NPMP 238.9 AHMP NA

USGS Map Reference Wiseman, Ak. T 29N R 12W Sec. 23

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,20,21,30</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>31</u>

Pence's Pond Creek is a small (~1 m wide, 30 cm deep) clear water stream that flows southwest across the pipeline to the Middle Fork of the Koyukuk River approximately 150 m downstream. The stream drains an area of about 4.8 km<sup>2</sup> above the pipeline and flows down a relatively steep (~5%) gradient. The stream bottom is composed primarily of silt with some boulders (Refs. 11 and 20). Stream banks are vegetated with grasses, some spruce and mosses (Ref. 11).

This creek is a rearing area for grayling in spring (Ref. 30) and sculpin are also suspected to be present during some portion of the open water period (Refs. 11 and 20). Available information does not permit a full assessment of the stream's importance to fish during the open water season. Winter fish use of this stream is expected to be low to non-existent, as streams of this size and nature freeze to the bottom.

**WATERBODY**Waterbody Confusion CreekMain Drainage Yukon River Tributary to Middle Fork KoyukukNPSI 3-61.02 NPAS 41 NPMP 233.5 AHMP N/AUSGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 30**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>31</u>
Summer	<u>GR</u>	<u>R</u>	<u>31</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>77</u>

Confusion Creek is a narrow (2 m) stream with a gravel bottom bordered by 0.5 m high gravel banks heavily vegetated with willow, dwarf birch and spruce. Flowing west down a moderate gradient (~1.0%), this stream drains an area above the alignment of approximately 4 km (Ref. 11).

During the spring and early summer of unusually wet years, Confusion Creek appears to offer marginal fish habitat. Fish have been reported trapped in several small pools below the proposed crossing on 10 June 1976 (Ref. 31). On 15 June 1977 Confusion Creek was dry (Ref. 31). Spring sources have been reported below the pipeline route (Ref. 11), but an extensive early winter survey of Confusion Creek in November of 1979 failed to verify the existence of any spring sources, and the creek was completely dry at that time (Ref. 77). Confusion Creek appears to be only marginally important to fish in the early part of the open water season.

## WATERBODY

Waterbody North Fork Confusion CreekMain Drainage Yukon River Tributary to Middle Fork Koyukuk RiverNPSI 3-61.01 NPAS 41 NPMP 233.0 AHMP NAUSGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>31</u>

North Fork Confusion Creek is a small stream that flows north across the proposed pipeline route through a narrow channel bordered by spruce, birch, willow and grasses.

The small stream has been reported to be a rearing area for grayling during spring and summer (Ref 11); however, only spring documentation is available (Ref. 30). Fish are probably present in this stream throughout the open water period; however, migrations must occur since this stream had no suitable fish habitat in late November, 1977 (Ref. 31).

## WATERBODY

Waterbody Minnie Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 3-61 NPAS 41 NPMP 231.8 AHMP NA

USGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 18

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	CN,GR	M,R,S	11,30
Summer	BB,CN,GR	R	11,30,34,38
Fall	None		11,30,34
Winter	None		11

Minnie Creek is a moderate sized stream (2-15 m wide and up to 30 cm deep) that flows west across the pipeline through a spruce, willow, alder and birch low-land muskeg area (Ref 11). Its waters are slightly stained and the stream bottom consists primarily of coarse gravel and rubble (Ref. 34). This stream drains an area above the pipeline route of about 150 km<sup>2</sup>. Springs have been reported within the drainage area of the stream (Ref. 11).

Minnie Creek is a rearing area for sculpin and grayling in the spring and summer, as well as, a rearing area for burbot during summer (Refs. 30 and 34). Dolly Varden and round whitefish are also suspected to rear in Minnie Creek during the open water period (Refs. 11 and 34); however no actual documentation exists for these species. This area is probably utilized for spawning, as grayling fry were observed throughout the area surveyed (Ref. 34). No specific fall fisheries information is available for the stream, however, fish use is likely, as the stream offers suitable habitat well into fall. Springs in the area may extend the length of time the stream offers suitable habitat in fall or early winter, but suitable overwintering habitat is not expected to be present near the proposed crossing.

## WATERBODY

Waterbody Middle Fork Koyukuk River NPSI 2-60.19Main Drainage Yukon River Tributary to Yukon RiverNPSI 2-60.19 NPAS 41 NPMP 231.0 AHMP NAUSGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 7,18

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,DV,GR,LS,RW</u>	<u>M,R</u>	<u>11,20,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>GR</u>	<u>W</u>	<u>21</u>

The Middle Fork of the Koyukuk River is a braided stream which drains a spruce, birch, and muskeg watershed of approximately 3,264 km<sup>2</sup> north of the present pipeline crossing (Ref. 11). From the crossing, the river flows south to join the North and South Forks of the Koyukuk River. In the vicinity of the proposed crossing, the river is 35-60 m wide with a bottom of sand and gravel.

Grayling, Dolly Varden, slimy sculpin, longnose sucker, and round whitefish have been captured in the vicinity of the pipeline crossing during spring (Ref. 20). These species are probably present throughout the open water period although this has not been documented. Adult king and chum salmon have been observed in the Middle Fork of the Koyukuk as far upstream as Wiseman. Local residents reported that salmon once migrated as far upstream as the pipeline crossing but, this run was apparently eliminated by overharvesting and siltation (Ref. 21). Grayling have been observed in open leads in winter, indicating that overwintering habitat does exist. Apparently water flow is maintained all winter throughout the river adjacent to the pipeline corridor (Ref. 21).

This stream is considered important to fish year-round.

# WATERBODY

Waterbody Union Gulch Creek #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.18 NPAS 41 NPMP 230.7 AHMP NA

USGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 7

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CD,GR</u>	<u>M,R,S</u>	<u>20,21,30</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,31</u>
Fall	<u>RW</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Union Gulch Creek is an anabranch of the middle fork of the Koyukuk River. This clear stream is approximately 0.3 - 1.2 m wide and 0.1 - 0.9 m deep, substrate is gravel and pebbles, and banks are vegetated with willow and grasses (Refs. 20 and 21).

In the vicinity of crossing #1, Union Gulch Creek serves as a spring and fall migration route and rearing area for grayling, round whitefish and sculpin (Refs. 11, 20, 21, 30 and 31). Additionally, young-of-the-year grayling reported upstream near crossing #2 in July 1977 (Ref. 31), suggesting that spawning could also occur in the vicinity of the present crossing. Winter use of Union Gulch Creek is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Union Gulch Creek #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.17 NPAS 41 NPMP 230.2 AHMP NA

USGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CD,GR</u>	<u>M,R,S</u>	<u>20,21,30</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,31</u>
Fall	<u>RW</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Union Gulch Creek is an anabranch of the Middle Fork of the Koyukuk River. This clear stream is approximately 0.3 - 1.2 m wide and 0.1 - 0.9 m deep, substrate is gravel to pebbles and banks are vegetated with willow and grasses (Refs. 20 and 21).

In the vicinity of crossing #2 Union Gulch Creek serves as a spring and fall migration route and rearing area for grayling, round whitefish and sculpin (Refs. 11, 20, 21, 30 and 31). Young-of-the-year grayling were observed at the proposed crossing in July 1977 (Ref. 31), suggesting that spawning occurs in the area. Winter use of Union Gulch Creek is unlikely as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Confederate Gulch Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.16 NPAS 41 NPMP 229.3 AHMP NA

USGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Confederate Gulch Creek is a small tundra stream which drains a muskeg area adjacent to the Middle Fork Koyukuk River floodplain. This stream drains a number of small ponds, the largest of which is approximately 3,700 square meters.

This stream probably provides suitable habitat for grayling throughout the open water period; however, only information for spring is available. Grayling are reported to spawn within the LWC on the TAPS workpad (Ref. 11). It is very likely that this small stream freezes to the bottom in winter and grayling make annual spring and fall migrations to use the stream during the open water period.



## WATERBODY

Waterbody North Fork Confederate Gulch Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.15 NPAS 41 NPMP 228.8 AHMP N/A

USGS Map Reference Wiseman, Ak. T 30N R 11W Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>11</u>
Winter	<u>None</u>	<u>None</u>	<u>11,31</u>

North Fork Confederate Gulch Creek is a small tundra stream which drains a muskeg area near the confluence of the Hammond and Middle Fork Koyukuk Rivers. The stream is crossed by the proposed pipeline route and then joins Confederate Gulch Creek before being crossed by the Haul Road.

Little information is available concerning fish use of North Fork Confederate Gulch Creek. In spring the stream flow is adequate to provide fish habitat; however, by fall the reduced flow is entirely underground (Ref. 11). No overwintering habitat exists (Refs. 11 and 31).

## WATERBODY

Waterbody Hammond RiverMain Drainage Yukon RiverTributary to Middle Fork Koyukuk RiverNPSI 2-55NPAS 40NPMP 228.1AHMP NAUSGS Map Reference Wiseman, Ak.T 31NR 11WSec. 32 & 33

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>CN,DV,GR,WF</u>	<u>R</u>	<u>11,20,30,67</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

The Hammond River is a small stream (4.0-4.5 m wide) in summer with an active gravel floodplain occasionally up to 300 m wide. This river has a high runoff in spring but is dry in winter. Islands are present in the floodplain and are vegetated primarily with willow. The main stream banks are 0.3-1.0 m high and are bordered with spruce and willow with a few forbs and grasses (Refs. 55 and 67).

Both adult and juvenile grayling have been found in the Hammond River in June in the vicinity of the proposed pipeline crossing (Ref. 67). Grayling also use this area for rearing in August (Ref. 30). Dolly Varden, slimy sculpin, and whitefish have been observed in spring and use this stream as a rearing area. The area proposed for the pipeline crossing does not provide overwintering habitat for fish (Ref. 55).

## WATERBODY

Waterbody Middle Fork Koyukuk River AnabranckMain Drainage Yukon River Tributary to Yukon RiverNPSI 2-60.14 NPAS 40 NPMP 227.5 AHMP NAUSGS Map Reference Wiseman, Ak. T 31N R 11W Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Middle Fork Koyukuk River Anabranck is a small side channel of the main river. At the crossing, the channel is 5-10 m wide and the substrate is gravel and sand.

Information on fish use of this channel of the Middle Fork Koyukuk River is lacking. Fish species which are present in the main channel are probably also found in the side channel during the open water season. Due to its small size, this stream probably does not provide overwintering habitat.

WATERBODY

Waterbody Middle Fork Koyukuk River NPSI 260.13

Main Drainage Yukon River Tributary to Yukon River

NPSI 260.13 NPAS 40 NPMP 227.1 AHMP NA

USGS Map Reference Wiseman, Ak. T 31N R 11W Sec. 33

FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,DV,GR,LS,RW</u>	<u>M, R</u>	<u>20,21,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>GR</u>	<u>W</u>	<u>21</u>

The Middle Fork of the Koyukuk River is a braided stream which drains a spruce, birch and muskeg watershed of approximately 3,200 km<sup>2</sup> north of the present crossing of the pipeline (Ref. 11). From this point, the river flows south to join the North and South Forks of the Koyukuk River west of the pipeline route. At this pipeline crossing, the river is approximately 16-38m wide with a bottom of sand and gravel.

In spring, grayling, Dolly Varden, slimy sculpin, longnose sucker, and round whitefish have been taken in the Middle Fork Koyukuk River near the present pipeline crossing (Ref. 20). These species are probably also present throughout the open water period, although studies have not been performed in summer or fall. King and chum salmon are known to utilize this branch or the Koyukuk as far upstream as Wiseman. Local residents reported that salmon once migrated as far upstream as the pipeline crossing, but this run was apparently eliminated by overharvesting and siltation (Ref. 21). Grayling have been observed in open leads in winter, indicating that winter habitat does exist. Apparently, water flow is maintained all winter throughout the river adjacent to the pipeline corridor (Ref. 21).

This stream is considered important to fish year-round.

**WATERBODY**

Waterbody Richardson's Slough #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.12 NPAS 40 NPMP 225.2 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 35

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,RW</u>	<u>M,R</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Richardson's Slough drains into Middle Fork Koyukuk River and crosses the proposed pipeline at two points. The slough is approximately 20 m wide and 75 cm deep (Ref. 11) and vegetation in the area is scattered spruce, willow, alder and birch.

In the vicinity of crossing #1, grayling use this stream for spring and fall migration and as rearing habitat throughout the open water period (Refs. 11 and 30). Additionally, round whitefish have been reported in June (Refs. 11 and 30).

Winter use at crossing #1 is unlikely, as water bodies of this nature tend to freeze solid in winter.

**WATERBODY**

Waterbody Richardson's Slough #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.11 NPAS 40 NPMP 225.2 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 35

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,RW</u>	<u>M,R</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Richardson's Slough drains into Middle Fork Koyukuk River and crosses the proposed pipeline at two points. The slough is approximately 20 m wide and 75 cm deep (Ref. 11) and vegetation in the area is scattered spruce, willow, alder and birch. Crossing #2 is approximately 75 m west of crossing #1. Grayling use this area for spring and fall migration and as rearing habitat throughout the open water period (Refs. 11 and 30). Additionally, round whitefish have been reported present in the vicinity at crossing #2 in June (Refs. 11 and 30).

Winter use at crossing #2 is unlikely, as water bodies of this nature tend to freeze solid in winter.

## WATERBODY

Waterbody Over Creek #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.10 NPAS 40 NPMP 224.8 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 26 and 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Over Creek is a small stream approximately 2 m wide and 0.3-0.6 m deep (Ref. 11), that drains into the Middle Fork Koyukuk River. Substrate is gravel and cobble, and bank vegetation is spruce and grasses (Ref. 11).

This stream crosses the proposed pipeline route at four different locations. In the vicinity of crossing #1, grayling and burbot have been captured in June and likely use this area for migration and rearing in spring (Refs. 11 and 30). No data are available for summer and fall, but it is likely that fish are present throughout the open water season and out migrate in fall. Winter use near crossing #1 is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Over Creek #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.09 NPAS 40 NPMP 224.8 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Over Creek is a small stream approximately 2 m wide and 0.3-0.6 m deep (Ref. 11), which joins the Middle Fork Koyukuk River. Substrate is gravel and cobble, and bank vegetation is spruce and grasses (Ref. 11).

This stream crosses the proposed pipeline route at four different locations. In the vicinity of Over Creek crossing #2, grayling and burbot have been captured in June and likely use this area for migration and rearing in spring (Refs. 11 and 30). No data are available for summer and fall, but it is likely that fish are present throughout the open water season and out migrate in fall. Winter use near crossing #2 is unlikely as streams of this nature tend to be dry or freeze solid in winter.



## WATERBODY

Waterbody Over Creek #3

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.08 NPAS 40 NPMP 224.7 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB, GR</u>	<u>M, R</u>	<u>11, 30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Over Creek is a small stream approximately 2 m wide and 0.3-0.6 m deep (Ref. 11), which joins the Middle Fork Koyukuk River. Substrate is gravel and cobble, and bank vegetation is spruce and grasses (Ref. 11).

This stream crosses the proposed pipeline route at four different locations. In the vicinity of Over Creek crossing #3, grayling and burbot have been captured in June and likely use this area for migration and rearing in spring (Refs. 11 and 30). No data are available for summer and fall, but it is likely that fish are present throughout the open water season and out migrate in fall. Winter use of crossing #3 is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Over Creek #4

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.07 NPAS 40 NPMP 224.7 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>BB,GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Over Creek is a small stream approximately 2 m wide and 0.3-0.6 m deep (Ref. 11), which joins the Middle Fork Koyukuk River. Substrate is gravel and cobble, and bank vegetation is spruce and grasses (Ref. 11).

This stream crosses the proposed pipeline route at four different locations. In the vicinity of Over Creek crossing #4, grayling and burbot have been captured in June and likely use this area for migration and rearing in spring (Refs. 11 and 30). No data are available for summer and fall, but it is likely that fish are present throughout the open water season and out migrate in fall. Winter use of crossing #4 is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Alignment Slough #1Main Drainage Yukon RiverTributary to Middle Fork Koyukuk RiverNPSI 2-60.06NPAS 40NPMP 224.1AHMP NAUSGS Map Reference Chandalar, Ak.T 31N R 11W Sec. 25

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in system but site specific data are lacking.

Alignment Slough draws an area of less than 2.5 km<sup>2</sup> southeast of the proposed pipeline route. This slough flows through tussocks, willows, and spruce to empty into the Middle Fork of the Koyukuk River. The slough is made up of a series of small channels and is crossed by the workpad six times between Northwest Mileposts 223.5 and 224.5 (Ref. 61). Crossing #1, located at APS 836+40, is the southernmost channel of Alignment Slough which is crossed by the proposed pipeline.

Although site specific information is not available for the six crossings of Alignment Slough, grayling are known to use the general area in spring for rearing (Refs. 11, 30 and 62). Young-of-the-year grayling were observed in isolated pools of the slough in June (Ref. 62) which indicates the general area is used for spawning. Alignment Slough is unlikely to provide winter habitat due to its small size and fish present probably migrate out of the area in fall.

**WATERBODY**

Waterbody Alignment Slough #2

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.05 NPAS 40 NPMP 224.0 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 25

**FISHERIES ASSESSMENT**

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in system but site specific data are lacking.

Alignment Slough drains an area of less than 2.5 km<sup>2</sup> southeast of the proposed pipeline route. This slough flows through tussocks, willows, and spruce to empty into the Middle Fork of the Koyukuk River. The slough is made up of a series of small channels and is crossed by the work pad six times between Northwest Mileposts 223.5 and 224.5 (Ref. 61). Crossing #2 is located at Alyeska Pipe Station 841+20 which is just north of crossing #1.

Although site specific information is not available for the six crossings of Alignment Slough, grayling are known to use the general area in spring for rearing (Refs. 11, 30, and 62). Young-of-the-year grayling were observed in isolated pools of the slough in June (Ref. 62) which indicates that the general area is used for spawning. Alignment Slough is unlikely to provide winter habitat due to its small size.

WATERBODY

Waterbody Alignment Slough #3

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.04 NPAS 40 NPMP 224.0 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 25

FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in system but site specific data are lacking.

Alignment Slough drains an area of less than 2.5 km<sup>2</sup> southeast of the proposed pipeline route. This slough flows through tussocks, willows, and spruce to empty into the Middle Fork of the Koyukuk River. The slough is made up of a series of small channels and is crossed by the work pad six times between Northwest Mileposts 223.5 and 224.5 (Ref. 61). Crossing #3 is located at Alyeska Pipe Station 845+28 which is south of crossing #4.

Although site specific information is not available for the six crossings of Alignment Slough, grayling are known to use the general area in spring for rearing (Refs. 11, 30, and 62). Young-of-the-year grayling were observed in isolated pools of the slough in June (Ref. 62) which indicates that the general area is used for spawning. Alignment Slough is unlikely to provide winter habitat due to its small size.

## WATERBODY

Waterbody Alignment Slough #4

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.03 NPAS 40 NPMP 223.9 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 25

## FISHERIES ASSESSMENT

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present but site specific data are lacking.

Alignment Slough drains an area of less than 2.5 km<sup>2</sup> southeast of the proposed pipeline route. This slough flows through tussocks, willows, and spruce to empty into the Middle Fork of the Koyukuk River. The slough is made up of a series of small channels and is crossed by the work pad six times between Northwest Mileposts 223.5 and 224.5 (Ref. 61). Crossing #4 is located at Alyeska Pipe Station 849+30 which is south of crossing #5.

Although site specific information is not available for the six crossings of Alignment Slough, grayling are known to use the general area in spring for rearing (Ref. 11, 30 and 62). Young-of-the-year grayling were observed in isolated pools of the slough in June (Ref. 62) which indicates that the general area is used for spawning. Alignment Slough is unlikely to provide winter habitat due to its small size.

## WATERBODY

Waterbody Alignment Slough #5

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.02 NPAS 40 NPMP 223.8 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 25

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in system but site specific data are lacking.

Alignment Slough drains an area of less than 2.5 km<sup>2</sup> southeast of the proposed pipeline route. This slough flows through tussocks, willows, and spruce to empty into the Middle Fork of the Koyukuk River. It is made up of a series of small channels and is crossed by the work pad six times between Northwest Mileposts 223.5 and 224.5 (Ref. 61). Crossing #5 of Alignment Slough is located at Alyeska Pipe Station 855+70 which is just south of crossing #6.

Although site specific information is not available for the six crossings of Alignment Slough, grayling are known to use the general area in spring for rearing (Refs. 11, 30, and 62). Young-of-the-year grayling were observed in isolated pools of the slough in June (Ref. 62) which indicates that the general area is used for spawning. Alignment Slough is unlikely to provide winter habitat due to its small size.

# WATERBODY

Waterbody Alignment Slough #6

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60.01 NPAS 40 NPMP 223.7 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 11W Sec. 25

# FISHERIES ASSESSMENT

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in system but site specific data are lacking.

Alignment Slough drains an area of less than 2.5 km<sup>2</sup> southeast of the proposed pipeline route. This slough flows through willows and spruce to the Middle Fork of the Koyukuk River. It is made up of a series of small channels and is crossed by the proposed pipeline six times between Northwest Mileposts 223.5 and 224.5 (Ref. 61). Crossing #6 of Alignment Slough is on the northernmost channel of this slough and is located at Alyeska Pipe Station 860+00.

Although site specific information is not available for the six crossings of Alignment Slough, grayling are known to use the general area in spring for rearing (Refs. 11, 30, and 62). Young-of-the-year grayling were observed in isolated pools of the slough in June (Ref. 62) which indicates that the general area is used for spawning. Alignment Slough is unlikely to provide winter habitat due to its small size.



## WATERBODY

Waterbody Nugget Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-60 NPAS 40 NPMP 223.2 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 10W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>20,21</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30,34</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Nugget Creek is a fast-flowing run-off stream approximately 2.5 m wide and 23 cm deep (Ref. 34). Turbidity varies from clear to silty and substrate is composed of coarse gravel and rubble. Bank vegetation is spruce, birch, willow, alder and some grasses.

The presence of grayling and slimy sculpin in August 1975 (Refs. 30 and 34) suggests that these species utilize Nugget Creek near the proposed crossing throughout the open water period. However, data gaps exist concerning fish use of this stream in spring and fall. It should be noted that an investigation in June 1971 failed to capture fish, but this may have been due to adverse sampling conditions (Refs. 20 and 21).

Winter use of Nugget Creek is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

# WATERBODY

Waterbody Wolf Pup Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-59 NPAS 40 NPMP 222.7 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 10W Sec. 19

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>20</u>
Summer	<u>CN</u>	<u>R</u>	<u>34</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Located approximately 35.4 km north of Coldfoot, Wolf Pup Creek is a small stream (1.5 m wide and 20-30 cm deep) with a substrate of sand and gravel. Bank vegetation is overhanging willow (Ref. 34).

An investigation near the area of the proposed crossing in August 1975 reported one dead slimy sculpin and described Wolf Pup Creek as a ravine supplied by runoff (Ref. 34). Many isolated pools created by low flow in summer months were also noted. Investigations in June 1971 failed to capture fish (Ref. 20). It appears that, in the area of the proposed crossing, Wolf Pup Creek provides marginal habitat during the open water period. No overwintering habitat is expected to be present.

## WATERBODY

Waterbody Sheep Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-53 NPAS 40 NPMP 222.2 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 10W Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R</u>	<u>30</u>
Summer	<u>None</u>	<u></u>	<u>34</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Sheep Creek is a high gradient stream approximately 1.8 m wide and 25-40 cm deep which drains into Middle Fork Koyukuk River (Ref. 34). Substrate is sand and fine to coarse gravel; banks are vegetated with grasses, alder, willow, birch and spruce (Refs. 11 and 34). Hallberg 1975 (Ref. 11) reported that in the area of the proposed pipeline crossing the steep gradient of Sheep Creek causes barriers to fish movement during low flow periods. This suggests that in the area of the proposed crossing, Sheep Creek provides marginal habitat except during high flow periods. The presence of grayling and slimy sculpin in June and an undated sighting of unidentified fingerlings (Ref. 30) indicate that fish use likely occurs in the area of the proposed crossing during high flow periods. Absence of fish in August 1975 (Ref. 34) suggests that fish migrate downstream as flow decreases in the dry summer months. Information concerning fall fish use of Sheep Creek is lacking, but winter use is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

**WATERBODY**

Waterbody Cushing Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-52.01 NPAS 39 NPMP 222.0 AHMP NA

USGS Map Reference Chandalar, AK. T 31N R 10W Sec. 18

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Cushing Creek is a small tributary (~0.3 m wide and 0.3 m deep) of Middle Fork Koyukuk River. Its channel is poorly defined with mud substrate, and banks are vegetated with grasses, willow and spruce (Ref. 11).

No information concerning fish use of Cushing Creek in the vicinity of the proposed crossing is available. There has been one report of an unidentified fish species present in this stream, but specific information on location or time is not available (Ref. 11). Winter use of this stream is unlikely, as streams of this nature tend to be dry or freeze solid in winter. Further data are necessary to assess the importance of Cushing Creek in the open water season.

## WATERBODY

Waterbody Gold Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-52 NPAS 39 NPMP 221.4 AHMP NA

USGS Map Reference Chandalar, Ak. T 31N R 10W Sec. 18

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>X</u>	<u>M,R</u>	<u>30,64</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,34</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>31</u>

Gold Creek, located approximately 37 km north of Coldfoot Camp, is a fast flowing runoff stream approximately 4.5-6 m wide and 0.3-0.9 m deep. Its streambed is sand to boulders and bank vegetation is willow, aspen, and alder (Refs. 11, 21, and 34).

The presence of grayling fry in August 1975 (Ref. 34) near the proposed crossing indicates that Gold Creek is very likely used for spring spawning, as well as for summer rearing. An undated non-site specific observation also reported sculpin to be present in Gold Creek (Ref. 11). Gold Creek was dry on 4 August 1978 (Ref. 31). Therefore, fish utilization of the stream is relatively brief and would be confined to spring and the first few months of summer.

## WATERBODY

Waterbody Linda Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-51 NPAS 39 NPMP 220.9 AHMP NA

USGS Map Reference Chandalar, Alaska T 31N R 10W Sec. 7 and 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>21</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Linda Creek, located approximately 38 km north of Coldfoot, is fed by Linda Creek Lake and runoff (Ref. 34). In the vicinity of the proposed pipeline crossing Linda Creek is approximately 1.2 m wide and 10 cm deep with a stream bed composed of silt and coarse gravel; banks are vegetated with willow, spruce and grass (Refs. 11 and 34).

Grayling and slimy sculpin reported in August (Ref. 30) and undated reports of slimy sculpin (Refs. 11 and 20) indicate that this stream is used for rearing at least during the summer. Out migration likely occurs in fall before freeze-up. Past investigators have reported siltation and channelization in Linda Creek near the proposed crossing due to an upstream mining operation, which has resulted in marginal fish habitat during the open water period (Refs. 11, 20 and 34). Winter use of Linda Creek is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Valve Site Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-49.07 NPAS 39 NPMP 218.6 AHMP NA

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 31 and 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>20</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Valve Site Creek is a small stream which drains an area of approximately 1 km<sup>2</sup> east of the proposed pipeline route (Ref. 11). The stream flows west through willow, sedge and spruce to the Middle Fork of the Koyukuk River.

Fish use in this stream is unlikely at any time except, perhaps, during high water periods when fish could migrate into Valve Site Creek from the Koyukuk River. This area was investigated on 28 June 1971 at which time no flow, pools, or fish were found (Ref. 20). Due to the small size of this stream, winter habitat is lacking.

## WATERBODY

Waterbody Rocky Creek #1

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-49.06 NPAS 38 NPMP 216.2 AHMP N/A

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 20 and 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R,S</u>	<u>11,30,31</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Rocky Creek #1 is the farthest downstream of three proposed crossings of this stream. The stream consists of an old meander of the Middle Fork Koyukuk River and lies within its floodplain. It drains a marshy area between the TAPS workpad and the Haul Road. This marsh receives overflow from Sukakpak Creek and Pamplin's Potholes during periods of high water.

Rocky Creek #1 supports grayling and slimy sculpin throughout the open water period. A spawning area is reported in the vicinity of Rocky Creek #1 (Ref. 11). This stream is expected to be dry or frozen solid in winter.



## WATERBODY

Waterbody Rocky Creek #2Main Drainage Yukon RiverTributary to Middle Fork Koyukuk RiverNPSI 2-49.05NPAS 38NPMP 216.1AHMP N/AUSGS Map Reference Chandalar, Ak.T 32N R 10W Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,30,31</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Rocky Creek #2 is the second of three proposed crossings of this stream. The stream is an old meander of the Middle Fork Koyukuk River and lies within its floodplain. It drains a marshy area between the TAPS workpad and the Haul Road. During periods of high water this marsh receives overflow from Sukakpak Creek and Pamplin's Potholes.

Rocky Creek #2 provides suitable habitat for grayling and slimy sculpin throughout the open water period. Spawning near crossing #2 has not been documented but a grayling spawning area has been reported near crossing #1 (Ref. 11). This stream is likely to be dry or frozen solid during the winter months.

## WATERBODY

Waterbody Rocky Creek #3

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-49.04 NPAS 38 NPMP 215.9 AHMP N/A

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>11,30,31</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Rocky Creek #3 is the farthest upstream crossing of a small stream formed by an old meander of the Middle Fork Koyukuk River. This stream drains a marshy area between the TAPS workpad and the Haul Road and during periods of high water it receives overflow from Sukakpak Creek and Pamplin's Potholes.

This section of Rocky Creek is known to support grayling and may also serve as a rearing area for slimy sculpin throughout the open water period. Spawning near crossing #3 has not been documented, but a grayling spawning area has been reported near crossing #1 (Ref. 11). Through winter this stream is probably frozen solid or dry.

## WATERBODY

Waterbody Sukakpak Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-49.03 NPAS 38 NPMP 215.2 AHMP NA

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11,20</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

2

Sukakpak Creek originates from a 13 km area east of the pipeline route and flows through a series of small ponds and a marshy meadow area into the Middle Fork of the Koyukuk River. The stream is 1-3 m wide, contains numerous shallow pools and has a bottom of sand and gravel. Bank vegetation is composed primarily of grasses and sedges.

Grayling are present in Sukakpak Creek throughout the open water period. Numerous small salmonids which were believed to be grayling fry were observed upstream of the pipeline pad on 14 September 1976 (Ref. 11). This indicates that Sukakpak Creek may be used as a spawning area. Due to the small size of this stream overwintering habitat is probably not present at the pipeline crossing and fish utilizing this area would have to out migrate at the close of the open water season.

## WATERBODY

Waterbody North Fork Sukakpak Creek

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-49.02 NPAS 38 NPMP 214.7 AHMP NA

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>X</u>	<u>R</u>	<u>20</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

North Fork Sukakpak Creek is a small tundra stream that drains a small area east of the pipeline route and flows through marshy meadow areas into the Middle Fork of the Koyukuk River. The stream channel is poorly defined. On 28 June 1971 a small flow of water through grasses was present.

Fish believed to be grayling were observed but not caught on 28 June 1971 in North Fork Sukakpak Creek (Ref. 2). Sculpin may also use this stream in the open water period (Ref. 11), however, their presence has not been verified. Winter habitat does not exist in this stream and fish utilizing the stream would have to out migrate at the close of the open water season.

## WATERBODY

Waterbody Unnamed Creek NPSI 2-49.01Main Drainage Yukon RiverTributary to Middle Fork Koyukuk RiverNPSI 2-49.01NPAS 38NPMP 214.2AHMP NAUSGS Map Reference Chandalar, Ak.T 32N R 10W Sec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-49.01, is a high gradient runoff stream that drains a small area east of the proposed pipeline route and flows westerly through an area typically vegetated with willow, alder and some grasses.

Grayling have been reported to be present in Unnamed Creek, NPSI 2-49.01, on 30 April 1975 (Ref. 11). Due to the size and nature of this stream, fish use is likely restricted to migration and rearing during periods of high flow. Winter use of this stream is unlikely as streams of this nature tend to be dry or freeze solid in winter.

**WATERBODY**Waterbody Middle Fork Koyukuk River NPSI 2-49Main Drainage Yukon River Tributary to Yukon RiverNPSI 2-49 NPAS 38 NPMP 214.1 AHMP NAUSGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 9**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,DV,GR,LS,RW</u>	<u>M,R</u>	<u>30,74</u>
Summer	<u>None*</u>	<u></u>	<u>None</u>
Fall	<u>None*</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*See assessment - fish present but site specific data lacking

The present crossing of the Middle Fork of the Koyukuk River is located approximately 3km downstream of the confluence of the Bettles River and the Dietrich River. In this area the Koyukuk River is extensively braided and a number of river channels are present. The bottom material consists of sand and gravel and bank vegetation is grasses, sedges, willow, and spruce.

A variety of fish species are found near the proposed crossing of the Middle Fork Koyukuk River in spring (Ref. 30). Although site specific information is lacking, this general area of the river is known to contain fish throughout the open water period. Chum salmon occur in the Koyukuk River (Ref. 30); however, it is doubtful that they occur in upstream areas near the present crossing (Ref. 21), and its water flow is apparently maintained all winter throughout the river section adjacent to the pipeline corridor (Ref. 21). Information on winter fish use near the proposed crossing is lacking but this portion of the river should be considered to be important to fish year round.

## WATERBODY

Waterbody Wayback CreekMain Drainage Yukon River Tributary to Middle Fork Koyukuk RiverNPSI 2-48.04NPAS 38NPMP 213.4AHMP NAUSGS Map Reference Chandalar, Ak.T 32NR 10WSec. 4,9

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wayback Creek is a high water channel of the Middle Fork of the Koyukuk River that was modified by TAPS construction (Ref. 11). It receives a small amount of water through seepage from adjacent areas. Typical vegetation in the area consists of willow, aspen, alder and birch.

Grayling fingerlings have been reported in this stream in September (Refs. 11 and 30), but no other data on fish use exists. Access to Wayback Creek is likely restricted to periods of high flow and it is possible that fish become trapped when water levels recede. Winter use of the area by fish would not be possible.

## WATERBODY

Waterbody Millie's Meander

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-48.03 NPAS 38 NPMP 213.0 AHMP NA

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R</u>	<u>11,30,31,64,70</u>
Summer	<u>CN</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Millie's Meander is a small side channel of the Middle Fork of the Koyukuk River that flows through an area of open spruce forest and mixed<sup>2</sup> shrub (Refs. 11 and 70). It has a drainage area of approximately 3.8 km<sup>2</sup>.

In the vicinity of the proposed crossing, grayling and slimy sculpin use Millie's Meander for migration and rearing (Refs. 11, 30, 31, 64 and 70). Although information concerning fall use is lacking, slimy sculpin have been reported present in July (Ref. 30). Both species likely use this stream in the area of the proposed crossing for rearing throughout the open water period and for fall migration. Winter use is unlikely as streams of this nature tend to be dry or freeze solid in winter.



## WATERBODY

Waterbody Unnamed Creek, NPSI 2-48.02

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-48.02 NPAS 38 NPMP 212.6 AHMP NA

USGS Map Reference Chandalar, Ak. T 32N R 10W Sec. 4

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>GR</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-48.02, is a very small stream with a drainage area of approximately 1.5 km<sup>2</sup> west of the proposed pipeline route (Ref. 11). This stream flows east through sedges and willows to the Middle Fork Koyukuk River.

Grayling have been observed near the proposed crossing in May. In a previous year, this stream was dry in June. Due to the temporary nature of this stream, it is probably only used by fish in spring and early summer, although large amounts of precipitation could extend the normal period of fish use.

## WATERBODY

Waterbody Eva's AlvMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-48.01 NPAS 38 NPMP 211.3 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Eva's Alv is a small high gradient stream that flows easterly into the Dietrich River and drains approximately 10.3 km<sup>2</sup>. The stream is approximately 1.2 m wide and 2.5-5.0 cm deep. Substrate is composed of fine sand to boulders and banks are vegetated with spruce, willow, and alder (Ref. 11).

Although spring and summer information is lacking, grayling reported in September verify that Eva's Alv is used by fish during at least part of the open water season. In all likelihood, fish are also present in spring and summer. Spring and fall migrations would necessarily have to occur since the small size and nature of this stream would preclude overwintering in the area.

## WATERBODY

Waterbody Dietrich River Floodplain NPSI 2-48Main Drainage Yukon River Tributary to Middle Fork Koyukuk RiverNPSI 2-48 NPAS 38 NPMP 211.0 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LS</u>	<u>M,R</u>	<u>30,31</u>
Summer	<u>CN,GR,LS, RW</u>	<u>R</u>	<u>30</u>
Fall	<u>BB,CN,GR</u>	<u>M,R</u>	<u>11,30,31</u>
Winter	<u>GR,X</u>	<u>W</u>	<u>11,31,55,77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This is the farthest downstream crossing and it occurs 550 m upstream of the confluence of the Bettles and Dietrich Rivers. In this location the stream is confined to a single channel which is 30-40 m wide and lies within a 180 m wide floodplain. Substrate is gravel and some cobble.

This region of the Dietrich River provides habitat for numerous fish species, many of which may be present year-round. Fish species present during open water include burbot, slimy sculpin, grayling, longnose sucker and round whitefish (Refs. 11,30 and 31). Dolly Varden are known to be present farther upstream (Ref. 77) and probably also occur at this crossing. This region of the river serves as a migration route for fishes moving to upstream spawning and rearing areas in spring. During the fall many of the upstream tributaries begin to freeze and fish migrate downstream to overwintering areas. Early winter investigations found grayling in the vicinity of the proposed crossing on 14 November 1979 (Ref. 77). No fish were found on 9 April 1979. By 26 April 1979 meltwater had caused the water level to rise and numerous juvenile fish were observed (Ref. 77). Additional overwintering areas are reported to occur in the lower regions of the Dietrich River (Refs. 11 and 31).

## FISHERIES ASSESSMENT (CON'T)

### Dietrich River Floodplain NPSI 2-48 (cont'd)

The lower reaches of the Dietrich River are considered important to fish year-round.

## WATERBODY

Waterbody 1415 Lake InletMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-46.01NPAS 38NPMP 210.4AHMP NAUSGS Map Reference Chandalar, Ak.T 33N R 10W Sec. 25 and 26

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

1415 Lake Inlet is a small stream which flows from a relatively large shallow lake east of the Haul Road and pipeline route into a smaller shallow lake west of the pipeline. The stream passes through thick growths of willow, sedges and grasses.

No data exists on fish use of this stream. Any possible fish use would be restricted to the open water season, since the stream would freeze to the bottom in winter.

## WATERBODY

Waterbody Brockman CreekMain Drainage Koyukuk River Tributary to Dietrich RiverNPSI 2-46 NPAS 37 NPMP 209.7 AHMP NAUSGS Map Reference Chandalar, AK T 33N R 10W Sec. 25

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,DV,GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>CN</u>	<u>R</u>	<u>30</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

Brockman Creek has a steep gradient and a 50 m wide floodplain. Its large rock and cobble substrate suggests that it is subject to frequent flooding and high velocity water from nearby mountains. The channel runs essentially straight downhill to its confluence with the Dietrich River.

Brockman Creek is a rearing area for sculpin, grayling and Dolly Varden in summer and fall. It was reported that this stream is probably used by grayling for spawning (Ref. 11); however, this has not been documented. Brockman Creek freezes to the bottom and provides no overwintering habitat (Ref. 55).

## WATERBODY

Waterbody Steitz Lake OutletMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-45.04 NPAS 37 NPMP 209.2 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>30,70</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,64</u>
Fall	<u>CD,GR,LS</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Steitz Lake Outlet flows through a marshy area of grasses and sedges within a poorly defined channel from Steitz Lake west across the pipeline. After flowing into a smaller lake east of the pipeline, the stream continues into the Dietrich River.

All age classes of grayling have been observed in Steitz Lake Outlet in spring and summer (Refs. 30, 64 and 70) indicating use of the stream by this species for spawning and rearing. Sculpin, grayling and longnose sucker have been observed in this stream as late in the season as October (Refs. 11 and 30). Burbot have been taken at the confluence with the Dietrich River (Ref 11), but whether this species uses the stream in the vicinity of the pipeline crossing is not known. Due to the small size of this stream, it probably does not provide habitat throughout the winter.

## WATERBODY

Waterbody South Branch Airport CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-45.03 NPAS 37 NPMP 208.6 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,20</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

South Branch Airport Creek is a clear, small stream approximately 0.3 m wide and 0.1 m deep. The stream is almost entirely silt bottomed pools with grassy banks (Ref. 11). It is located approximately 0.8 km south of Dietrich Camp runway.

Information concerning fish use of this stream for spring and fall is not available. However, grayling have been reported in the region of the proposed crossing in July 1971 (Refs. 11 and 20). Winter use is unlikely as streams of this nature tend to be dry or freeze solid in winter.



**WATERBODY**

Waterbody Middle Tributary to Airport Creek

Main Drainage Dietrich River Tributary to South Branch Airport Creek

NPSI 2-45.02 NPAS 37 NPMP 208.4 AHMP NA

USGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 13,24

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,20</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Middle Tributary of Airport Creek is a clear, small stream approximately 0.3 m wide and 0.1 m deep. The stream is nearly 100% pools with a silt bottom and grassy banks (Ref. 11). It is located approximately 0.4 km south of Dietrich Camp runway.

Information concerning fish use of this stream for spring and fall is not available. However, grayling have been reported in the region of the proposed crossing in July 1971 (Refs. 11 and 20). Winter use is unlikely as streams of this nature tend to be dry or freeze solid in winter.

**WATERBODY**Waterbody Airport CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-45.01NPAS 37NPMP 207.8AHMP NAUSGS Map Reference Chandalar, Ak.T 33N R 10W Sec. 14**FISHERIES ASSESSMENT**SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>DV,GR</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Airport Creek is located approximately 0.5 km northeast of Dietrich Camp. In the vicinity of the proposed crossing, the stream is a collection of very small pockets of water with little flow between pools. The substrate is silt and banks are grassy (Ref. 11).

Dolly varden and grayling occur near the proposed crossing in June (Refs. 11 and 30). Since Airport Creek would provide no overwintering habitat, fish must migrate into the system in spring. Duration of fish use in the open water period is unknown, but it is probably brief, since little flow was observed in early summer (Ref. 11).

## WATERBODY

Waterbody Disaster CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-45 NPAS 37 NPMP 207.1 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>30,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Disaster Creek<sub>2</sub> is a small stream which drains a mountainous area of approximately 19 km<sup>2</sup> east of the pipeline route. Above the Haul Road, Disaster Creek has a steep gradient. Below the Haul Road, gradient lessens and the stream flows through a braided channel over material site 104-3 before flowing into the Dietrich River. At the proposed crossing, Disaster Creek is 1-2 m wide, its substrate is sand, gravel and boulders, and the stream banks are vegetated with spruce, alder and willow.

Adult and juvenile grayling have been found during July in Disaster Creek between the Haul Road and its confluence with the Dietrich River. Slimy sculpin are also known to use this portion of the stream in summer (Refs. 30 and 64). Winter habitat is probably lacking in Disaster Creek due to its small size.

## WATERBODY

Waterbody Unnamed Creek, NPSI 2-43.07Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-43.07 NPAS 37 NPMP 206.8 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 11

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-43.07, is an extremely small stream which drains a small area of sedge and willows east of the proposed pipeline route. Little information is available for this stream and fish use has not been documented by field observations. Due to the small size of this stream, fish use would be restricted to the open water period, since winter habitat would not be available.

## WATERBODY

Waterbody Trap SloughMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-43.06NPAS 37NPMP 206.6AHMP NAUSGS Map Reference Chandalar, Ak.T 33N R 10W Sec. 11

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>X</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Located approximately 1-1.5km north of the Dietrich Camp runway, Trap Slough is an old anabranch of the Dietrich River which has been cut off by Guide Bank B (Ref. 11).

An investigation in June 1977 reported unidentified small fish in Trap Slough (Ref. 11). Information concerning fish use of this stream during the remaining open water period is not available. Overwintering in Trap Slough is unlikely as streams of this nature tend to be dry or frozen solid in winter.

## WATERBODY

Waterbody Dietrich River NPSI 2-43.05

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-43.05 NPAS 37 NPMP 206.4 AHMP NA

USGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 2,11

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS,RW</u>	<u>M,R,S</u>	<u>21,30</u>
Summer	<u>CN,GR,LS,RW</u>	<u>R</u>	<u>21,30</u>
Fall	<u>BB</u>	<u>M,R,</u>	<u>30</u>
Winter	<u>None</u>		<u>11,31,77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This crossing is located approximately 7.4 km upstream of the confluence of the Bettles and Dietrich Rivers. In this region, the stream is braided and the floodplain is about 370 m wide. Substrate is gravel, sand, and cobble.

The lower regions of the Dietrich River provides habitat for numerous fish species, many of which may be present year-round. Fish present in this area during the open water season include burbot, slimy sculpin, grayling, longnose sucker and round whitefish (Refs. 11, 30 and 31). Dolly Varden have been captured farther upstream (Ref. 77) and probably also occur at this crossing. The lower regions of the river serve as a migration route for fish ascending to upstream spawning and rearing areas in spring and for those returning to wintering areas within the lower Dietrich River and Middle Fork Koyukuk River during fall. Although no site specific data exist for this crossing, adjacent upstream and downstream regions support fish during the winter (Refs. 11, 31, and 77) and it is highly likely that overwintering habitat occurs at the present crossing.

This portion of the Dietrich River should be considered important to fish year round.

## WATERBODY

Waterbody Dietrich River NPSI 2-43.04

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-43.04 NPAS 37 NPMP 205.7 AHMP NA

USGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR,LS,RW</u>	<u>M,R,S</u>	<u>21,30</u>
Summer	<u>CN,GR,LS,RW</u>	<u>R</u>	<u>21,30</u>
Fall	<u>BB</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This crossing occurs approximately 8.5 km upstream of the confluence of the Bettles and Dietrich Rivers. In this region, the stream is braided and the floodplain is 335 m wide. Substrate is gravel, sand and cobble.

The lower regions of the Dietrich River provides habitat for numerous fish species, many of which may be present year-round. Fish present in this area during the open water season include burbot, slimy sculpin, grayling, longnose sucker and round whitefish (Refs. 11, 30 and 31). Dolly Varden have been captured farther upstream (Ref. 77) and probably also occur at this crossing. The lower regions of the river serve as a migration route for fish ascending to upstream spawning and rearing areas in spring and for those returning to wintering areas in the lower Dietrich River and Middle Fork Koyukuk River during fall. Although no site specific data exist for this crossing, adjacent upstream and downstream regions, support fish during the winter (Refs. 11, 31, and 77) and it is highly likely that overwintering habitat occurs at the present crossing.

This portion of the Dietrich River should be considered important to fish year-round.

## WATERBODY

Waterbody Sahr's SloughMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-43.03NPAS 37NPMP 205.6AHMP NAUSGS Map Reference Chandalar, Ak.T 33NR 10WSec. 2

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>X</u>	<u>W</u>	<u>11</u>

Sahr's Slough is located approximately 2.7 km north of the Dietrich Camp runway in an area vegetated with scattered spruce and low brush.

Fish use information is not available for this stream during the open water period. Although Sahr's Slough is not expected to provide suitable winter habitat, an unidentified fish species was observed in November 1976 (Ref. 11). Further investigations would be necessary to assess the importance of Sahr's Slough to fish.



## WATERBODY

Waterbody Meadow SloughMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-43.02 NPAS 37 NPMP 205.4 AHMP NAUSGS Map Reference Chandalar, Ak. T 33N R 10W Sec. 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>X</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Meadow Slough is located approximately 3 km north of the Dietrich Camp runway in an area vegetated with scattered spruce and low brush.

An observation of an unidentified fish in September 1976 (Ref. 11) documents that fish occur in the stream but no other information is available. Winter fish habitat in Meadow Slough is expected to be non-existent.

**WATERBODY**Waterbody Unnamed Creek, NPSI 2-43.01Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-43.01 NPAS 37 NPMP 204.8 AHMP NAUSGS Map Reference Chandalar, Ak. T 34N R 10W Sec. 35**FISHERIES ASSESSMENT**SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-43.01, is located approximately 1 km south of Snowden Creek and drains a small area of alder, willow and sedge east of the proposed pipeline route.

No information is available on fish use in this stream. Fish use, if it exists, would be restricted to the open water period, since this stream is too small to provide overwintering habitat.

## WATERBODY

Waterbody Snowden CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-43NPAS 36NPMP 204.1AHMP NAUSGS Map Reference Chandalar, Ak.T 34N R 10W Sec. 26

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>CN,GR</u>	<u>R</u>	<u>11,20</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>30,64</u>
Fall	<u>None</u>	<u></u>	<u>34</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Snowden Creek drains a mountainous area of approximately 43 km<sup>2</sup> east of the pipeline route. The lower portion of the stream, where the crossing is located, is wide (channel 30 m; stream 4 m wide in summer), fast flowing and braided (Refs. 11 and 34). Substrate ranges from sand to boulders with heavy fines in areas of gravel. The banks are vegetated with alder, spruce and willow. Fish passage is blocked at the Haul Road by a perched CMP (Ref. 64).

Snowden Creek appears to lack good spawning habitat (Ref. 34), but both grayling and sculpin are known to use the area between the Haul Road and its confluences as a rearing area in spring and summer (Refs. 20 and 64). Fish are also likely to be present in the fall. Snowden Creek probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Unnamed Creek, NPSI 2-41.05

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

NPSI 2-41.05 NPAS 36 NPMP 203.6 AHMP NA

USGS Map Reference Chandalar, Ak. T 34N R 10W Sec. 27 and 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-41.05, is located about 1 km north of Snowden Creek and drains a small area of spruce muskeg east of the pipeline.

Grayling are known to utilize this stream as a rearing area in spring. Data on fish use during the remainder of the open water season are not available. This stream probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Snowden Pond OutletMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-41.04NPAS 36NPMP 203.4AHMP NAUSGS Map Reference Chandalar, Ak. T 34N R 10W Sec. 27 and 26

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Snowden Pond Outlet drains a small lake east of the pipeline located approximately 1.2 km north of Snowden Creek. The small stream flows west through spruce muskeg to join the Dietrich River.

Grayling are found near the proposed crossing in summer, but data on fish use during the rest of the year are lacking. Snowden Pond Outlet probably does not provide winter habitat and fish using this area would have to migrate in from adjoining areas.

## WATERBODY

Waterbody Numbers Lake CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-41.03 NPAS 36 NPMP 202.7 AHMP NAUSGS Map Reference Chandalar, Ak. T 34N R 10W Sec. 22

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CD,GR</u>	<u>R</u>	<u>11,20</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Numbers Lake Creek drains a mountainous area of about 11 km<sup>2</sup> east of the pipeline and flows west into the Dietrich River. Average stream width at the pipeline crossing is about 1 m. Substrate is sand, gravel and cobbles and the bank vegetation consists of spruce, sedges and willows. Several waterfalls are located from the pipeline crossing; these may be barriers to fish passage.

Adult and juvenile grayling and sculpin have been found in Numbers Lake Creek in summer. Data on fish use of this stream during the remainder of the year are lacking. Winter use is doubtful, due to the stream's small size. Fish utilizing this area would have to migrate in from the Dietrich River.

## WATERBODY

Waterbody Dunder's DribbleMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-41.02NPAS 36NPMP 202.6AHMP NAUSGS Map Reference Chandalar, Ak.T 34N R 10W Sec. 22

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>GR</u>	<u>R</u>	<u>30</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,31</u>
Fall	<u>CN,GR</u>	<u>R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Dunder's Dribble is the outlet of 3035 Lake (a small lake located between the Haul Road and the pipeline route). This stream flows through a marshy muskeg area to the Dietrich River, but flow seems to be intermittent. On 1 July 1971, there was no flow (Ref. 11), the stream was dry on 9 July 1977, but was flowing at the same time the preceding year (Ref. 31).

Slimy sculpin and grayling have been reported to use Dunder's Dribble as a rearing area during the open water season. However, due to the intermittent nature of the stream, its importance to fish is unclear. Winter habitat is probably not present, due to the small size, and fish using Dunder's Dribble would have to migrate in from adjoining areas.

## WATERBODY

Waterbody Stanzla Creek

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

NPSI 2-41.01 NPAS 36 NPMP 202.5 AHMP NA

USGS Map Reference Chandalar, Ak. T 34N R 10W Sec. 22

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11,30,31</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,31</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Stanzla Creek drains a small lake and flows west through spruce and muskeg to its confluence with the Dietrich River. Beaver dams on the stream apparently do not constitute a barrier to fish movement (Ref. 11).

Near the proposed crossing, grayling use Stanzla Creek for spring migration and for rearing in spring and summer. Grayling spawning also occurs in the stream (Refs. 11, 30, and 31). Longnose sucker and round whitefish are also suspected to be present (Ref. 11) but have not as yet been captured in the stream. Fish must migrate out of Stanzla Creek in fall, since the stream would provide no overwintering habitat.



## WATERBODY

Waterbody Ugh CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-41 NPAS 36 NPMP 201.6 AHMP NAUSGS Map Reference Chandalar, Ak. T 34N R 10W Sec. 15

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>30</u>
Summer	<u>None</u>	<u></u>	<u>20</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Ugh Creek is a high gradient run-off stream with a wide rocky stream bed. It flows through material site 105.2 and sinks into an alluvial fan near its mouth (Refs. 11 and 20). Some flow had been reported in the vicinity of the TAPS Crossing (Ref. 11).

The presence of grayling in June (Ref. 30) and an undated report of grayling and slimy sculpin (Ref. 11) indicate that this stream is used by fish at least in the spring. Fish use is likely restricted to the area of flow reported downstream near the TAPS Crossing (Refs. 11 and 20). Winter use at Ugh Creek is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Unnamed Creek, NPSI 2-39.01Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 29.39.01NPAS 36NPMP 199.2AHMP NAUSGS Map Reference Chandalar, AK T 34N R 10W Sec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11, 30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-39.01 is a small stream which drains a spruce muskeg area east of the pipeline route and flows into the Dietrich River.

Grayling are known to use this stream in the summer as a rearing area, but data on fish use during the remainder of the year are lacking. Due to the small size of Unnamed Creek, it probably does not provide winter habitat and fish utilizing the area would have to migrate to and from the Dietrich River.

## WATERBODY

Waterbody Steep CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-39NPAS 35NPMP 197.2AHMP NAUSGS Map Reference -Chandalar, Ak.-T 35N R 10W Sec. 28

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Steep Creek is a glacial stream, which drains a mountainous area of approximately 19 km<sup>2</sup> east of the pipeline and flows west to the Dietrich River. At the pipeline crossing, the stream is 1-2 m wide and 5-8 cm deep; substrate material ranges from sand to boulders and bank vegetation is spruce and willow.

Steep Creek provides marginal fish habitat due to its very steep gradient (Ref 30) and shallow nature (much of its water percolates into an alluvial fan above its confluence). No studies have been performed on fish use of Steep Creek, but use is expected to be low or non-existent due to the physical characteristics of the stream. No winter habitat is expected and fish could only use the stream during periods of high water.

## WATERBODY

Waterbody Buff CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-38NPAS 35NPMP 195.8AHMP NAUSGS Map Reference Chandalar, Ak.T 35N R 10W Sec. 16.21

## FISHERIES ASSESSMENT

	*SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>20</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish reported in the stream but specific data are lacking.

Buff Creek is a steep mountainous stream with a braided, wide rocky stream-bed. It flows westerly through spruce and willow to its confluence with the Dietrich River (Refs. 20 and 30).

Fish use of Buff Creek is likely restricted to periods of high runoff since its flow is intermittent. Grayling have been reported in this stream (Refs. 11 and 30) but no information is available concerning time or location. This stream is likely to be dry by fall or frozen to the bottom in winter.

## WATERBODY

Waterbody Burger's Bayou

Main Drainage Dietrich River Tributary to Drainage Material Site 106

NPSI 2-36.02 NPAS 35 NPMP 195.5 AHMP N/A

USGS Map Reference Chandalar, Ak. T 35N R 10W Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV,GR</u>	<u>R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>11,30</u>
Winter	<u>CN</u>	<u>W</u>	<u>11,30,77</u>

Burger's Bayou is a shallow, slow-flowing, spring-fed stream originating approximately 50 m upstream of the Haul Road crossing. The bottom substrate is composed of gravel covered with filamentous green algae. Bordered on the east side by a steep spruce-covered slope and on the west side by dense willow and spruce, this clear-water stream flows southwest 600 m to the Dietrich River. The drainage area above the pipeline crossing is approximately 18.6 km (Ref. 11).

Burger's Bayou has been documented to serve as a rearing area for grayling and Dolly Varden during spring (Ref. 30). Although no summer or fall fisheries investigations have taken place, it is highly likely that fish occupy Burger's Bayou throughout the entire year as slimy sculpin were present in mid November (Ref. 77). Burger's Bayou has been reported to remain open all year (Ref. 11), and unusually high water temperatures have been recorded during the winter (Ref. 77). This suggests that the stream is greatly influenced by spring sources.

No information concerning spawning in Burger's Bayou is available but conditions appear to be suitable for successful spawning.

## WATERBODY

Waterbody Drainage Material Site #106Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-36.01NPAS 35NPMP 195.3AHMP NAUSGS Map Reference Chandalar, Ak. T 35N R 10W Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,64</u>
Fall	<u>CN,GR</u>	<u>R</u>	<u>30</u>
Winter	<u>GR</u>	<u>W,R</u>	<u>30,55</u>

An unnamed spring originates on the east side of the Dietrich River floodplain and flows through Alyeska Material Site 106. Both channels of this spring, one on the west side of the staging area and one on the east side, flow together immediately upstream of and then empty into Material Site 106. During TAPS construction, Material Site 106 was excavated to approximately 20 feet below the water line in an effort to create an overwintering habitat in the pit. The gravel pit is also used as a water supply by the Chandalar Haul Road maintenance facility.

Adult and juvenile grayling have been found in this waterbody in summer, fall and winter. Use of this area for spawning has not been documented since information on spring use does not exist. No young-of-the-year grayling have been observed. Slimy sculpin have also been observed in this area in fall and may also be overwintering in the area. Although extensive aufeis buildup prevented sampling in April 1979 (Ref. 55), it appears that this waterbody provides suitable fish habitat throughout the year.

## WATERBODY

Waterbody Unnamed Creek NPSI 2-36Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-36 NPAS 35 NPMP 193.0 AHMP NAUSGS Map Reference Chandalar, Ak. T 35N R 10W Sec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek NPSI 2-36 is a steep mountainous stream with a wide braided streambed. It flows west through scattered spruce and willow to its confluence with the Dietrich River.

Grayling have been reported to be present in Unnamed Creek NPSI 2-36 in July (Ref. 30). Exact location is unknown but they were probably found near the mouth of the stream. Fish use in the area of the proposed crossing is likely restricted to periods of high flow. Winter use of the stream by fish is unlikely as streams of this nature tend to be dry or freeze solid in winter.

# WATERBODY

Waterbody Dietrich River Floodplain NPSI 2-34.06

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-34.06 NPAS 34 NPMP 192.4-191.3 AHMP NA

USGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 21

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV</u>	<u>M,R</u>	<u>31</u>
Summer	<u>DV</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>31,119</u>
Winter	<u>CN,DV,GR</u>	<u>W</u>	<u>31,77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This crossing occurs approximately 30.7 km upstream of the confluence of the Bettles River and Dietrich River. In this region the proposed route lies along the east side of the floodplain and crosses the braided channel several times. The floodplain is approximately 530 m in width and the substrate is gravel and cobble with some sand.

The middle regions of the Dietrich River provide habitat for numerous fish species although little site specific data exists for this crossing. Several species - including burbot, slimy sculpin, Dolly Varden, grayling and round whitefish are reported to occur in the general region (Refs. 11 and 30). Slimy sculpin, Dolly Varden and grayling have been observed in this area of the Dietrich River during the winter months (Refs. 31 and 77) and Dolly Varden have been observed here in early spring and summer (Refs. 30 and 31). This area is utilized as a migration route in spring and fall. During breakup, fish begin to move upstream to spawning and rearing areas in the river itself and upstream tributaries. In the fall fish move downstream to overwintering areas. Grayling and Dolly Varden are known to spawn in tributary streams in this area (Ref 11 and 31) and could also spawn in the river itself. Rearing of various life stages of those species listed above occurs in this region of the Dietrich River throughout



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FISHERIES ASSESSMENT (CON'T)

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Dietrich River Flooplain NPSI 2-34.06 (cont'd)

the open water period. This crossing should be considered an overwintering site (Refs. 31 and 77).

The area in the vicinity of this crossing is important to fish year-round.

# WATERBODY

Waterbody Beaver Dam Brook #1

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

NPSI 2-34.05

NPAS 34

NPMP 191.7

AHMP NA

USGS Map Reference Chandalar, Ak.

T 36N R 10W Sec. 28

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>R</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>20,21,30,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Beaver Dam Brook is a clear water stream that is joined by a small spring, then flows west through a marshy area across the Haul Road and proposed pipeline to join the Dietrich River. It is contained by high banks with overhanging vegetation including alder, willow and grass. Beaver have reportedly constructed dams upstream of the Haul Road and at the Haul Road CMP. These dams are effective barriers to fish passage (Refs. 20 and 64).

When not blocked by beaver dams, this stream provides excellent fish habitat (Ref. 30) and grayling are known to use the stream in spring and summer as a rearing area. Fish use in fall and winter has not been documented, but the stream probably does not provide overwintering habitat due to its small size.

## WATERBODY

Waterbody Beaver Dam Brook #2Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-34.04 NPAS 34 NPMP 191.1 AHMP NAUSGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 28

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Beaver Dam Brook #2 is on a very small stream that flows from the main channel of the Dietrich River east across the pipeline and Haul Road to join Beaver Dam Brook #1. Water flow in this stream is intermittent (Ref. 11) and it would not provide fish habitat except during high water periods.

## WATERBODY

Waterbody Beaver Dam Brook #3Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-34.03 NPAS 34 NPMP 190.9 AHMP NAUSGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 28

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCESSpring NoneSummer NoneFall NoneWinter NoneNoneNoneNoneNone

Beaver Dam #3 is on a very small stream that flows east from the main channel of the Dietrich River across the pipeline and Haul Road to join Beaver Dam Brook #1. Water flow in the stream is intermittent (Ref. 11) and it would not provide fish habitat except during periods of high water.

## WATERBODY

Waterbody Beaver Dam Brook #4Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-34.02NPAS 34NPMP 190.8AHMP NAUSGS Map Reference Chandalar, Ak.T 36NR 10WSec. 21 and 28

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring

NoneNone

Summer

NoneNone

Fall

NoneNone

Winter

NoneNone

Beaver Dam Brook #4 is on a small stream that flows east from the main channel of the Dietrich River across the pipeline and the Haul Road to join Beaver Dam Brook #1. Water flow in the stream is intermittent (Ref. 11) and it would not provide fish habitat except during high water periods.

## WATERBODY

Waterbody Beaver Dam Brook #5Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-34.01 NPAS 34 NPMP 190.7 AHMP NAUSGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 21

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>X</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Beaver Dam Brook #5 is on a very small stream that flows east from the main channel of the Dietrich River across the pipeline route and Haul Road to join Beaver Dam Brook #1.

Unidentified fish have been observed near crossing #5 during July (Ref. 30). However, water flow in this stream is intermittent (Ref. 11) and it would not provide fish habitat except during high water periods.

## WATERBODY

Waterbody Nutirwik Creek

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

NPSI 2-34 NPAS 34 NPMP 189.8 AHMP NA

USGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,20,21,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Nutirwik Creek is normally a clear water stream approximately 4.6 m wide and 15-45 cm deep. Substrate is gravel to cobbles and spruce, scrub alder, and grasses line its banks (Refs. 11 and 21).

Although fall information is not available, grayling have been reported to occur in Nutirwik Creek in June and July (Refs. 11, 20, 21, and 30), and it is very probable that they are in the area throughout the open water season. Other species suspected to be present include Dolly Varden, sculpin, and round whitefish (Refs. 11 and 21). Due to its small size, it is unlikely that Nutirwik Creek provides any overwintering habitat and species present in fall likely migrate downstream into the Dietrich River before freeze-up.

## WATERBODY

Waterbody Dietrich River Floodplain NPSI 2-32.06

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-32.06 NPAS 34 NPMP 189.8-188.1 AHMP NA

USGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 10,15,16 and 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV</u>	<u>M,R,S</u>	<u>31</u>
Summer	<u>DV</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>31</u>
Winter	<u>CN,GR</u>	<u>W</u>	<u>31,77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This crossing occurs 35.9 km upstream of the confluence of the Bettles River and the Dietrich River. The main channel is crossed once near the mouth of the Nutirwik Creek and the pipeline then continues up the west side of the floodplain for 2.7 km. In this area the braided channel lies within a floodplain approximately 200 m in width. The substrate is gravel and cobble with some sand.

The middle regions of the Dietrich River provide habitat for a number of fish species many of which may be present on a year-round basis. Several species including burbot, slimy sculpin, Dolly Varden, grayling and round whitefish are reported to occur in the general area (Ref. 11). However, few documented fish observations are available for this section of the river. Slimy sculpin and grayling have been observed near the crossing in winter (Refs. 31 and 77) and Dolly Varden are present in early spring and summer (Refs. 30 and 31). This area serves as a migration route in spring and fall. During breakup fish begin to move upstream to spawning and rearing areas in the river itself and upstream tributaries. In the fall fish move downstream to overwintering areas. Grayling and Dolly Varden are known to spawn in tributary streams and spring sources along this reach of the river (Refs. 11 and 31) and could also spawn in the main channel. Rearing of various life



## Dietrich River Floodplain NPSI 2-32.06 (cont'd)

stages of those species listed above occurs in this region of the Dietrich River throughout the open water season. This crossing should be considered an overwintering site (Refs. 31 and 77).

The Dietrich River in the proximity of this crossing is important to fish year-round.

## WATERBODY

Waterbody Unnamed Spring NPSI 2-32.05Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-32.05NPAS 34NPMP 187.4AHMP NAUSGS Map Reference Chandalar, Ak.T 36NR 10WSec. 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>GR</u>	<u>W</u>	<u>41,55</u>

Unnamed Spring, NPSI 2-32.05, is a clear water stream, 2-4 m wide, originating 170 m east of the proposed pipeline crossing. It flows approximately 0.5 km before reaching the Dietrich River. Its banks are variable (low sloping to incised) and substrate consists of rock and gravel.

Although spring and fall information is lacking, grayling were reported in August (Ref. 30).

Surveys indicate that this spring is a fish overwintering area only during some years. LGL personnel observed juvenile grayling in this spring in January 1976 (Ref. 41), but winter surveys conducted in April 1979 found the spring to be solidly frozen (Ref. 55).

Due to the apparent variability of winter habitat in Unnamed Spring, it would be necessary to obtain information in the winter of proposed construction in order to assess its importance to fish.

## WATERBODY

Waterbody Dietrich River NPSI 2-32.04Main Drainage Yukon River Tributary to Middle Fork Koyukuk RiverNPSI 2-32.04 NPAS 34 NPMP 187.4-187.2 AHMP NAUSGS Map Reference Chandalar, Ak. T 36N R 10W Sec. 3 and 10

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>31</u>
Summer	<u>None</u>	<u></u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>31,77</u>

\* See assessment - fish present in river but site specific data are lacking

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This crossing occurs 38.1 km upstream of the confluence of the Bettles River and the Dietrich River. In this area the braided channel lies within a floodplain approximately 200 m in width. The substrate is gravel and cobble with some sand.

Site specific data for this area of the Dietrich River are wholly lacking; however, substantial amounts of information exist for other nearby regions. Several species of fish including burbot, slimy sculpin, Dolly Varden, grayling and round whitefish are reported in the Dietrich River (Ref. 11) and most, if not all, can be expected to occur in the river in the vicinity of NPSI 2-32.03. Slimy sculpin, Dolly Varden and grayling are present in upstream and downstream sections of the river in winter (Refs. 31 and 77). Various reports (Refs. 11, 21,30,31, and 119) document the presence of these species in addition to round whitefish during the open water period at a number of locations (NPSI 2-29.03, 2-32.01, 2-34.06, 2-43.04) in the river.

The present area must be a migration route for some fish since fish move

## FISHERIES ASSESSMENT (CON'T)

## Dietrich River NPSI 2-32.04 (cont'd)

upstream in the spring to spawning and rearing areas and downstream in the fall to overwintering areas. Grayling and Dolly Varden are known to spawn in tributary streams near the present section of pipeline route (Refs. 11 and 31) and they could also spawn in the mainstem of the river. Rearing of various life stages of fish occurs in this general area and suitable early winter habitat was present in areas further upstream and downstream.

Despite the lack of site specific data for this area, general information and site specific data from adjacent regions indicate that the present area should be considered important to fish year-round.

## WATERBODY

Waterbody Dietrich River Floodplain, NPSI 2-32.03Main Drainage Yukon RiverTributary to Middle Fork Koyukuk RiverNPSI 2-32.03NPAS 33NPMP 187.0-186.4AHMP NAUSGS Map Reference Chandalar, Ak.T 36NR 10WSec. 3

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>31</u>
Summer	<u>None</u>	<u></u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>31</u>
Winter	<u>None</u>	<u></u>	<u>31,77</u>

\* See assessment - fish present in the river but site specific data are lacking

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. This crossing occurs 39.6 km upstream of the confluence of the Bettles River and the Dietrich River. In this region the pipeline route lies within the floodplain for about 1 km and crosses several channels of the river. The floodplain is approximately 130-300 m in width and substrate is gravel and cobble with some sand.

Site specific data for this area of the Dietrich River are wholly lacking; however, substantial amounts of information exist for other nearby regions. Several species of fish including burbot, slimy sculpin, Dolly Varden, grayling and round whitefish are reported in the Dietrich River (Ref. 11) and most, if not all, can be expected to occur in the river in the vicinity of NPSI 2-32.03. Slimy sculpin, Dolly Varden and grayling are present in upstream and downstream sections of the river in winter (Refs. 31 and 77). Various reports (Refs. 11, 21,30,31 and 119) document the presence of these species, in addition to round whitefish, during the open water period at a number of locations (NPSI 2-29.03, 2-32.01, 2-34.06, 2-43.04) in the river.

The present area must be a migration route for some fish since fish move

## FISHERIES ASSESSMENT (CON'T)

Dietrich River Floodplain, NPSI 2-32.03 (cont'd)

upstream in the spring to spawning and rearing areas and downstream in the fall to overwintering areas. Grayling and Dolly Varden are known to spawn in tributary streams near the present section of the pipeline route (Refs.11 and 31) and they could also spawn in the mainstem of the river. Rearing of various life stages of fish occurs in this general area and suitable early winter habitat was present in areas further upstream and downstream.

Despite the lack of site specific data for this area, general information and site specific data from adjacent regions indicate that the present area should be considered important to fish year-round.

## WATERBODY

Waterbody Overwintering CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-32.02NPAS 33NPMP 185.9AHMP NAUSGS Map Reference Chandalar, Ak.T 37N R 10W Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>BB,CN,DV,GR</u>	<u>R</u>	<u>30</u>
Fall	<u>CN,DV,GR</u>	<u>M,R,S</u>	<u>11,30</u>
Winter	<u>DV</u>	<u>W</u>	<u>40</u>

Overwintering Creek is a springfed area in the Dietrich River flood plain. Near the proposed crossing, the stream is divided into two channels separated by an area of low brush. Depths range from 7.5-46 cm (Ref. 11).

Being springfed (Ref. 30), Overwintering Creek provides important year-round fish habitat (Refs. 30 and 40). A variety of species utilize this stream in summer and fall (Refs. 11 and 30) and Dolly Varden are present in winter (Ref. 30). Although no information is available in spring, fish are very likely to be present. The presence of spring, fall and winter spawning in the system is indicative of year-round flow and this stream is considered important to fish throughout the year.

**WATERBODY**Waterbody Dietrich River Flooplain, NPSI 2-32.01Main Drainage Yukon River Tributary to Middle Fork Koyukuk RiverNPSI 2-32.01 NPAS 33 NPMP 186.0-184.9 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T <sup>17S</sup>37N R <sup>10E</sup>10W Sec. <sup>2</sup>35**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>31</u>
Summer	<u>None</u>	<u></u>	<u>11,30</u>
Fall	<u>CN,DV,GR</u>	<u>M,R</u>	<u>31,119</u>
Winter	<u>DV</u>	<u>W</u>	<u>31,77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. The present area is about 40 km upstream of the confluence of the Bettles River and the Dietrich River. In this region the pipeline route lies within the floodplain for about 1.7 km and crosses the braided channel several times. The floodplain is approximately 180 m wide and substrate is gravel and cobble with some sand.

The upper regions of the Dietrich River provide habitat for a number of fish species throughout the open water season. Slimy sculpin, Dolly Varden and grayling have been caught at this crossing of the Dietrich River during the fall (Ref. 119) and a Dolly Varden was captured here during early winter investigations (Ref. 77). Other fishes suspected to occur in the area include burbot and round whitefish (Ref. 11). This area serves as a migration route in spring and fall. During breakup fish begin to move upstream to spawning and rearing areas in the river itself and in nearby tributaries. In the fall fish move from these tributaries and upper reaches of the Dietrich River to overwinter in areas farther downstream. Rearing of various life stages of those species listed above occurs in this region of the Dietrich River throughout the open water season. Although a Dolly Varden was captured at this crossing in early winter, shallow water and negligible flow suggest that this area probably does not offer fish habitat through the entire winter (Ref. 77). Additional late winter investigations are suggested to verify the nature of winter habitat.



## WATERBODY

Waterbody Oskar's EddyMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-31NPAS 33NPMP 184.3AHMP NAUSGS Map Reference Chandalar, Ak.T 17S R 10E Sec. 2

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV</u>	<u>M,R</u>	<u>30</u>
Summer	<u>DV</u>	<u>R</u>	<u>20,21</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Oskar's Eddy is a steep mountainous glacial stream with a drainage area of approximately 6.5 km<sup>2</sup> above the proposed pipeline. Its stream bed is gravel and cobble and spruce, birch and willow line the banks (Refs. 11 and 30).

Dolly Varden have been reported near the proposed crossing in June (Ref. 30) and in upper areas of the drainage in July (Refs. 20 and 21). This suggests that in the area of the proposed crossing, Dolly Varden use Oskar's Eddy for spring and fall migration and for rearing, probably throughout the open water period. It should be noted that an undated observation reported that grayling are also present in the stream (Ref. 11). Winter use of this stream is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Unnamed Creek, NPSI 2-30.02Main Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-30.02 NPAS 33 NPMP 184.1 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 16S R 10E Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u>None</u>	<u>20</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 2-30.02 is a small stream located in the Dietrich River floodplain, which probably carries mostly run-off water from the hillside east of the Haul Road. This creek was found to be dry in early summer (Ref. 20). Other data on fish habitat are lacking, but it is evident that this stream would flow only during periods of heavy run-off.

## WATERBODY

Waterbody Bear Track CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-30.01 NPAS 33 NPMP 183.6 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 16S R 10E Sec. 36

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>DV</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Bear Track Creek is a small, humic-stained tributary to the Dietrich River that flows through spruce and willows in the vicinity of the proposed pipeline crossing. Stream flow is reported to be intermittent (Refs. 11 and 30).

Bear Track Creek is a rearing area for Dolly Varden only during highwater periods. The stream is reported to have high discharge in spring and to be dry in other periods (Refs. 11 and 30).

# WATERBODY

Waterbody Dietrich River Floodplain NPSI 2-29.03

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-29.03 NPAS 33 NPMP 183.3-182.9 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 16S R 10E Sec. 25,36

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR,RW</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. In the present region, the route lies within the floodplain for approximately 1 km and crosses the main channel once. The floodplain in this area is 100 m wide and the channel is somewhat braided. The substrate is gravel and cobble with some sand.

The upper regions of the Dietrich River provide habitat for a number of fish species throughout the open water season. Grayling and round whitefish have been caught at this crossing during summer and grayling are present in fall (Ref. 30). Dolly Varden and slimy sculpin are also suspected to occur here (Refs. 11 and 20). This area serves as a migration route in spring and fall. During breakup, fish begin to move upstream to spawning and rearing areas in the river itself and in nearby tributaries. In the fall, fish move from these tributaries and upper reaches of the Dietrich River to overwinter in areas farther downstream. Rearing of various life stages of those species listed above occurs in this region of the Dietrich River throughout the open water season. Although a Dolly Varden was captured at a downstream crossing (Dietrich River Floodplain NPSI 2-32.01) in early winter, the small size and negligible flow suggest that this region of the river does not provide fish habitat in late winter.

## WATERBODY

Waterbody Dietrich River Floodplain NPSI 2-29.02

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

NPSI 2-29.02 NPAS 33 NPMP 182.4-181.1 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T16S,16SR10E,11E Sec.25,19 & 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>77</u>

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. For a distance of approximately 2 km, the pipeline route follows the centerline of the Dietrich River floodplain, near its headwaters, crossing the main channel many times. In this region, the braided channel lies within a floodplain from 30-100 m in width. The substrate is gravel and cobble with some sand.

The upper regions of the Dietrich River provide habitat for a number of fish species throughout the open water season. Grayling have been reported at this crossing of the Dietrich River during the summer and fall (Ref. 30). Dolly Varden and slimy sculpin are also suspected to occur in the area (Refs. 11 and 20). This area serves as a migration route in spring and fall. During breakup, fish begin to move upstream to spawning and rearing areas in the river itself and in nearby tributaries. In the fall, fish move from these tributaries and upper reaches of the Dietrich River to overwinter in areas farther downstream. Rearing of various life stages of those species listed above occurs in this region of the Dietrich River throughout the open water season. The small size of the Dietrich River in this area suggests that little or no fish habitat is present through the winter months.

## WATERBODY

Waterbody Andy's CreekMain Drainage Middle Fork Koyukuk River Tributary to Dietrich RiverNPSI 2-29.01 NPAS 32 NPMP 180.9 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 16S R 11E Sec. 20,29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>DV,GR</u>	<u>R</u>	<u>20,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Andy's Creek is a clear, glacial stream that flows over a steep gradient from the Chandalar Shelf to the Dietrich River. Stream side vegetation consists of willow and alder and substrate is gravel and boulders.

In the vicinity of the pipeline crossing, Andy's Creek provides good fish habitat and is a rearing area for grayling and Dolly Varden in summer. These fish were captured during a July 1971 survey and at that time a fish barrier was observed just above the Haul Road (Ref. 20). Other information is lacking for Andy's Creek, but it is thought that fish must migrate to and from the stream in spring and fall since it would provide no overwintering habitat.

## WATERBODY

Waterbody West Fork of the North Fork Chandalar River NPSI 2-29Main Drainage Chandalar River Tributary to North Fork Chandalar RiverNPSI 2-29 NPAS 32 NPMP 179.0-178.7 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 16S R 11E Sec. 16

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>20,21</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>30,64</u>
Winter	<u>CN,GR</u>	<u>W</u>	<u>77</u>

West Fork of the North Fork Chandalar River is crossed or encroached upon by the proposed pipeline route three times. The southernmost of these is an actual crossing which occurs approximately 2.0 km south of the Chandalar airstrip. At this point the river consists of two main channels which lie within a 300 m wide gravel and sand floodplain. Through the winter these channels are fed by spring sources located 800 m upstream of the crossing.

The vicinity of the proposed pipeline crossing provides year-round fish habitat. Grayling and slimy sculpin were present in summer, fall and winter (Refs. 20, 21, 30 and 77). No spring studies have been performed but it is very likely that fish are also present at that time. Dolly Varden and round whitefish are also suspected to be present (Refs. 11,20 and 21) although none have actually been caught or observed in the vicinity of the pipeline route.

This portion of the river is important to fish year-round.

## WATERBODY

Waterbody West Fork of the North Fork Chandalar River Floodplain NPSI 2-28Main Drainage Chandalar River Tributary to North Fork Chandalar RiverNPSI 2-28 NPAS 32 NPMP 177.3-176.1 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 16S R 11E Sec. 3 and 10

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30,64</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>30,64</u>
Winter	<u>None</u>	<u>None</u>	<u>77</u>

This is the second of three proposed encroachments of the West Fork of the North Fork Chandalar River. In this region the proposed pipeline route encroaches upon the east bank of the floodplain from the Chandalar airstrip to 2 km upstream. The river in this area is a shallow, braided stream that flows over gravel and sand. The floodplain is bordered by willow which gives way to alpine tundra.

The river in this area provides fish habitat throughout the open water season. Grayling and slimy sculpin have been captured during summer and fall (Refs. 11,30 and 64). These species utilize this area as a migration route, moving upstream during breakup and returning to downstream wintering areas in fall. Rearing of sculpin and grayling likely continues from breakup to freeze-up and spawning by both of those species may occur here in spring. This section of the river freezes solid or goes completely dry in winter providing no winter fish habitat (Ref. 77). Dolly Varden and round whitefish are suspected to be present in the West Fork of the North Fork Chandalar River (Refs. 11,20 and 21), although none have been caught or observed in the vicinity of the three proposed crossings.



## WATERBODY

Waterbody West Fork of the North Fork of the Chandalar River Floodplain NPSI 2-28Main Drainage Chandalar River Tributary to North Fork Chandalar RiverNPSI 2-28 NPAS 31 NPMP 174.6-174.2 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 15S R 11E Sec. 26 and 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>X</u>	<u>R</u>	<u>11,20,21,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

This is the farthest upstream of three proposed pipeline encroachments upon the West Fork of the North Fork Chandalar River. It is located 4.6 km upstream of the Chandalar airstrip. In this area, the proposed pipeline route encroaches on the east bank of the floodplain near the headwaters of the stream. The small, braided stream flows within a gravel and sand floodplain (up to 150 m wide). Some willow occurs within the floodplain but alpine tundra is the predominate vegetation.

This section of the river provides fish habitat from breakup to freeze-up but little information is available concerning fish use. Unidentified fish were observed in the area late in the summer of 1978 (Ref. 64). Grayling and slimy sculpin are known to be present 4 km downstream (Refs. 11,20,21 and 64) and no barriers to fish movement are present. Grayling and sculpin probably spawn here in spring with rearing continuing until late fall. This section of the stream dries up or freezes solid in winter and provides no fish habitat at that time.

## WATERBODY

Waterbody Atigun River Flood PlainMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 2-27 NPAS 30-31 NPMP 171.0-165.1 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 14S 15S R 12E 12E Sec. 20,29&32 5,6,7&8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR,X</u>	<u>R</u>	<u>11,30,49</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u>None</u>	<u>119</u>

The Atigun River flows north 73 km from its origins in the Brooks Range to where it joins the Sagavanirktok River. The proposed pipeline route lies within the actual flood plain of the East Fork Atigun River from its headwaters to the first Haul Road Bridge 9.5 km downstream. This section of the river is braided and channels are crossed many times by the proposed pipeline route. A moderate gradient and gravel/cobble substrate are typical of the flood plain in this region. Riffle areas are most common but pools are occasionally found throughout the area.

The upper Atigun River supports fish throughout the open water season. Grayling are the only species reported to be present (Refs. 11 and 30), although unidentified fish have been observed at the Haul Road Bridge (Ref. 49) and in the vicinity of the Atigun camp (Ref. 11). Grayling probably enter this area during breakup and rearing would continue until fall. No fish habitat appeared to be present in late November 1979 (Ref. 119).

## WATERBODY

Waterbody Unnamed Creek NPSI 2-26Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-26 NPAS 29 NPMP 163.1 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 14S R 12E Sec. 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline crossing, Unnamed Creek, NPSI 2-26, cascades over a steep alluvial fan, through a material site, to its confluence with the Atigun River. Stream substrate consists of gravel and cobbles and the channel is confined by low banks of tundra vegetation.

Fish use has not been documented for Unnamed Creek, NPSI 2-26. It is thought that fish may utilize this stream near the pipeline crossing, only during highwater periods. During periods of low water, summer and fall, the stream may be subterranean, filtering through the porous alluvial substrate. Winter fish use is probably non-existent due to the size and nature of this stream.

# WATERBODY

Waterbody Unnamed Creek NPSI 2-25.03

Main Drainage Sagavanirktok River Tributary to Atigun River

NPSI 2-25.03 NPAS 29 NPMP 162.9 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 14S R 12E Sec. 8

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Near the proposed pipeline crossing, Unnamed Creek, NPSI 2-25.03 flows over a steep alluvial deposit to its confluence with the Atigun River. Stream substrate consists of gravel and cobbles and the channel is confined by low tundra banks.

Although fish use has not been documented for Unnamed Creek, NPSI 2-25.03 near the proposed pipeline crossing, fish have been reported in downstream areas near TAPS, about 450 m from the proposed crossing (Ref. 11). Due to the small size and steep gradient of this stream, it is likely that fish utilize the area near the proposed crossing only during periods of high water. Little or no flow is expected in late summer and the stream would provide no winter fish habitat.

**WATERBODY**Waterbody Unnamed Creek NPSI 2-25.02Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-25.02 NPAS 29 NPMP 162.8 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 14S R 12E Sec. 8**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Near the proposed pipeline crossing, Unnamed Creek, NPSI 2-25.02 flows over a steep alluvial deposit to its confluence with the Atigun River. Stream substrate consists of gravel and cobbles and the channel is confined by low tundra banks.

Although fish use has not been documented for Unnamed Creek, NPSI 2-25.02 near the proposed pipeline crossing, fish have been reported in downstream areas, near TAPS, about 450 m from the proposed crossing (Ref. 11). Due to the small size and steep gradient of this stream, it is likely that fish utilize the area near the proposed crossing only during periods of high water. Little or no flow is expected in late summer and the stream would provide no winter fish habitat.

**WATERBODY**Waterbody Unnamed Creek NPSI 2-25.01Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-25.01 NPAS 29 NPMP 162.5 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 14S R 12E Sec. 8**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Near the proposed pipeline crossing, Unnamed Creek, NPSI 2-25.01 flows over a steep alluvial deposit to its confluence with the Atigun River. Stream substrate consists of gravel and cobbles and the channel is confined by low tundra banks.

Although fish use has not been documented for Unnamed Creek, NPSI 2-25.01 near the proposed pipeline crossing, fish have been reported in downstream areas near TAPS, about 450 m from the proposed crossing (Ref. 11). Due to the small size and steep gradient of this stream, it is likely that fish utilize the area near the proposed crossing only during periods of high water. Little or no flow is expected in late summer and the stream would provide no winter fish habitat.

## WATERBODY

Waterbody Trevor CreekMain Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-25 NPAS 29 NPMP 159.8 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 13S R 12E Sec. 28

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>70</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline crossing, Trevor Creek is a clear, braided stream that meanders through the Atigun River floodplain and into the Atigun River. The glacial waters flow over gravel and boulder substrate and are confined by low banks vegetated with dwarf willow and tundra flora.

Trevor Creek provides excellent fish habitat and is a rearing area for grayling in spring and summer. Grayling have been documented to occur from 300 m upstream of the TAPS to the stream's confluence with the Atigun River (Ref. 64) with the largest numbers found in a scour pool downstream of the Haul Road culvert. Fish migrations undoubtedly occur as streams of this size and nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Tyler Creek #1Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-24.03 NPAS 29 NPMP 159.3 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 13S R 12E Sec. 28

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR,RW</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tyler Creek is a braided, clear water stream that meanders through an extensive riparian willow floodplain to its confluence with the Atigun River. The stream channel is confined by low banks and substrate consists of gravel and cobbles. The proposed pipeline route involves three crossings of Tyler Creek. Crossing #1 is the most upstream of the three.

In the vicinity of crossing #1, Tyler Creek provides excellent fish habitat and is a rearing area for grayling and round whitefish. These species were observed in the area between the Haul Road and the proposed pipeline crossing in July 1977 (Ref. 11). Migration of these species undoubtedly occurs as streams of this size and nature tend to provide unsuitable habitat for fish in winter.



## WATERBODY

Waterbody Tyler Creek #2Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-24.02 NPAS 29 NPMP 159.0 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 13S R 12E Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>30</u>
Summer	<u>GR,RW</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tyler Creek is a braided, clear water stream that meanders through an extensive riparian willow floodplain to its confluence with the Atigun River. The stream channel is confined by low banks and substrate consists of gravel and cobbles. The proposed pipeline route involves three crossings of Tyler Creek. Crossing #2 is approximately 450 m downstream of crossing #1.

Near crossing #2 Tyler Creek provides excellent fish habitat and is a rearing area for grayling and round whitefish during the open water period. These species were observed in the vicinity of this crossing in June and July 1978 (Ref. 11). Winter fish use is probably non-existent as this stream would not provide suitable habitat after freeze-up. Migrations to and from this area would therefore, have to occur.

## WATERBODY

Waterbody Tyler Creek #3Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-24.01 NPAS 29 NPMP 159.0 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 13S R 12E Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tyler Creek is a braided, clear water stream that meanders through an extensive riparian willow floodplain to its confluence with the Atigun River. The stream channel is confined by low banks and substrate consists of gravel and cobbles. The proposed pipeline route involves three crossings of Tyler Creek.

In the vicinity of crossing #3, Tyler Creek provides excellent fish habitat and is a rearing area for grayling. This species was observed in the vicinity of crossing #3 during a July 1979 survey (Ref. 11). Migration of these fish and fish inhabiting upstream reaches undoubtedly occurs (Ref. 118). Winter fish use is probably non-existent as streams of this size and nature provide unsuitable habitat in winter.

## WATERBODY

Waterbody Roche Moutonee CreekMain Drainage Sagavanirktok RiverTributary to Atigun RiverNPSI 2-24NPAS 28NPMP 153.3AHMP N/AUSGS Map Reference Philip Smith Mountains, Ak. T 12S R 12E Sec. 28

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR,LT</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>GR,LT,RW</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30,57</u>
Winter	<u>None</u>		

Roche Moutonee Creek is a small (3-6.5 m wide) slightly turbid stream which flows west across the Haul Road and proposed pipeline into the Atigun River. This stream flows through a large (100-150 m) gravel and cobble floodplain and has a braided channel with low, gradual sloping banks lined with willow.

During open water periods Roche Moutonee Creek is utilized by grayling for migration and rearing. In addition, the presence of young-of-the-year grayling indicates that this stream provides suitable spawning habitat for this species (Ref. 57). Lake trout and round whitefish have also been reported in the stream during open water periods (Refs. 11 and 30). It is unlikely that Roche Moutonee Creek provides any overwintering habitat near the proposed pipeline crossing due to its small size, but good fish habitat is present during the open water period.

## WATERBODY

Waterbody One-One-Three CreekMain Drainage Sagavanirktok RiverTributary to Atigun RiverNPSI 2-23.03NPAS 28NPMP 153.2AHMP NAUSGS Map Reference Philip Smith Mountains, AK. T 12S R 12E Sec. 28

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

One-One-Three Creek is a very small stream that flows northwest across the proposed pipeline approximately 180 m north of Roche Moutonee Creek.

No fisheries information exists with which to assess the importance of this stream to fish and field studies during the open water period would be necessary to obtain pertinent data. However, winter use is not expected since streams of this size and nature normally freeze to the bottom.

## WATERBODY

Waterbody Mainline SpringMain Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-23.02 NPAS 27 NPMP 152.2 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 12S R 12E Sec. 21

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC, GR</u>	<u>R</u>	<u>11, 64</u>
Fall	<u>AC</u>	<u>M, R</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Mainline Spring, a tributary to the Atigun River, is a small (1-3 m), shallow stream which rises from what is now an abandoned material site. Its slightly turbid water flows over sand, silt and gravel substrate. In the vicinity of the pipeline crossing, the stream is confined by low, gradually sloping banks vegetated with willow, grass and sedge.

Mainline Spring provides important habitat for fish throughout the open water season. Adult and young-of-the-year grayling were observed in July of 1977 and 1979 (Refs. 11 and 64), indicating use of this waterbody for spawning and as a nursery area. Arctic char also use this area for rearing (Refs. 11 and 57). Spring and fall migrations undoubtedly occur (Refs. 11 and 57). Although winter investigations have not been conducted, winter use of Mainline Spring is unlikely as streams of this size and nature are normally dry or freeze to the bottom in winter.

**WATERBODY**

Waterbody Holden Creek

Main Drainage Sagavanirktok River Tributary to Atigun River

NPSI 2-23.01 NPAS 27 NPMP 151.5 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 12S R 12E Sec. 16

**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>GR</u>	<u>R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Holden Creek is a clear water stream of moderate size that flows southwest to the Atigun River through a broad floodplain vegetated with willow. The banks of this stream are occasionally incised and show some signs of block slumpage. Holden Creek flows down a moderate (~ 2%) gradient, through material site No. 114-1 and drains an area above the alignment of approximately 16 km<sup>2</sup> (Ref. 11).

Available information does not permit an assessment of this stream's importance to fish during spring. However, grayling have been documented in the area in summer and fall (Ref. 30) suggesting the likelihood that Holden Creek offers valuable fish habitat during spring. Winter fish use of this stream is expected to be low to non-existent as this stream is likely dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Vanish CreekMain Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-23 NPAS 27 NPMP 151.4 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 12S R 12E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>GR</u>	<u>R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Vanish Creek is a small stream that originates from a spring source located at the northern boundry of material site #114-1. This stream crosses the pipeline and flows northwest approximately 2km to the Atigun River.

Vanish Creek is probably a rearing area for grayling and Arctic char during the open water period (Ref 11), however actual documentation is limited to rearing grayling during summer and fall (Ref. 30). No information is available with which to assess fish use of this stream in spring. Due to its small size, Vanish Creek is not expected to offer suitable habitat during winter.

## WATERBODY

Waterbody Unnamed Creek NPSI 2-22.05Main Drainage Atigun RiverTributary to Vanish CreekNPSI 2-22.05NPAS 27NPMP 151.3AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 12S R 12E Sec. 16

## FISHERIES ASSESSMENT

\* SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*See assessment - Arctic char reported but field documentation is lacking

Unnamed Creek NPSI 2-22.05 is a very small stream that flows along the northern border of material site #114-1 before crossing the pipeline and flowing into Vanish Creek.

Arctic char have been reported in this stream (Ref. 11), however, no actual documentation appears to be available. Present information does not permit an assessment of this stream's importance to fish during the open water periods. Streams of this size and nature normally freeze to the bottom and provide no habitat in winter.



## WATERBODY

Waterbody Tad CreekMain Drainage Atigun RiverTributary to Vanish CreekNPSI 2-22.04NPAS 27NPMP 151.1AHMP N/AUSGS Map Reference Philip Smith Mountains, Ak. T 12S R 12E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tad Creek is a small, high gradient stream that flows west through low shrub and tussock tundra into Vanish Creek, approximately 1.6 km south of TAPS Pump Station #4.

Tad Creek is a summer rearing area for grayling, but no information regarding fish use during spring or fall is available. It is assumed that fish migrate out of the stream in fall and return in spring or early summer. The possibility that grayling spawn in the stream also exists. Due to its small size, this stream provides no winter habitat for fish.

## WATERBODY

Waterbody Tee Lake Outlet #1

Main Drainage Sagavanirktok River Tributary to Atigun River

NPSI 2-22.03 NPAS 27 NPMP 148.9 AHMP NA

USGS Map Reference Philip Smith Mountain, Ak. T 12S R 12E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11.30</u>
Summer	<u>GR,RW</u>	<u>M,R,S</u>	<u>11.30,31.70</u>
Fall	<u>BB,GR</u>	<u>M,R</u>	<u>11.30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tee Lake Outlet is a small humic-stained stream that flows northwest from Tee Lake to the Atigun River, through an area of muskeg swamp bordered by subalpine tundra. The pipeline crosses Tee Lake Outlet in two locations, the most southerly is Tee Lake Outlet #1, approximately 520 m downstream of Tee Lake ( 1 km north of Alyeska Pump Station #4).

Tee Lake Outlet near crossing #1 has been documented to serve as a spawning, rearing and migration pathway for a number of fish species during the open water period (Ref. 30). Numerous other species including Arctic char, sculpin and lake trout have been reported to use this stream; however, actual field documentation is not available. Tee Lake Outlet #1 is not expected to provide suitable overwintering habitat; however, grayling have been documented to overwinter in Tee Lake (Ref. 11).

**WATERBODY**Waterbody Tee Lake Outlet #2Main Drainage Sagavanirktok River Tributary to Atigun RiverNPSI 2-22.02 NPAS 27 NPMP 148.9 AHMP NAUSGS Map Reference Philip Smith Mountains, AK. T 12S R 12E Sec. 5**FISHERIES ASSESSMENT**SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>GR</u>	<u>M,R,S</u>	<u>11,30</u>
Summer	<u>GR,RW</u>	<u>M,R</u>	<u>11,30,31,70</u>
Fall	<u>BB,GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Tee Lake Outlet is a small humic-stained stream which flows northwest from Tee Lake to the Atigun River through an area of muskeg swamp bordered by subalpine tundra. The pipeline crosses Tee Lake Outlet in two locations; Crossing #2 is the northernmost and is located approximately 600 m downstream of Tee Lake.

Tee Lake Outlet near Crossing #2 has been documented as a spawning, rearing and migration pathway for a number of fish species during the open water period (Ref. 30). Numerous other species including Arctic char, sculpin and lake trout have been reported to use this stream; however, actual field documentation is not available. Tee Lake Outlet #2 is not expected to provide suitable overwintering habitat; however, grayling have been documented to overwinter in Tee Lake (Ref. 11).

## WATERBODY

Waterbody Mosquito LakeMain Drainage Sagavanirktok RiverTributary to Atigun RiverNPSI 2-22.01NPAS 27NPMP 148.9AHMP N/AUSGS Map Reference Philip Smith Mountains, Ak. T 11S R 12E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>BB, RW</u>	<u>S, R</u>	<u>30, 57</u>
Winter	<u>None</u>	<u></u>	<u>55</u>

Mosquito Lake is a small clear tundra lake that lies to the east of the Atigun River and is near Galbraith Lake. Water depths taken during winter investigations in 1979 varied from 1.9 m to a maximum of 6.1 m (Ref. 54). The nearshore areas are vegetated with sedges and rooted aquatic plants and the lake bottom is mud and detritus. Lake outflow is through a poorly defined channel that originates from the swampy southern shore of the lake and flows approximately 300 m to the Atigun River. Fish movement between Mosquito Lake and the Atigun River is prevented by the small size of the outflow channel and series of small waterfalls where it joins the Atigun River except during unusually high water periods.

Mosquito Lake provides year-round habitat for fish. During investigations in September 1979 burbot and gravid round whitefish were captured (Ref. 57). It is assumed that both species successfully reproduce within the lake. Numerous grayling were previously reported in Mosquito Lake (Ref. 11 and 30); however, fishing efforts in April and September 1979 failed to capture grayling.

## WATERBODY

Waterbody Atigun River

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 2-22 NPAS 27 NPMP 147.6 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 11S R 12E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AC,BB,CN,GR,LT,RW</u>	<u>M,R,S</u>	<u>11,30</u>
Summer	<u>AC,BB,CN,GR,LT,RW</u>	<u>R</u>	<u>11,30,31,76</u>
Fall	<u>AC,BB,CN,GR,LT,RW</u>	<u>M,R</u>	<u>30,57</u>
Winter	<u>None</u>	<u>None</u>	<u>77</u>

The Atigun River flows north 73 km from its origins in the Brooks range to the Sagavanirktok River. The proposed pipeline route lies within the Atigun River valley for a distance of approximately 35 km and crosses the river twice. The farthest downstream crossing occurs near Galbraith Lake where the river turns easterly towards the Sagavanirktok River. Here the 25 m wide braided channel lies within a 125 m wide flood plain. Steep incised banks to 7 m high are composed of sand and gravel and are partially covered by tundra vegetation. The substrate is sand and gravel and the water is typically clear except during high runoff in spring.

This stream provides suitable fish habitat throughout the open water season. The Atigun River serves as a migration route for fish moving to upstream spawning and rearing areas in spring and returning to downstream wintering areas in fall. Grayling fry have been found in the river, indicating that spawning may occur in the area (Ref. 11). Other species present include Arctic char, burbot, slimy sculpin, round whitefish and lake trout (Refs. 11 and 30). These species may be found rearing in the vicinity of the crossing from breakup to freeze-up. Early winter investigations indicate a lack of suitable habitat near the proposed crossing which would preclude fish use throughout the winter months (Ref. 77).

## WATERBODY

Waterbody Jill CreekMain Drainage Itkillik River Tributary to Itkillik RiverNPSI 1-21.11 NPAS 25 NPMP 140.7 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 35

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Jill Creek is a beaded tundra stream that drains a marshland area. The channel is narrow, well defined and is confined by low banks. Stream substrate is gravel or mud and silt. Jill Creek flows northwesterly to the Itkillik River.

Documentation on fish use in Jill Creek is limited at this time. A single grayling was observed during a summer survey in 1976 (Ref. 30). However, no fish were captured or observed during subsequent open water investigations conducted in 1977 and 1978 (Refs. 30 and 64). Winter fish use is probably non-existent as streams of this size and nature dry up or freeze to the bottom during this period.

## WATERBODY

Waterbody Jill Creek TributaryMain Drainage Itkillik River Tributary to Jill CreekNPSI 1-21.10 NPAS 25 NPMP 140.4 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Jill Creek Tributary is a small, beaded stream that drains a tundra marshland. The channel is narrow and confined by low banks. Stream substrate is gravel and/or mud and silt. This stream flows southwesterly to join Jill Creek just below the Haul Road.

Fish use in Jill Creek has not been documented although it is believed that fish may be present (Ref. 11) during the open water period. Winter fish use is unlikely as streams of this size and nature tend to dry up or freeze solid after freeze-up.

**WATERBODY**Waterbody Ed CreekMain Drainage Kuparuk River Tributary to Toolik LakeNPSI 1-21.09 NPAS 25 NPMP 140.0 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10 S R 11 E Sec. 26**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Ed Creek is a very narrow stream that drains a muskeg marshland and flows through an incised channel to Toolik Lake. Stream banks are vegetated with tundra flora and substrate is gravel or mud and silt.

Fish use has not been documented in Ed Creek near the proposed pipeline crossing. Grayling and lake trout have been reported present at the inlet to Toolik Lake (Ref. 11) and fish use has been documented in similar tributaries to the lake (Ref. 118). It is possible that fish are present in Ed Creek in the vicinity of the pipeline route as well.

Winter fish use in Ed Creek is non-existent as streams of this size and nature either dry up or freeze to the bottom during this period.



**WATERBODY**Waterbody Mack CreekMain Drainage Toolik Lake Tributary to Ed CreekNPSI 1-21.08 NPAS 25 NPMP 139.6 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 26**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Mack Creek is a beaded clear-water stream that flows through tundra marshlands in an incised channel. This stream is one of several that flow into Toolik Lake. Stream banks are vegetated with tundra flora and substrate is gravel or mud and silt.

Fish use of Mack Creek is unknown, although it is believed that grayling are present (Ref. 11). Fish have been documented in similar tributaries to Toolik Lake (Ref. 118) and it is likely that some fish are present in Mack Creek in the vicinity of the pipeline route. Winter fish use of Mack Creek is probably non-existent as streams of this size and nature tend to provide no habitat for fish during this period.

**WATERBODY**Waterbody Terry CreekMain Drainage Toolik Lake Tributary to Ed CreekNPSI 1-21.07 NPAS 25 NPMP 139.1 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 23**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Terry Creek is a beaded stream that flows through tundra marshlands in an incised channel. Terry Creek is one of several tributaries to Toolik Lake. Stream banks are vegetated with tundra flora and substrate is gravel or mud and silt.

In the vicinity of the proposed pipeline route, Terry Creek is a rearing area for grayling. These fish were captured or observed during open water surveys conducted in 1976, 1977, 1978 and 1979 (Ref. 11, 30, and 64). Fish migration undoubtedly occurs in spring and fall as streams of this size and nature provide unsuitable habitat for fish in winter.

# WATERBODY

Waterbody Moss Creek

Main Drainage Kuparuk River Tributary to Terry Creek

NPSI 1-21.06 NPAS 25 NPMP 138.6 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 23

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Moss Creek is an extremely small stream that originates east of the proposed pipeline route in a muskeg area and flows into Terry Creek west of the pipeline. Stream banks are vegetated with tundra flora and substrate is gravel, mud and silt.

Moss Creek is reported to have good fish habitat upstream of the pipeline crossing (Ref. 30). No fisheries investigations have been conducted, but fish are believed to be present in Moss Creek during the open water period (Ref. 30). Grayling and lake trout have been reported downstream in the inlet of Toolik Lake (Ref. 11) and fish use is documented in similar tributaries to the lake (Ref. 118). Moss Creek probably does not provide winter habitat as streams of this size either dry up or freeze to the bottom during winter.

## WATERBODY

Waterbody Hallock CreekMain Drainage Terry Creek Tributary to Moss CreekNPSI 1-21.05 NPAS 25 NPMP 138.4 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 14

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Hallock Creek is a small stream with many beaded channels. Its red-stained waters flow over a steep gradient and substrate is gravel or mud and silt. The stream is combined by low muskeg/tundra banks.

An investigation conducted in mid-July 1977 reported that fish habitat in Hallock Creek was poor to non-existent due to the small amount of water present at that time (Ref. 30). It was also suggested that fish passage would be hindered at the Haul Road (Ref. 30). Although no other documentation exists, fish utilization of this stream is expected to be low to non-existent and confined to periods of high water.

## WATERBODY

Waterbody Yan CreekMain Drainage Kuparuk River Tributary to Kuparuk RiverNPSI 1-21.04 NPAS 25 NPMP 136.0 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 10S R 11E Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Yan Creek flows through tundra marshlands in a uniform channel with large pools to 0.9 m deep. Banks are tundra covered and substrate is gravel or mud and silt.

Downstream of the proposed pipeline crossing, Yan Creek provides good fish habitat, but to date only slimy sculpin have been reported in the area during summer. Fish habitat above the crossing is non-existent (Ref. 11). This stream would provide no overwintering habitat and present data indicate that downstream portions could be used during the open water season.

**WATERBODY**Waterbody Becky Creek #1Main Drainage Kuparuk River Tributary to Kuparuk RiverNPSI 1-21.03 NPAS 24 NPMP 134.2 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 9S R 11E Sec. 35**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11.30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Becky Creek is a small beaded tundra stream which drains two small lakes and crosses the proposed pipeline twice before joining the Kuparuk River.

Summer investigations in past years have reported grayling adults and fry present near the area of Becky Creek proposed crossing #1 (Refs. 11 and 30). This suggests that the area serves as a spring and fall migration route, spawning area and rearing area throughout the open water period, but no documentation is available for other than the summer period.

Winter use of Becky Creek is unlikely as streams of this nature tend to be dry or freeze solid in winter.

**WATERBODY**Waterbody Becky Creek #2Main Drainage Kuparuk River Tributary to Kuparuk RiverNPSI 1-21.02 NPAS 24 NPMP 132.8 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 9S R 11E Sec. 25**FISHERIES ASSESSMENT**

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in stream but site specific data are lacking.

Becky Creek is a small beaded tundra stream which drains two small lakes and crosses the proposed pipeline twice before joining the Kuparuk River.

Although no site specific information is available for crossing #2, grayling have been documented at crossing #1 (Refs. 11 and 30). Since the stream very likely freezes to the bottom in winter, grayling must use the area near crossing #2 as a spring and fall migration route. Spawning and rearing could also occur near crossing #2.

# **WATERBODY**

Waterbody Holt Creek

Main Drainage Kuparuk River Tributary to Becky Creek

NPSI 1-21.01 NPAS 24 NPMP 132.6 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 9S R 11E Sec. 25  
9S 12E 30

# **FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R,S*</u>	<u>30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*See assessment.

Holt Creek originates from three small lakes east of the proposed pipeline and flows 1-2 km north to the Kuparuk River. The stream is small and clear with substrates consisting of gravel and cobble (Ref. 30).

Both adult grayling and grayling fry are found above and below the pipeline crossing in Holt Creek during summer and early fall (Refs. 11 and 30). Fish use during spring is not well documented but presence of adults and fry indicates that grayling spawn. Grayling are also found in the lakes from which Holt Creek flows (Refs. 11 and 30). This stream probably does not provide winter habitat due to its small size; however, grayling are believed to overwinter in its headwater lakes (Ref. 30).



## WATERBODY

Waterbody Kuparuk RiverMain Drainage Kuparuk River Tributary to Kuparuk RiverNPSI 1-21 NPAS 24 NPMP 131.9 AHMP NAUSGS Map Reference Philip Smith Mountains T 9S R 12E Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11,30,67</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30,36</u>
Fall	<u>CN,GR</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u>None</u>	<u>55</u>

The Kuparuk River is located west of the Sagavanirktok River. It flows north from headwater glacial lakes for about 300 km before emptying into Gwyder Bay. In its upper portion, the Kuparuk River is a beaded stream where little scouring occurs and the banks are stable and well vegetated (Ref. 11 and 30). Where crossed by the pipeline, this stream is 15-20 m wide and has a substrate consisting mostly of large cobbles and boulders (Ref. 11 and 67).

The entire Kuparuk River drainage offers habitat suitable for grayling spawning and rearing during the open water season (Ref. 11 and 36). The general pattern of use in the upper portion of the river is for grayling to overwinter in lakes, migrate downstream in spring, spawn, spend the summer in the river and migrate upstream back to the lakes in the fall (Ref. 11). Adult, juvenile and young-of-the-year grayling have been found in the vicinity of the pipeline crossing in spring, summer and fall. Slimy sculpin have also been observed in this area during early fall (Ref. 30). During winter, no suitable overwintering habitat has been found near the pipeline crossing (Ref. 55).

## WATERBODY

Waterbody East Fork Kugaruk RiverMain Drainage Kugaruk River Tributary to Kugaruk RiverNPSI 1-20.01 NPAS 23 NPMP 130.4 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 9S R 12E Sec. 17

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The East Fork of the Kugaruk River drains an area of approximately 3.6 km<sup>2</sup> upstream of the pipeline crossing (Ref. 11). In the vicinity of the proposed pipeline, this stream is a small beaded foothill stream about 1 m wide with tundra banks (Ref. 30).

Although data are limited, grayling are known to use this area for rearing during summer (Ref. 30). It has also been reported that whitefish utilize this stream during the open water period (Ref. 30), but documentation appears to be unavailable. The East Fork of the Kugaruk River, at the pipeline crossing, probably does not provide overwintering habitat due to its small size. Fish utilizing this part of the stream would have to migrate in from other areas.

## WATERBODY

Waterbody Toolik RiverMain Drainage Kuparuk River Tributary to Kuparuk RiverNPSI 1-20 NPAS 23 NPMP 129.5 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 9S R 12E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Toolik River is a clear beaded foothill stream approximately 6 m wide. Its substrate is coarse gravel and mud and banks are tundra covered. Maximum pool depths are about 1.8 m (Ref. 11).

All sizes of grayling were reported to be abundant in July and Arctic char were also present in the stream (Ref. 11 and 30). It is probable that the Toolik River is used by fish throughout the open water season and that grayling spawn in the stream as well. Spring and fall migrations likely occur since the stream is unlikely to provide suitable overwintering habitat.

# WATERBODY

Waterbody East Fork Toolik River

Main Drainage Kuparuk River Tributary to Toolik River

NPSI 1-19.01 NPAS 23 NPMP 129.4 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 9S R 12E Sec. 16

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

East Fork Toolik River is a small foothill stream with well vegetated banks and an incised channel. It joins the Toolik River approximately 152 m south of the proposed pipeline crossing (Ref. 30).

An assessment of the importance of East Fork Toolik River is not possible due to lack of information. Winter use is unlikely as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Oksrukuyik CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-19 NPAS 22 NPMP 122.7 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 9S 8S R 13E 13E Sec. 4 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AC,CN,GR</u>	<u>M,R,S</u>	<u>11,30</u>
Summer	<u>AC,CN,GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>None</u>	<u></u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Oksrukuyik Creek is a moderate sized (5-10 m) tributary to the Sagavanirktok River. In the vicinity of the pipeline crossing the clear, brown water flowover a steep gradient of cobble and boulder substrate. A dense growth of green algae covers the stream bottom in summer and willow and tundra grass line 0.3-1.0 m high banks.

Oksrukuyik Creek provides excellent fish habitat and is utilized by Arctic char, grayling and slimy sculpin throughout the open water season (Refs. 11, 30 and 64). Grayling fry found in July 1978 (Ref. 30) indicate spawning in the stream. Oksrukuyik Creek is also used as a rearing area and is a likely migration route as well. Although winter investigations have not been conducted fish use is unlikely as streams of this size and nature are dry or freeze to the bottom during winter.

## WATERBODY

Waterbody Shifish Creek #1

Main Drainage Sagavanirktok River Tributary to Oksrukuyik Creek

NPSI 1-18.04 NPAS 22 NPMP 121.3 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 8S R 13E Sec. 28 and 33

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*See assessment - fish documented at crossing #2

At crossing #1 Shifish Creek is a narrow (0.3-0.6m) tundra stream of brown-stained water. Stream substrate is composed of gravel and boulders with attached green algae. Low tundra banks less than 0.5m high are vegetated with dwarf willow.

Fish use has not been documented near crossing #1 of Shifish Creek. Although Arctic char were observed downstream (~1.2m) at crossing #2 during a July 1977 survey (Ref 30) it is not known if stream flow and/or depth are sufficient to allow fish movement upstream to crossing #1. Winter fish use is probably non-existent as streams of this size and nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Shifish Creek #2Main Drainage Sagavanirktok River Tributary to Oksrukuyik CreekNPSI 1-18.03 NPAS 22 NPMP 120.5 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 8S R 13E Sec. 27

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>57,64</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

At crossing #2 Shifish Creek is a narrow (0.3-0.6m) tundra stream of brown-stained water. Stream substrate is composed of gravel and boulders with attached green algae. Low tundra banks less than 0.5m high are vegetated with dwarf willow.

In the vicinity of crossing #2 Shifish Creek is a rearing area for Arctic char in summer (Ref 30). Fall surveys in 1979 indicated that potential habitat was available, however, the small size of the stream could limit its suitability for fish during low water periods (Ref 57 and 64). In addition, no fish were captured in the stream in mid-September 1979 (Ref. 57). Fish use in winter is non-existent as streams of this size and nature are dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Thiele's TrickleMain Drainage Sagavanirktok River Tributary to Oksrukuyik CreekNPSI 1-18.02 NPAS 21 NPMP 119.1 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 8S R 13E Sec. 23

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - outlet of lake known to have fish

Thiele's Trickle is a very small outlet of a lake located between TAPS and the Haul Road. This stream flows from the lake northerly through low tundra banks to join Oksrukuyik Creek (~350 m).

Fish use of Thiele's Trickle has not been documented at any time. Reference 11 states that the small lake from which the stream flows contains fish, although documentation appears not to be available. Winter fish use is probably non-existent due to the size and nature of this stream.



## WATERBODY

Waterbody Lower Oksrukuyik Creek #1

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-18.01 NPAS 20 NPMP 109.5 AHMP NA

USGS Map Reference Phillip Smith Mountains, Ak. T 7S R 14E Sec. 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11</u>
Summer	<u>BB,GR,WF</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>AC,CN,GR</u>	<u>M,R</u>	<u>30,57,64</u>
Winter	<u>None</u>	<u></u>	<u>77</u>

Lower Oksrukuyik Creek is a large (6-16 m wide) clear water stream with gravel/cobble substrate. It is characterized by large, deep pools (2 m<sup>2</sup>) and shallow riffles. The 1.5-3.0 m high banks are lined with willow and are actively eroding.

Lower Oksrukuyik Creek near crossing #1 provides excellent fish habitat and is used by a variety of fish throughout the open water season and perhaps throughout the year. The stream is a rearing and feeding area for grayling, Arctic char, whitefish and slimy sculpin (Refs. 11, 30, 57 and 64). The presence of grayling fry observed during the summer of 1979 (Ref. 64) indicates that spring spawning occurs in this stream. Arctic char found during a survey conducted in early October 1979 (Ref. 64) may indicate use of this area for fall spawning activities. Internal migration throughout Lower Oksrukuyik Creek #1 has been reported (Ref. 11).

Although early winter investigations conducted in 1979 did not verify the presence of fish in Lower Oksrukuyik Creek #1, high dissolved oxygen levels and an abundance of free water at all sample locations indicate possible overwintering habitat (Ref. 77). Previous studies in late fall documented the presence of Arctic char, grayling and sculpin in Lower Oksrukuyik Creek (Refs. 57 and 64). This strongly suggests that fish use the stream at least in early winter. Information on late winter conditions is necessary to verify the importance of this region to fish.

## WATERBODY

Waterbody Lower Oksrukuyik Creek #2Main Drainage Sagavanirktok River Tributary to Oksrukuyik Creek #1NPSI 1-18 NPAS 20 NPMP 109.4 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 7S R 14E Sec. 8

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>77</u>

Lower Oksrukuyik Creek near crossing #2 is a side channel off the main stream (where crossing #1 is located). This region is approximately 20 km upstream of the confluence of Lower Oksrukuyik Creek and the Sagavanirktok River.

At the proposed pipeline crossing, Lower Oksrukuyik Creek provides good fish habitat during the open water season, although site specific fishery data for this period is not available. During 1979 fall investigations of crossing #1 on Lower Oksrukuyik Creek, sufficient water was observed at crossing #2 to sustain fish use (Ref. 57). However, the region was dry in November 1979 (Ref. 77) and provides no winter habitat.

## WATERBODY

Waterbody Unnamed Creek NPSI 1-17.02Main Drainage Sagavanirktok RiverTributary to Oksrukuyik CreekNPSI 1-17.02NPAS 20NPMP 109.2AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 7S R 14E Sec. 5 and 8

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 1-17.02, is a very small beaded stream that flows through low tundra banks to its confluences with Oksrukuyik Creek. Stream substrate is gravel or mud and silt.

No data are available on fish use of this stream, although it has been suggested that fish may be present (Ref. 11). Winter fish use is extremely unlikely as this small stream would be dry or frozen solid in winter.

## WATERBODY

Waterbody Unnamed Creek NPSI 1-17.01Main Drainage Sagavanirktok River Tributary to Oksrukuyik CreekNPSI 1-17.01 NPAS 20 NPMP 108.9 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 7S R 14E Sec. 5

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 1-17.01, is a very small beaded stream that flows through low tundra banks to its confluence with Oksrukuyik Creek. Stream substrate is gravel or mud and silt.

No data are available on fish use of this stream, although it has been suggested that fish may be present (Ref. 11). Winter fish use is extremely unlikely as this small stream would be dry or frozen solid in winter.

## WATERBODY

Waterbody Rudy CreekMain Drainage Sagavanirktok River Tributary to Oksrukuyik CreekNPSI 1-17 NPAS 19 NPMP 108.5 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 7S R 14E Sec. 5

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Rudy Creek is stained light brown and flows easterly through tundra for 12.9 km to its confluence with Oksrukuyik Creek (Ref. 11). The stream is approximately 4.2 m wide and 0.2 m deep with a substrate of cobbles and boulders; dominant bank vegetation is willow (Ref. 11).

Grayling and Arctic char are present in Rudy Creek in summer (Ref. 11), but no other information is available. This stream provides fish habitat throughout the open water period, but is probably not suitable for winter use.

## WATERBODY

Waterbody Bassett CreekMain Drainage Sagavanirktok River Tributary to Dennis CreekNPSI 1-16.03 NPAS 19 NPMP 106.9 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 6S R 14E Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Bassett Creek is a small tundra stream that drains approximately .25 km<sup>2</sup> above the pipeline route and flows into Dennis Creek about 5.5 km north of Pump Station #3.

Fisheries information for Bassett Creek is not available. Winter use of the stream is unlikely due to its small size.

## WATERBODY

Waterbody Dennis CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-16.02 NPAS 19 NPMP 106.8 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 6S R 14E Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Dennis Creek is a small beaded tundra stream which drains 1.9 km (Ref. 11) and is located 5.6 km north of Pump Station #3.

Reports of Arctic char in July 1977 and grayling in August 1976 (Refs. 11 and 30), document that, in the area of the proposed crossing, Dennis Creek is used for summer rearing. No information is available for the remainder of the year, but fish are likely to be present throughout the open water period. Winter use is unlikely, as streams of this nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Climb CreekMain Drainage Sagavanirktok River Tributary to Dennis CreekNPSI 1-16.01 NPAS 19 NPMP 106.3 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 6S R 14E Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC,GR,X</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Climb Creek is a small (~1 m wide) beaded tundra stream that drains 1.6 km<sup>2</sup> (Ref.11) above the proposed pipeline crossing. The crossing is located 6.2 km north of Pump Station #3.

Grayling adults and fry were present in the stream in August 1976 (Refs. 11 and 30). This suggests that spawning occurs in the stream, as well as summer rearing. Other species reported present include Arctic char in July 1977 (Refs. 11 and 30) and unidentified juvenile fish in July 1978 (Ref. 64). Winter use of Climb Creek is unlikely as streams of this nature tend to be dry or freeze solid in winter. Due to this feature, fish would necessarily have to undergo spring and fall migrations in order to utilize the stream during the open water period. However, no data are available on fish use of the stream in seasons other than summer.



## WATERBODY

Waterbody Poison Pipe CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-16 NPAS 19 NPMP 106.0 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 6S R 14E Sec. 19

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>30</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Poison Pipe Creek located approximately 7 km north of Pump Station #3, is a small beaded tundra stream that drains an area of about 24 km<sup>2</sup> above the proposed pipeline crossing. The stream is 1-3 m wide and substrate is gravel and cobble (Ref. 30).

In the area of the proposed crossing, grayling use Poison Pipe Creek as a spring and fall migration route and as a rearing area throughout the open water period (Refs. 11 and 30). Other species reported in the stream include Arctic char and unidentified fry (Refs. 11 and 30). Presence of the latter suggest spawning in the area. Winter use of Poison Pipe Creek is unlikely as streams of this nature tend to be dry or freeze solid in winter.

# WATERBODY

Waterbody Polygon Creek

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-15 NPAS 19 NPMP 105.1 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 6S R 14E Sec. 19

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AC,BB,CN</u>	<u>M,R,S</u>	<u>30</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>11,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Polygon Creek is a small tundra stream that winds through a long (~ 8 km), narrow channel of gravel and cobble to the Sagavanirktok River. The area extending from the mouth of the stream to approximately 300 m upstream is dry except during high water periods (Ref. 11).

During most of the open water period, Polygon Creek is a rearing area for Arctic char, grayling and burbot as well as a spring spawning area for grayling. These species have been documented in the spring of 1977 and/or the summer of 1977 and 1979 (Refs. 11, 30, and 64). Fall or winter fishery studies have not been conducted. Winter fish use of Polygon Creek is probably unlikely as streams of this size and nature tend to be dry or frozen to the bottom in winter. Since downstream regions could be dry in fall, fish using this stream in spring and summer could become trapped and perish in the winter.

## WATERBODY

Waterbody Gustafson GulchMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-14 NPAS 18 NPMP 102.2 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 6S R 14E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>63</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Gustafson Gulch is a small, beaded, tundra stream of humic-stained waters that flow over mud substrate. Approximately 230 m upstream of its confluence with the Sagavanirktok River the substrate changes to cobbles and boulders.

In the vicinity of the pipeline crossing, Gustafson Gulch is a rearing area for Arctic char and grayling during summer (Refs. 11 and 30) and probably throughout the open water season. The presence of grayling fry and adults in July 1977 (Refs. 11 and 30) strongly suggests that spring spawning also occurs in this stream. No data are available regarding spring, or winter use of Gustafson Gulch. No fish were observed in the creek during a September, 1979 survey, although fish habitat appeared to be good (Ref. 63). During the same survey, a single slimy sculpin was observed at the confluence of Gustafson Gulch and the Sagavanirktok River (Ref. 63).

It is thought that winter fish use of Gustafson Gulch is nonexistent as streams of this size and nature usually dry up or freeze solid in winter.

## WATERBODY

Waterbody Arthur CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-13 NPAS 18 NPMP 101.8 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 5S R 14E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AC,BB,CN,GR</u>	<u>M,R,S,</u>	<u>11,30</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30,64</u>
Fall	<u>None</u>	<u></u>	<u>63</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Arthur Creek is a small (2-3 m wide) clear water stream that flows over gravel, cobble and boulders to the Sagavanirktok River. Pools providing good fish habitat, are found intermittently along the 7.5 km long stream. Stream banks are vegetated with willow and tundra flora.

In the vicinity of the pipeline crossing, Arthur Creek is a rearing area and migration route for Arctic char, burbot, slimy sculpin and grayling through spring, summer and possibly fall (Refs. 11 and 30). Grayling fry and adults observed during July 1977 and 1979 surveys (Refs. 30 and 64) suggests that spring spawning occurs in this stream. No fish were observed in this stream in September 1979 and water levels were low (2-5 cm deep) (Ref. 63). Winter fish use of this stream is non-existent as streams of this size and nature are dry or frozen solid in winter.

# WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-12.05

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-12.05 NPAS 18 NPMP 99.4 AHMP NA

USGS Map Reference Philip Smith Mountains, Ak. T 5S R 14E Sec. 21

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Sagavanirktok River Side Channel, NPSI 1-12.05, is the farthest upstream of two proposed crossings of the same channel (See Sagavanirktok River Side Channel, NPSI 1-12.04). This channel is oxbow-shaped and is an overflow area for the Sagavanirktok River (Ref. 11). Examination of aerial photographs indicate that at this crossing, the channel is very narrow.

This side channel provides good fish habitat and is used by grayling as a rearing area and migration route (Refs. 11 and 30) in spring and winter. Adult grayling and grayling fry observed in July 1977 indicate spawning occurs in this area (Ref. 11). Fall fishery investigations of this waterbody have not been conducted and examination of aerial photographs indicate that fish habitat may deteriorate in the fall as lower water levels occur in the Sagavanirktok River. An accurate assessment of fall fish use of this area would require field study.

Winter use of this side channel is unlikely as channels of this size and nature dry up or freeze solid in winter.

**WATERBODY**Waterbody Sagavanirktok River Side Channel NPSI 1-12.04Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-12.04 NPAS 18 NPMP 99.0 AHMP NAUSGS Map Reference Philip Smith Mountains, Ak. T 5S R 14E Sec. 21**FISHERIES ASSESSMENT****SPECIES  
DOCUMENTED****FISH  
USE****MAJOR  
FISHERIES  
REFERENCES**

Spring	<u>CN,GR</u>	<u>M,R,S</u>	<u>11,30</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Sagavanirktok River Side Channel, NPSI 1-12.04 is the most downstream of two proposed pipeline crossings of the same channel (See Sagavanirktok River Side Channel, NPSI 1-12.05). This channel is oxbow shaped and is an overflow area of the Sagavanirktok River (Ref. 11).

This side channel provides excellent fish habitat and is utilized by grayling and slimy sculpin for rearing and as a migration route (Refs. 11 and 30). Presence of adult and young-of-the-year grayling in July 1979 (Ref. 11) strongly indicates that spawning occurs in this area. These fish undoubtedly migrate to and from the Sagavanirktok River in the spring and fall.

Winter fish use of this side channel is unlikely as channels of this size and nature provide unsuitable habitat as winter progresses.

## WATERBODY

Waterbody Clark's LakeMain Drainage Sagavanirktok River Tributary to Stump CreekNPSI 1-12.03 NPAS 17 NPMP 98.4-98.2 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 5S R 14E Sec. 16

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Clark's Lake is a small, brown-stained lake about 600 m long and 120 m in width. The TAPS workpad bisects the lake, forming two distinct waterbodies connected by one culvert. This culvert appeared adequate for fish passage during fall 1979 (Ref. 57). The west half of the lake is the deeper of the two and it is bordered by dwarf willow and tundra vegetation. Shallows of the east half support abundant sedges. The weed-choked outlet may inhibit fish passage between Clark's Lake and Stump Creek during low water periods.

Fish use of Clark's Lake has not been documented, although ninespine stickleback are reported to be present (Ref. 11). This species, as well as grayling, which are indigenous to Stump Creek, could utilize the lake. Fish were not captured or observed during a 1979 fall survey (Ref. 57).

No winter data is available for Clark's Lake and information is insufficient to assess its importance to fish at the present time.

**WATERBODY**Waterbody Stump CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-12.02 NPAS 17 NPMP 98.0 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 5S R 14E Sec. 16**FISHERIES ASSESSMENT**SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR,S9</u>	<u>M,R</u>	<u>57,63</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Stump Creek is a small stream that drains Clark's Lake. It flows approximately 3 km to its confluence with the Sagavanirktok River. Humic-stained waters follow gentle gradient through low tundra connecting a series of muskeg marshes and ponds. Channel width varies from 0.3-3.0 m and consists of mud and detritus in ponded areas with occasional cobbles and boulders in faster water. Rooted aquatic vegetation is abundant in areas of slow flowing water, while filamentous green algae cover the cobbles and boulders in riffle areas. Numerous caddis fly larvae were observed in fall 1979 (Ref. 57).

Stump Creek provides an important rearing area for grayling and ninespine stickleback (Refs. 11, 30, and 57) probably throughout the open water season. Lake trout have also been reported to be present in this stream (Refs. 11 and 30) although presence of this species has not been documented. Fish migration undoubtedly occurs in this stream, since streams of this size and nature are normally dry or freeze solid during winter.



## WATERBODY

Waterbody Lori Creek

Main Drainage Sagavanirktok River Tributary to Alternate Channel of Sagavanirktok River

NPSI 1-12.01 NPAS 17 NPMP 93.0 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 4S R 14E Sec. 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Lori Creek originates in a small tundra lake west of the proposed pipeline route and flows north to the Sagavanirktok River. The total length of the stream is about 8 km (Ref. 11). Lori Creek is a small beaded tundra stream with a mud bottom, a well defined channel, and well vegetated banks (Ref. 30).

In the vicinity of the proposed pipeline crossing, Lori Creek provides good grayling habitat and adult and juvenile grayling have been found during summer. Data on fish use throughout the remainder of the year is lacking, but fish use is probably restricted to the open water period. Winter habitat in Lori Creek is unlikely due to its small size; fish using the stream would have to migrate in from other areas.

## WATERBODY

Waterbody Charlotte CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-12 NPAS 16 NPMP 91.0 AHMP NAUSGS Map Reference Sagavanirktok, AK. T 4S R 14E Sec. 18

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>64</u>
Summer	<u>AC,CN,GR,S9</u>	<u>R</u>	<u>11,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>64</u>

Charlotte Creek is a stable stream of humic-stained waters that drains a headwater lake. Its low stream banks are heavily vegetated with grass and willow. This stream is characterized by short pool areas and long riffles that flow over gravel, large cobbles and boulders.

Charlotte Creek provides good fish habitat for several kilometers and is considered to be one of the most productive fish streams crossed by the Haul Road in the North Slope (Ref. 64). Arctic char, slimy sculpin, ninespine stickleback, and grayling utilize this stream as a rearing area during the open water season (Refs. 11, 30 and 64) and grayling spawning occurs during spring (Ref. 64). Fall investigations have not been performed, but fish must leave the area, since the stream provides no overwintering habitat (Ref. 64). This stream is considered to be important to fish throughout the open water season.

## WATERBODY

Waterbody Happy Valley Camp CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-11 NPAS 16 NPMP 87.3 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 3S R 14E Sec. 30

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>GR</u>	<u>M,R,S</u>	<u>11</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,64</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u>None</u>	<u>11</u>

Happy Valley Camp Creek is a foothill stream confined by low banks vegetated with willow, alder and tundra flora. The humic-stained waters flow over gravel, cobble and boulder substrate.

This stream near the proposed crossing is a rearing and spawning area for grayling in spring and summer. During open water surveys in 1971 grayling spawning activities were monitored (Ref. 11) and grayling fry were observed in the stream in July 1978 (Ref. 64). Fish undoubtedly migrate from this stream in late summer or fall since it is dry in winter (Ref.11).

## WATERBODY

Waterbody Milke Creek

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-10 NPAS 16 NPMP 86.6 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 3S R 14E Sec. 19 & 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R,S</u>	<u>11,30</u>
Summer	<u>AC,GR,S9</u>	<u>R</u>	<u>11,30</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>30,63</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Milke Creek is a stable foothill stream (Ref. 11) of humic-stained waters that flow in alternating riffles and pools. Stream banks are low and vegetated with thick willows and alder and substrate consists of gravel, rocks and some large cobbles.

In the vicinity of the pipeline crossing, Milke Creek provides excellent habitat and is a rearing area for Arctic char, grayling and ninespine stickleback from breakup to freeze-up (Refs. 11, 30 and 63).. Direct evidence that grayling use this area for spawning was found during a June survey in 1971 (Ref. 11). Migrations undoubtedly occur as streams of this size and nature provide unsuitable habitat for fish in winter. This stream is considered important to fish throughout the open water period.

## WATERBODY

Waterbody Stout CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-9 NPAS 15 NPMP 83.1 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 3S R 14E Sec. 5

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>AC,BB,CN,GR</u>	<u>R</u>	<u>30</u>
Summer	<u>GR</u>	<u>R</u>	<u>11,64,70</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Stout Creek is a moderate sized stream that drains several small lakes in its headwaters. The humic-stained waters flow through undercut banks vegetated with willow and alder. Stream substrate consists of cobbles and boulders.

Stout Creek provides good fish habitat and is a rearing area for Arctic char, burbot, slimy sculpin and grayling probably throughout the open water season (Refs. 11, 30, 64, and 70). Reference 11 suggests that spawning may also occur near the Haul Road crossing. Fish migration undoubtedly occurs as streams of this size and nature are dry or freeze solid after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-8.03

Main Drainage Sagavanirktok River Tributary to Spoiled Mary Creek

NPSI 1-8.03 NPAS 15 NPMP 81.9-81.5 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River flood plain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel or mud and silt. Sagavanirktok River Side Channel, NPSI 1-8.03, is the most upstream of the three crossings of an overflow area that enters the west side of Spoiled Mary Creek (Ref. 11).

Fish use of this area has not been documented at any time, although Reference 30 suggests that grayling use this area for rearing. Fish present in Spoiled Mary Creek (Ref. 118) may utilize the overflow area during periods of highwater. Winter fish use would be non-existent due to the size and nature of the site.

## WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-8.02

Main Drainage Sagavanirktok River Tributary to Spoiled Mary Creek

NPSI 1-8.02 NPAS 15 NPMP 81.9-81.5 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River flood plain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel or mud and silt. Sagavanirktok River Side Channel, NPSI 1-8.02, is the second crossing of an overflow area that enters the west side of Spoiled Mary Creek (Ref. 11).

Fish use of this area has not been documented at any time, although Reference 30 suggests that grayling may use this area for rearing. Fish are present in Spoiled Mary Creek (Ref. 118) and it is possible that the overflow area is utilized by these fish during highwater periods. Winter fish use would be non-existent due to the size and nature of the site.

## WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-8.01Main Drainage Sagavanirktok River Tributary to Spoiled Mary CreekNPSI 1-8.01 NPAS 15 NPMP 81.9-81.5 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 33

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River flood plain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel or mud and silt.

Sagavanirktok River Side Channel, NPSI 1-8.01, is the most downstream crossing of an overflow area that enters the west side of Spoiled Mary Creek (Ref. 11).

Fish use of this area has not been documented at any time, although Reference 30 suggests that grayling may use this area for rearing. Fish are present in Spoiled Mary Creek (Ref. 118) and it is possible that the overflow area is utilized by those fish during high water periods. Winter fish use would be non-existent due to the size and nature of the site.



## WATERBODY

Waterbody Spoiled Mary CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-8 NPAS 15 NPMP 81.5 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 33

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>CN</u>	<u>M,R</u>	<u>11,30</u>
Summer	<u>AC,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Spoiled Mary Creek is a shallow spring fed stream that also receives water from the Sagavanirktok River during high water periods. This slow-flowing stream winds through a narrow (1-2 m) channel over gravel and cobble substrate. Intermittent pools (to 0.5 m deep) provide excellent fish habitat (Ref. 30).

Spoiled Mary Creek provides important habitat to several species of fish throughout the open water season. This stream is a rearing area for slimy sculpin, grayling and Arctic char (Refs. 11 and 30), and grayling fry were found in July (Ref. 30), indicating that spawning may occur in this stream. Spoiled Mary Creek undoubtedly serves as a migration route for fish during spring and fall.

Winter use of Spoiled Mary Creek is probably non-existent, as streams of this size and nature are dry or freeze to the bottom substrate after freeze-up.

# WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.11

Main Drainage Sagavanirktok River Tributary to Mark Creek

NPSI 1-7.11 NPAS 14 NPMP 79.2 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 16,21

# FISHERIES ASSESSMENT

## SPECIES DOCUMENTED

## FISH USE

## MAJOR FISHERIES REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt. Sagavanirktok River Side Channel at NPSI 1-7.11 is located in the middle of an old highwater side channel upstream from NPSI 1-7.10.

Fish use of Sagavanirktok Side Channel, NPSI 1-7.11, is probably low and confined to those periods when water levels in the Sagavanirktok River are high. No specific information is available for this crossing but this side channel contained only one isolated pool at crossing NPSI 1-7.10 in the fall of 1979 (Ref. 57).

Winter fish use is nonexistent as channels of this size and nature dry up or freeze solid in winter.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.10Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.10NPAS 14NPMP 78.8AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt. Sagavanirktok River Side Channel at 1-7.10 is located on the downstream end of an old highwater side channel. An isolated pool (0.4 m deep) upstream of the TAPS workpad was the only water present in this channel during a 1979 fall investigation (Ref. 57). There was no fish access to this pool at that time. Fish use of Sagavanirktok River Side Channel at NPSI 1-7.10 is probably low and confined to those periods when water levels in the Sagavanirktok River are high.

Winter fish use is nonexistent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.09Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.09 NPAS 14 NPMP 78.7 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Fish use of the Sagavanirktok River Side Channel, NPSI 1-7.09, is probably low and confined to those periods when water levels in the Sagavanirktok River are high. Fish use at this particular crossing has not been assessed at any time. However, adjacent crossings at NPSI 1-7.08 and 1-7.10 were dry or contained isolated pools in the fall of 1979 (Ref. 57).

Winter fish use is nonexistent: as channels of this size and nature generally provide unsuitable habitat for fish after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.08Main Drainage Sagavanirktok RiverTributary to Mark CreekNPSI 1-7.08NPAS 14NPMP 78.6AHMP NAUSGS Map Reference Sagavanirktok, Ak.T 2SR 14ESec. 16

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Fish use of the Sagavanirktok River Side Channel, NPSI 1-7.08, is probably low and confined to those periods when water levels in the Sagavanirktok River are high. This area was found dry during a 1979 fall survey (Ref. 57).

Winter fish use is nonexistent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.

**WATERBODY**Waterbody Sagavanirktok River Side Channel, NPSI 1-7.07Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.07 NPAS 14 NPMP 78.2 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 16**FISHERIES ASSESSMENT****SPECIES  
DOCUMENTED****FISH  
USE****MAJOR  
FISHERIES  
REFERENCES**

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u>None</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt. Side Channel NPSI 1-7.07 is 3-6 m wide.

Fish use of the Sagavanirktok River Side Channel, NPSI 1-7.07, is probably low and confined to those periods when water levels in the Sagavanirktok River are high. Reference 11 indicates the presence of unidentified fish at such a time although fish use has not been documented. This channel was found dry during a 1979 fall survey (Ref. 57).

Winter fish use is non-existent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.06Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.06 NPAS 14 NPMP 77.7 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>11</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Fish use of the Sagavanirktok River Side Channel, NPSI 1-7.06, is probably low and confined to those periods when water levels in the Sagavanirktok River are high. Reference 11 indicates the presence of unidentified fish during high water but specific details are not available. To accurately assess fish use of this channel field study would be necessary.

Winter fish use is non-existent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.05Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.05 NPAS 14 NPMP 77.7 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 9

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Fish use of the Sagavanirktok River Side Channel, NPSI 1-7.05, is probably low and confined to those periods when water levels in the Sagavanirktok River are high. However, no field documentation exists for this crossing, therefore, a full assessment cannot be made at the present time.

Winter fish use is non-existent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.



## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.04Main Drainage Sagavanirktok RiverTributary to Mark CreekNPSI 1-7.04NPAS 14NPMP 77.3AHMP NAUSGS Map Reference Sagavanirktok, Ak.T 2SR 14ESec. 9

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>* GR,S9</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - not site specific information

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Crossing NPSI 1-7.04 is the most upstream of three proposed pipeline crossings of the same channel. Waters of this side channel drain a number of spring sources in the Sagavanirktok floodplain although during high water periods water may flow directly into the channel from the Sagavanirktok River.

The channel at crossing NPSI 1-7.04 is 2-5 m wide and the substrate is overlain with filamentous algae. Water depth was 10-30 cm in fall 1979 (Ref. 57)..

Sagavanirktok River Side Channel, NPSI 1-7.04, provides good fish habitat during the open water season. Although 1979 fall sampling efforts did not yield fish from this area, grayling and ninespine stickleback were captured 600 m downstream (see Sagavanirktok River Side Channel, NPSI 1-7.03 and 1-7.02). Fish blocks that would impede upstream movement to this area were not observed.

Winter fish use of this side channel is nonexistent as channels of this size and nature provide unsuitable habitat after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.03Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.03 NPAS 14 NPMP 77.0 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14E Sec. 4

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>GR,S9</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels were confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

The crossing is approximately 300 m downstream of Sagavanirktok River Side Channel, NPSI 1-7.04. Waters of this side channel drain a number of spring sources in the Sagavanirktok River floodplain, although during high water periods water may flow directly into the channel from the river.

The channel at this crossing is 0.6-12 m in width and 0.3-1.0 m in depth. Upstream of TAPS workpad LWC the channel is wide, the predominate substrate is mud with abundant *Equisetum* and sedge flora and the water is slow-flowing.

Sagavanirktok River Side Channel, NPSI 1-7.03, provides excellent habitat and is used as a migration route and a rearing area for ninespine stickleback and grayling (Ref. 57). These species were captured during a 1979 fall investigation (Ref. 57) which may indicate fish use throughout the open water season however, spring and summer documentation does not exist for this area.

Winter Fish use of this side channel is non-existent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.

## WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.02Main Drainage Sagavanirktok River Tributary to Mark CreekNPSI 1-7.02 NPAS 14 NPMP 76.7 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2S R 14 Sec. 3

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>S9</u>	<u>M,R</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Crossing NPSI 1-7.02 is the most downstream of three proposed pipeline crossings of the same channel. Waters of this side channel drain a number of spring sources in the Sagavanirktok floodplain although during high water periods water may flow directly into the channel from the Sagavanirktok River.

Channel width at crossing NPSI 1-7.02 varies from 6-10 m. The stream is slow flowing with depths to 2.0 m. At this location the LWC on the workpad forces the water into shallow riffles over a gravel and cobble substrate. In the slower water the predominate substrate is mud.

Sagavanirktok River Side Channel, NPSI 1-7.02 provides excellent fish habitat. Only ninespine stickleback have been captured in this area but grayling have been recorded upstream at crossing NPSI 1-7.03 (Ref. 57) and it is highly likely that they occur near the present crossing. It is likely that fish occur in the region in spring and summer but no documentation exists.

Winter fish use of this side channel is non-existent as channels of this size and nature provide unsuitable habitat for fish after freeze-up.

# WATERBODY

Waterbody Sagavanirktok River Side Channel, NPSI 1-7.01

Main Drainage Sagavanirktok River Tributary to Mark Creek

NPSI 1-7.01 NPAS 14 NPMP 75.9 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 1S R 14E Sec. 34

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels drain the Sagavanirktok River floodplain. Within the study area, these channels are confined by low banks vegetated with dwarf willow and tundra flora. Stream substrate is gravel and/or mud and silt.

Fishery investigations have not been conducted on Sagavanirktok River Side Channel, NPSI 1-7.01. This channel flows parallel to Mark Creek at the pipeline crossing and empties into Mark Creek approximately 250 m downstream from the proposed pipeline crossing. Aerial photographs indicate that this channel is large enough to support fish and fish have been documented in Mark Creek. Therefore, indirect evidence suggests that fish probably use the area during the open water season but no documentation exists to support these speculations.

Winter fish use of this side channel is unlikely as channels of this size and nature provide unsuitable habitat after freeze-up.

## WATERBODY

Waterbody Mark CreekMain Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-7 NPAS 14 NPMP 75.8 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 1S R 14E Sec. 34

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>CN,GR</u>	<u>M,R,S</u>	<u>11,30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>BB,CN,GR,WF</u>	<u>M,R</u>	<u>11,30</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Mark Creek is a small, lightly humic-stained stream approximately 1.5 m wide and 0.3-1.0 m deep. Mark Creek flows northeast approximately 16 km from its origin in upland tundra to the Sagavanirktok River. This stream is bordered by 0.5-1.5 m banks vegetated with willow and tundra flora. Pools up to 10 m long, 6 m wide and 1.8 m deep are common in its lower reaches.

During spring and early summer Mark Creek serves as a migration route and rearing area for slimy sculpin and grayling which move into the stream from the Sagavanirktok River. It is also a grayling spawning stream and provides rearing habitat for burbot, slimy sculpin, grayling and whitefish until habitat begins to deteriorate due to the onset of winter.

## WATERBODY

Waterbody Toolik River TributaryMain Drainage Sagavanirktok River Tributary to Toolik RiverNPSI 1-5.49 NPAS 13 NPMP 69.2 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 1N R 14E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route, Toolik River Tributary is a small beaded stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt.

The stream near the proposed crossing may be a rearing area for fish during open water (Ref. 30); however, documentation of fish presence and fish use of this stream is not available. Reference 11 suggests that fish may not migrate as far as the Haul Road. Fish use in winter is probably non-existent, as streams of this size and nature are dry or frozen to the bottom in winter.

## WATERBODY

Waterbody Unnamed Creek, NPSI 1-5.48

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.48 NPAS 12 NPMP 63.9 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 1N R 14E Sec. 12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline crossing Unnamed Creek, NPSI 1-5.48 is a small beaded stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt.

Fishery investigations have not been conducted on this stream at any time. It is probable that winter use is non-existent, but field study during the open water period would be necessary to clarify its importance to fish.

## WATERBODY

Waterbody Wood Creek #1

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.47 NPAS 11 NPMP 59.0 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>S9</u>	<u>R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel to and into the Sagavanirktok River. It is confined by low banks vegetated with willow and tundra flora. Stream substrate consists of gravel or mud and silt. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Crossing #1 is the most upstream of 12 proposed crossings on the Wood Creek system. It is located on the tributary that flows about 600 m from the pipeline route to its confluence with Wood Creek.

Ninespine stickleback have been found near crossing #1 in the fall (Ref. 11). Fish could occur in the region throughout the open water season, but out-migration must occur in the fall since this stream would provide no overwintering habitat.



## WATERBODY

Waterbody Wood Creek #2

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.46 NPAS 11 NPMP 58.9 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>X</u>	<u>R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #2 is an upstream tributary in the Wood Creek drainage and is upstream of Crossing #3.

Numerous unidentified fry were observed in the fall near crossing #2 and fish have been found trapped in the region during periods of low water (Ref. 11). Fish apparently spawn in the area and are likely present throughout the open water season. Migrations to and from this region must occur since the stream would not provide overwintering habitat.

## WATERBODY

Waterbody Wood Creek #3Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.45 NPAS 11 NPMP 58.5 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 24

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel to and into the Sagavanirktok River. It is confined by low banks vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #3 is the most upstream of the proposed pipeline crossings on the mainstem of Wood Creek.

Fish use of this area has not been studied, although it is undoubtedly a migration route for species inhabiting the upstream reaches (see assessments for crossings #2 and #3). Winter fish use of this area is probably non-existent, as streams of this size and nature tend to provide unsuitable habitat for fish after freeze-up.

# WATERBODY

Waterbody Wood Creek #4

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.44 NPAS 11 NPMP 58.4 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 13 and 24

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel to and into the Sagavanirktok River. It is confined by low banks vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Wood Creek crossing #4 is the most upstream of three proposed crossings on one tributary to Wood Creek.

Fish use of this area has not been studied, although examination of aerial photographs indicates that use is probably low and confined only to high water periods during the open water season. Winter use in the vicinity of crossing #4 is non-existent, as streams of this size and nature tend to be dry or frozen solid in winter.

# WATERBODY

Waterbody Wood Creek #5

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.43 NPAS 11 NPMP 58.3 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 13

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel and/or mud and silt. Crossing #5 is approximately 150 m downstream of crossing #4.

Fish use of this area has not been studied, although examination of aerial photographs indicates that fish use is probably low and confined only to high water periods during the open water season. Winter fish use in the vicinity of crossing #5 is non-existent as streams of this size and nature are dry or frozen solid in winter.

## WATERBODY

Waterbody Wood Creek #6Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.42 NPAS 11 NPMP 58.1 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #6 is the most downstream of three crossings of one tributary to Wood Creek.

Fish use of this area has not been studied, although examination of aerial photographs indicates that fish use is probably low and confined only to high water periods during the open water season. Winter fish use in the vicinity of crossing #6 is non-existent, as streams of this size and nature tend to be dry or frozen solid in winter.

## WATERBODY

Waterbody Wood Creek #7

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.41 NPAS 11 NPMP 58.0 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 13

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #7 is on an old channel of Wood Creek.

Grayling and ninespine stickleback are reported to utilize this channel (Ref. 76), although field documentation is not apparently available. Examination of aerial photographs indicates that fish use of the area is probably low and confined to periods of high water during the open water season. Migration of species present undoubtedly occurs, as streams of this size and nature do not provide winter habitat.

## WATERBODY

Waterbody Wood Creek #8Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.40 NPAS 11 NPMP 57.7 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 13

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #8 is on an old side channel of Wood Creek.

Fish use at crossing #8 has not been studied. However, examination of aerial photographs indicates that fish use is probably very low and confined to periods of high water during the open water season. Winter fish habitat in the vicinity of crossing #8 is non-existent, as streams of this size and nature tend to be dry or solidly frozen in winter.

## WATERBODY

Waterbody Wood Creek #9

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.39 NPAS 11 NPMP 57.1 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>GR</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #9 is located on the east fork of the Wood Creek system.

Grayling have been found in the vicinity of crossing #9 in summer and fall (Ref. 11) and are probably also present in spring. Reference 76 suggests that nine-spine stickleback are also present although documentation of this species is apparently not available. Fish migration undoubtedly occurs in this area, as streams of this size and nature tend to be dry or solidly frozen in winter.



## WATERBODY

Waterbody Wood Creek #10

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.38 NPAS 10 NPMP 56.5 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 12

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #10 crosses a tributary of Wood Creek approximately 1.1 km downstream of crossing #9.

Fish use of this area has not been studied. Examination of aerial photographs suggests that fish use is low and would be confined to high water periods. Winter fish use in the vicinity of crossing #10 is non-existent, as streams of this size and nature are dry or frozen solid in winter.

## WATERBODY

Waterbody Wood Creek #11Main Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.37NPAS 10NPMP 56.4AHMP NAUSGS Map Reference Sagavanirktok, Ak.T 2NR 14ESec. 12

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring

None

Summer

None

Fall

None

Winter

NoneNoneNoneNoneNone

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flora. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mud and silt. Crossing #11 is a second crossing of a tributary to Wood Creek. It is located approximately 200 m downstream of Wood Creek #10.

Fish use of this tributary has not been documented. Examination of aerial photographs suggests that fish use is low and confined to high water periods during the open water season. Winter fish use in the vicinity of Wood Creek #11 is non-existent, as streams of this size and nature tend to dry and/or freeze solid in winter.

## WATERBODY

Waterbody Wood Creek #12Main Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.36NPAS 10NPMP 55.8AHMP NAUSGS Map Reference Sagavanirktok, Ak.T 2NR 14ESec. 1

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Wood Creek flows parallel and into the Sagavanirktok River. It is confined by low banks that are vegetated with willows and tundra flors. Stream flow in the upstream reaches and tributaries is intermittent and influenced by periods of high water in the Sagavanirktok River and run-off waters. Stream substrate consists of gravel or mixtures of mud and silt. Crossing #12 of Wood Creek is approximately 300 m upstream of its confluence with the Sagavanirktok River.

In the vicinity of the proposed pipeline crossing, Wood Creek is summer rearing area for grayling (Ref. 11) and spawning may occur in the spring. Reference 76 suggests that ninespine stickleback are also present in this area, although documentation of this species is not available. The area near crossing #12 is utilized as a migration route during the open water season since winter habitat is probably non-existent. The small size of this stream strongly suggests that it freezes to the bottom in winter.

## WATERBODY

Waterbody Extension Creek #1

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.35 NPAS 10 NPMP 55.4 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 2 and 1

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in stream but site specific data are lacking

In the vicinity of the proposed route, Extension Creek is a narrow, meandering stream confined by low banks that are vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Crossing #1 of Extension Creek is approximately 4 km upstream from its confluence with the Sagavanirktok River. This area provides marginal habitat but could be used by grayling or ninespine stickleback (Ref. 30) during the open water season. Fish presence or use in this region of Extension Creek has not been documented, although grayling fry have been found about 100 m downstream at Extension Creek crossing #2 (Ref. 11). Winter fish use of this stream is probably non-existent as streams of this size and nature tend to provide unsuitable habitat after freeze-up.

## WATERBODY

Waterbody Extension Creek #2

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.34 NPAS 10 NPMP 55.4 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N R 14E Sec. 2 and 1

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks that are vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Crossing #2 is approximately 100 m downstream of Extension Creek #1. This area is a rearing area for grayling during the open water season. Numerous grayling fry, observed in August 1977 (Ref. 11) indicate that spawning may also occur in this area. Reference 76 suggests that ninespine stickleback are also present in this area, however, documentation of this is not available. Because winter habitat is not present in streams of this size and nature, fish migrate in and out of this stream in spring and fall, respectively.

# WATERBODY

Waterbody Extension Creek #3

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.33 NPAS 10 NPMP 55.1 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 2N,3N R 14E Sec. 35,2

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Extension Creek #3 is a crossing of a small tributary to the mainstem of Extension Creek. This tributary is a rearing area for grayling (Ref. 11) perhaps throughout the open water season. Grayling fry, found in pools in August 1977 (Ref. 11) strongly indicated that spawning occurs in this area during spring. Reference 76 suggests that ninespine stickleback are also present although documentation of this is not available. Because winter habitat is not present in streams of this size and nature, fish migrate in and out of this stream in spring and fall, respectively.

## WATERBODY

Waterbody Extension Creek #4Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.32 NPAS 10 NPMP 55.1 AHMP NAUSGS Map Reference Sagavanirktok, Ak T 3N R 14E Sec. 35

## FISHERIES ASSESSMENT

\* SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - Fish present in stream but site specific data are lacking

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Fish use of Extension Creek at crossing #4 has not been documented. However, grayling captured in the upper reaches of this stream (Refs. 11 and 118) must migrate through this area during the open water season. Winter use of Extension Creek at crossing #4 is probably non-existent as streams of this size and nature provide unsuitable fish habitat after freeze-up.

# WATERBODY

Waterbody Extension Creek #5

Main Drainage Sagavanirktok River

Tributary to Sagavanirktok River

NPSI 1-5.31

NPAS 10

NPMP 53.9

AHMP NA

USGS Map Reference Sagavanirktok, Ak.

T 3N

R 14E

Sec. 26

# FISHERIES ASSESSMENT

## SPECIES DOCUMENTED

## FISH USE

## MAJOR FISHERIES REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Extension Creek #5 is a rearing area for grayling probably throughout the open water season. Grayling were observed in a pool during an August 1977 survey (Ref. 11). Reference 76 suggests that ninespine stickleback are also present in this area although documentation of this species is not available. Fish present here and in upstream reaches (Ref. 118) undoubtedly use the area as a migration route in spring and fall as streams of this size and nature provide unsuitable habitat after freeze-up.



## WATERBODY

Waterbody Extension Creek #6Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.30 NPAS 10 NPMP 53.8 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 3N R 14E Sec. 26

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Crossing #6 crosses a feeder stream of Extension Creek. This stream, in the vicinity of the pipeline route, is a rearing area for grayling probably throughout the open water season. Grayling fry found in this area (Ref. 11) strongly indicate spawning use of the stream. Reference 76 suggests that ninespine stickleback are also present in this area, however, documentation of this is not available. Because winter habitat is not present in streams of this size and nature, fish migrate in and out of this stream in spring and fall, respectively.

## WATERBODY

Waterbody Extension Creek #7Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.29 NPAS 10 NPMP 53.2 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 3N R 14E Sec. 26

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\* See assessment - fish present in stream but site specific data are lacking

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Fish use of Extension Creek at crossing #7 has not been documented. However, grayling have been observed or captured in the upper reaches of this stream (Refs. 11 and 118). These fish must migrate through the vicinity of crossing #7 during the open water season as streams of this nature tend to provide unsuitable habitat for fish after freeze-up.

## WATERBODY

Waterbody Extension Creek #8Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.28 NPAS 10 NPMP 53.0 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 3N R 14E Sec. 23

## FISHERIES ASSESSMENT

	* SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*See assessment - fish present in stream but site specific data are lacking.

In the vicinity of the proposed pipeline route, Extension Creek is a narrow, meandering stream confined by low banks vegetated with tundra flora. Stream substrate consists of gravel or mud and silt. The proposed pipeline route involves 8 crossings of Extension Creek.

Fish use of Extension Creek at crossing #8 has not been documented. However, grayling have been captured or observed in the upper reaches of this stream (Refs. 11 and 118). These fish must migrate through this area during the open water season as streams of this size and nature tend to provide unsuitable habitat for fish after freeze-up.

# WATERBODY

Waterbody Unnamed Pond, NPSI 1-5.27

Main Drainage Sagavanirktok River

Tributary to Sagavanirktok River

NPSI 1-5.27

NPAS 9

NPMP 50.0

AHMP NA

USGS Map Reference Sagavanirktok, Ak.

T 3N R 14E Sec. 3 and 10

## FISHERIES ASSESSMENT

### SPECIES DOCUMENTED

### FISH USE

### MAJOR FISHERIES REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Pond, NPSI 1-5.27 is an isolated tundra pond on unknown depth. Examination of aerial photographs indicates that this pond is a very shallow waterbody and is encroached upon by the proposed pipeline route on the northeastern shoreline.

Fish use of Unnamed Pond, NPSI 1-5.27, has not been documented at any time; however, fish use is probably non-existent year-round, as tundra ponds of this depth freeze solid in winter.

## WATERBODY

Waterbody Ghost Creek #1Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.26 NPAS 9 NPMP 49.5 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 3N R 14E Sec. 3

## FISHERIES ASSESSMENT

\*\* SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. References 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling, as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

At crossing #1, Ghost Creek provides only marginal habitat from breakup to freeze-up (Ref. 30). Winter use of this area is believed to be non-existent as streams of this size and nature are often dry or freeze solid in winter.

## WATERBODY

Waterbody Ghost Creek #2

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.25 NPAS 9 NPMP 49.3 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 3N R 14E Sec. 3

## FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

Ghost Creek #2 provides good habitat for fish (Ref. 30) from breakup to freeze-up, but site specific data on fish use is lacking. Winter use of Ghost Creek #2 is believed to be non-existent as streams of this size and nature are often dry or freeze solid in winter.

## WATERBODY

Waterbody Ghost Creek #3Main Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.24NPAS 9NPMP 48.9AHMP N/AUSGS Map Reference Sagavanirktok, Ak.T 4N  
3NR 14E  
14ESec. 34  
3

## FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicated that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observations is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

At crossing #3, Ghost Creek provides good fish habitat (Ref. 30) from break-up to freeze-up, but site specific data are lacking. Winter fish use of Ghost Creek is believed to be non-existent as streams of this size are often dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Ghost Creek #4Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.23 NPAS 9 NPMP 48.7 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 34

## FISHERIES ASSESSMENT

\*\* SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

At crossing #4, Ghost Creek provided good fish habitat (Ref. 30) from breakup to freeze-up but site specific data on fish utilization are lacking. Winter fish use of Ghost Creek is believed to be non-existent as streams of this nature are dry or freeze to the bottom in winter.



**WATERBODY**Waterbody Ghost Creek #5Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.22 NPAS 9 NPMP 48.0 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 34**FISHERIES ASSESSMENT**

	SPECIES ** DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

Ghost Creek #5 provides good habitat for fish (Ref. 30) from breakup to freeze-up but site specific data on fish utilization are lacking. Winter fish use of Ghost Creek #5 is believed to be non-existent as streams of this size are normally dry or freeze solid in winter.

## WATERBODY

Waterbody Ghost Creek #6Main Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.21NPAS 9NPMP 47.6AHMP N/AUSGS Map Reference Sagavanirktok, Ak.T 4NR 14ESec. 27

## FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

Ghost Creek #6 provides good fish habitat from breakup to freeze-up and grayling have been reported in summer near crossing #6. Winter fish use is probably non-existent as streams of this size and nature normally are dry or freeze to the bottom in winter.

# WATERBODY

Waterbody Ghost Creek #7

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.20 NPAS 9 NPMP 47.5 AHMP N/A

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 27

# FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

At crossing #7, Ghost Creek provides good habitat for fish from breakup to freeze-up and grayling are present in summer (Ref. 11). Winter fish use of Ghost Creek is believed to be non-existent as streams of this size and nature are often dry or freeze to the bottom in winter.

**WATERBODY**Waterbody Ghost Creek #8Main Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.19NPAS 9NPMP 47.3AHMP N/AUSGS Map Reference Sagavanirktok, Ak.T 4NR 14ESec. 27**FISHERIES ASSESSMENT****\*\*SPECIES  
DOCUMENTED****FISH  
USE****MAJOR  
FISHERIES  
REFERENCES**

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

Ghost Creek #8 provides good fish habitat (Ref. 11) from breakup to freeze-up but no information is available concerning site specific utilization. Winter fish use of this area is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Ghost Creek #9Main Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.18NPAS 9NPMP 47.2AHMP N/AUSGS Map Reference Sagavanirktok, Ak.T 4NR 14ESec. 27

## FISHERIES ASSESSMENT

\*\* SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

At crossing #9, the west side of Ghost Creek is encroached by the TAPS workpad. This area provides good fish habitat from breakup to freeze-up (Ref. 11) but site specific data concerning fish utilization are lacking. Winter fish use is probably non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

# WATERBODY

Waterbody Ghost Creek #10

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.17 NPAS 9 NPMP 47.1 AHMP N/A

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 27 and 28

# FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

The west side of Ghost Creek is encroached by the TAPS workpad from crossing #9 to crossing #14 inclusive. Crossing #10 provides good fish habitat (Ref. 11) from breakup to freeze-up and grayling are present in summer (Ref. 11). Winter fish use is probably non-existent as streams of this nature are normally dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Ghost Creek #11Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.16 NPAS 9 NPMP 46.7 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 21

## FISHERIES ASSESSMENT

\*\* SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

The west side of Ghost Creek is encroached by the TAPS workpad from crossing #9 to crossing #14 inclusive. Crossing #11 provides good fish habitat from breakup to freeze-up and grayling are present in summer (Ref. 11). Winter habitat is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Ghost Creek #12Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.15 NPAS 9 NPMP 46.3 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 21

## FISHERIES ASSESSMENT

	SPECIES ** DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

The west side of Ghost Creek is encroached by the TAPS workpad from crossing #9 to crossing #14. Crossing #12 provides good fish habitat from break-up to freeze-up and grayling are present in summer (Ref. 11). Winter fish use is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.



## WATERBODY

Waterbody Ghost Creek #13

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.14 NPAS 9 NPMP 46.1 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 21

## FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

The west side of Ghost Creek is encroached by the TAPS workpad from crossing #9 to crossing #14. Crossing #13 provides good fish habitat from breakup to freeze-up and grayling are present in summer (Ref. 11). Winter fish use is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

# WATERBODY

Waterbody Ghost Creek #14

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.13 NPAS 8 NPMP 45.7 AHMP N/A

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 16

# FISHERIES ASSESSMENT

	SPECIES ** DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

The west side of Ghost Creek is encroached by the TAPS workpad from crossing #9 to crossing #14. Crossing #14 provides good fish habitat (Ref. 11) from breakup to freeze-up but fish utilization during this period is unavailable. Winter fish use is believed to be non-existent as streams of this size are normally dry or freeze to the bottom in winter.

**WATERBODY**Waterbody Ghost Creek #15Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.12 NPAS 8 NPMP 45.6 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 16**FISHERIES ASSESSMENT**

	SPECIES ** DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment - fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

Ghost Creek #15 provides good fish habitat from breakup to freeze-up and grayling are present in summer (Ref. 11). Winter fish use of this area is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Ghost Creek #16

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.11 NPAS 8 NPMP 45.3 AHMP N/A

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 15 and 16

## FISHERIES ASSESSMENT

	SPECIES ** DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>GR</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

Ghost Creek #16 provides good fish habitat from breakup to freeze-up and grayling are present in the summer (Ref. 11). Winter fish use of this area is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

## WATERBODY

Waterbody Ghost Creek #17

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.10 NPAS 8 NPMP 45.1 AHMP N/A

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 15 and 16

## FISHERIES ASSESSMENT

	** SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CD, GR</u>	<u>R</u>	<u>11</u>
Fall	<u>S9</u>	<u>M,R</u>	<u>11</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*\* See assessment -- fish use throughout most of the system but site specific data often lacking.

Ghost Creek is a small tundra stream characterized by a network of braided channels that drain the Sagavanirktok River flood plain. Low gravel stream banks are vegetated with dwarf willow and tundra flora. Ghost Creek is crossed by the pipeline at 36 different locations. Of these 36 crossings, 17 were judged to be potential fish use areas.

Reference 11 indicates that grayling, ninespine stickleback and sculpin are found in 13 km of fish habitat in the Ghost Creek system. Reference 30 and 76 do not report the presence of sculpin in the stream. Adult grayling and grayling fry were observed in Ghost Creek (Ref. 30) although the location of the observation is not recorded. Although site specific information for each of the 17 crossings is largely unavailable, Ghost Creek must be considered a likely spawning stream for grayling as well as a migration route and rearing area for grayling, ninespine stickleback and possibly sculpin during the open water period.

In August 1975 over 100 grayling and sculpin were found trapped in a pool near crossing #17 (Ref. 11). This pool was made of washed-in gravels that served as a barrier during low water periods (Ref. 11). Ninespine stickleback were also found in this area (Ref. 11). Fish use at Ghost Creek #17 is probably substantial from breakup to freeze-up. Winter fish use of Ghost Creek #17 is believed to be non-existent as streams of this size and nature are normally dry or freeze to the bottom in winter.

# WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-5.09

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.09 NPAS 8 NPMP 43.5 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 3

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels and side sloughs lie within the Sagavanirktok River floodplain. Within the study area, they are confined by low banks vegetated with dwarf willow and tundra flora. Substrate consists of gravel or mud and silt. These side channels are commonly used by grayling for spawning and rearing (Ref. 11) but site specific data are often lacking.

Sagavanirktok River Side Channel, NPSI 1-5.09 is one of two crossings of a large channel (Ref. 118, See NPSI 1-5.08). Fish use at this crossing has not been documented in the field, although, it has been reported that grayling could use the area for rearing. Examination of aerial photographs indicates that fish use of this area is probably low and confined to those periods when water levels in the Sagavanirktok River are high.

# WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-5.08

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.08 NPAS 8 NPMP 42.9 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 4N R 14E Sec. 3

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>CN,GR</u>	<u>R</u>	<u>11,30</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels and side sloughs lie within the Sagavanirktok River floodplain. Within the study area they are confined by low banks vegetated with dwarf willow and tundra flora. Substrate consists of gravel or mud and silt. These side channels are commonly used by grayling for spawning and rearing (Ref. 11), but site specific data are often lacking.

Sagavanirktok River Side Channel, NPSI 1-5.08, is one of two crossings of a large channel (Ref. 118; see NPSI 1-5.09). This channel is a rearing area for grayling and slimy sculpin during the open water season (Ref. 30). Migration undoubtedly occurs; fish rearing in these side channels are thought to overwinter in the Sagavanirktok River (Ref. 11).

# WATERBODY

Waterbody Sagavanirktok River NPSI 1-5.07

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.07 NPAS 8 NPMP 42.6 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 5N R 14E Sec. 32

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels and side sloughs lie within the Sagavanirktok River floodplain. They are confined by low banks that are vegetated with dwarf willow and tundra flora. Substrate consists of gravel or mud and silt. Some side channels are used by grayling for spawning and rearing (Ref. 11) but site specific data are lacking in many cases.

Fish use of Sagavanirktok River at NPSI 1-5.07 has not been documented. Examination of aerial photographs taken in August 1978 indicates that fish use of this area is probably low and confined to high water periods in the Sagavanirktok River.



## WATERBODY

Waterbody Sagavanirktok River NPSI 1-5.06Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.06 NPAS 8 NPMP 42.4 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 5N R 14E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels and side sloughs lie within the Sagavanirktok River floodplain. They are confined by low banks vegetated with dwarf willow and tundra flora. Substrate consists of gravel or mud and silt. Some side channels are commonly used by grayling for spawning and rearing (Ref. 11) but site specific data are lacking in many cases.

Fish use of Sagavanirktok River at NPSI 1-5.06 has not been documented. Examination of aerial photographs taken in August 1978 indicates that fish use of this area is probably low and confined to high water periods in the Sagavanirktok River.

## WATERBODY

Waterbody Sylvia CreekMain Drainage Sagavanirktok RiverTributary to Sagavanirktok RiverNPSI 1-5.05NPAS 7NPMP 38.4AHMP NAUSGS Map Reference Sagavanirktok, Ak.T 5NR 14ESec. 7

## FISHERIES ASSESSMENT

SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>AC, GR</u>	<u>M, R, S</u>	<u>11</u>
Summer	<u>AC, GR, S9</u>	<u>R</u>	<u>11</u>
Fall	<u>None</u>		<u>None</u>
Winter	<u>None</u>		<u>None</u>

Sylvia Creek is a small tundra stream that drains several ponds and lakes approximately 800m upstream of its confluence with the Sagavanirktok River. The channel is confined by low banks and substrate is gravel or mud and silt.

In the vicinity of the proposed pipeline route Sylvia Creek is a spawning and rearing area for grayling and ninespine stickleback (Ref. 11 & 30) and a rearing area for Arctic char (Ref. 11) during the open water season. Reference 11 suggests that fish become isolated in the river during periods of low flow. Fish migration undoubtedly occurs as streams of this size and nature tend to be dry or freeze solid in winter.

## WATERBODY

Waterbody Unnamed Pond, NPSI 1-5.04

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-5.04 NPAS 7 NPMP 37.9 AHMP NA

USGS Map Reference Sagavanirktok, Ak. T 5N R 14E Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Pond, NPSI 1-5.04 is a very small (~100 m in length) tundra pond located within the Sagavanirktok River floodplain. Examination of aerial photographs indicates that this pond is very shallow and received water only during periods of heavy run-off. This pond is encroached upon by the proposed pipeline on its northeast shoreline.

Fish use of this pond has not been documented at any time. However, fish use is probably non-existent year-round, as tundra ponds of this shallow nature freeze solid in winter.

**WATERBODY**Waterbody Sagavanirktok River Side Channel NPSI 1-5.03Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.03 NPAS 7 NPMP 37.9 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 5N R 14E Sec. 7**FISHERIES ASSESSMENT****\*SPECIES  
DOCUMENTED****FISH  
USE****MAJOR  
FISHERIES  
REFERENCES**

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

\*See assessment - fish present in channel but site specific data are lacking.

A network of braided channels and side sloughs lie within the Sagavanirktok River floodplain. Within the study area, they are confined by low banks vegetated with dwarf willow and tundra flora. Substrate consists of gravel or mud and silt. These side channels are commonly used by grayling for spawning and rearing (Ref. 11), but site specific data are often lacking.

Sagavanirktok River Side Channel at NPSI 1-5.03, is one of two crossings of the same channel (Ref. 118; see NPSI 1-5.02). Fish use in the vicinity of the present proposed crossing has not been documented. However, grayling have been observed in downstream reaches of the same channel at NPSI 1-5.02, (Ref. 118) and it is likely that fish use this area as well during the open water season. Migration undoubtedly occurs as fish present in these side channels overwinter in the Sagavanirktok River (Ref. 11).

## WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-5.02Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.02 NPAS 7 NPMP 38.1 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 5N R 14E Sec. 7

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>GR</u>	<u>M,R</u>	<u>30</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

A network of braided channels and side sloughs drain the Sagavanirktok River floodplain. Within the study area, they are confined by low banks vegetated with dwarf willow and tundra flora. Substrate consists of gravel or mud and silt. These side channels are commonly used by grayling for spawning and rearing (Ref. 11), but site specific data are often lacking.

Sagavanirktok River Side Channel at NPSI 1-5.02, is one of two crossings of the same channel (Ref. 118; see NPSI 1-5.03). This channel is a rearing area for grayling (Ref. 30), probably throughout the open water season. Migration undoubtedly occurs as fish present in these side channels overwinter in the Sagavanirktok River (Ref. 11).

## WATERBODY

Waterbody Unnamed Creek, NPSI 1-5.01Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-5.01 NPAS 7 NPMP 35.4 AHMP NAUSGS Map Reference Sagavanirktok, Ak. T 6N R 14E Sec. 30

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 1-5.01, is a small tundra stream confined by low banks with gravel and mud or silt substrate. This stream drains several tundra lakes and ponds upstream of the proposed pipeline route then empties into the Sagavanirktok River. Examination of aerial photographs indicates the presence of a pond immediately west of the TAPS Haul Road.

Reference 11 suggests the presence of grayling in Unnamed Creek, NPSI 1-5.01 during the spring and summer months, however, documentation is apparently not available. Winter fish use is probably non-existent, as streams of this size and nature tend to provide unsuitable habitat for fish after freeze-up.

# **WATERBODY**

Waterbody Sagavanirktok River Floodplain NPSI 1-5

Main Drainage Sagavanirktok River

Tributary to Sagavanirktok River

NPSI 1-5

NPAS 6-7

NPMP 35.4-32.7

AHMP NA

USGS Map Reference Sagavanirktok, Ak.

6N

13E

13,24,25

T 6N

R 14E

Sec. 26,30

# **FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Sagavanirktok River Floodplain is a series of highwater canals confined by low, gravel banks. Examination of aerial photographs taken in August 1978 indicates that only isolated pools of water were present near crossing NPSI 1-5. These pools are potential fish traps, since they would be dry or frozen to the bottom in winter.

Site specific data for this region is not available. However, the Sagavanirktok River is known to contain various life history stages of a variety of fish species including grayling, Arctic char, round whitefish, slimy sculpin and burbot (Ref. 11,30, and 76). The habitat in the vicinity of crossing NPSI 1-5 could support these species during periods of high water. Fish use during winter is non-existent.





## WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-4.04Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-4.04 NPAS 6 NPMP 30.5 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 6N R 13E Sec. 1  
6N 14E 6

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Sagavanirktok River side channels in this area are large meandering streams that flow away from then parallel to the main river for approximately 3 to 4.5 km before converging again with the main channel. Confined by low banks vegetated with willow and tundra flora, two of the larger channels have containment dikes at their divergence from the Sagavanirktok River. It is not known to what degree these dikes restrict surface flow; however, inter-gravel flow has been documented (Ref. 11) and these side channels do contain sufficient water during the open water period to provide suitable fish habitat.

Grayling and ninespine stickleback have been reported to utilize the Sagavanirktok side channels (Refs. 11 and 77) but no site-specific data are available for the crossing. Many of the side channels are dry in the fall but it is believed that they are used by fish during periods of high water.

# WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-4.03

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

NPSI 1-4.03 NPAS 6 NPMP 30.1 AHMP N/A

USGS Map Reference Sagavanirktok, Ak. T 7N R 14E Sec. 31

# FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Sagavanirktok River side channels in this area are large meandering streams that flow away from then parallel to the main river for approximately 3 to 4.5 km before converging again with the main channel. Confined by low banks vegetated with willow and tundra flora, two of the larger channels have containment dikes at their divergence from the Sagavanirktok River. It is not known to what degree these dikes restrict surface flow; however, intergravel flow has been documented (Ref. 11) and these side channels do contain sufficient water during the open water period to provide suitable habitat.

Grayling and ninespine stickleback have been reported to utilize the Sagavanirktok side channels (Refs. 11 and 77) but no site-specific data are available for the crossing. Many of the side channels are dry in the fall but it is believed that they are used by fish during periods of high water.

## WATERBODY

Waterbody Sagavanirktok River Side Channel NPSI 1-4.02Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-4.02 NPAS 6 NPMP 30.0 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 7N R 14E Sec. 31

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Sagavanirktok River side channels in this area are large meandering streams that flow away from then parallel to the main river for approximately 3 to 4.5 km before converging again with the main channel. Confined by low banks vegetated with willow and tundra flora, two of the larger channels have containment dikes at their divergence from the Sagavanirktok River. It is not known to what degree these dikes restrict surface flow; however, inter-gravel flow has been documented (Ref. 11) and these side channels do contain sufficient water during the open water period to provide suitable fish habitat.

Grayling and ninespine stickleback have been reported to utilize the Sagavanirktok side channels (Refs. 11 and 77) but no site-specific data are available for the crossing. Many of the side channels are dry in the fall, but it is believed that they are used by fish during periods of high water.

**WATERBODY**Waterbody Sagavanirktok River Side Channel NPSI 1-4.01Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-4.01 NPAS 6 NPMP 29.9 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 7N R 14E Sec. 31**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Sagavanirktok River side channels in this area are large meandering streams that flow away from then parallel to the main river for approximately 3 to 4.5 km before converging again with the main channel. Confined by low banks vegetated with willow and tundra flora, two of the larger channels have containment dikes at their divergence from the Sagavanirktok River. It is not known to what degree these dikes restrict surface flow; however, inter-gravel flow has been documented (Ref. 11) and these side channels do contain sufficient water during the open water period to provide suitable habitat.

Grayling and ninespine stickleback have been reported to utilize the Sagavanirktok side channels (Refs. 11 and 77) but no site-specific data are available for the crossing. Many of the side channels are dry in the fall but it is believed that they are used by fish during periods of high water.

## WATERBODY

Waterbody Sagavanirktok River Floodplain-Spur Dikes NPSI 1-4Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-4 NPAS 5 NPMP 27.3-25.5 AHMP N/AUSGS Map Reference Sagavanirktok, Ak. T 7N R 14E Sec. 8, 17 and 18

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>CN,GR</u>	<u>W</u>	<u>77</u>

The Sagavanirktok River near NPSI 1-4 is a braided stream confined by low gravel banks within the flood plain 24 km south of Deadhorse. The westernmost branch of the river is crossed (below ground) by the TAPS and is lined by a series of spur dikes, constructed to control erosion. Three spur dikes have caused significant pools and deep channels to form.

Winter field investigations conducted November 1979 documented that this habitat was utilized by grayling and slimy sculpin during the winter period (Ref. 77). No open water site-specific fisheries data for this habitat is presently available. However, the Sagavanirktok River in this area is known to contain various life history stages of a variety of fish species, including grayling, Arctic char, round whitefish, slimy sculpin and burbot (Refs. 11, 30 and 76). The habitat created by the spur dikes in the Sagavanirktok River flood plain probably supports many of these species throughout the open water period.

**WATERBODY**Waterbody Unnamed Creek, NPSI 1-3.02Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-3.02 NPAS 5 NPMP 23.0 AHMP NAUSGS Map Reference Beechey Point, AK. T 8N R 14E Sec. 28**FISHERIES ASSESSMENT**

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Creek, NPSI 1-3.02 is a small stream confined by low banks vegetated with tundra flora. This stream connects a series of shallow tundra lakes and ponds and then drains into the Sagavanirktok River.

No fisheries investigations have been performed on this stream. Fish use in winter is probably non-existent, as most tundra streams of this size freeze to the bottom in the winter.

## WATERBODY

Waterbody Unnamed Lake NPSI 1-3.01Main Drainage Sagavanirktok River Tributary to Sagavanirktok RiverNPSI 1-3.01 NPAS 4 NPMP 17.2 AHMP NAUSGS Map Reference Beechey Point, Ak. T 9N R 14E Sec. 33

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Unnamed Lake, NPSI 1-3.01, is a tundra pond of unknown depth that is confined by low banks vegetated with tundra flora. This lake is encroached upon by the proposed pipeline route on its northeastern shoreline.

Fish use of Unnamed Lake, NPSI 1-3.01, has not been documented at any time. The presence of fish in tundra lakes of this size and nature is dependent on lake depth and fish access into the lake.

## WATERBODY

Waterbody Little Putuligayuk RiverMain Drainage Prudhoe BayTributary to Putuligayuk RiverNPSI 1-3NPAS 2NPMP 10.2AHMP NAUSGS Map Reference Beechey Point, Ak.T 10N R 14E Sec. 29

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Little Putuligayuk River is a typical beaded, tundra stream characterized by alternating channels and pools to 1.5 m deep. In the area of the proposed pipeline crossing, the low tundra banks are lined with sedges and the stream bottom consists of mud and gravel. Grasses are abundant in the stream bed.

Fish use of the Little Putuligayuk River cannot be definitely determined, but it is thought that utilization is extremely low or non-existent. During a 1979 fall survey, fish habitat appeared favorable, but no fish were captured in the area. Winter use is probably non-existent as streams of this size and nature are generally dry or freeze solid during winter.



## WATERBODY

Waterbody Pump Station #1 Drainage DitchMain Drainage Prudhoe Bay Tributary to Putuligayuk RiverNPSI 1-2 NPAS 1 NPMP 4.8 AHMP NAUSGS Map Reference Beechey Point, Ak. T 11N R 14E Sec. 32

## FISHERIES ASSESSMENT

	SPECIES DOCUMENTED	FISH USE	MAJOR FISHERIES REFERENCES
Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>None</u>	<u></u>	<u>None</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

Pump Station #1 drainage ditch is an artificial channel that extends from Pump Station #1 to the Putuligayuk River. Fish presence in the channel has not been documented. It is probable that water is present only during periods of high run-off and that the channel does not provide habitat for fish at other times. The channel is considered to have minimal importance to fish.

**WATERBODY**Waterbody Putuligayuk RiverMain Drainage Prudhoe Bay Tributary to Prudhoe BayNPSI 1-1 NPAS 1 NPMP 3.2 AHMP NAUSGS Map Reference Beechey Point, Ak. T 11N R 14E Sec. 28**FISHERIES ASSESSMENT**SPECIES  
DOCUMENTEDFISH  
USEMAJOR  
FISHERIES  
REFERENCES

Spring	<u>None</u>	<u></u>	<u>None</u>
Summer	<u>None</u>	<u></u>	<u>None</u>
Fall	<u>S9</u>	<u>R</u>	<u>57</u>
Winter	<u>None</u>	<u></u>	<u>None</u>

The Putuligayuk River is a broad (10-20 m) shallow stream of brown-stained water that drains into Prudhoe Bay. Previous excavation has altered the gravel floodplain (50-100 m) in the vicinity of the pipeline crossing, causing the formation of large, shallow pools. Banks of tundra muskeg vegetation exhibit block slumpage.

Few data are available upon which to base assessments for the Putuligayuk River near the proposed crossing. A single ninespine stickleback was captured in late fall 1979 (Ref. 57). At that time the stream provided only fair fish habitat and fish utilization was low. It was also thought that the stream would freeze to the bottom near the proposed crossing and provide no overwintering habitat.

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