Ecological Research Associates

FINAL REPORT

FALL 1980 FISHERIES SURVEY AND PROVISIONAL LIST OF WATERBODIES ALONG THE NORTHWEST ALASKAN PIPELINE COMPANY ROUTE

TO: FLUOR NORTHWEST, INC.
P.O. BOX 60089
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FALL 1980 FISHERIES SURVEY AND PROVISIONAL LIST OF WATERBODIES ALONG THE NORTHWEST ALASKAN PIPELINE COMPANY ROUTE: PRUDHOE BAY TO THE YUKON TERRITORY

Final Report

Prepared for and Funded by
NORTHWEST ALASKAN PIPELINE COMPANY

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FOREWARD

Northwest Alaskan Pipeline Company, through Fluor Northwest, Inc., has sponsored a number of investigations to delineate fish distribution along the proposed pipeline route and to identify critical fish habitats and activities that are requisite for maintenance of fish populations in the region. Fish utilization of many habitats or streams is highly seasonal; therefore, studies through time are necessary to document changing patterns of fish distribution. Prior to this investigation, fisheries studies conducted by LGL along the proposed pipeline route have taken place in late winter (Ref. 55), spring (Ref. 54), fall (Ref. 57) and early winter (Ref. 77). The results of these seasonal studies along with all other known information, have been integrated and summarized in order to provide a comprehensive, up to date report on present knowledge of fish populations along the proposed pipeline.

The present report is a continuation of investigations on fish distribution and habitat use in the fall. Recent changes in the pipeline alignment, primarily north of Fairbanks, which introduced new streams to the pipeline route necessitated study, as information on fish in many of these streams was absent.

Consequently, a total of 99 stream crossings were investigated in the late fall of 1980. This information is a further contribution toward understanding fish resources along the pipeline route and an aid in resolving potential conflicts between fish resources and pipeline construction and operation.

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ACKNOWLEDGEMENTS

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ABSTRACT

The natural gas pipeline proposed by Northwest Alaskan Pipeline Company traverses hundreds of waterbodies in the Beaufort Sea and Yukon River drainages. This report describes the fall fish use of these waterbodies based on a review of available information and field surveys of streams selected for examination by Fluor Northwest Inc. for the 1980 Fall Fisheries Investigation. Sources of information including reports, unpublished documents, agency memoranda and personal communications were examined for fall fisheries data at 386 crossings of waterbodies along the pipeline route. Results of the field surveys and literature review indicate that approximately one-fourth of the streams crossed by the proposed pipeline are used by fish in the fall. An assessment of these data is listed in Appendix II.

This report describes the fall fish use at 99 proposed crossings or near-crossings of the Northwest Alaskan Gas Pipeline in Alaska. Stream surveys were conducted 04-29 September 1980. Biological, chemical and physical data gathered are listed in a stream catalogue. Fish species caught were grayling, broad whitefish, round whitefish, chum salmon, Arctic char, Dolly Varden, burbot, longnose sucker, lake chub, slimy sculpin and ninespine stickleback.

Fish used 33 of the 99 crossings surveyed during the fall period. No fish were caught in the remaining 66; of these, 25 were considered to provide suitable habitat, 36 were considered marginal. Evidence of fall spawning was only observed in one stream and fall spawning species were present in 11 waterbodies examined. Many of the streams were dry or of a small size and depth and likely to freeze solid in winter. Since the eggs of most fall spawning species incubate throughout the winter and hatch in spring, fall spawning cannot successfully occur in many of the small streams that were studied.

INTRODUCTION

Northwest Alaskan Pipeline Company proposes to construct the Alaskan segment of a buried pipeline which would transport chilled natural gas from the arctic to southern markets. The proposed routing of the Northwest Alaskan Pipeline parallels the Alyeska Oil Pipeline from Prudhoe Bay to Delta Junction with some variances, particularly around the Fairbanks area. From Delta Junction the proposed route follows the Haines-Fairbanks Products Pipeline right-of-way east from Delta Junction to the Alaska/ Canada border.

On 29 August 1980 LGL Ecological Research Associates, Inc. (LGL) was awarded a contract by and through Fluor Northwest, Inc., funded by Northwest Alaskan Pipeline Company to conduct fall fisheries surveys along the proposed gasline route. The major purpose of this survey was to assess the fish utilization of waterbodies crossed or potentially affected by the Northwest Alaskan Pipeline project during the fall season. This report presents the results of the 1980 fall program: (1) a provisional list of 386 waterbodies crossed or potentially affected by the proposed pipeline project with an evaluation of existing fall fisheries for each; and (2) a fall assessment of waterbodies selected for field examination by Fluor Northwest, Inc. during the period 04-29 September 1980.

Fall Studies

Objectives and Justification

The objectives of the 1980 fall fisheries study were to:

1) Investigate the presence, absence and species composition of fish in selected streams,

2) Record fish use (spawning, rearing and migrating) of selected aquatic habitats, and

3) Record stream features which may affect fish utilization of the habitat (e.g., impassible natural barriers, drainage structures or intermittent flow).

Fish populations along the proposed Northwest Alaskan pipeline route typically require a variety of aquatic habitats to complete their life cycle. Several streams or sections of streams are required by these fish at specific times of the year. A common pattern, for example, is for fish to overwinter at one location, feed at another and spawn at still another. It therefore becomes necessary to investigate streams during each biologically-important season since fish utilization generally varies from stream to stream.

The purpose of the present fisheries program is to document which streams are important to fish during the fall season. Many species in the study area spawn at this time: Dolly Varden, arctic char, lake trout, inconnu, ciscoes, lake whitefish, round whitefish, humpback whitefish, king salmon, chum salmon and silver salmon. Fall is also a time when fish typically migrate from their summer feeding and rearing areas to overwintering areas. Many summer feeding and rearing areas are located in upstream portions of drainages that freeze to the bottom during winter. Fall dwonstream migrations are especially important since fish would likely perish in winter if such movements were not successfully completed.

Selection of Streams for Field Investigation

An evaluation of available fall infromation for the hundreds of streams crossed by the gas line was based on an extensive literature survey, communication with state and federal agencies, and professional experience. Primary sources for literature were published government and consultant reports and file data from the Joint Fish and Wildlife Advisory Team (JFWAT) in Anchorage. Agencies consulted included: State Pipeline Coordinators Office, Alaskan Department of Fish and Game (Habitat, Commercial and Sport Fish Divisions) and U.S. Fish and Wildlife Service (Stream Alteration Division). Criteria to standardize the evaluation of available fisheries data for the fall season are shown in Table 1.

Report Format

This report combines historical information together with data generated during the fall 1980 field surveys in order to provide a current assessment of fall fish use of selected streams affected by the Northwest Alaskan Pipeline route. An updated provisional list of 386 waterbodies crossed or potentially affected by the gasline along its route from Prudhoe Bay to the Canadian Border is presented in Appendix II. For each of these streams, sources of available fall fisheries data and the current status of this information are indicated.

Data gathered during the fall field survey are presented on a stream-by-stream basis ("Stream Catalogue"). This information is also presented in a tabular summary of results (Table 2).

Table 1. Criteria for evaluating available fisheries data for the fall season.

Number*	Fall Criteria
1	Fish Use Area--Waterbody investigated and fish use documented.
2	No Fish Use--Waterbody investigated and no fish use documented.
3	No Fish Use Inferred--Absence of habitat inferred and supported by indirect evidence: small drainage with negligible intermittent or no flow or fish blockage present.
4	Data Gaps Present--Waterbody investigations incomplete or lacking: waterbody has not been surveyed for fish use, or previous data were inconclusive.

*Cited in Appendix II.

Table 2. Summary of fall survey (04-29 September 1980) of selected streams in the vicinity of the proposed Northwest Alaskan Pipeline route. Abbreviations used are: AC (Arctic char), BB (burbot), BW (broad whitefish), CN (slimy sculpin), DS (chum salmon), DV (Dolly Varden), GR (grayling), LC (lake chub), LS (longnose sucker), RW (round whitefish), S9 (ninespine stickleback), NPRX (Northwest Pipeline River and Floodplain Crossing number).

Waterbody	NPRX	Suspected Fall Migration or Movement	Feeding and Rearing (Species)	No Fish Caught: Good* Habitat Present	No Fish Caught: Habitat Marginal*	No Fish Caught: Habitat Absent	Potential Fish Blocks Present	Text Page
Tanana River Side Channel	095-1	X	BW,LC,LS,RW					22
Lower Rosa Creek	093-1	X		X				25
Unnamed Creek	FH-086-2 (Rev 3)	X	GR					28
Drainage Ditch	FH-082-2 (Rev 3)	X	GR					31
Unnamed Creek	086-4				X		X	34
Unnamed Creek	086-3	X	GR					37
Unnamed Creek	086-2				X		X	40
Moose Creek	085-1	X	CN,GR					43
Chena River Side Channel	084-3				X		X	46
Potlatch Creek	083-5				X		X	49
Tributary to Little Chena River #1	083-4				X		X	52
Little Chena River	083-2	X		X				55
Iowa Creek	083-1	X	CN,GR					58
Tributary to Smallwood Creek	082-2			X				61
Smallwood Creek	082-1	X	CN				X	64
Nugget Creek Tributary	081-5			X			X	67
Fox Creek	080-2				X		X	70
Little Globe Creek	076-2				X		X	73
Globe Creek	075-2	X		X				76
Slate Creek Tributary	073-5				X		X	79
Slate Creek	073-4			X			X	82
Ski Jump Ramp Creek	073-3					X	X	84
Tributary to Wilber Creek	073-1				X			87
Shorty Creek	072-3			X			X	90
Tributary to Tolovana River	072-2					X		93

Table 2 (continued)

Waterbody	NPRX	Suspected Fall Migration or Movement	Feeding and Rearing (Species)	No Fish Caught: Good* Habitat Present	No Fish Caught: Habitat Marginal*	No Fish Caught: Habitat Absent	Potential Fish Blocks Present	Text Page
Unnamed Tributary to West Fork Tolovana River	071-2				X			96
Lost Creek	071-1	X		X				99
West Fork Erickson Creek	069-1	X		X				102
Hess Creek Tributary	068-5					X		105
Hess Creek Tributary					X			108
Two-Bank Creek	068-2				X		X	111
Unnamed Creek	068-1				X			114
Two-Bit Creek	067-5				X		X	117
Unnamed Creek	067-3				X			120
Hot Cat Creek	067-2			X			X	123
Unnamed Creek	067-1				X		X	126
Unnamed Creek	066-4				X		X	129
Isom Creek	066-3			X				132
Tributary to Isom Creek	066-2			X				135
Unnamed Creek	062-3				X		X	138
Unnamed Creek	062-2				X		X	141
Stumblin Creek	062-1				X		X	144
Unnamed Creek	061-2				X		X	147
Knowater Creek	060-2				X		X	150
Fed Creek	059-1				X		X	153
Smoky Creek	057-1				X		X	156
Unnamed Creek	056-3	X			X		X	159
Netsch's Creek Tributary #1	054-3	X		X				162
Grizzly Creek	052-2		CN,GR					165
Unnamed Bonanza Creek Channel	052-1	X			X		X	168
Oxbow Lake System	051-5				X		X	121
North Fork Little Nasty Creek	051-1				X		X	174
Catch 22 Springs	None	X	CN					177
1-Acre Lake	047-6	X						180
Abba-Dabba Creek	047-2	X	CN	X				183

Table 2 (continued)

Waterbody	NPRX	Suspected Fall Migration or Movement	Feeding and Rearing (Species)	No Fish Caught: Good* Habitat Present	No Fish Caught: Habitat Marginal*	No Fish Caught: Habitat Absent	Potential Fish Blocks Present	Text Page
Crossroads Creek #1	046-3				X			186
Trent's Trickle	045-4	X	GR					189
Cathedral Mountain Creek #1	044-6				X			192
Cathedral Mountain Creek #2	044-6					X		195
Slate Creek	043-8	X	DS,GR					198
Marion Creek	042-6	X	GR					201
North Fork Marion Creek Overflow #1	042-5					X		204
Cushing Creek	039-4			X				207
North Fork Sukakpak Creek	FH-038-7					X		210
Snowden Creek	036-4	X	GR				X	213
Steep Creek	035-4			X			X	216
Buff Creek	035-3			X				219
Burger's Bayou	035-2	X	BB,CN,GR					222
Beaver Dam Brook #1	034-7	X	CN,GR,RW					225
Beaver Dam Brook #2	034-6				X		X	228
Beaver Dam Brook #3	034-5				X		X	230
Beaver Dam Brook #4	034-4				X		X	232
Nutirwik Creek	034-3	X	DV		X		X	234
Homewood Spring	034-2	X	CN,DV,GR					237
Wetfoot Creek	033-2	X	DV,GR,RW					240
Dietrich River #3	032-3	X	DV,GR					243
Dietrich River #2	032-3	X	CN,DV,GR					246
Dietrich River #1	032-3	X	CN,GR,RW					248
Jill Creek	025-9	X						250
Ed Creek	025-7	X		X				253
Mack Creek	025-6	X		X				256
Yan Creek	025-1			X				259
Toolik River	023-2	X		X				262
East Fork Toolik River	023-1			X				265
Rudy Creek	019-6	X	GR, [illegible]					268

Table 2 (continued)

Waterbody	NPRX	Suspected Fall Migration or Movement	Feeding and Rearing (Species)	No Fish Caught: Good* Habitat Present	No Fish Caught: Habitat Marginal*	No Fish Caught: Habitat Absent	Potential Fish Blocks Present	Text Page
Dennis Creek	019-4	X	GR					271
Polygon Creek	019-1	X	GR					274
Gustafson Gulch	018-4	X	GR					277
Arthur Creek	018-3	X	GR					280
Charlotte Creek	016-3	X	GR,RW					283
Happy Valley Camp Creek	016-2	X	AC,CN,GR,RW					286
Stout Creek	015-2	X	GR					289
Spoiled Mary Creek	015-1			X				292
Unnamed Creek	012-1				X			295
East Fork Sylvia Creek	007-5				X		X	298
Telma Creek	007-1	X	S9					301
Pescado Creek	005-2	X	S9				X	304
Low-Life Creek	004-2	X	S9					307
Little Putuligayuk River	002-1	X		X				310

* Refer to page 18 in text for description of "good" and "marginal" habitat.

STUDY AREA

The route of the proposed Northwest Alaskan pipeline is shown in Figure 1. The study area addressed in this report is the northern section of the pipeline from Prudhoe Bay to Prospect Creek (Figure 2), then east to Delta Junction (Figure 3). Between Prudhoe Bay and Atigun Pass, a distance of approximately 276 km, the proposed route crosses the arctic coastal plain, traverses the northern foothills of the Brooks Range and crests Atigun Pass -- the highest point in the Alaska routing. Within this area, the pipeline alignment parallels most of the Sagavanirktok River. Large streams like the Sagavanirktok River are characteristically fast-flowing, clear and have wide, extensively braided, gravel floodplains. They support resident and anadromous fish at different times of year and are often used for overwintering. Smaller streams along this section, many of which are tributaries to the larger streams, are usually narrow, single channel drainages with stained water and support fewer species than larger streams. These drainages usually freeze to the bottom in winter. Surrounding vegetative types include willow, dwarf birch and tundra flora.

South of Atigun Pass, the route continues through the Brooks Range where it crosses the Dietrich and Upper Koyukuk drainages. Most streams within the first 130 km south of Atigun Pass are wide, braided and fast-flowing throughout the summer. Floodplains are gravel and usually without meanders. Vegetative cover in this region changes from white spruce, lichens and dwarf willows in the mountain areas, to black spruce and birch, intermixed with tundra and muskeg in lower elevations.

Approximately 130 km south of Atigun Pass, the proposed gas pipeline route enters the Yukon drainage where most streams exhibit a high degree of meandering. Although some of the larger streams are clear, most are stained brown with tannins and lignins leached from muskeg areas. Many of the larger streams, like the Koyukuk and Jim River, support over-wintering fish and provide habitat for all spawning salmon. Although most small streams do not provide overwintering habitat, they are used by juvenile and young-of-the-year fish during the summer. Black spruce and willow are predominant in tundra areas, while large spruce and birch vegetate river bottoms.

From the Yukon River crossing, the proposed gas pipeline parallels the TAPS oil line south through the White Mountains. Approximately 16 km north of Fairbanks the current alignment departs from the oil line route and continues southeast through the White Mountains and then through the Tanana River Valley to Big Delta. Most waterbodies in the White Mountains are small tundra streams characterized by moderate to steep gradient and dense riparian vegetation of grass, sedge, willow, alder, birch and spruce. These streams provide rearing and feeding areas for juvenile and young-of-the-year fish but do not provide overwintering habitat. Streams located within the Tanana River Valley are generally clear but

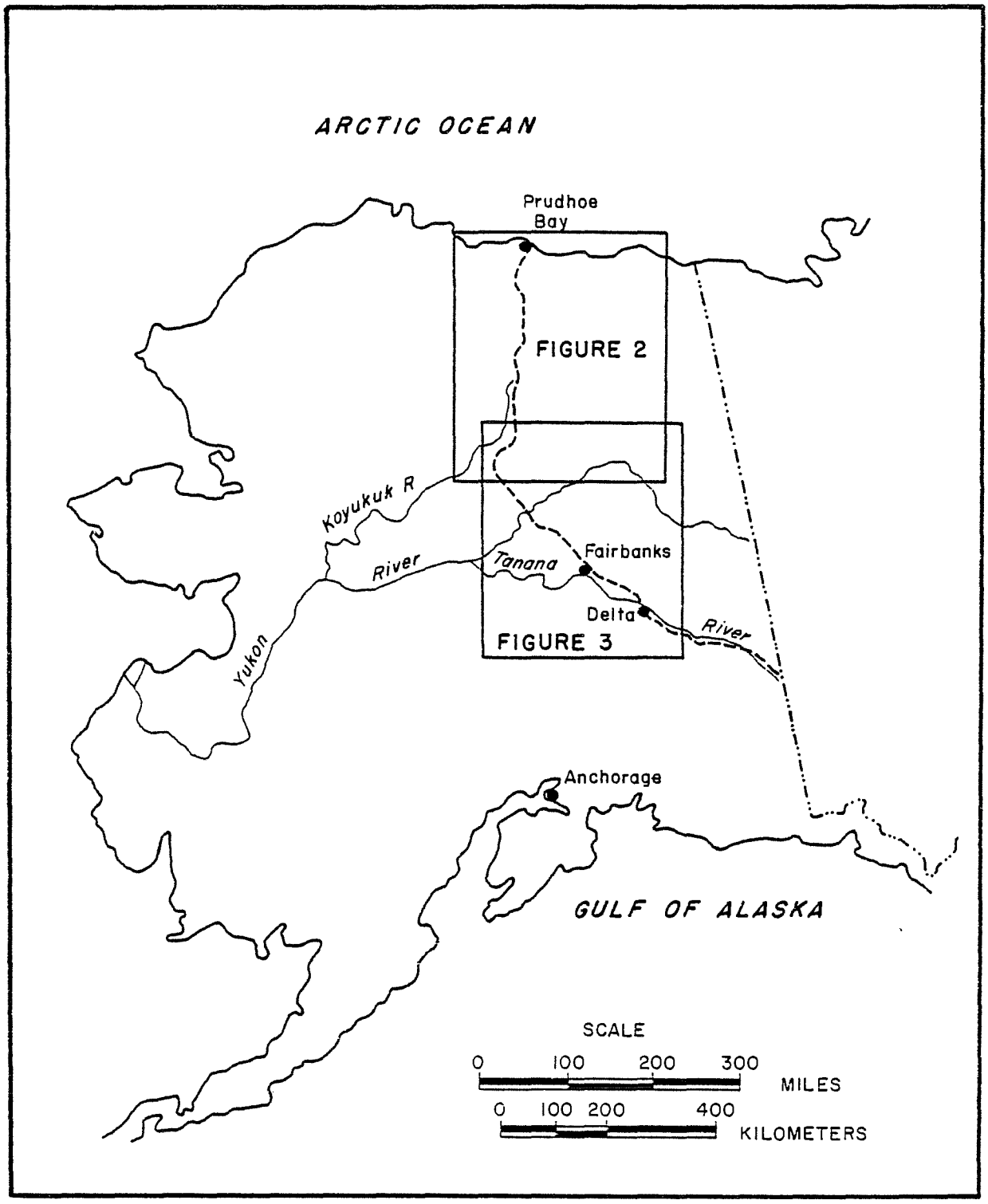

Fig. 1. Route of the proposed Northwest Alaska Pipeline from Prudhoe Bay to the Alaska/Yukon border.

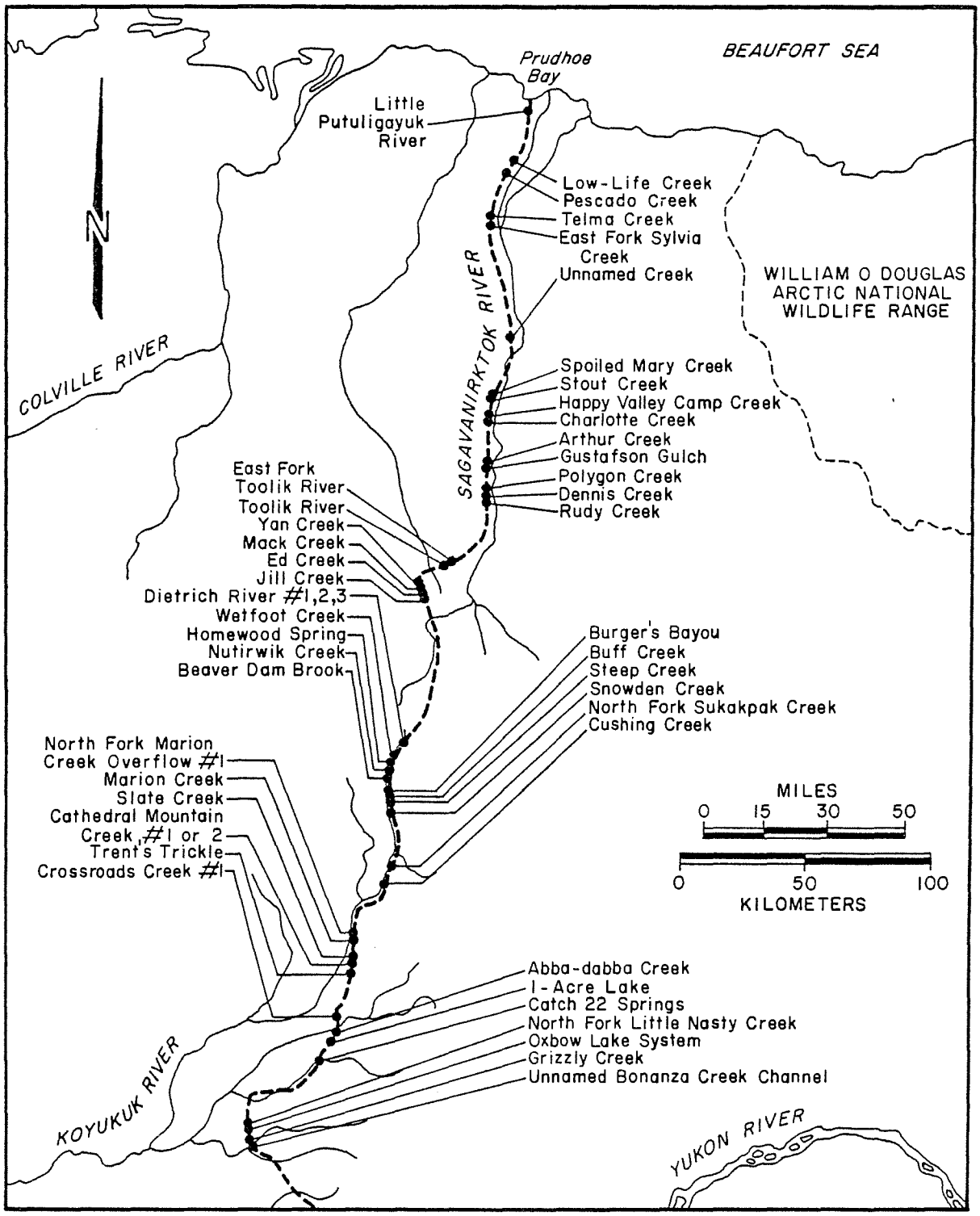

Fig. 2. Northwest Alaska Pipeline route and sample sites from Prudhoe Bay to Prospect Creek.

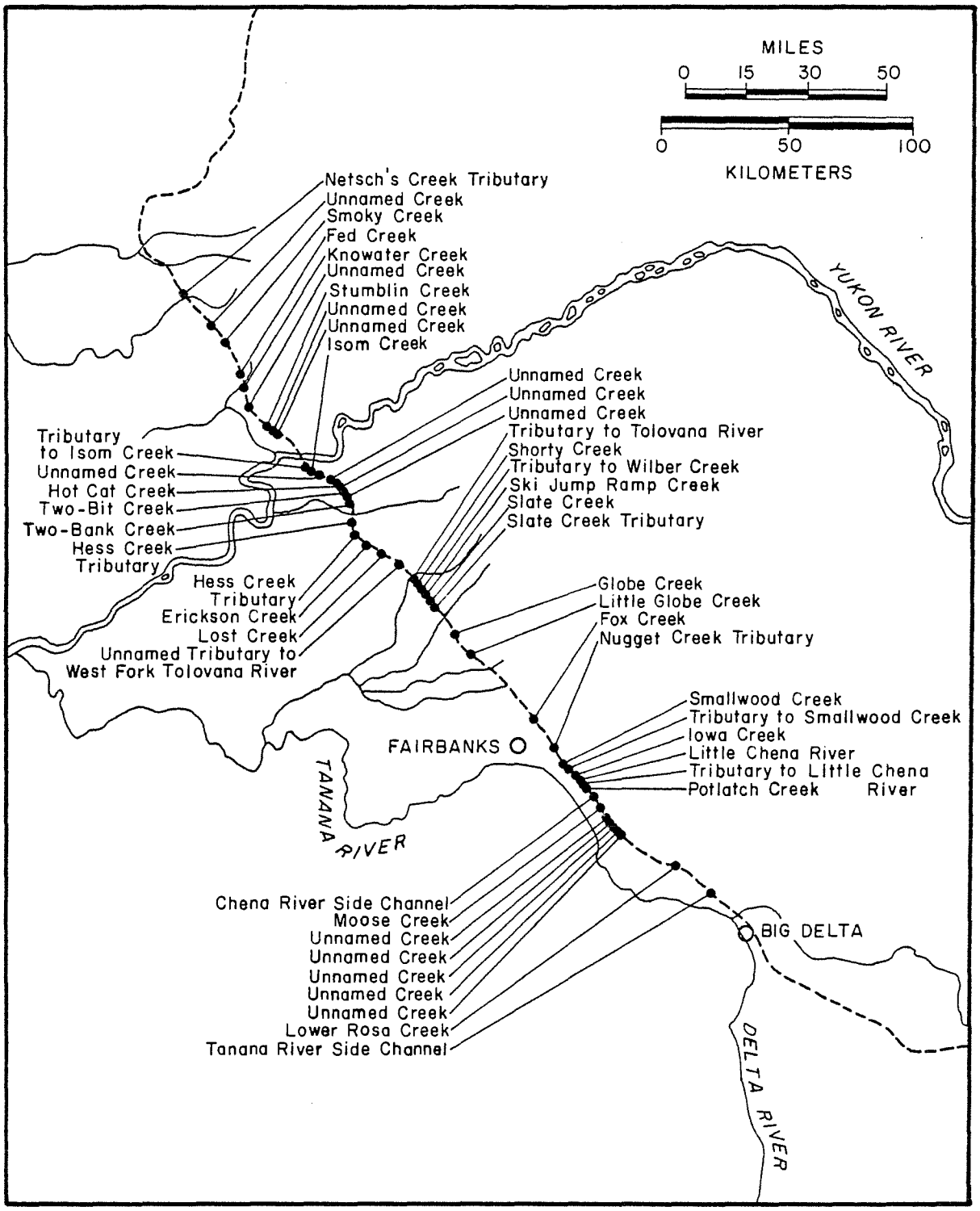

Fig. 3. Northwest Alaska Pipeline route and sample sites from Prospect Creek to Delta Junction.

humic-stained and flow through alternating tundra or muskeg and mature stands of spruce, birch and willow. The larger of these streams such as the Little Chena River, the Chena River, and the Tanana River are more turbid and are contained by steep banks vegetated with mature stands of spruce, birch and willow with some herbaceous plants and grasses. These larger streams usually provide winter habitat for some species of fish at least through early winter season, although the extent of utilization of these streams is uncertain.

PATTERNS OF FISH MOVEMENTS AND STREAM USAGE

After breakup has occurred, fish are normally found in three general types of streams along the proposed pipeline route: (1) small beaded tundra streams, (2) large-size streams and (3) large rivers. The small beaded tundra streams(e.g., Dennis Creek and S.F. Minton Creek) are usually frozen solid during winter and ice break-up occurs between late March and early June. These streams vary from 0.5-1.5 m in width and seldom exceed 1 m in depth. Substrates are variable but contain gravel, sand, silt and detritus. Although the water is usually clear, it is frequently stained from tannins and lignins leached from surrounding vegetation. Stream banks are often 0.5-1.5 m in height, undercut and vegetated with dwarf birch and willow.

Within the proposed gasline corridor, small beaded tundra streams like Dennis Creek are used primarily by grayling, but round whitefish and/or char may occasionally be present depending on geographical location of the stream. Adult grayling may move into these streams at spring breakup, spawn and then move some distance back downstream. During the egg incubation period (early May to early July) juvenile grayling, juvenile whitefish and/or juvenile char may also move upstream into these areas. After the grayling eggs have hatched in late June to early July, emergent fry remain in the general vicinity until late summer or fall. As fall approaches and water temperature drops, all fish begin moving downstream to overwintering areas. Small beaded tundra streams generally do not provide spawning habitat for fall spawning species.

Large streams or small rivers (e.g., Moose Creek or Lower Rosa Creek) are usually 5-10 m in width, with stained or clear water and a substrate consisting primarily of gravel and sand. Banks, 0-2 m in height, are seldom incised. These drainages typically exhibit alternating stretches of deep, slow-moving water and shallow, rapid riffles. Some pools, especially in lower reaches, may be deep enough to provide overwintering habitat.

Within the proposed gasline corridor, medium-size streams receive more intense use by fish than small beaded tundra streams. Excluding overwintering, these drainages generally serve as major spring and fall migration routes for many species. Some, especially those with perennial spring sources, may be used for spawning by spring and fall spawning species. Young-of-the-year of fall spawning species (primarily whitefish, and char) and eggs of spring spawning species (primarily grayling, northern pike, longnose sucker and slimy sculpin) may be present during spring. By late June or early July, fry of spring spawners have emerged and may remain in the vicinity until fall. Many streams are used intensively as nursery areas throughout the open-water season by juvenile grayling, whitefish, sculpin, pike, chub, char and others. Adult fish of several species are commonly present throughout the season. Some of the most northerly medium-sized streams may also support an anadromous fish run during the open water season. As fall approaches, fish generally begin moving downstream to overwintering areas.

Large rivers similar to the Tanana, Yukon, Koyukuk and others vary from 100-1000 m in width and 1-10 m in depth. Floodplains are usually braided and consist of gravel, sand, and silt, depending on river origin. Large rivers usually do not freeze solid and so they provide year-round habitat for fish and are the primary migration pathways for all species of anadromous fish. During spring, many juvenile salmon migrate downstream to enter the ocean; others may remain in freshwater for one or two years, depending on the species. A variety of freshwater fish also use large rivers as migration routes, spawning sites and nursery areas year-round. Virtually all large rivers provide overwintering habitat for fish.

METHODS

Fall field investigations were conducted between 04 and 29 September 1980. Two-man field crews surveyed streams, generally from north to south along the proposed Northwest Alaskan Pipeline route. The Prudhoe Bay Haul Road provided access to streams investigated 04-16 and 28-29 September between Prudhoe Bay and the Yukon River. The Elliot Highway and a Bell 206 B Jet Ranger helicopter provided access to areas surveyed between the Yukon River and Delta Junction 14-27 September 1980.

The series of Northwest Pipeline route sheets used throughout this report to identify stream locations is indicated in Reference 125.

Following is a tabular outline summarizing the field sampling methods and units used:

Factor	Method	Units
Fish	electrofisher seine gill net (when applicable)	fish/electrofishing sec fish/m^2 from standardized seine haul fish/h from standardized gill net set
Discharge/Velocity	Pygmy current meter	m^3/sec; m/sec
Potential fish blocks (if present)	estimated	verbal and pictorial description
Depth	meter stick	cm
Wetted width (max.)	tape measure	m
Wetted width (min.)	tape measure	m
Potential for winter discharge	estimated	presence/absence
Bank stability	estimated	% stable
Substrate	estimated	% fines, sand, gravel, cobble-boulder, bedrock
Aquatic vegetation	estimated	presence/absence
Riparian vegetation	estimated	% muskeg, spruce, willow-alder, tundra
Cover	estimated	% cover
Temperature	pocket thermometer	° C
pH	Hach field pH meter	pH units
Conductivity	YSI-SCT meter	mhos/cm
Dissolved oxygen	YSI dissolved oxygen meter	mg/ℓ
Turbidity	Hach-turbitity meter	NTU
Color	visual comparison method	color units
Nitrate nitrogen	Hach kit	mg/ℓ N
Phosphate	Hach kit	mg/ℓ P
Hardness	Hach kit	mg $CaCO_3$/ℓ

Field Samples

Streams were examined in the vicinity of each proposed pipeline crossing selected for investigation. Field surveys were generally conducted within 100-200 m upstream and 150-200 m downstream of the proposed crossing. Habitats sampled were those most likely to be used by fish (i.e., calm backwater or eddys for juvenile and young-of-the-year fish, deep pools for adult fish and shallow gravel areas for bottom-dwelling fish). The fall 1980 baseline survey program was modified somewhat, in contrast to previous seasonal investigations (Refs. 54, 55, 57, 77), toward the collection of quantitative data that could be used for inter- and intrasite comparisons. Data describing the biological, chemical and physical attributes of streams are presented within this report.

Fish

A variety of techniques were used to sample fish. Within shallow waterbodies, the Smith-Root Type VIII-A backpack electroshocker was generally most effective. Beach seines of 1/8-inch mesh also proved effective. In larger and deeper streams, monofilament (1.2-1.8 cm square mesh) and nylon (1.8-3.2 cm square mesh) gillnets provided primary means of sampling. Angling, dipnets, baited set lines and visual (including low altitude aerial) observations were also used where appropriate.

Captured fish were measured, weighed and released if possible. Fork lengths were recorded for all species except burbot and slimy sculpin where total lengths were measured. All length measurements were recorded to the nearest millimeter and weight measurements were recorded to the nearest gram.

Since age and growth data are not available for specific waterbodies examined in this study area, life history classifications (fry, juvenile and adult) in this report are professional judgements based on age and growth information for the general region.

Physical and Chemical Measurements

Flow was measured with a Gurly Pygmy current meter. The lower detection limit of this meter is approximately 0.015m/sec when stream flow is measured for a standard period of 60 sec. Stream discharge was calculated based on stream velocity and the cross-sectional area of water. The latter was calculated from measurements of depth at intervals which varied from 0.25 to approximately 2.5 m, depending on stream size. Depth profiles obtained in this manner have been filed with Northwest Alaskan Pipeline Company and Fluor Northwest, Inc.

Dissolved oxygen (YSI Dissolved Oxygen Meter Model 57), pH (Hach portable pH meter), conductivity (YSI Model 22 S-C-T), temperature, color (Hach Kit Model CO-1), total hardness (Hach Kit Model HA-71A), nitrate (Hach Kit Model NI-12), and phosphate (Hach Kit Model PO-24) were measured when free water was present. Each pH, DO and S-C-T meter was calibrated prior to use for quality control. With the exception of conductivity measurement, the degree of error in measurements was small and within the limits of precision for methods used (Appendix I). Field thermometers, calibrated against an NBS certified thermometer, were accurate within the limits of manufacturer's specifications.

Conductivity measurements are recorded at field temperatures. Conversion of these values to conductivity at standard temperature (25° C) may be accomplished by using calculations provided in the 14th edition of Standard Methods for the Examination of Water and Wastewater.

Water samples were collected from each sample site and immediately preserved with mercuric chloride. The samples were transported to Fairbanks where turbidity was determined (Hach Turbidimeter).

Depth and wetted width were measured to the nearest centimeter at the proposed crossing. Bank stability was determined by estimating the percentage of bank area which showed signs of active erosion then substracting that from 100 percent. Bank stability along with substrate, aquatic and riparian vegetation, and cover were estimated at transects selected approximately 75-100 m upstream and downstream of each sample site. These were visual estimates and should be considered approximations of conditions at the time of the observation.

Data Limitations

Although a variety of sampling gear was used to collect fish, it is recognized that each method is, to some degree, selective for sizes of fish. Gillnets do not capture young-of-the-year fish and angling tended to catch only large fish in clear streams. Beach seining was effective in shallow water for juvenile and young-of-the-year fish but generally failed to catch larger fish. Electroshocking was the most effective means of collecting fish in the majority of streams sampled. This method collected bottom-dwelling fish, young-of-the-year fish as well as juvenile and adult fish. The most obvious limitation of this method was the depth to which the operator could work. Deep streams, which could not be waded and electroshocked, were sampled with gillnets, angling and/or aerial surveys. Despite these sampling variabilities, it was felt that by using the appropriate gear for the habitat sampled, the catch was representative of the fish present.

RESULTS AND DISCUSSION

Provisional List of Waterbodies

In a large-scale project such as pipeline construction, it is essential, for reference purposes, to maintain an updated list of waterbodies crossed or potentially affected by the pipeline. To date, the provisional list contains 386 entries (Appendix II). Reference 125 provided the basis for this list which includes lotic and lentic habitats known to contain fish or having potential for fish utilization. Some waterbodies have multiple crossings -- each crossing is treated as a separate entry in the list.

References that contain fisheries data are listed for each waterbody and the most recent evaluation of this information, according to the criteria listed in Table 1, is presented. It must be emphasized that this review is an ongoing process. Since our initial examination of available information a substantial amount of new data has been gathered. These data, together with site inspections of streams in the study area have allowed a more realistic appraisal of streams and fish populations along the proposed pipeline route. These up-dated results indicate that approximately one-fourth of all streams now included in the provisional list are used by fish during fall. There is a group of "borderline" streams for which data are considered inadequate to confidently classify their utilization by fish in fall. There are to date 164 such crossings. It is probable that the majority of these streams have a low fisheries potential in fall because of thier small size (drainage basins are usually less than five square miles).

General Results of Fall Survey

Fisheries surveys were conducted along the proposed pipeline route 04-29 September. During these surveys, waterbodies (some with multiple crossings) including side channels of major rivers, ponds, streams, sloughs and springs were investigated. In all, 99 crossings were examined.

Eleven species of fish were collected in 34 waterbodies:

Arctic Char *(Salvelinus alpinus)*
Arctic grayling *(Thymallus arcticus)*
Broad whitefish *(Coregonus nasus)*
Round whitefish *(Prosopium cylindraceum)*
Burbot *(Lota lota)*
Longnose sucker *(Catostomus catostomus)*
Lake chub *(Couesius plumbeus)*
Slimy sculpin *(Cottus cognatus)*
Chum salmon *(Oncorhynchus keta)*
Ninespine stickleback *(Pungitius pungitius)*
Dolly Varden *(Salvelinus malma)*

The species caught and their use of streams along the proposed pipeline route are summarized in Table 2 and presented in detail in the Stream Catalogue. Fish were captured at 33 of the 99 sites investigated. Grayling were the most frequently occurring species and were present at 25 sites. Twelve crossings were used by slimy sculpin, the second most frequently encountered fish species during the fall survey. Burbot, broad whitefish and chum salmon were rarely encountered - only once during the fall investigation.

Although good fall habitat was available at 24 crossings, September sampling efforts at those crossings suggest that fish use was low to non-existent. Available information indicates that downstream migration of grayling in streams along the pipeline corridor begins as early as 1 August and can continue as late as 5 October. Present information indicates that heaviest emigration occurs between late August and early September (Refs. 21, 34, 84, 101 and 106). It is therefore possible that fall downstream migration had occurred in some streams prior to the present survey period (04-29 September). This could account for the absence of fish in streams that provided good habitat during the survey.

The 34 crossings found to support fish populations during fall were used for feeding (rearing), migrating and/or spawning by one or more of the above mentioned species. Waterbodies utilized for spawning were identified by the presence of pre-spawning or ripe adults or spawned out fish. Fall spawning species (whitefish, char and salmon), although common in the study area, were found at only 11 crossings surveyed during fall. Documentation of spawning was found only at Slate Creek, as evidenced by carcasses of spawned out chum salmon along the bank. The majority of streams surveyed in the fall of 1980 were small and would probably freeze to the bottom in winter and incubating eggs of fall spawners would not survive in such environments. Movements probably varied from minor dispersal to major upstream and/or downstream migration to overwintering areas. Data regarding the magnitude, timing and direction of runs are difficult to obtain without extensive monitoring beyond the scope of this program.

Thirty-one waterbodies were found to have potential barriers to fall fish movement in the proposed pipeline area. Barriers, both natural (log jams, beaver dams, waterfall and dry areas) and artificial (highway culverts and low water crossings) varied greatly in permanancy and effectiveness. Detailed descriptions of fish barriers can be found in the appropriate stream assessments.

No fish were captured at or near 66 waterbody crossings surveyed during fall. Using the following guidelines, habitat was considered to be good at 24 of the waterbody crossings, marginal at 36, and absent at 6.

Good fish habitat - generally had an adequate water depth (15-20 cm minimum), measureable flow (at least 0.1-0.3 m^3/sec), and high dissolved oxygen concentration (5 mg/ℓ minimum). These sites were typically characterized by a pH which ranged from 6.5-8.5, adequate cover and no major barriers to fish movement.

Marginal fish habitat - generally had water depths less than 15-20 cm with negligible or intermittent flow. Potential barriers to fish movements were common at these sites.

Fish habitat absent - generally in old high water or runoff channels that were found dry. Typically these areas were overgrown with terrestrial flora indicating lack of water for prolonged periods.

Stream Catalogue

The purpose of the following stream catalogue is to provide ready access to fisheries data available for waterbodies examined during the fall survey (04-29 September 1980). For each stream entered in this catalogue, the following information is provided:

Waterbody	-	Location of waterbody, section surveyed and applicable identification numbers.
Assessment	-	A brief description of the waterbody and assessment of its potential for fish in fall.
Fish	-	Description and results of fish sampling efforts.
Physical Conditions	-	Description and results of chemical and physical measurements.

Several reference systems have been used to identify the location of each waterbody along the pipeline route:

NPRX	-	The Northwest Alaskan Pipeline River and Floodplain Crossing numbering system.
NPSI	-	The Northwest Alaskan Pipeline Stream Identification (NPSI) numbering system.
Highway Milepost	-	Highway milepost numbers indicate the point of intersection between the waterbody and the indicated highway.

When these do not intersect, milepost designations refer to the point on the highway which is closest to the sampling location.

Pipeline Milepost - Pipeline mileposts for the Northwest Alaskan Pipeline are indicated on the Fluor 1980 alignment sheet series (Ref. 125).

USGS Map - United States Geological Survey maps are the 1:250,000 scale series. Township, range and section number of specific sampling locations are indicated.

Abbreviations used in the catalogue are listed:

Identification

NPRX	-	Northwest Alaskan Pipeline River and Floodplain Crossing.
NPSI	-	Northwest Alaskan Pipeline Stream Identification number.

Milepost

AHMP	-	Alaska Highway Milepost
NPMP	-	Northwest Alaskan Pipeline Milepost (Ref. 42).

Pipeline

TAPS	-	Trans-Alaskan Pipeline System

Fishing Method

GN	-	Gillnet
SL	-	Setline
EF	-	Electrofish
AN	-	Angling
DN	-	Dipnet

Units

km	-	Kilometer
m	-	Meter
h	-	Hour

Stream Crossings

CMP	-	Corregated metal pipe
LWC	-	Low water crossing

Other

NA	-	Not applicable
P/A	-	Presence/Absence

Abbreviations have been combined to present a simple and concise means of representing sampling gear and fishing effort expended at a specific sampling location. The number of size and type of sampling gear is given first, followed by number of fish captured per effort in parentheses. For example, a 15 m gillnet fished for 20 hours capturing two fish would be presented as follows: 15mGN(2/20h). Effort in parentheses is always given as a cumulative total; effort for electrofishing refers to the time (in seconds) fished.

FALL SURVEY FORM

WATERBODY

Waterbody Tanana River Side Channel Source Tanana Valley Drainage

Main Drainage Yukon River Tributary to Tanana River

Figure 4 Gradient 0.4% Elevation 305 m

NPAS 95 NPMP 538.7 NPRX 095-1 AHMP NA

USGS Map Reference Big Delta, AK T 8S R 10E Sec. 32

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

The Tanana River Side Channel is located on the northwest side of the Tanana River. It is very similar to the main channel. Banks vary from gently sloping sand and silt to 2-3 m high actively eroding silt banks. The channel is well defined and the wide (15-20 m) turbid stream is slow-moving. Stream depths range to 2 m and may provide adequate overwintering habitat. During the fall 1980 investigation, one potential overwintering area was appropriately marked for future surveys. Riparian vegetation consists of willow, alder, birch, spruce, and grasses and substrate is fines, silt and mud.

The Tanana River and its side channels are important to many species of fish during the fall. Results of seining efforts during the fall 1980 survey indicate that this side channel is a fall rearing area for broad whitefish, lake chub, longnose sucker and round whitefish. Chum salmon in spawning condition and grayling have been documented in similar wide channels to the Tanana River during fall and winter (Refs. 55, 57 and 77). Since lake chubs are known to spawn in silty areas, the side channel may represent a potential spawning area for the species.

FISH

Date 22 September 1980

Fish Present Yes

Gear/Effort 5 m seine (47/200 m); shoreline, EF (0/150 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Broad whitefish	1		108	
Lake chub	1	2	38	60-113
Longnose sucker	41	1	33-71	85
Round whitefish	1		73	

PHYSICAL CONDITIONS

Date	22 September 1980
Wetted Width (m)	15-20
Depth (cm)	5-100
Discharge (m^3/s)	0.44
Dissolved Oxygen (mg/1)	15
Temperature (^oC)	3.5
Conductivity (umhos/cm)	118
pH (pH units)	8.8
Color (color units)	*
Turbidity (NTU)	80
T. Hardness (mg $CaCO_3$/1)	*
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/fines
Bank Stability (%)	75
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	10 grass, 50 willow/alder, 20 birch, 20 spruce
Cover (%)	1
Fish Block(s)	None observed

* Sample too turbid to obtain results by methods employed.

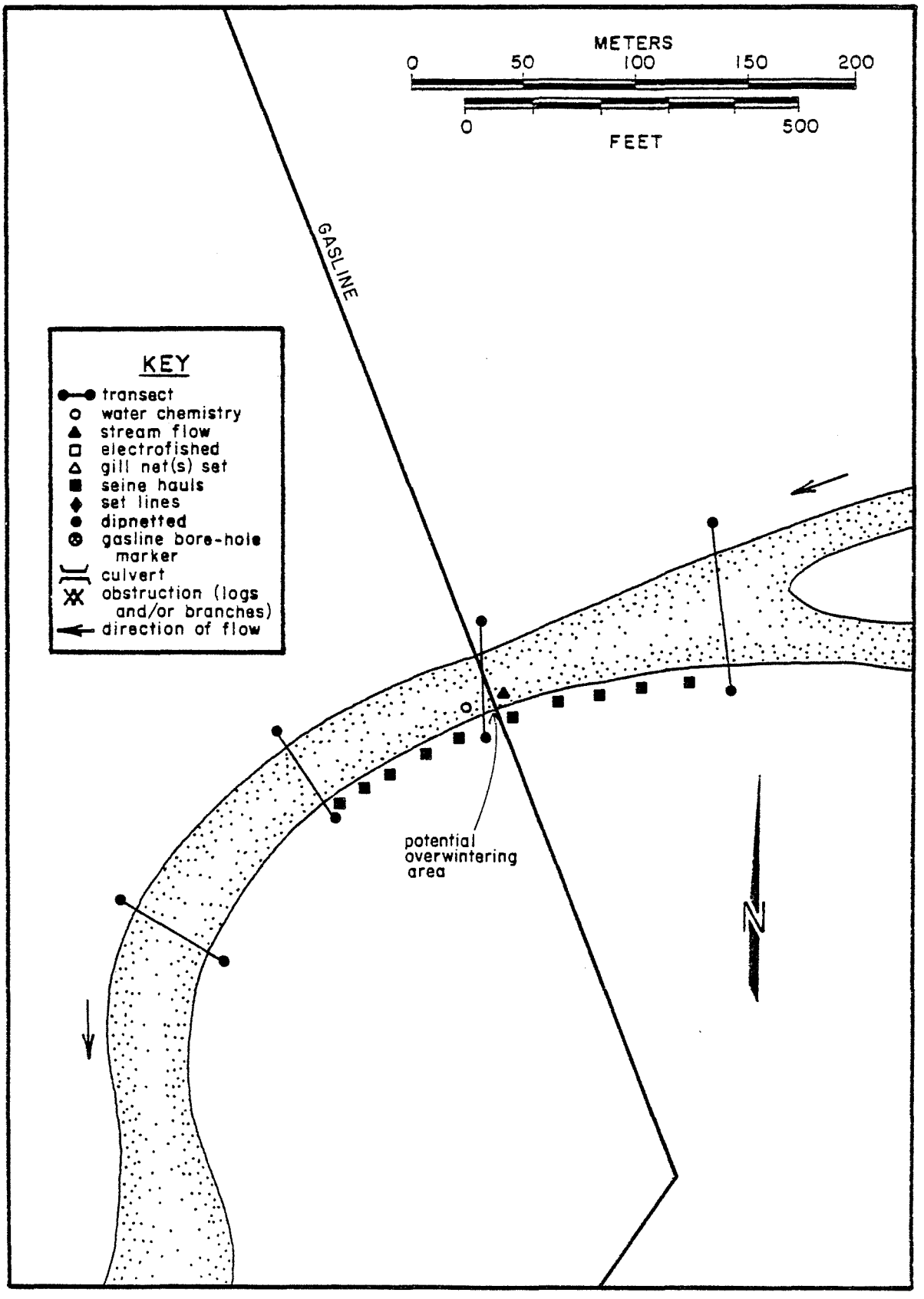

Fig. 4. Fall survey. Tanana River Side Channel, 22 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Lower Rosa Creek Source Taiga Drainage

Main Drainage Tanana River Tributary to Shaw Creek

Figure 5 Gradient 1.0% Elevation 277 m

NPAS 93 NPMP 526.4 NPRX 093-1 AHMP NA

USGS Map Reference Big Delta, AK T 7S R 8E Sec. 26

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Lower Rosa Creek is a narrow (0.3-2.0 m), humic-stained tributary to Shaw Creek. In the vicinity of the proposed pipeline crossing the slow-flowing water meanders southeasterly in a series of pools and deep channels through wetlands and forest. Riparian vegetation consists of willow, birch and spruce, and stream substrate is mud. Erosion has caused trees along the steep banks to slough into and over the channel.

At the proposed pipeline crossing fish use of Lower Rosa Creek, during fall, is low to non-existent. Although adequate water depth' (53-62 cm), flow and good cover was available in this stream, sampling efforts in September 1980 did not yield fish and none were visually observed. Grayling fry and juveniles and whitefish have been reported downstream of the proposed crossing during spring (Ref. 11). Approximately 2 km upstream of the proposed crossing Rosa Creek is intermittent and poorly defined during the fall period, thus, providing poor fish habitat (Ref. 57). No barriers to fish movement were observed during fall 1980 surveys and it is suspected that fish occasionally use Lower Rosa Creek.

FISH

Date 22 September 1980

Fish Present No

Gear/Effort EF (0/525 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	22 September 1980
Wetted Width (m)	0.3-2
Depth (cm)	53-62
Discharge (m^3/s)	0.17
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	1.5
Conductivity (umhos/cm)	85
pH (pH units)	7.1
Color (color units)	100
Turbidity (NTU)	4.1
T. Hardness (mg $CaCO_3$/1)	86
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud
Bank Stability (%)	80
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	50 willow, 30 birch, 20 spruce
Cover (%)	15
Fish Block(s)	None observed

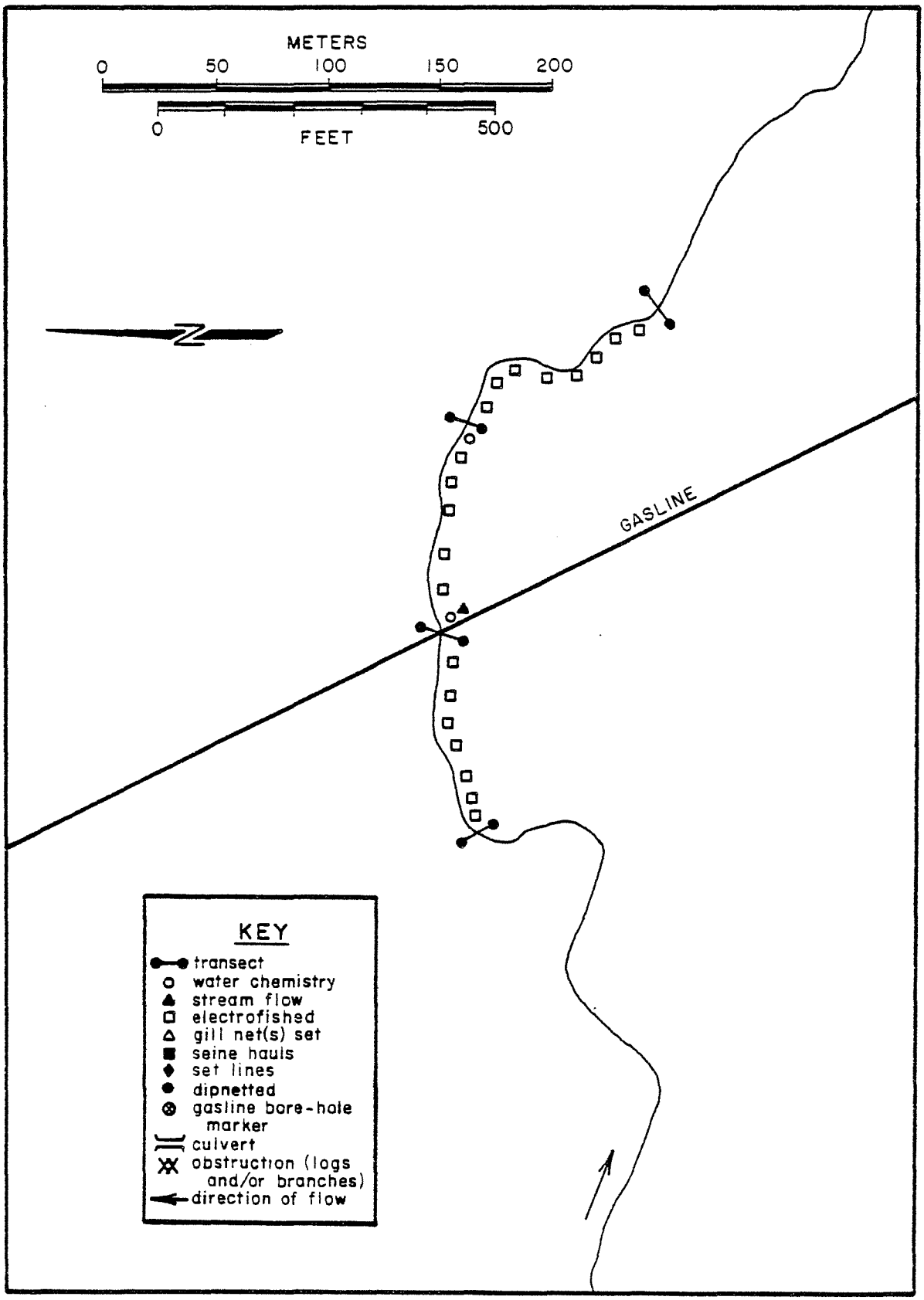

Fig. 5. Fall survey. Lower Rosa Creek, 22 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Muskeg Drainage

Main Drainage Moose Creek Tributary to French Creek

Figure 6 Gradient 1.0% Elevation 174 m

NPAS 86 NPMP 486.9 NPRX FH-086-2 AHMP NA

USGS Map Reference Fairbanks, AK T 3S R 4E Sec. 17

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek (NPMP 486.9) is the unchannelized upstream portion of Unnamed Creek (NPMP 486.5) (drainage ditch). It drains a muskeg wetland south of the White Mountains and flows northerly in alternating small, shallow pools and narrow, slow-flowing channels. This wet lowland area is overgrown with grasses and willows and bottom type is mud.

This stream provides good fall habitat and serves as a rearing area for grayling fry. Two grayling were captured by electrofishing efforts on 22 September 1980. Grayling were also captured 0.9 km downstream in the channelized drainage ditch (Ref. 122). Downstream fish migration likely occurs in the fall as streams of this small size would undoubtedly freeze solid in winter.

FISH

Date 22 September 1980

Fish Present Yes

Gear/Effort EF (2/600 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling	2		60-74	

PHYSICAL CONDITIONS

Date	22 September 1980
Wetted Width (m)	1-5
Depth (cm)	20-80
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	1
Conductivity (umhos/cm)	35
pH (pH units)	7.9
Color (color units)	85
Turbidity (NTU)	3.2
T. Hardness (mg $CaCO_3$/1)	32
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 grass, 40 willow
Cover (%)	35
Fish Block(s)	None observed

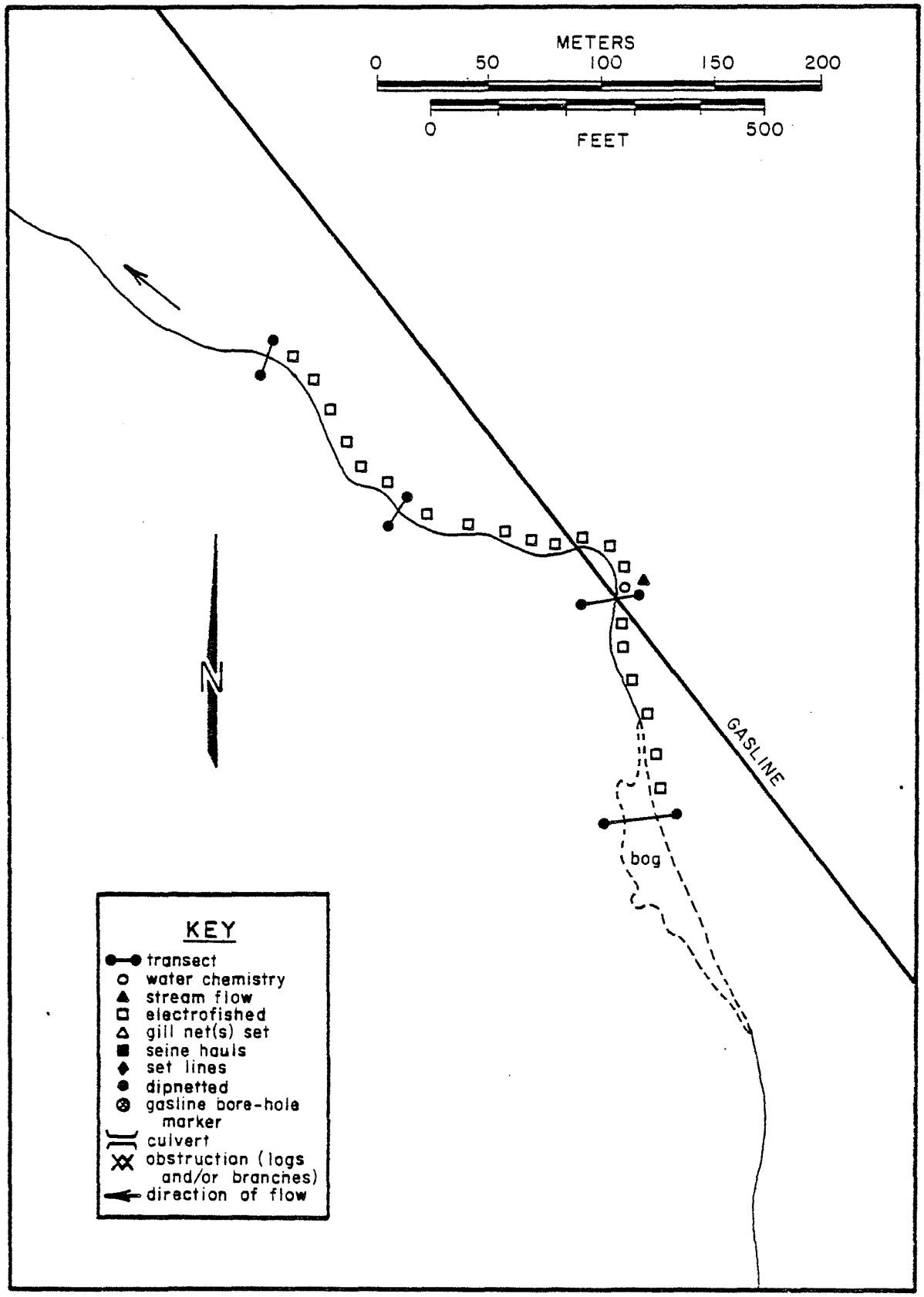

Fig. 6. Fall survey. Unnamed Creek (NPMP 486.9), 22 September 1980. Revision 2 alignment is shown.

FALL SURVEY FORM

WATERBODY

Waterbody Drainage Ditch Source: Muskeg Drainage

Main Drainage Moose Creek Tributary to French Creek

Figure 7 Gradient 1.0% Elevation 174 m

NPAS 86 NPMP 486.5 NPRX FH-086-2 AHMP NA

USGS Map Reference Fairbanks, AK T 3S R 4E Sec. 18

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Drainage Ditch is located downstream 0.9 km of Unnamed Creek crossing (NPMP 486.9). In the vicinity of the proposed pipeline crossing this stream has been channelized to serve as a drainage ditch. It flows north paralleling the Haines Products Pipeline for approximately 200 m then is diverted westward. Channelization of the creek has created uniform depth (22-29 cm) and width (4-5 m). The banks are stable (0.3 m high) and are lined with willow and alder except along the Haines pipeline corridor where little vegetation exists. Stream substrate is gravel, cobble and sand.

In the vicinity of the proposed pipeline crossing, this stream provides excellent fish habitat during fall; it is a rearing area for juvenile grayling. Grayling fry were captured at the present proposed crossing and upstream at NPMP 486.9 (Ref. 122). Drainage Ditch presumably serves as a downstream migration route as streams of this small size freeze solid during winter.

FISH

Date 20 September 1980

Fish Present Yes

Gear/Effort EF (2/764 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling		2		80-138

PHYSICAL CONDITIONS

Date	20 September 1980
Wetted Width (m)	4-5
Depth (cm)	22-29
Discharge (m^3/s)	0.27
Dissolved Oxygen (mg/1)	16
Temperature (^oC)	4
Conductivity (umhos/cm)	95
pH (pH units)	7.4
Color (color units)	95
Turbidity (NTU)	4.1
T. Hardness (mg $CaCO_3$/1)	86
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 sand, 60 gravel, 30 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 willow/alder
Cover (%)	5
Fish Block(s)	None observed

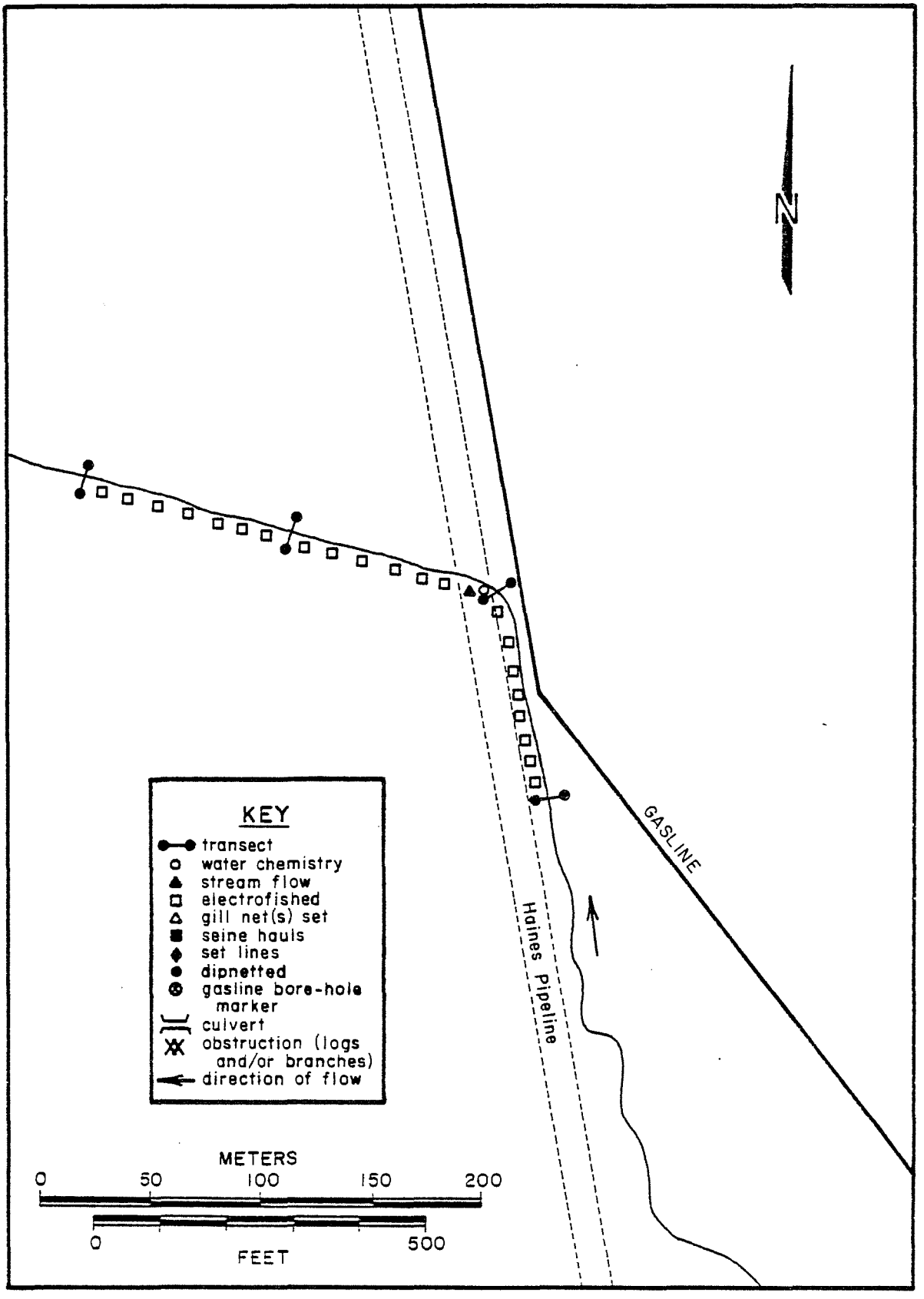

Fig. 7. Fall survey. Drainage Ditch, 20 September 1980. Revision 2 alignment is shown.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Tundra/Taiga Drainage

Main Drainage Moose Creek Tributary to French Creek

Figure 8 Gradient 1.0% Elevation 174 m

NPAS 86 NPMP 485.6 NPRX 086-4 AHMP NA

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

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek drains a low wetland tundra and taiga forest and flows westerly from the proposed pipeline crossing 0.8 km to French Creek. This intermittent stream forms a series of pools and bog areas connected by narrow stream channels clogged with logs and branches, and flow is frequently subterranean. The stream bottom consists of mud and detritus, and willow, alder, spruce, grasses and herbaceous plants vegetate the low banks. Numerous signs of beaver activity were observed in September 1980; however, no dams or lodges were present.

In the vicinity of the proposed pipeline crossing this stream does not provide fall fish habitat due to numerous clogged channels and intermittent or subterranean flow. Fish use of this stream is considered non-existent.

FISH

Date 20 September 1980

Fish Present

Gear/Effort None - intermittent stream with negligible flow

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	20 September 1980
Wetted Width (m)	0-18
Depth (cm)	Unable to measure - deep bog area
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	8.7
Temperature (^oC)	3.5
Conductivity (umhos/cm)	150
pH (pH units)	8.0
Color (color units)	95
Turbidity (NTU)	10.0
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud and detritus
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	50 willow/alder, 10 spruce, 20 grasses, 20 herbaceous plants
Cover (%)	30
Fish Block(s)	Intermittent stream with negligible flow

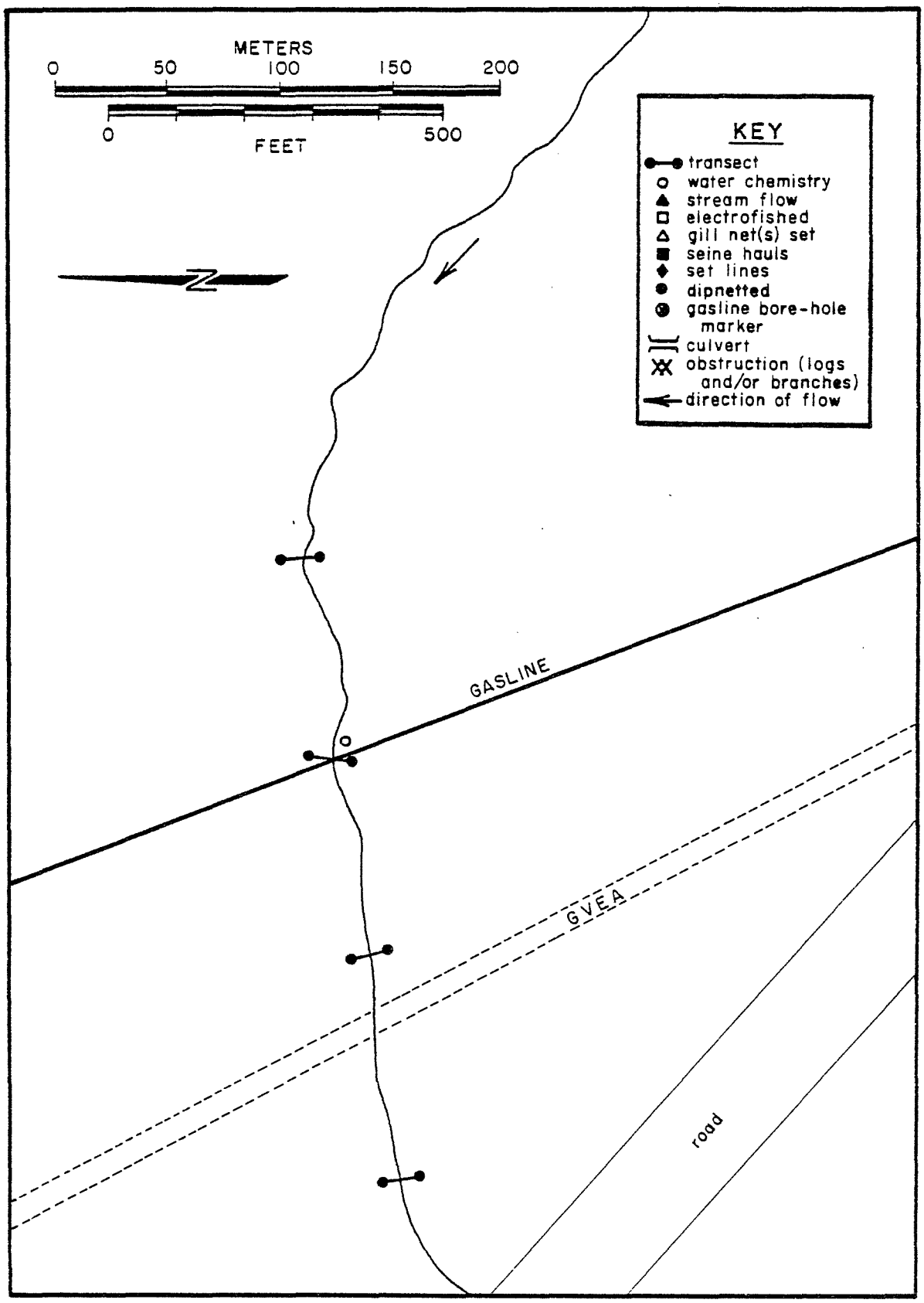

Fig. 8. Fall survey. Unnamed Creek (NPMP 485.7), 20 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Tundra Drainage

Main Drainage Moose Creek Tributary to French Creek

Figure 9 Gradient 1.0% Elevation 174 m

NPAS 86 NPMP 485.1 NPRX 086-3 AHMP NA

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

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of pipeline crossing; aerial surveyed entire length

ASSESSMENT

Unnamed Creek drains a tundra marshland and meanders westerly to its confluence with French Creek. The narrow, shallow (6-30 cm) water course flows in alternating pools (3.0 m wide) and narrow channels (0.5 m). The banks are stable and lined with a dense growth of grass, overhanging alder, birch and spruce. Stream substrate consists of fines and detritus and is somewhat vegetated with emergent grass.

This stream may serve as a limited rearing area for grayling fry and as a migratory route to downstream areas. The shallow nature of the stream would preclude winter fish habitat.

FISH

Date 18 September 1980

Fish Present Yes

Gear/Effort EF (1/552 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling	1		57	

PHYSICAL CONDITIONS

Date	18 September
Wetted Width (m)	0.5-3
Depth (cm)	6-30
Discharge (m^3/s)	0.01
Dissolved Oxygen (mg/1)	10
Temperature (^oC)	4.0
Conductivity (umhos/cm)	135
pH (pH units)	6.4
Color (color units)	90
Turbidity (NTU)	1.3
T. Hardness (mg $CaCO_3$/1)	154
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines/detritus
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	30 grass, 20 alder, 50 birch/spruce
Cover (%)	40
Fish Block(s)	None observed

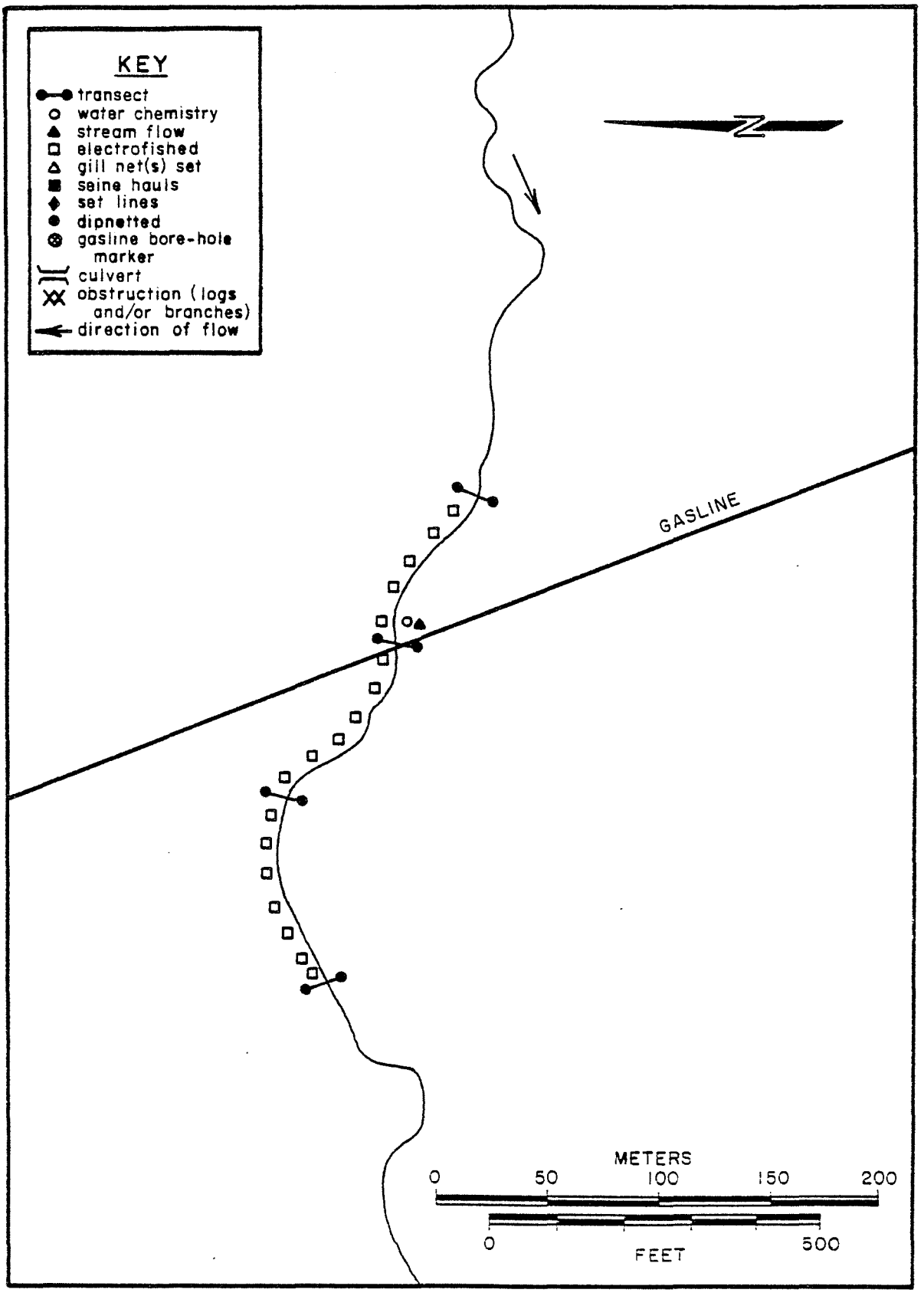

Fig. 9. Fall survey. Unnamed Creek (NPMP 485.1), 18 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Taiga Drainage

Main Drainage Moose Creek Tributary to French Creek

Figure 10 Gradient 1.0% Elevation 183 m

NPAS 86 NPMP 484.7 NPRX 086-2 AHMP NA

USGS Map Reference Fairbanks, AK T 3S R 4E Sec. 6

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek (RX 086-2) is a small stream that meanders through and drains a low wetland and taiga forest area. Stream flow in September 1980 was intermittent and in some areas subterranean. Riparian vegetation consists of grasses but some woody plants such as willow, alder, birch and spruce grow near the creek banks. Log debris clogs the channel and a 1 m drop exists at the confluence with French Creek.

In the vicinity of the proposed pipeline crossing, Unnamed Creek provides poor habitat for fish and fish use is nonexistent. Lack of surface flow, log debris and 1 m drop at French Creek confluence create numerous fish blocks that would be a barrier to fish movement even during periods of high runoff.

FISH

Date 20 September 1980

Fish Present

Gear/Effort None - intermittent and subterranean flow

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	20 September 1980
Wetted Width (m)	0.1-4.9
Depth (cm)	0-100
Discharge (m^3/s)	Negligible
Dissolved Oxygen (mg/1)	10
Temperature (^oC)	2.0
Conductivity (umhos/cm)	62
pH (pH units)	5.7
Color (color units)	100
Turbidity (NTU)	13
T. Hardness (mg $CaCO_3$/1)	51
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud
Bank Stability (%)	Undefined bank
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	75 grass, 20 willow/alder, 3 birch, 2 spruce
Cover (%)	50
Fish Block(s)	Log debris in streambed; stream intermittent and subterranean downstream of crossing; 1 m drop at confluence with French Creek.

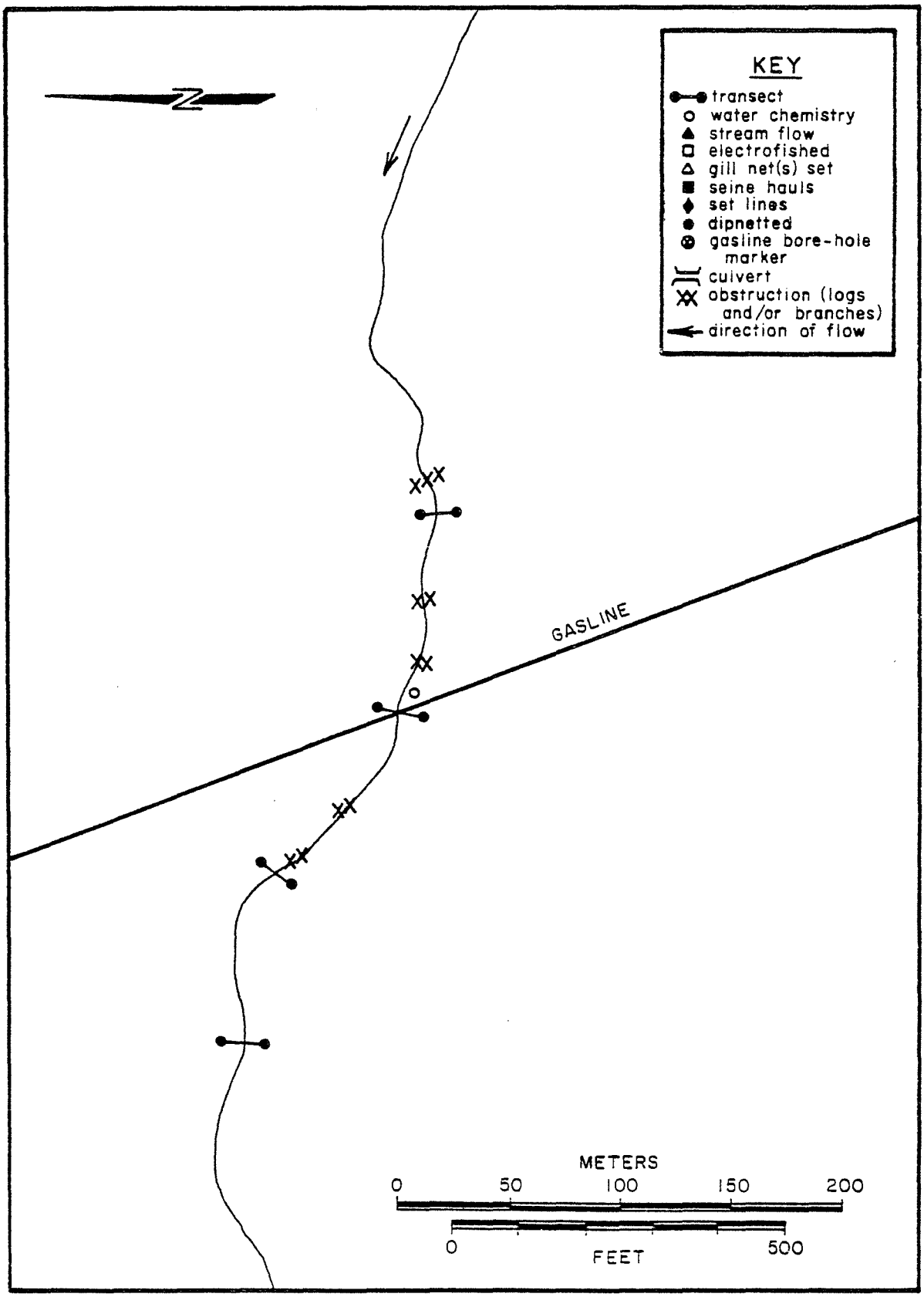

Fig. 10. Fall survey. Unnamed Creek (NPMP 484.7), 20 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Moose Creek #0 Source Muskeg/Taiga Drainage

Main Drainage Tanana River Tributary to Piledriver Slough

Figure 11 Gradient 0.01% Elevation 171 m

NPAS 85 NPMP 482.0 NPRX 085-1 AHMP NA

USGS Map Reference Fairbanks, AK T 2S R 3E Sec. 25

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Moose Creek is a moderately sized (3.2-4.2 m wide), deep (25-150 cm), meandering stream that drains a low-lying tundra/muskeg area east of Eielson Air Force Base and flows 7.2 km to Piledriver Slough. In the vicinity of the proposed pipeline crossing the well-defined stream channel is confined by high banks (1.5-3.0 m) vegetated with willow, alder, spruce, birch and grasses. Channel substrate is mud, sand and fines littered with deadfall slumped from stream banks.

During September 1980 Moose Creek provided excellent rearing habitat for grayling and slimy sculpin. Longnose sucker, round whitefish, humpback whitefish and burbot documented in the lower reaches of this stream during the open water period (Refs. 11, 30, 54 and 57) and northern pike and burbot documented during winter surveys (Ref. 77) may also utilize the present crossing. This area should be considered important to fall downstream migration since water depths of less than 2 m indicate that this portion of Moose Creek would freeze solid in winter.

FISH

Date 20 September 1980

Fish Present Yes

Gear/Effort EF (3/1361 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Slimy Sculpin		2		75
Grayling		1		150

PHYSICAL CONDITIONS

Date	20 September 1980
Wetted Width (m)	3.2-4.2
Depth (cm)	25-150
Discharge (m^3/s)	0.45
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	2.5
Conductivity (umhos/cm)	45
pH (pH units)	7.5
Color (color units)	40
Turbidity (NTU)	4.8
T. Hardness (mg $CaCO_3$/1)	68
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 mud, 40 fines, 50 sand
Bank Stability (%)	70
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	55 grasses, 30 willow/alder, 10 birch, 5 spruce
Cover (%)	2
Fish Block(s)	None observed

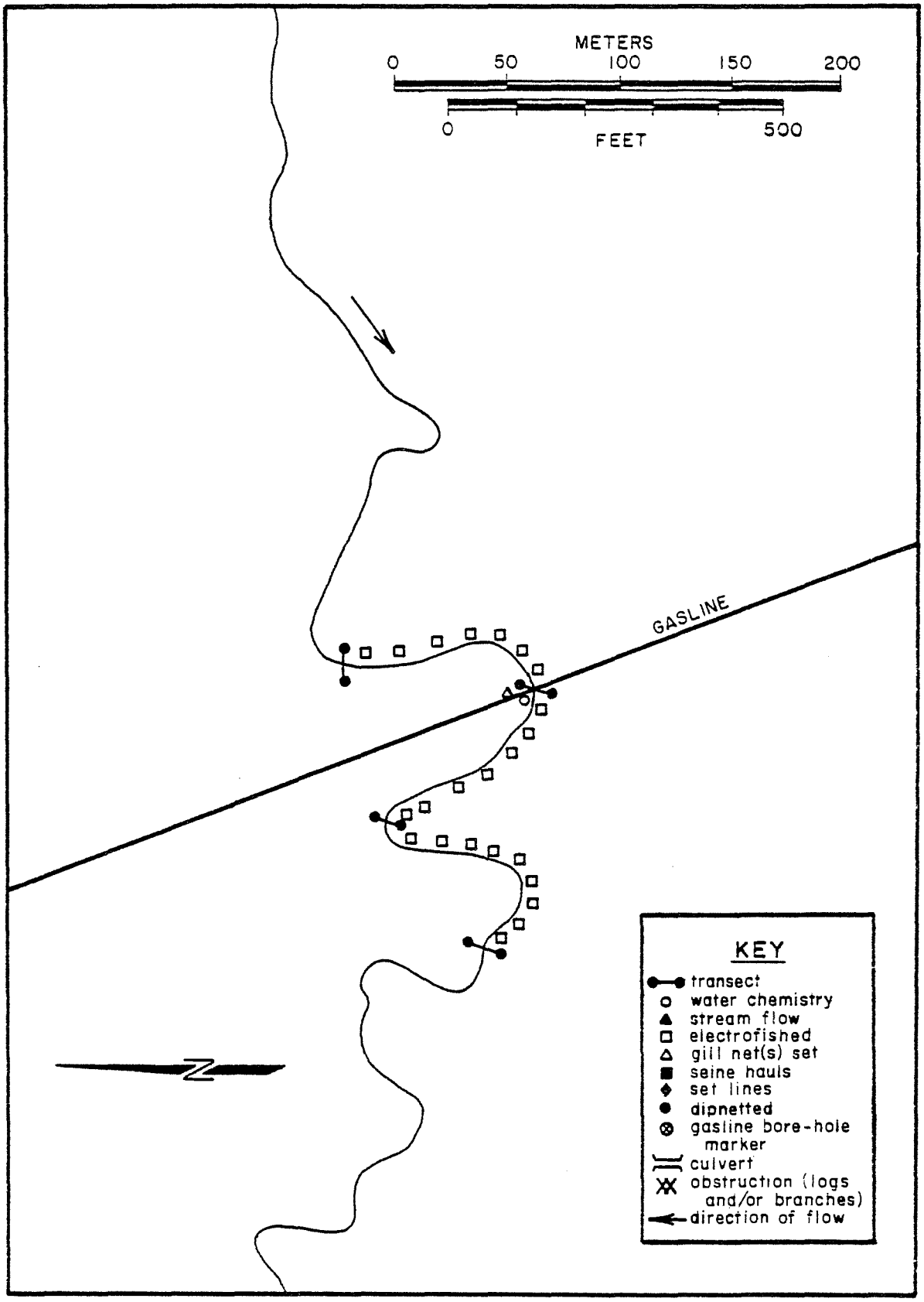

Fig. 11. Fall survey. Moose Creek, 20 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Chena River Side Channel Source Chena River Valley Drainage

Main Drainage Yukon River Tributary to Chena River

Figure 12 Gradient 0.03% Elevation 168 m

NPAS 84 NPMP 475.8 NPRX 084-3 AHMP NA

USGS Map Reference Fairbanks, AK T 1S R 3E Sec. 27

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing; aerial survey to confluence with Chena River

ASSESSMENT

The proposed crossing of this Chena River Side Channel is located approximately 1.8 km east of the Chena Lakes Flood Control Project. The wide stream (~ 12-15 meters) is confined by stable banks vegetated with grass, birch and herbaceous plants. Stream substrate consists of fines and detritus and aquatic vegetation is present. Beaver dams are located upstream and downstream of the proposed crossing. Water depths in many areas of this stream reach 2 m. As a result of the dams, fish migration into the area is blocked.

Electrofishing efforts during the fall 1980 survey did not locate any fish. In view of the poor access created by the fish blocks, this side channel does not provide suitable fish habitat at any time of the year.

FISH

Date 23 September 1980

Fish Present No

Gear/Effort EF (0/235 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	23 September 1980
Wetted Width (m)	~12-15
Depth (cm)	50-200
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	10
Temperature (^oC)	2
Conductivity (umhos/cm)	40
pH (pH units)	8.2
Color (color units)	50
Turbidity (NTU)	9.2
T. Hardness (mg $CaCO_3$/1)	11
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines/detritus
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 grass, 10 herbaceous plants, 30 birch
Cover (%)	3
Fish Block(s)	Beaver dam ~2 m upstream of crossing would prevent upstream fish movement; aerial surveys indicate beaver dams downstream and at least 2 locations with poorly defined or dry channels.

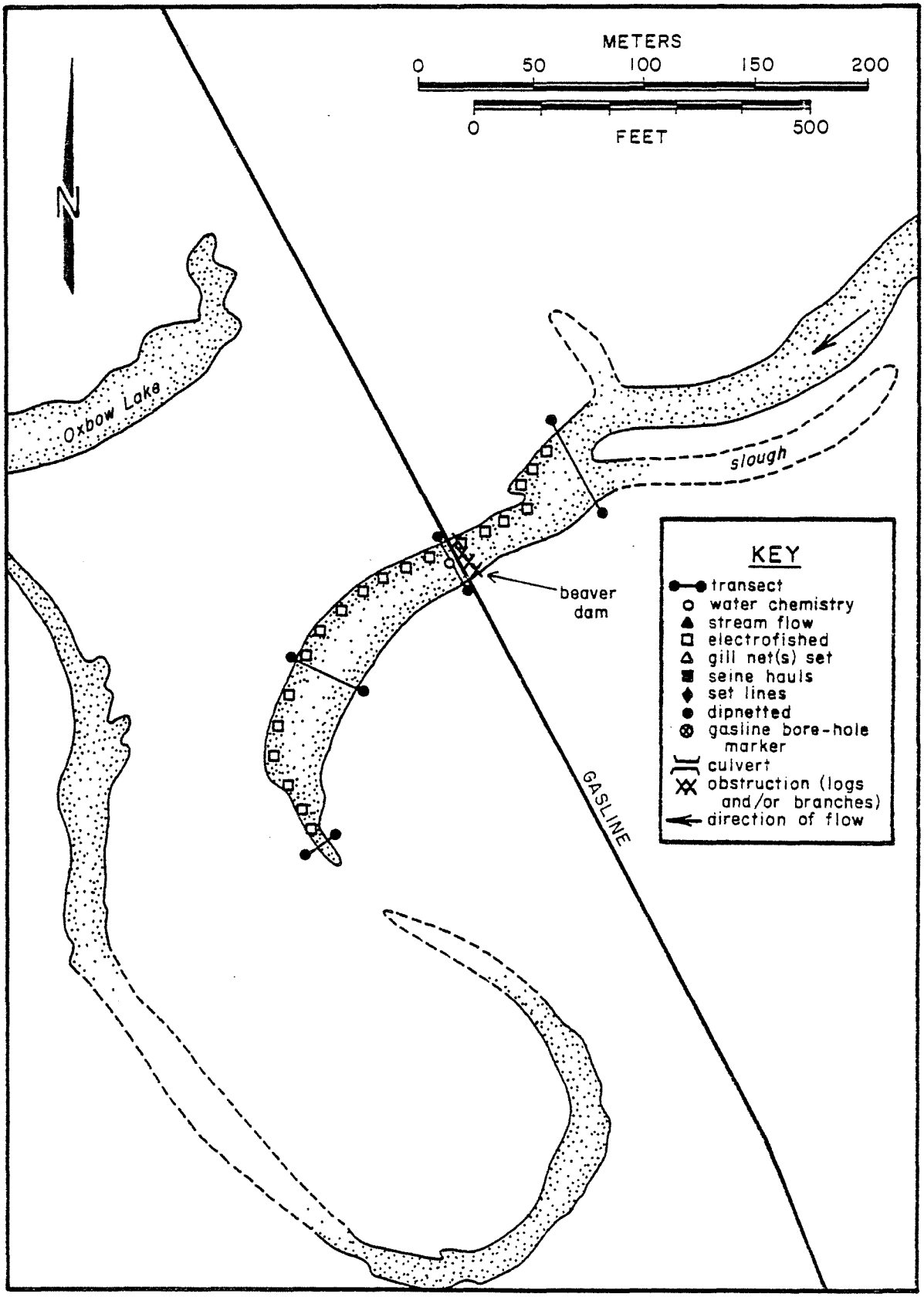

Fig. 12. Fall survey. Chena River Side Channel, 23 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Potlatch Creek Source Muskeg/Taiga Drainage

Main Drainage Tanana River Tributary to Chena River

Figure 13 Gradient 0.4% Elevation 168 m

NPAS 83 NPMP 472.7 NPRX 083-5 AHMP NA

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

Site Access Helicopter

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

NPRX 083-5; EMG probably in error, should be 083-6.

ASSESSMENT

Potlatch Creek drains a tundra/muskeg area south of the White Mountains and flows from the proposed gas line crossing 5.8 km to the Chena River. Surrounding riparian vegetation consists of spruce, alder and birch. Numerous beaver dams have been constructed up and downstream of the proposed pipeline crossing resulting in a series of deep, humic-stained pools, Bottom type consists of soil and detritus. Numerous aquatic plants line the margin of this stream.

The beaver dams in Potlatch Creek appear to be major barriers to fish movement in the vicinity of the proposed crossing. Electrofishing efforts in deep pools and shallow areas yielded no fish during the fall 1980 survey; therefore, fish use of Potlatch Creek is considered to be non-existent.

FISH

Date 18 September 1980

Fish Present None

Gear/Effort EF (0/149 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	18 September 1980
Wetted Width (m)	0.75 - 7
Depth (cm)	30-100
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	5.7
Temperature (^oC)	6.5
Conductivity (umhos/cm)	65
pH (pH units)	7.5
Color (color units)	250
Turbidity (NTU)	4.8
T. Hardness (mg $CaCO_3$/1)	85
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil and detritus
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	50 spruce, 30 alder, 20 birch
Cover (%)	10
Fish Block(s)	Beaver dams ≈ 100 m upstream and 15 m downstream of proposed crossing

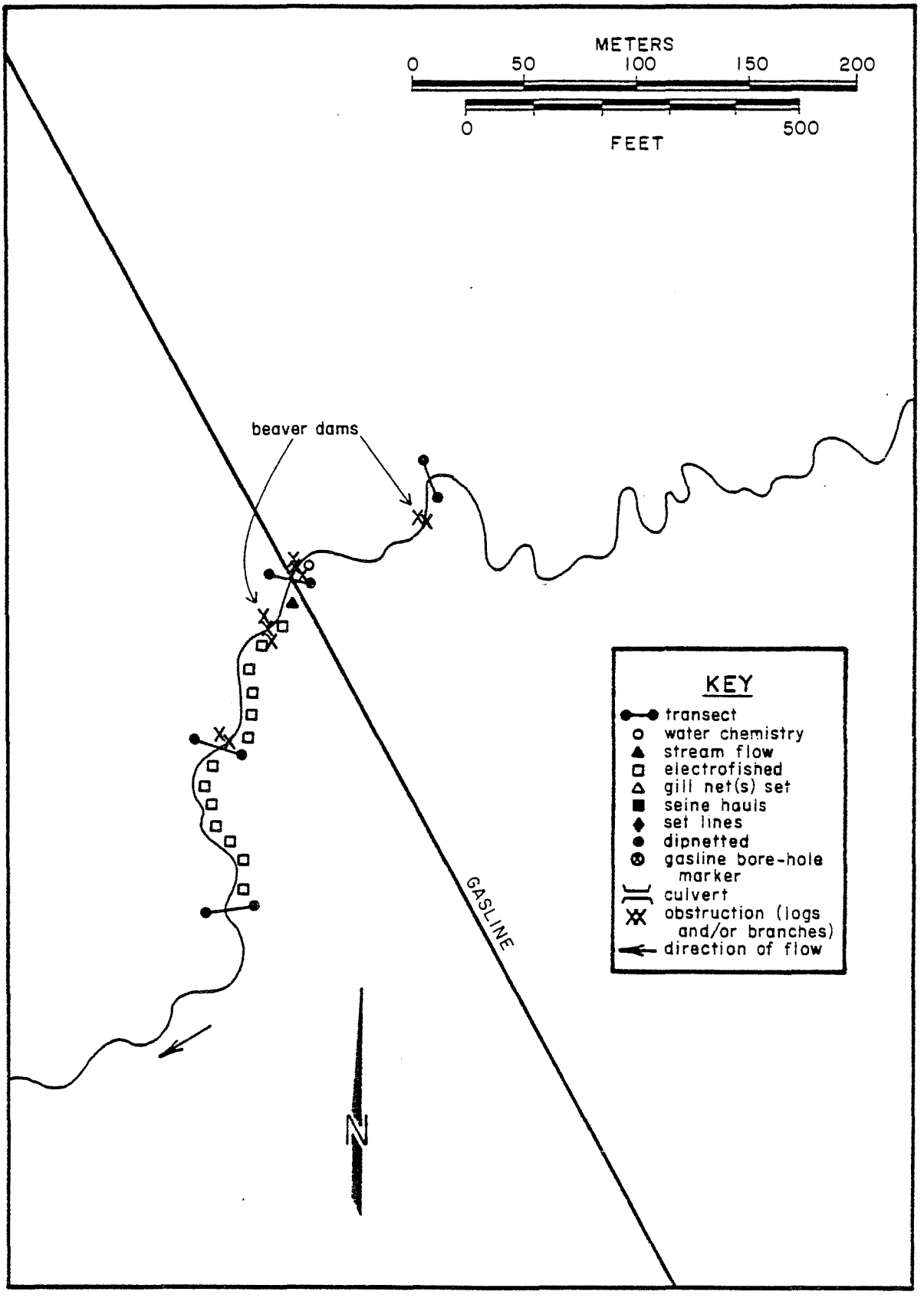

Fig. 13. Fall survey. Potlatch Creek, 18 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Tributary to the Little Chena River #1 Source Muskeg Drainage

Main Drainage Chena River Tributary to Little Chena River

Figure 14 Gradient 0.5% Elevation 153 m

NPAS 83 NPMP 469.9 NPRX 083-4 AHMP NA

USGS Map Reference Fairbanks, AK T 1N R 3E Sec. 31

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

NPRX 083-5 is probably correct.

ASSESSMENT

Tributary to Little Chena River #1 is an intermittent stream that drains a small lake north of the proposed pipeline crossing. The clear, humic-stained waters flow through an undefined channel bordered by tall grass and alder to the Little Chena River. Aquatic vegetation consists of water lillies and emergent grasses, and substrate is sand and fines. Beaver activity has resulted in active and abandoned dams up and downstream of the proposed pipeline crossing.

Due to its intermittent nature, the presence of beaver dams and low dissolved oxygen levels (2.5 mg/l) this stream does not provide suitable fish habitat and it is unlikely that fish use this stream during any time of year.

FISH

Date 19 September 1980

Fish Present

Gear/Effort None - barriers up and downstream of crossing

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	19 September 1980
Wetted Width (m)	0-6
Depth (cm)	100-300
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	2.5
Temperature (^oC)	6.0
Conductivity (umhos/cm)	110
pH (pH units)	6.1
Color (color units)	325
Turbidity (NTU)	10
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	Not visible from surface; sample of sand/fines taken
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	50 grass, 50 alder
Cover (%)	20
Fish Block(s)	Beaver dams up and downstream of proposed crossing; intermittent channel becomes undefined downstream

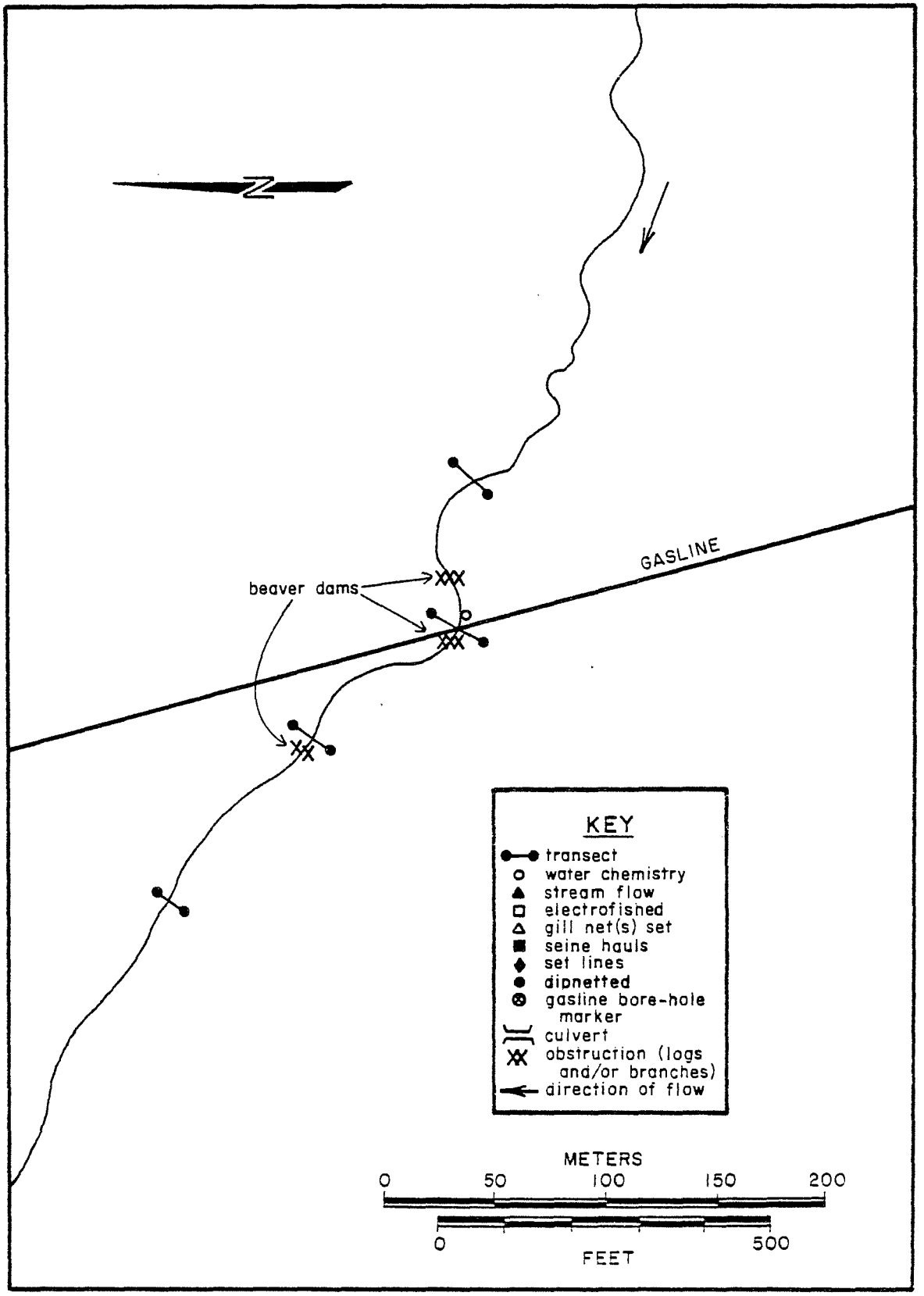

Fig. 14. Fall survey. Tributary to Little Chena River #1, 19 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Little Chena River Source Montane Drainage

Main Drainage Tanana River Tributary to Chena River

Figure 15 Gradient 0.5% Elevation 158 m

NPAS 83 NPMP 468.9 NPRX 083-3 AHMP NA

USGS Map Reference Fairbanks, Alaska T 1N R 3E Sec. 30

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

The Little Chena River is a moderately large, meandering stream that flows west from the White Mountains, draining many small clear-water tributaries. The proposed pipeline crossing occurs 23 km east of Fairbanks. In this area the Little Chena River is 12-14 m wide and an estimated 1.5-2.5 m deep. Its very turbid waters are contined by steep banks (~ 3 m) vegetated with willow, alder, grass and herbaceous plants. Stream substrate consists of mud.

Although no fish were captured or observed during the September 1980 surveys, the Little Chena River is presumably a fall migration route for fish movement from clearwater tributaries to wintering areas and likely provides fall rearing area for fish. Limited data are available concerning fish use of this river.

FISH

Date 18 September 1980

Fish Present No

Gear/Effort GN (0/24h), SL (0/24h)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	18 September 1980
Wetted Width (m)	~12-14
Depth (cm)	~150-250
Discharge (m^3/s)	5.98 (Ref 58)
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	3.5
Conductivity (umhos/cm)	75
pH (pH units)	6.2
Color (color units)	*
Turbidity (NTU)	78
T. Hardness (mg $CaCO_3$/1)	*
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	15 grass, 10 herbaceous plants, 75 willow alder
Cover (%)	1
Fish Block(s)	None observed

* High turbidity precluded measurement by methods employed.

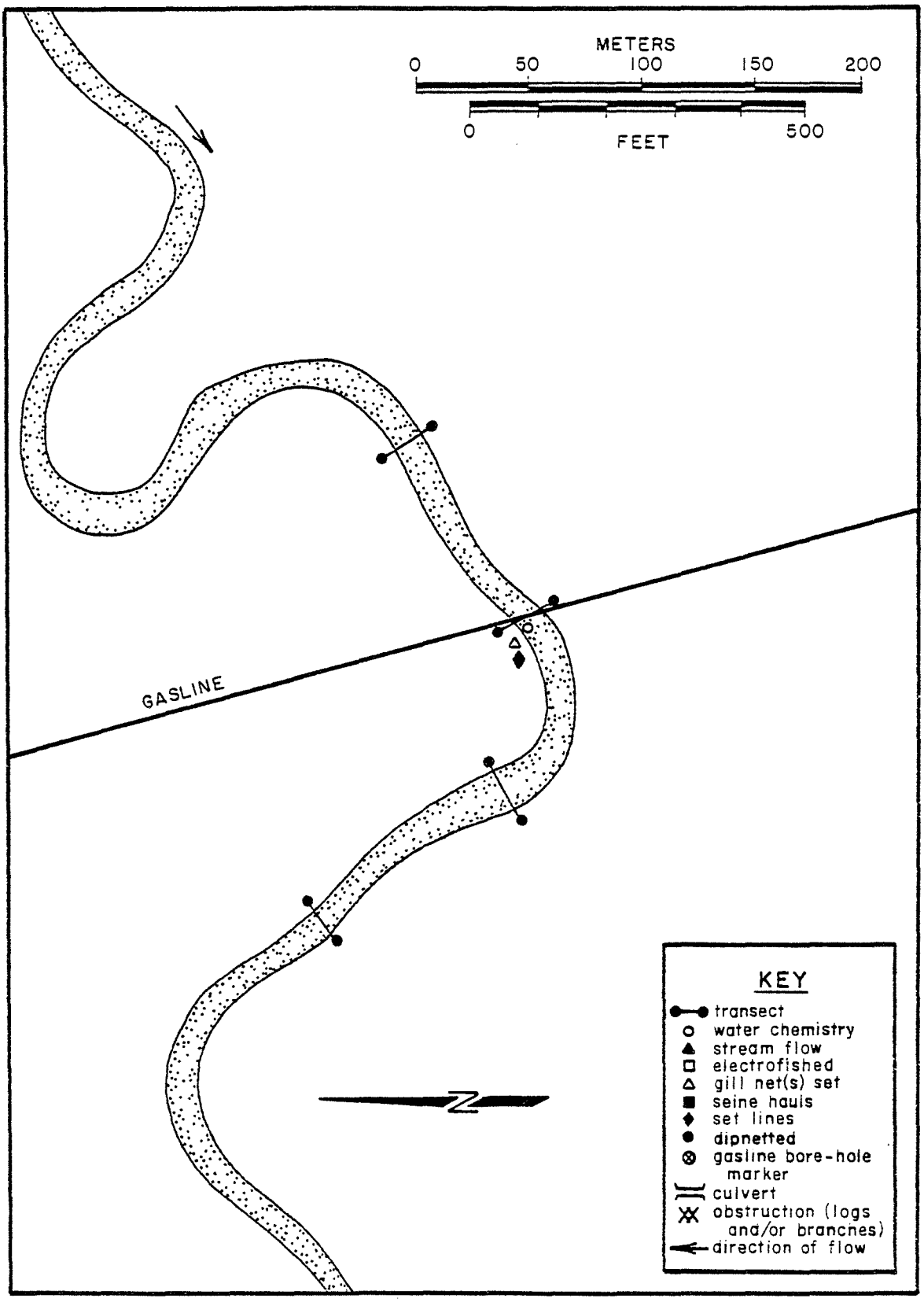

Fig. 15. Fall survey. Little Chena River, 18-19 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Iowa Creek Source Tundra/Muskeg Drainage

Main Drainage Chena River Tributary to Little Chena River

Figure 16 Gradient 0.3% Elevation 152 m

NPAS 83 NPMP 468.3 NPRX 083-2 AHMP NA

USGS Map Reference Fairbanks, Alaska T 1N R 2E Sec. 24

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed gasline crossing

ASSESSMENT

Iowa Creek is a moderate sized (3.5-12 m), fast-flowing stream that drains a tundra/muskeg area south of the White Mountains. From the proposed pipeline crossing this stream flows southwesterly 0.5 km to the Little Chena River. Several deep pools (1-2 m deep) were observed in the study area during the fall 1980 survey. Riparian vegetation consists of overhanging willow, alder, birch and spruce. Numerous logs litter the stream channel and provide good cover (~ 30%). A beaver dam is present at the crossing and fish were caught both upstream and downstream of the dam.

Iowa Creek provides excellent fall habitat and is a rearing area for young-of-the-year and juvenile grayling and adult slimy sculpin. The presence of young-of-the-year grayling suggests that this stream may be a grayling spawning area as well. During this investigation two potential overwintering areas were located 30 m and 60 m upstream of the proposed crossing. No additional information concerning fish use of Iowa Creek is available at this time.

FISH

Date 19 September 1980

Fish Present Yes

Gear/Effort EF (3/387)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Slimy Sculpin		1		111
Grayling	1	1	74	100

PHYSICAL CONDITIONS

Date	19 September 1980
Wetted Width (m)	3.5-12
Depth (cm)	12-76
Discharge (m^3/s)	0.45
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	2.5
Conductivity (umhos/cm)	30
pH (pH units)	7.3
Color (color units)	150
Turbidity (NTU)	6.8
T. Hardness (mg $CaCO_3$/1)	68
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	60 fines, 40 detritus
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 willow/alder, 30 spruce, 10 birch
Cover (%)	30
Fish Block(s)	None observed

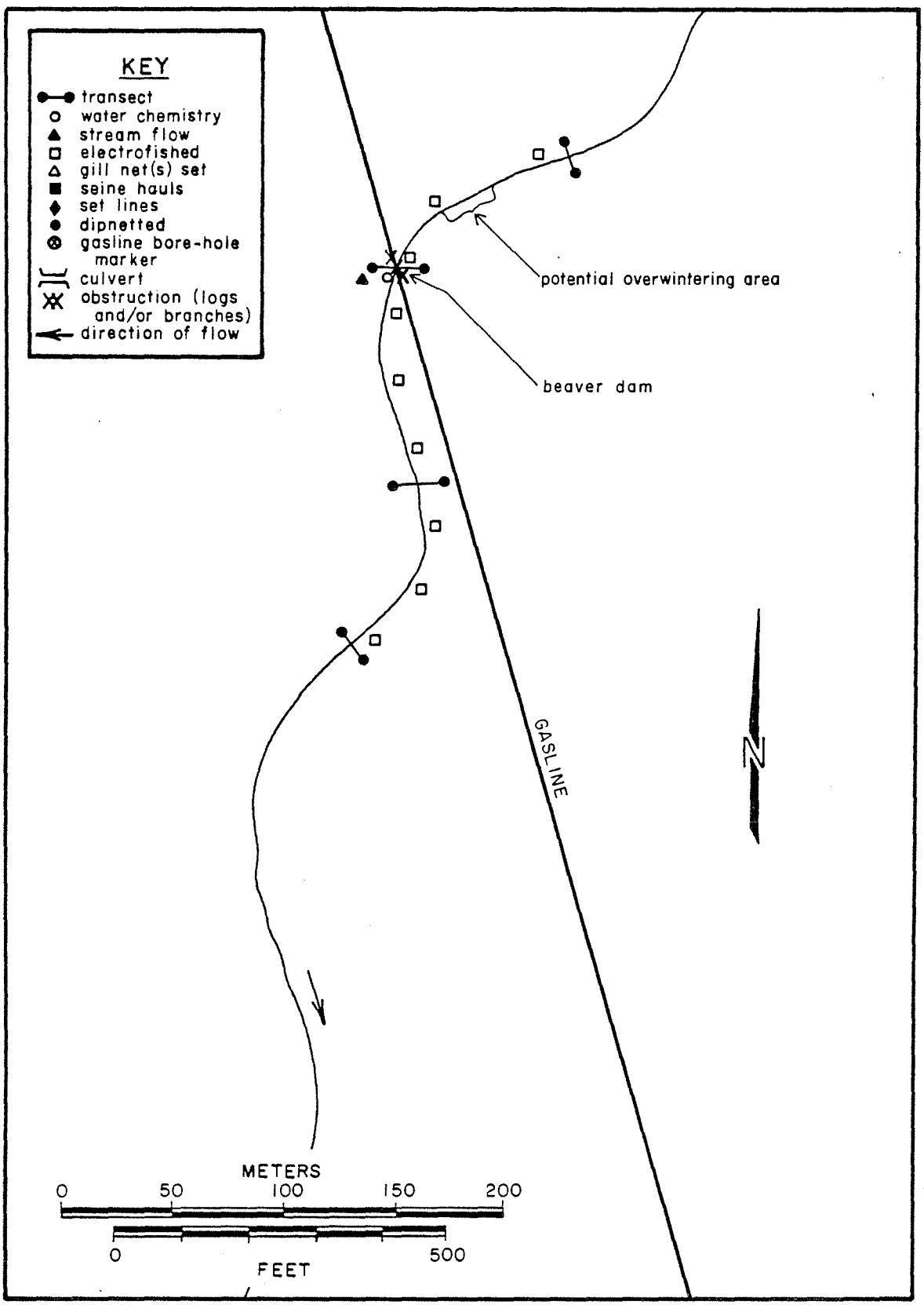

Fig. 16. Fall survey. Iowa Creek, 19 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Tributary to Smallwood Creek #2 Source Muskeg/Taiga Drainage

Main Drainage Chena River Tributary to Little Chena River

Figure 17 Gradient 1.8% Eelvation 197 m

NPAS 82 NPMP 465.9 NPRX 082-2 AHMP NA

USGS Map Reference Fairbanks, AK T 1N R 1E Sec. 14

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Tributary to Smallwood Creek is a narrow (0.3-1.5 m wide), humic-stained stream that drains an area south of the White Mountains. It flows southerly to the Little Chena River through a well defined channel lined with a dense growth of overhanging willow and alder. Stream substrate consists of mud and detritus.

During the fall adequate water depth (15-80 cm), cover (40%), and discharge (0.02 m^2/sec) provided suitable fish habitat. However, electrofishing efforts indicate that fish use of this stream was low to non-existent at this time. No additional information concerning fish use of this stream is available at this time.

FISH

Date 18 September 1980

Fish Present No

Gear/Effort EF (0/226 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	18 September 1980
Wetted Width (m)	0.3-1.5
Depth (cm)	15-80
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	8.6
Temperature (^oC)	2.0
Conductivity (umhos/cm)	30
pH (pH units)	6.1
Color (color units)	190
Turbidity (NTU)	1.4
T. Hardness (mg $CaCO_3$/1)	68
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	80 detritus, 20 sand/mud
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	85 alder, 15 willow
Cover (%)	40
Fish Block(s)	None observed

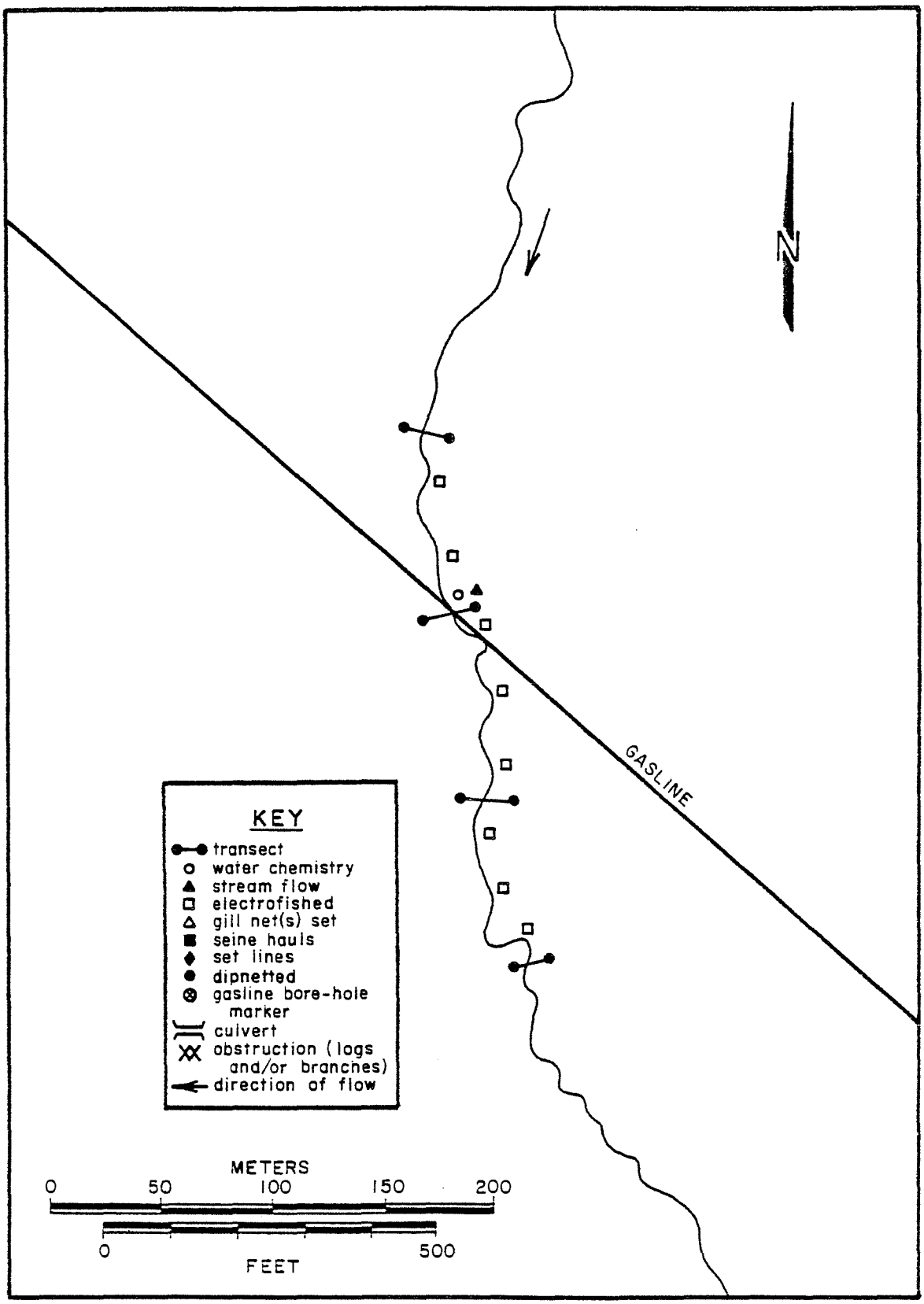

Fig. 17. Fall survey. Tributary to Smallwood Creek, 18 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Smallwood Creek Source Montane/Taiga Drainage

Main Drainage Little Chena River Tributary to Unnamed Creek

Figure 18 Gradient 1.0% Elevation 192 m

NPAS 82 NPMP 463.9 NPRX 082-1 AHMP NA

USGS Map Reference Fairbanks, AK T 1N R 1E Sec. 9

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Smallwood Creek is a shallow (4-21 cm) clear-water stream that drains the south slope of Gilmore Dome and flows southerly to join Unnamed Creek. Many small tributaries feed Smallwood Creek. Immediately north of the proposed pipeline crossing 7 beaver dams are present. Below the beaver dams Smallwood Creek flows through a narrow uniform channel lined with willow and alder. Stream substrate consists of fines and sand and banks are stable.

Smallwood Creek provides excellent fall fish habitat but sampling efforts on 16 September 1980 yielded only four slimy sculpin. Although no previous studies have been conducted on this stream it is suspected that grayling may also use this area during the open water season. Upstream of the proposed crossing (~ 50 m) a series of beaver dams serve as an effective block to fish movement beyond those areas. Fall migration out of Smallwood Creek undoubtedly occurs as streams of this size generally freeze solid or become dry in winter.

FISH

Date 16 September 1980

Fish Present Yes

Gear/Effort EF (4/762)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Slimy sculpin		4		70-100

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	0.4-2.8
Depth (cm)	4-21
Discharge (m^3/s)	0.09
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	3
Conductivity (umhos/cm)	60
pH (pH units)	6.9
Color (color units)	<5
Turbidity (NTU)	7.9
T. Hardness (mg $CaCO_3$/1)	68
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	50 fines, 50 sand
Bank Stability (%)	99
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	100 willow/alder
Cover (%)	15
Fish Block(s)	None observed downstream;7 beaver dams upstream.

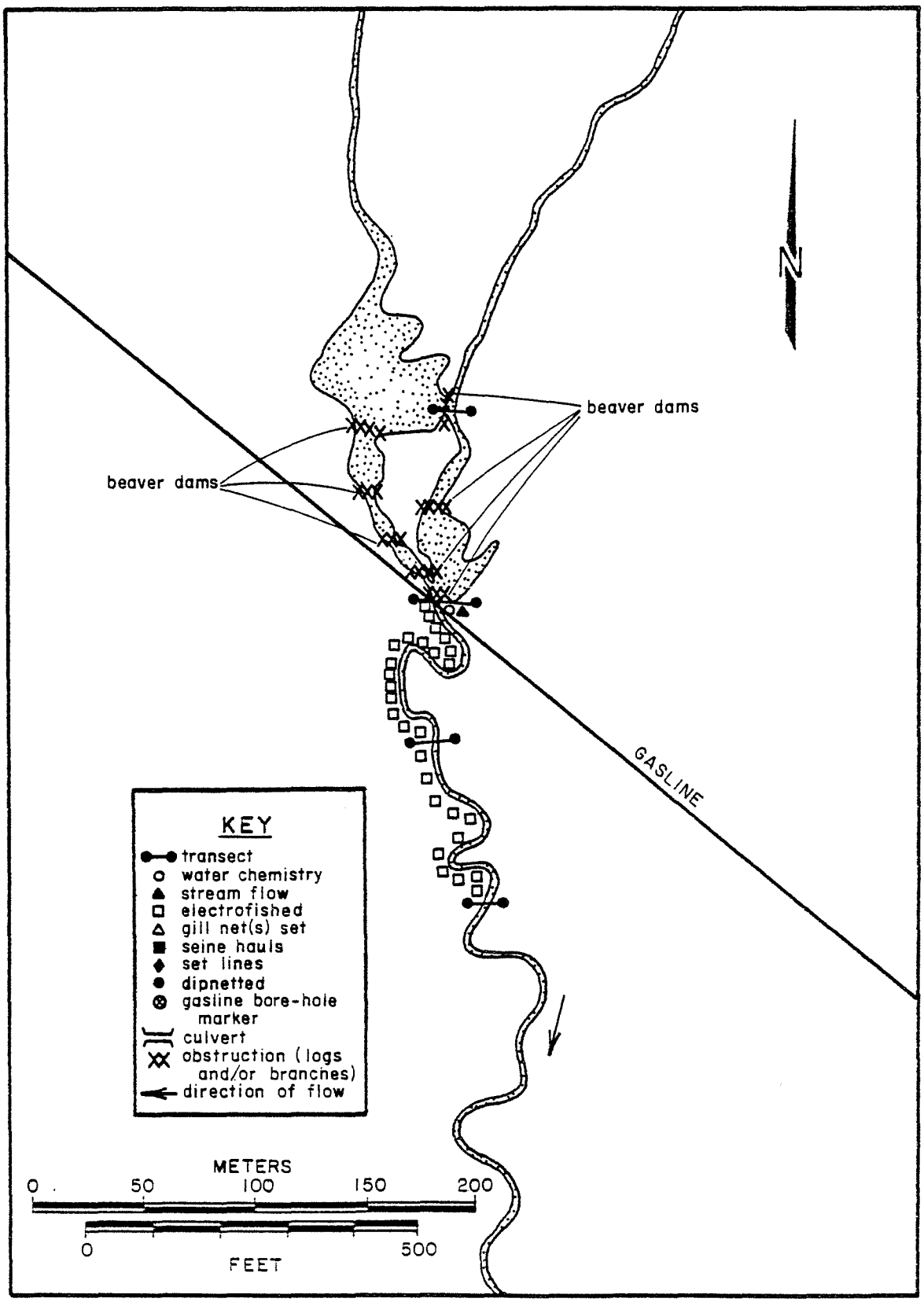

Fig. 18. Fall survey. Smallwood Creek, 16 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Nugget Creek Tributary Source Montane/Taiga Drainage

Main Drainage Smallwood Creek Tributary to Nugget Creek

Figure 19 Gradient 5.3% Elevation 485 m

NPAS 81 NPMP 460.5 NPRX 081-5 AHMP NA

USGS Map Reference Fairbanks, AK T 2N R 2E Sec. 36

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Nugget Creek Tributary is a narrow stream (average width is 1 m) which flows easterly for approximately 1 km before joining Nugget Creek. Its streambed is primarily fines and sand and is confined by stable banks densely vegetated with grass, willow and spruce. Fish habitat appeared good, with many small pools and debris in stream providing good cover. However, abandoned beaver dams located above and below the proposed crossing and on Nugget Creek itself, likely restrict any fish movement to this area.

During the recent fall survey, no fish were captured or observed. Beaver dams downstream of the proposed crossing would preclude fish use of this stream in the vicinity of the crossing at any time of the year.

FISH

Date 23 September 1980

Fish Present No

Gear/Effort EF (0/296 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	23 September 1980
Wetted Width (m)	0.3-5
Depth (cm)	10-18
Discharge (m^3/s)	0.04
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	1.0
Conductivity (umhos/cm)	30
pH (pH units)	6.5
Color (color units)	25
Turbidity (NTU)	2.1
T. Hardness (mg $CaCO_3$/1)	13
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	40 fines, 60 sand
Bank Stability (%)	98
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	60 grass, 30 willow, 10 spruce
Cover (%)	35
Fish Block(s)	Beaver dams downstream of proposed crossing and in Nugget Creek

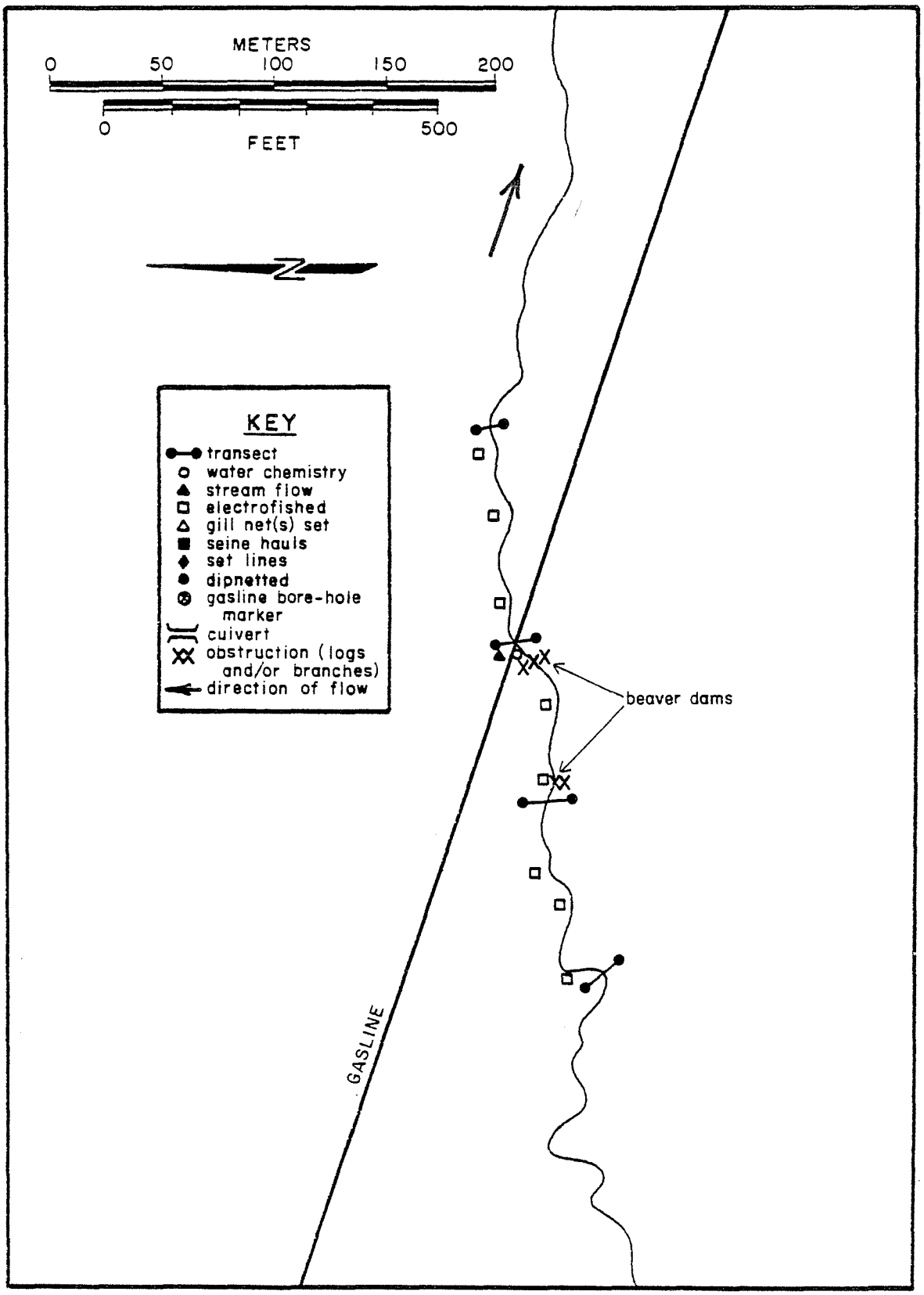

Fig. 19. Fall survey. Nugget Creek Tributary, 23 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Fox Creek Source Montane/Taiga Drainage

Main Drainage Chatanika River Tributary to Goldstream Creek

Figure 20 Gradient 3.3% Elevation 305 m

NPAS 80 NPMP 454.4 NPRX 080-2 AHMP NA

USGS Map Reference Fairbanks, AK T 2N R 1E Sec. 19

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Fox Creek is a small (0.6-3.4 m wide) stream that flows southward paralleling the Elliott Highway. The proposed pipeline crossing is located 3.0 km north of the junction of the Elliott and Steese Highways. At the crossing Fox Creek flows through a previously mined area and is confined by tailings overgrown with alder, willow and a few spruce. In this area the stream appears to have been channelized and solid waste (beer cans, lumber, abandoned mining equipment) litter the stream bottom. Regions up and downstream of the proposed crossing have numerous fallen trees and resultant branches and logs in the channel.

Fox Creek provides very poor fish habitat during the fall and fish use at this time is non-existent. The presenceof numerous potential barriers would preclude fish movement to this area. Sampling efforts were hindered by insufficient water depth, and no fish were observed in the vicinity of the crossing. No additional information concerning fish use of Fox Creek is available at this time.

FISH

Date 17 September 1980

Fish Present

Gear/Effort None-intermittent stream

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	17 September 1980
Wetted Width (m)	0.6-3.4
Depth (cm)	0-11
Discharge (m^3/s)	0.03
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	5.0
Conductivity (umhos/cm)	140
pH (pH units)	7.4
Color (color units)	40
Turbidity (NTU)	8.8
T. Hardness (mg $CaCO_3$/1)	257
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	60 silt, 20 pebble, 20 cobble
Bank Stability (%)	50
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	80 willow, 10 alder, 10 spruce
Cover (%)	10
Fish Block(s)	Solid waste and numerous branches in stream channels

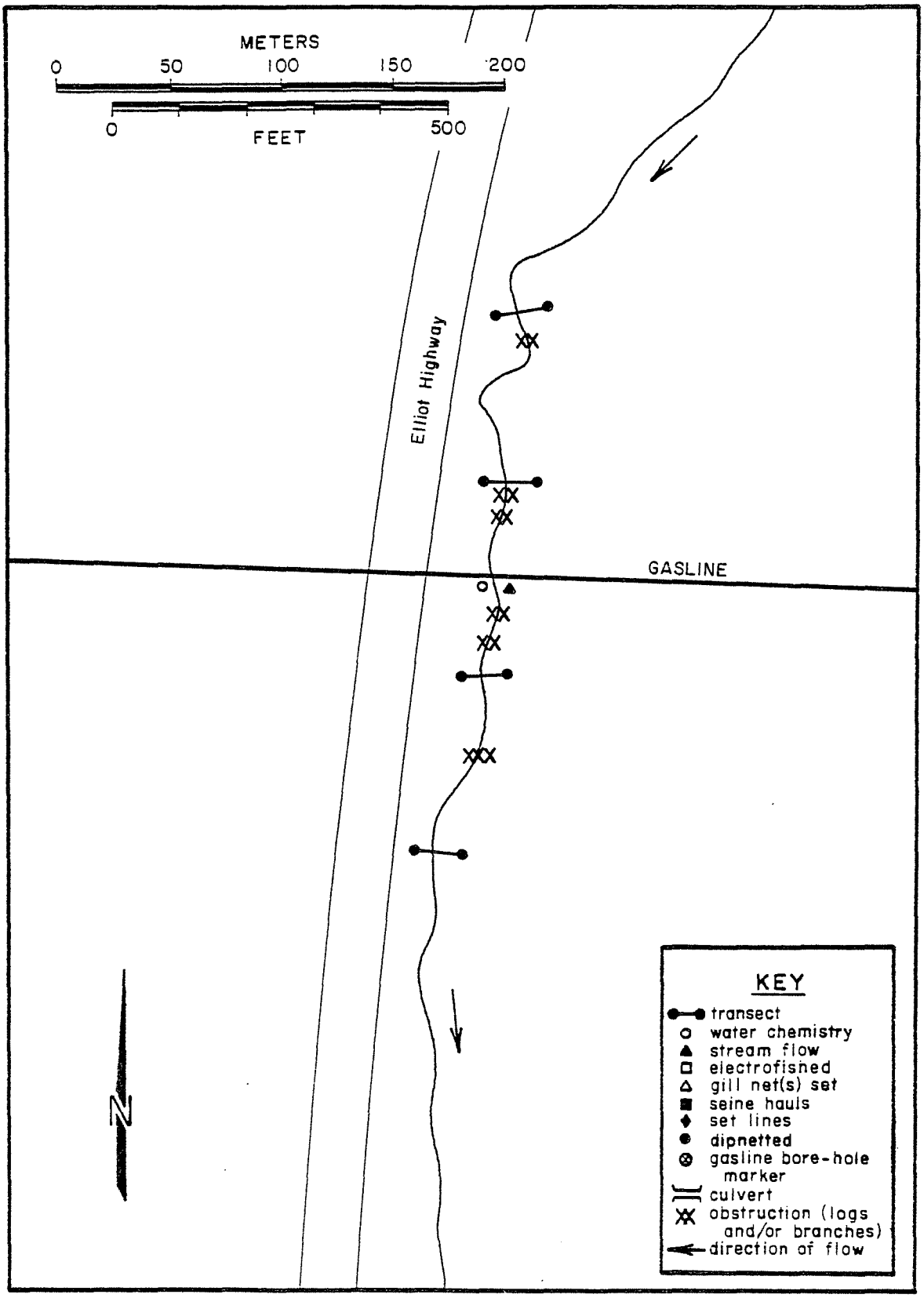

Fig. 20. Fall survey. Fox Creek, 17 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Little Globe Creek Source Montane/Taiga Drainage

Main Drainage Tatalina River Tributary to Globe Creek

Figure 21 Gradient 5% Elevation 274 m

NPAS 76 NPMP 429 NPRX 076-2 AHMP NA

USGS Map Reference Livengood, AK T 5N R 3W Sec. 22

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Little Globe Creek is a small stream that flows north 6 km from the crossing to its confluence with Globe Creek near the Elliott Highway. For 1.7 km of its channel length Little Globe Creek parallel the TAPS work pad. Surrounding vegetation consists of grasses, spruce, alder and willow. Numerous branch and log jams were observed primarily in the vicinity of the proposed pipeline crossing in September 1980. Sixty meters downstream of the crossing, Little Globe Creek flows across a low water crossing of an Alyeska pipeline access.

The shallow clogged nature of this stream in the sample area precluded effective seining, gill netting or electrofishing. Numerous dip netting efforts were made in open pools and riffles; however, no fish were captured or visually observed. It is expected that fish use at the time of the sampling effort was minimal or non-existent. No additional documentation concerning fish use of Little Globe Creek is available. A perched culvert was previously reported (Ref. 67) at the Elliott Highway crossing. Inspection of the culvert during this survey showed the culvert to be properly installed and flush with the stream bed.

FISH

Date 17 September 1980

Fish Present No

Gear/Effort DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	17 September 1980
Wetted Width (m)	0.3-2.3
Depth (cm)	40-43
Discharge (m^3/s)	0.14
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	2.9
Conductivity (umhos/cm)	48
pH (pH units)	8.8
Color (color units)	150
Turbidity (NTU)	3.6
T. Hardness (mg $CaCO_3$/1)	154
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil and detritus
Bank Stability (%)	20
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	10 grass, 50 willow, 10 alder, 30 spruce
Cover (%)	20
Fish Block(s)	Many log jams up and downstream of crossing could impede fish movement.

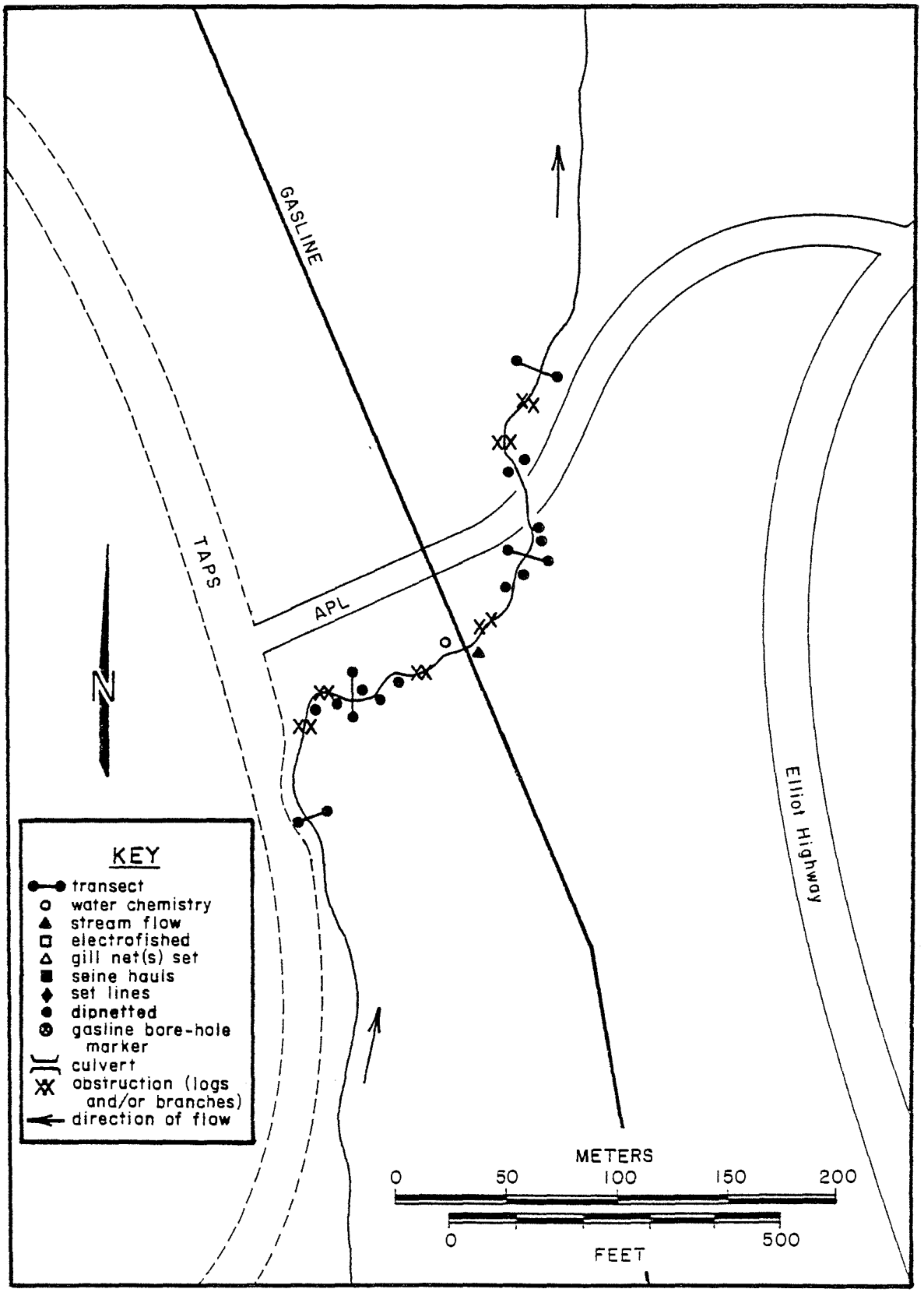

Fig. 21. Fall survey. Little Globe Creek, 17 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Globe Creek Source Montane/Taiga Drainage

Main Drainage Tolovana River Tributary to Tatalina River

Figure 22 Gradient 1.9% Elevation 274 m

NPAS 75 NPMP 426.3 NPRX 075-2 AHMP NA

USGS Map Reference Livengood, AK T 5N R 3W Sec. 9

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of the proposed pipeline crossing

ASSESSMENT

Globe Creek is a fast-flowing, humic-stained stream that drains an area of approximately 160 km^2 above the proposed pipeline crossing. It flows southwest to the Tatalina River through a well-defined channel confined by high, stable banks. Riparian vegetation consists of grasses and moss bordered by dense willow and alder with some spruce. The stream bottom is composed of gravel and sand except in pool areas, where the bottom is predominantly gravel, cobble and boulder. The stream was 6-9 m wide and 6-40 cm deep during the fall 1980 investigation. A wide variety of benthic invertebrates have been reported in Globe Creek and the stream is reported to have excellent recreational potential (Ref. 38).

Good habitat is available in Globe Creek during the fall season. However sampling efforts in the September 1980 investigation indicate that fish use was low to non-existent. Globe Creek has been reported to provide summer rearing for grayling (Refs. 11, 30 and 38). It is possible that downstream migration occurred prior to this survey.

FISH

Date 14 September 1980

Fish Present No

Gear/Effort EF (0/722 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	6-9
Depth (cm)	6-40
Discharge (m^3/s)	0.51
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	4
Conductivity (umhos/cm)	875
pH (pH units)	6.0
Color (color units)	65
Turbidity (NTU)	2.1
T. Hardness (mg $CaCO_3$/1)	62
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	75 gravel/cobble, 25 boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	20 grass/moss, 70 willow/alder, 10 spruce
Cover (%)	40
Fish Block(s)	None observed

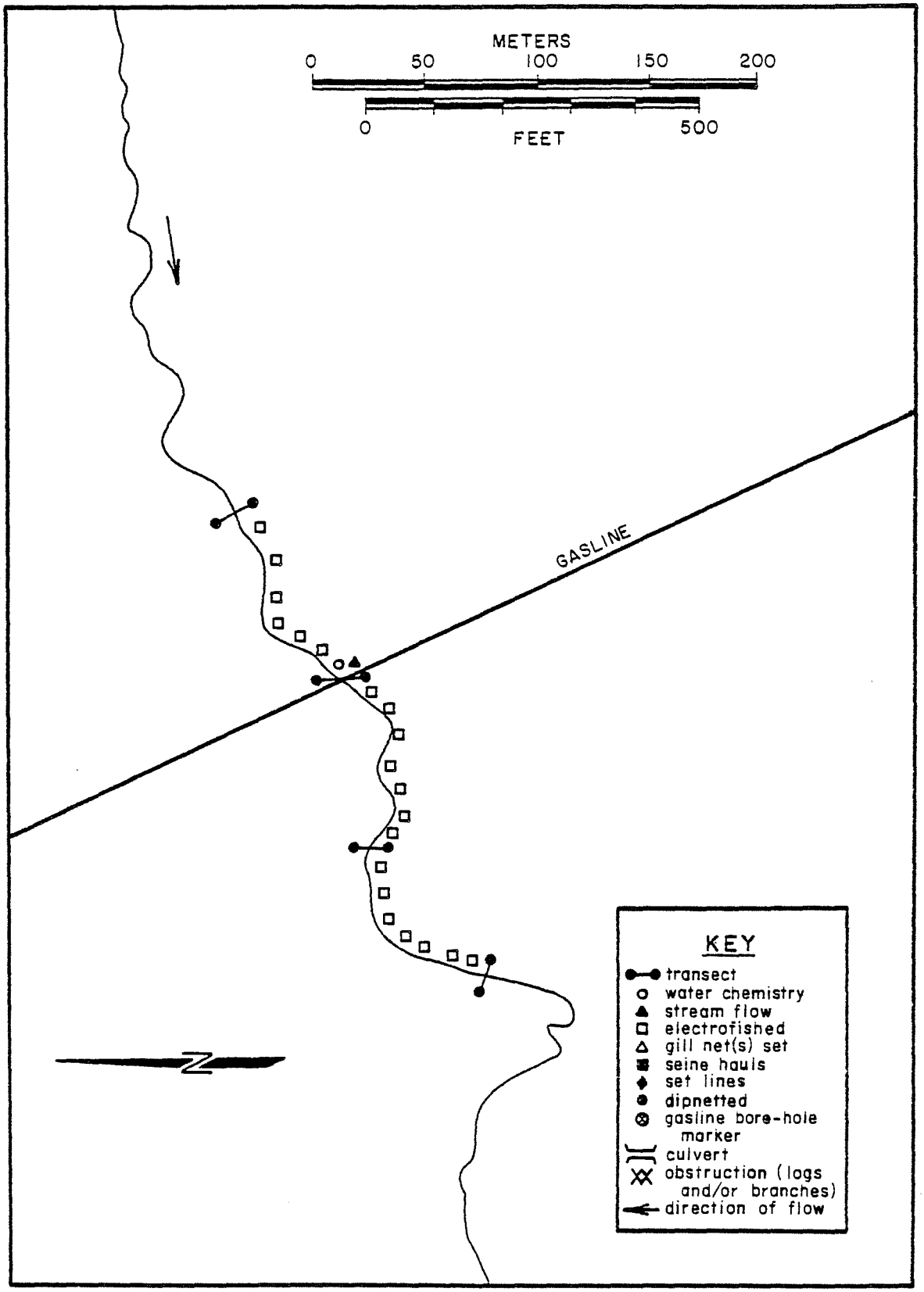

Fig. 22. Fall survey. Globe Creek, 14 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Slate Creek Tributary Source Montane/Taiga Drainage

Main Drainage Chatanika River Tributary to Slate Creek

Figure 23 Gradient 5.0% Elevation 274 m

NPAS 73 NPMP 416.8 NPRX 073-5 AHMP NA

USGS Map Reference Livengood, AK T 6N R 4W Sec. 8

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Slate Creek Tributary is a small stream that flows west into Slate Creek approximately 0.3 km downstream of the proposed pipeline crossing. The stream channel, poorly defined and littered with log debris, consists of wet gravel through which water percolates. At the time of the 1980 fall survey water in Slate Creek Tributary was percolating through the gravel at the low water crossing. Willow, alder, spruce and birch densely vegetate the surrounding area.

Low flow, numerous log jams, and a steep gradient of the TAPS workpad are effective barriers to fish movement in this stream. It is likely that these conditions would preclude fish use upstream of the TAPS workpad during any season, however fish use downstream of the workpad (outside the sample area) may exist during high water.

FISH

Date 16 September 1980

Fish Present

Gear/Effort None-negligible and intermittent flow

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	0.1-4.2 (primarily wet gravel near oil line crossing)
Depth (cm)	0-10
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	3.0
Conductivity (umhos/cm)	200
pH (pH units)	8.5
Color (color units)	30
Turbidity (NTU)	3.0
T. Hardness (mg $CaCO_3$/1)	239
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	95
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	40 willow, 40 alder, 10 spruce, 10 paper birch
Cover (%)	20
Fish Block(s)	Negligible intermittent flow and log debris and steep work pad at L.W.C. may impede fish movement

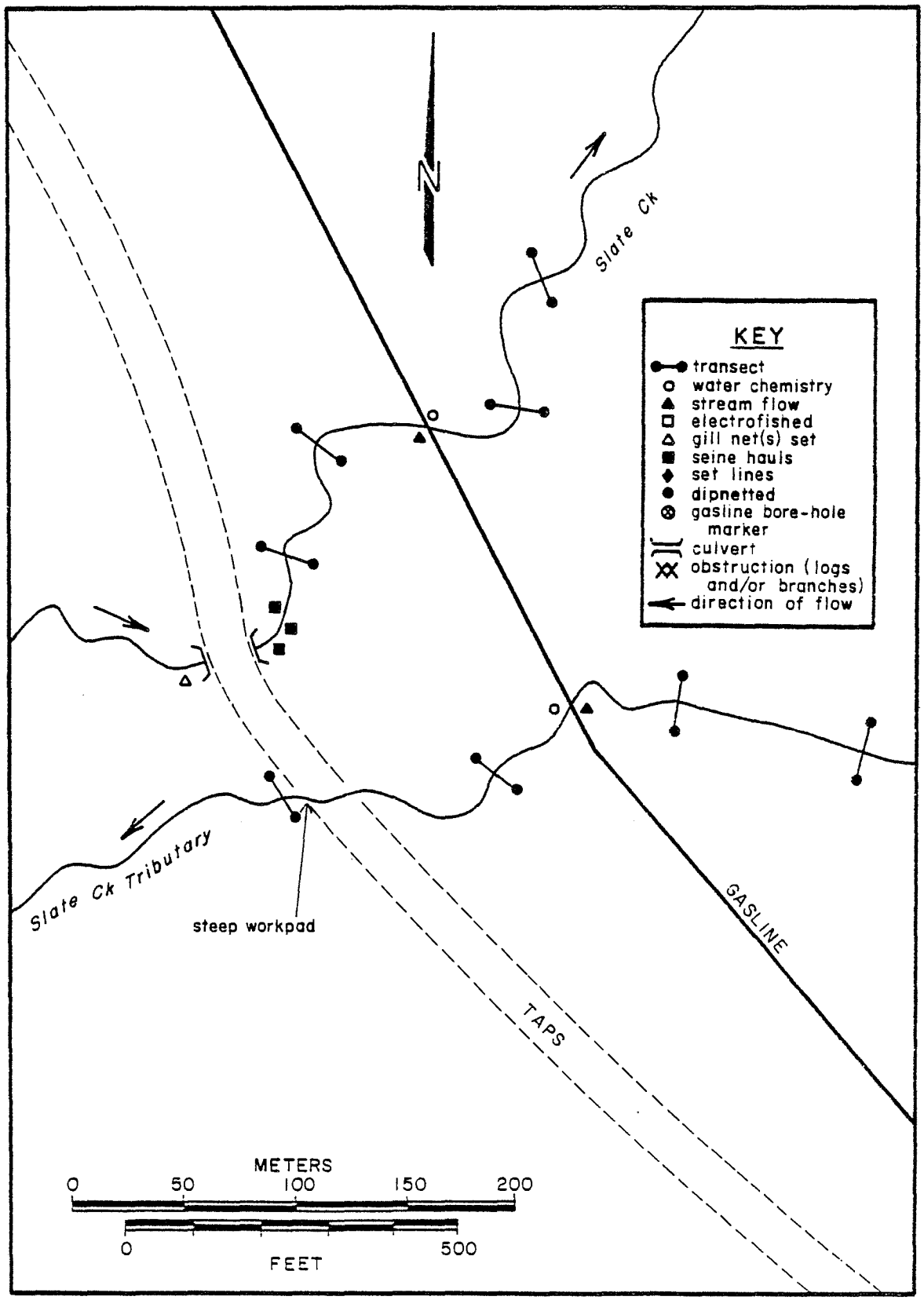

Fig. 23 and 24. Fall survey. Slate Creek Tributary, 16 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Slate Creek Source Montane/Taiga Drainage

Main Drainage Chatanika River Tributary to Tatalina River

Figure 24 Gradient 0.7% Elevation 241 m

NPAS 73 NPMP 416.6 NPRX 073-4 AHMP NA

USGS Map Reference Livengood, AK T 6N R 4W Sec. 5 and 8

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Slate Creek is a moderately small, humic-stained, meandering stream clogged in numerous places with branches and fallen trees. The predominant riparian vegetation is spruce, willow, alder and herbaceous plants. Substrate in Slate Creek consists of sand, gravel and pebbles.

Adequate water depth, cover and flow provide good habitat for fish in Slate Creek during fall. However, numerous log jams and resultant water falls are potential barriers to fish movement. Seine and gill net efforts during the fall 1980 survey did not yield fish indicating low to non-existent fish use at this time. Slate Creek is reported to serve as a rearing area for grayling during spring (Ref. 30), although specific documentaiton for this crossing is not available.

FISH

Date 16 September 1980

Fish Present No

Gear/Effort 15 m GN (0/18 h); 5 m Seine (0/35 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	2.5-7.1
Depth (cm)	6-35
Discharge (m^3/s)	0.24
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	3
Conductivity (umhos/cm)	35
pH (pH units)	8.4
Color (color units)	250
Turbidity (NTU)	4.7
T. Hardness (mg $CaCO_3$/1)	154
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	65 sand, 20 gravel, 15 pebble
Bank Stability (%)	60
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	50 spruce, 30 willow, 10 alder, 10 herbaceous plants
Cover (%)	20
Fish Block(s)	Numerous log jams up and downstream of crossing could impede fish movement.

FALL SURVEY FORM

WATERBODY

Waterbody Ski Jump Ramp Creek Source Montane/Taiga Drainage

Main Drainage Tatalina River Tributary to Slate Creek

Figure 25 Gradient 2.5% Elevation 326 m

NPAS 73 NPMP 414.9 NPRX 073-3 AHMP NA

USGS Map Reference Livengood, AK T 7N R 4W Sec. 31

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Ski Jump Ramp Creek is a small, narrow creek with many meanders, chutes and falls. It flows southeast 2.0 km from the proposed pipeline crossing to Slate Creek and drains both a taiga area on the north and a lichen covered slope on the south. Riparian vegetation consists of spruce, willow, alder, birch and grass and substrate is fines, sand, gravel and pebbles.

Instream debris in Ski Jump Ramp Creek has created effective blocks to fish passage particularly during periods of low water depth. Fish habitat during the September 1980 survey was marginally suitable for fish and no fish were detected.

FISH

Date 16 September 1980

Fish Present

Gear/Effort None-negligible flow

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	0.2-3.2
Depth (cm)	6-7
Discharge (m^3/s)	0.01
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	2.5
Conductivity (umhos/cm)	87
pH (pH units)	8.4
Color (color units)	100
Turbidity (NTU)	3.9
T. Hardness (mg $CaCO_3$/1)	188
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	45 fines, 20 sand, 30 gravel, 5 pebble
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 grasses, 10 willow, 10 alder, 10 spruce,
Cover (%)	20 10 paper birch
Fish Block(s)	Log debris up and downstream of crossing form probable barriers to fish movement at this time.

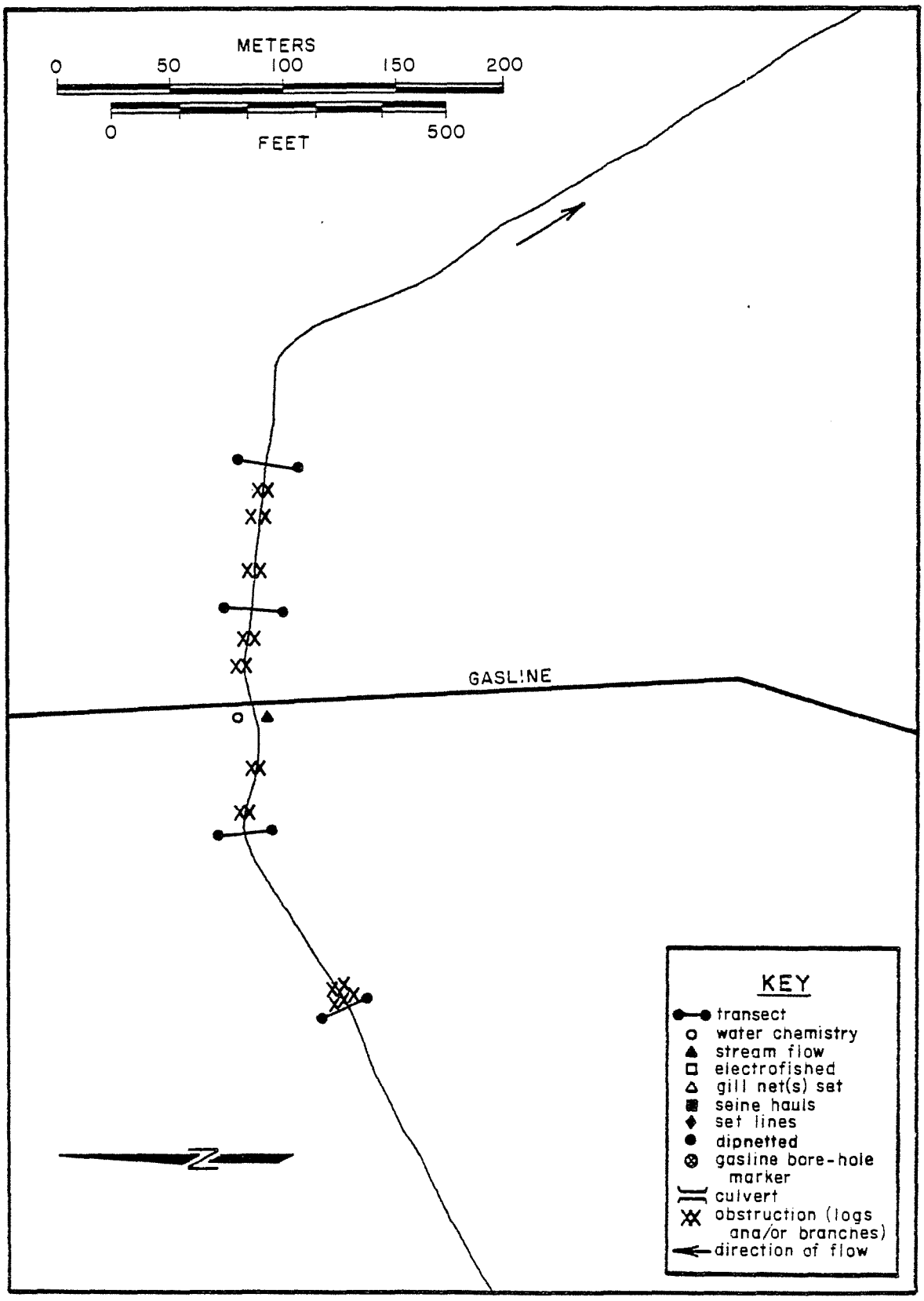

Fig. 25. Fall survey. Ski Jump Ramp Creek, 19 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Tributary to Wilber Creek Source Montane/Taiga Drainage

Main Drainage Tolovana River Tributary to Wilber Creek

Figure 26 Gradient 2.5% Elevation 381 m

NPAS 73 NPMP 412.7 NPRX 073-1 AHMP NA

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

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Tributary to Wilber Creek is a small stream that drains an area of approximately 2 km^2 above the proposed pipeline route. At the proposed crossing this creek is braided and densely vegetated with tall grass and willows. Approximately 200 m downstream of the proposed crossing, the channels disperse through a marsh area and become intermittent streams; substrate consists of mud and detritus and banks are vegetated with grasses, moss, willow, alder and some spruce.

No fish were captured and fall fish use of Tributary to Wilber Creek appeared to be low to non-existent. Should fish be present during years of particularly high water they would undoubtedly migrate downstream to larger waterbodies prior to freezeup as this stream would not provide fish habitat in winter.

FISH

Date 16 September 1980

Fish Present No

Gear/Effort Visual (0/300 m), EF (0/251 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	0-0.9
Depth (cm)	10-60
Discharge (m^3/s)	0.01
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	2
Conductivity (umhos/cm)	10
pH (pH units)	6.2
Color (color units)	170
Turbidity (NTU)	2.1
T. Hardness (mg $CaCO_3$/1)	51
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/detritus
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	55 grass/moss, 40 willow/alder, 5 spruce
Cover (%)	60
Fish Block(s)	Stream intermittent ~100 m downstream of proposed crossing

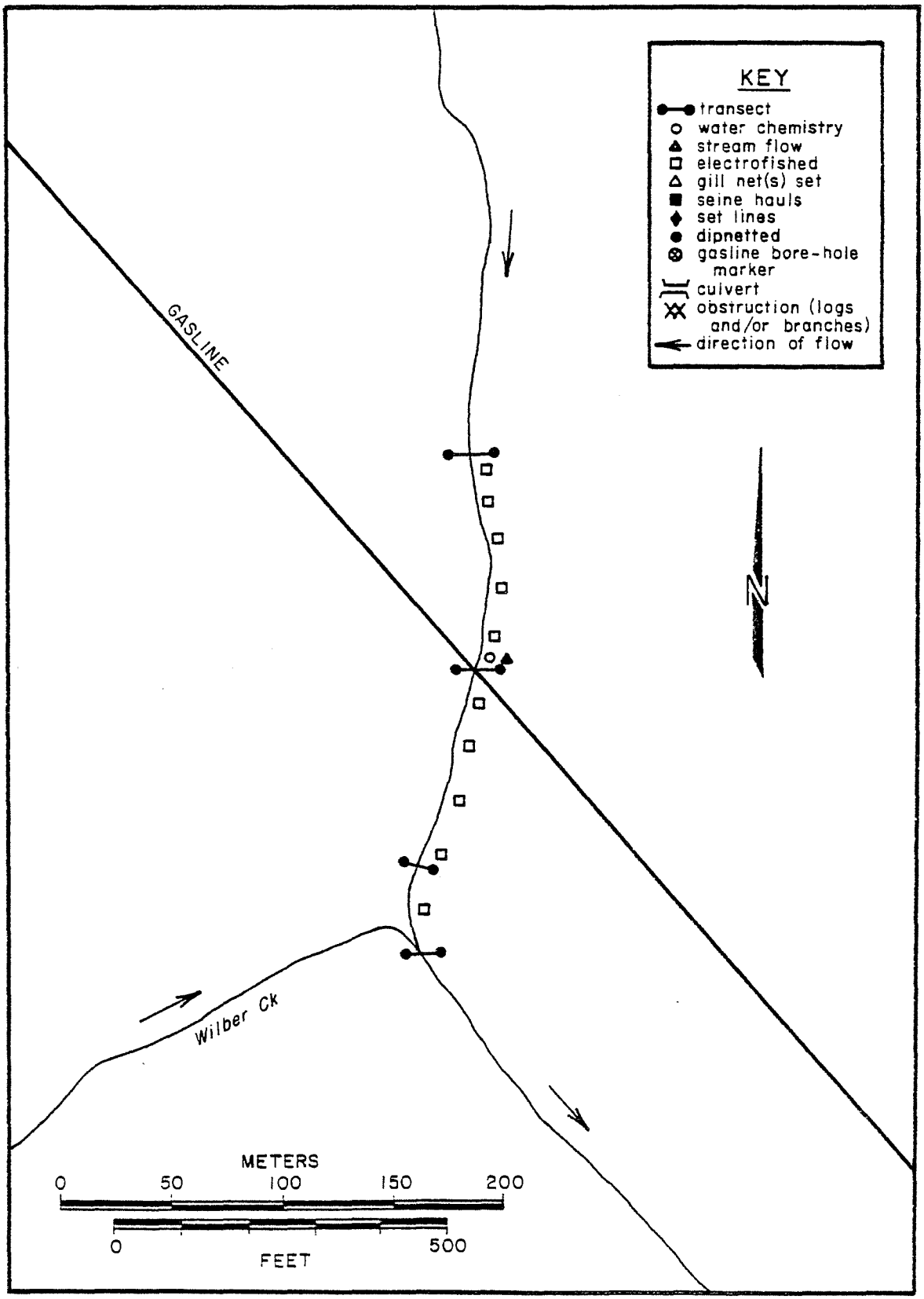

Fig. 26. Fall survey. Tributary to Wilbur Creek, 16 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Shorty Creek Source Montane/Taiga Drainage

Main Drainage Tanana River Tributary to Tolovana River

Figure 27 Gradient 5.0% Elevation 133 m

NPAS 72 NPMP 408.5 NPRX 072-3 AHMP NA

USGS Map Reference Livengood, AK T 7N R 5W Sec. 8

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Shorty Creek is a small stream (0.1-3.3) m wide that meanders west to the Tolovana River in a series of small pools and narrow channels (10-50 cm in depth). This stream drains an area of about 5.9 km^2 (Ref. 11) and has moderately high banks (0.5 m) vegetated with grass, moss and scattered willow, alder and spruce. Stream substrate consists entirely of mud and detritus.

Physical and chemical characteristics of Shorty Creek indicate good fall habitat for fish. However, instream log debris, approximately 175 m downstream of the proposed pipeline crossing, creates a 0.5 m falls which may preclude fish movement to this area. Intensive sampling efforts during the fall 1980 investigation did not yield fish. Although available information is limited it is suspected that fall fish use of this stream is low to non-existent.

FISH

Date 16 September 1980

Fish Present No

Gear/Effort EF (0/623 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	0.1-3.3
Depth (cm)	10-50
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	11
Temperature (^oC)	2
Conductivity (umhos/cm)	70
pH (pH units)	6.5
Color (color units)	60
Turbidity (NTU)	8.3
T. Hardness (mg $CaCO_3$/1)	120
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/detritus
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	80 grass/moss, 15 willow/alder, 5 spruce
Cover (%)	75
Fish Block(s)	Instream log debris ~175 m downstream of proposed crossing may impede fish movement

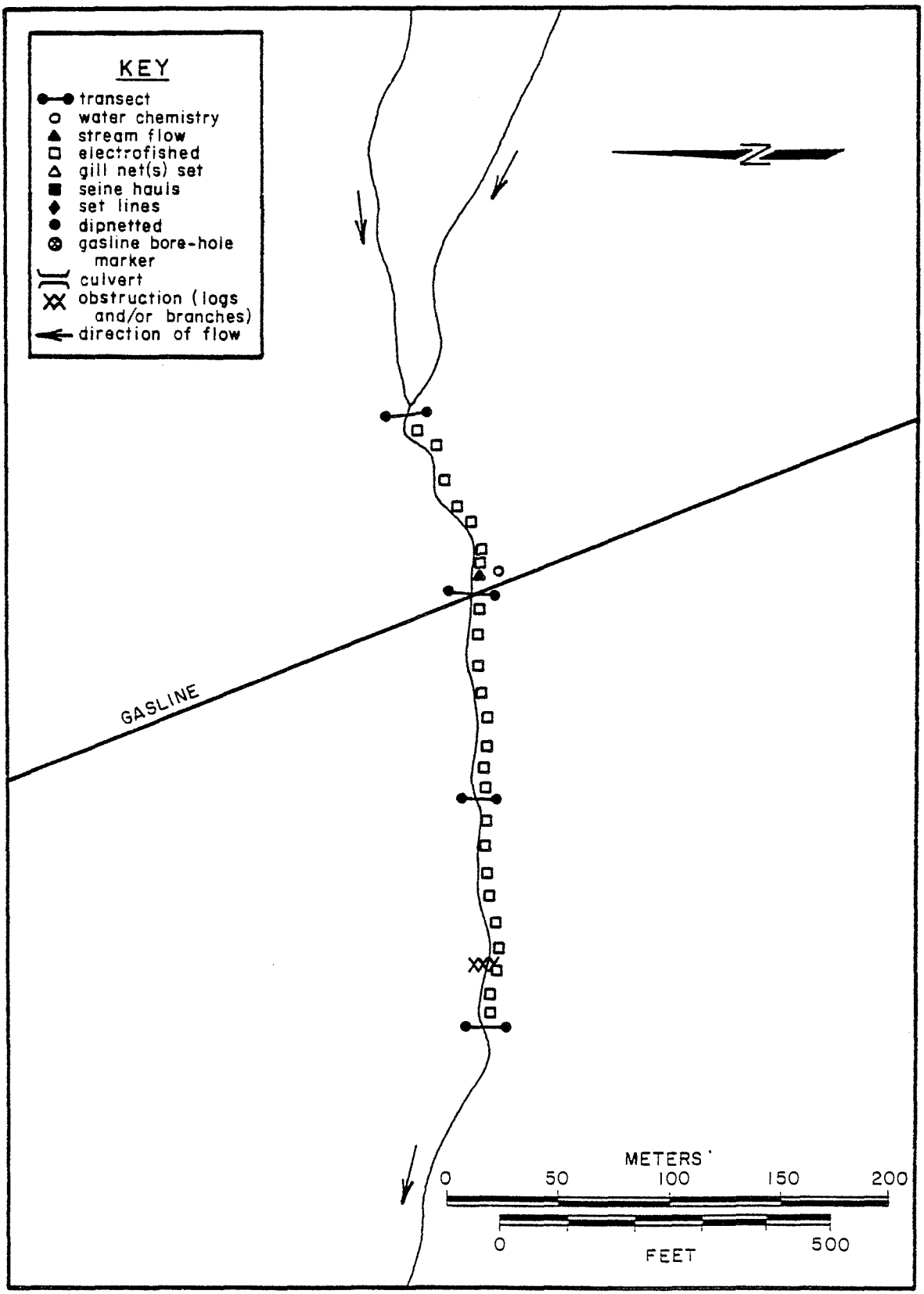

Fig. 27. Fall survey. Shorty Creek, 16 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Tributary to the Tolovana River Source Taiga Drainage

Main Drainage Tanana River Tributary to Tolovana River

Figure 28 Gradient 2.5% Elevation 125 m

NPAS 72 NPMP 407.5 NPRX 072-2 AHMP NA

USGS Map Reference Livengood, AK T 7N R 5W Sec. 5 and 8

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Tributary to the Tolovana River is an old high water channel of the Tolovana River that was dry at the time of the fall 1980 investigation. No inlet or outlet was observed at this time and the channel was vegetated with terrestrial grasses and willow which indicates that the channel had not been recently inundated. Tributary to the Tolovana River would contain water only during severe flooding and should not be considered fish habitat.

FISH

Date 16 September 1980

Fish Present

Gear/Effort None - streambed dry

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	16 September 1980
Wetted Width (m)	Streambed dry
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	100 grass
Bank Stability (%)	100 stable
Aquatic Vegetation (P/A)	NA
Riparian Vegetation (%)	80 willow/alder, 20 spruce
Cover (%)	<1
Fish Block(s)	Streambed dry

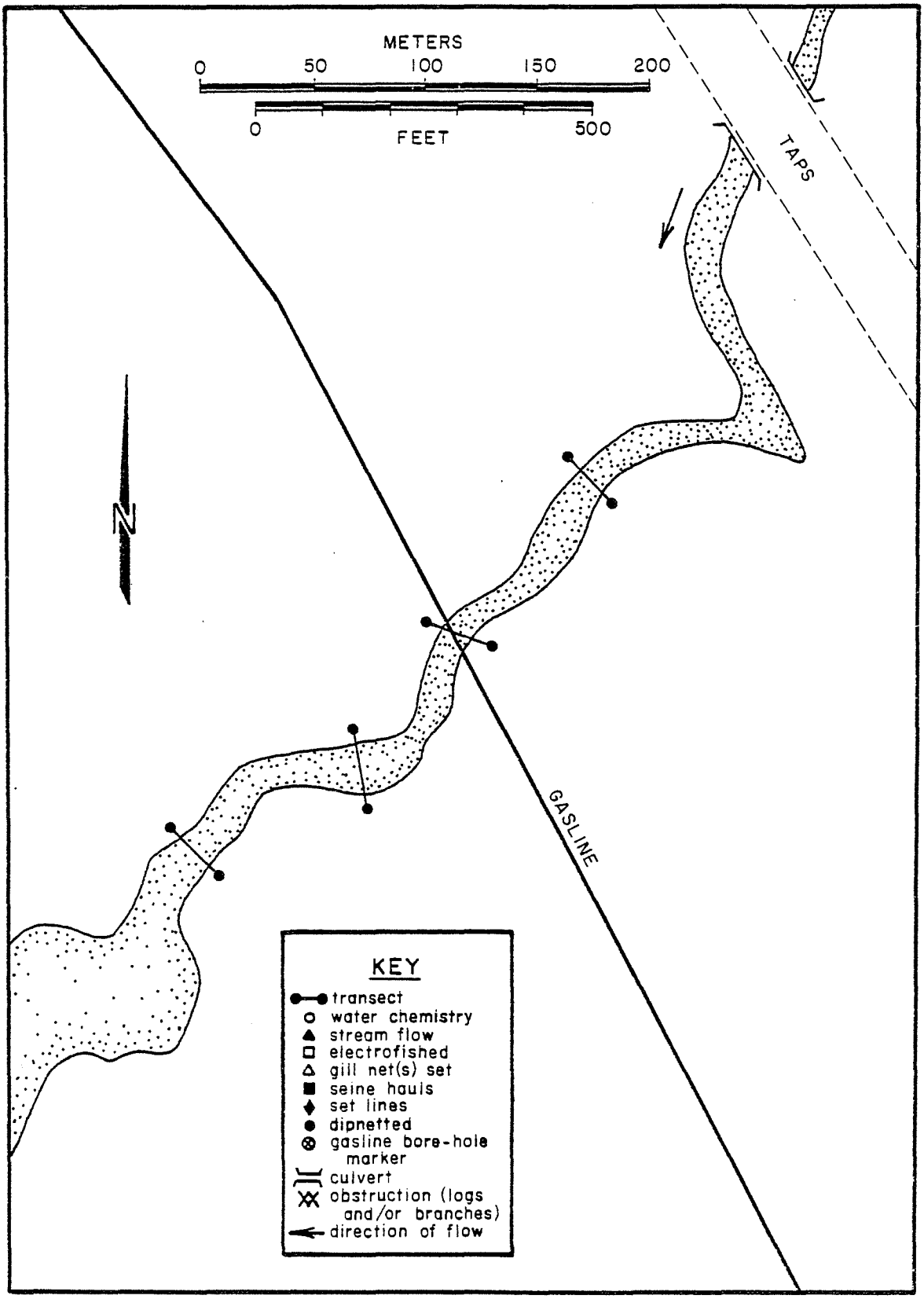

Fig. 28. Fall survey. Tributary to Tolovana River, 16 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody: Unnamed Tributary to the West Fork Tolovana River Source: Taiga Drainage

Main Drainage: Tanana River Tributary to: West Fork Tolovana River

Figure: 29 Gradient: 5.5% Elevation: 221 m

NPAS: 71 NPMP: 403.9 NPRX: 071-2 AHMP: NA

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

Site Access: Helicopter

Section Surveyed: 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Tributary to the West Fork Tolovana River is a narrow (0.2-1.7 m wide), shallow (1-6 cm deep) stream that flows southwest to the West Fork Tolovana River. Drainaing an area approximately 4.3 km^2 above the crossing, this stream flows over a moderately steep gradient (5.5%) (Ref. 11). The low banks are vegetated with grasses and a dense growth of overhanging willow, alder, birch and spruce. During the fall 1980 survey this stream was found dry 10 m upstream of the proposed pipeline crossing and choked with leaves and grass throughout the study area.

Unnamed Tributary to the West Fork Tolovana River provides marginal fall fish habitat in the vicinity of the proposed crossing and fish use is unlikely. Electrofishing efforts during the September 1980 investigation were extensive but limited to areas in the stream that were wide enough to accommodate the diameter of the electrode. Visual observation was obstructed by dense vegetative growth and instream debris. No fish were recorded.

FISH

Date 15 September 1980

Fish Present No

Gear/Effort EF (0/673 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	0.2-1.7
Depth (cm)	1-6
Discharge (m^3/s)	<0.01
Dissolved Oxygen (mg/1)	8.4
Temperature (^oC)	2.0
Conductivity (umhos/cm)	160
pH (pH units)	6.6
Color (color units)	55
Turbidity (NTU)	8.8
T. Hardness (mg $CaCO_3$/1)	171
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 sand, 75 gravel, 5 algae/detritus
Bank Stability (%)	99
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	70 grasses, 10 willow/alder, 15 birch, 5 spruce
Cover (%)	65
Fish Block(s)	Stream bed dry approximately 10 m upstream of proposed pipeline crossing.

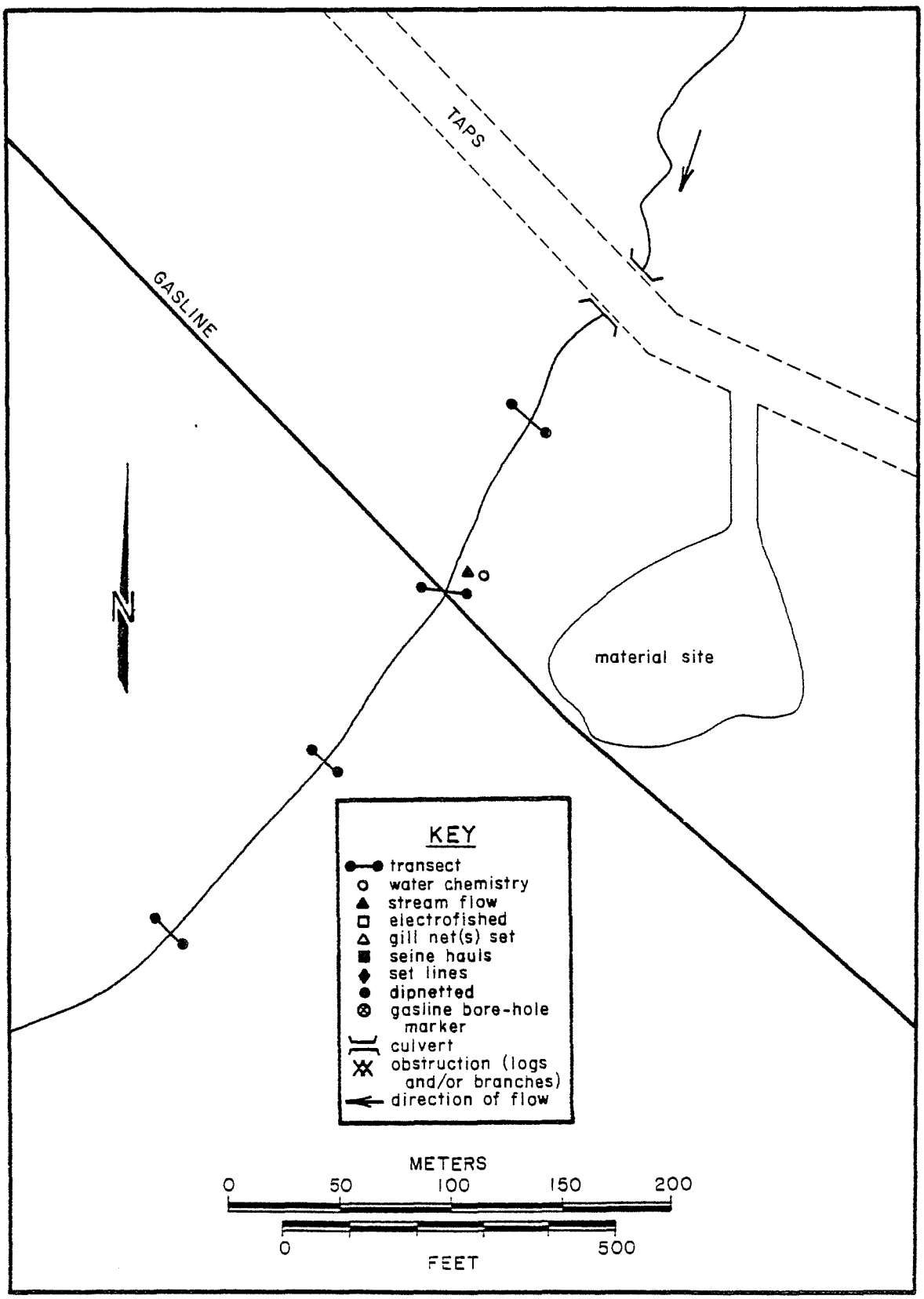

Fig. 29. Fall survey. Unnamed Tributary to West Fork Tolovana River, 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Lost Creek Source Taiga Drainage

Main Drainage Chatanika River Tributary to West Fork Tolovana River

Figure 30 Gradient 0.3% Elevation 197 m

NPAS 71 NPMP 400.7 NPRX 071-1 AHMP NA

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

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Lost Creek is a moderate sized, humic-stained stream 2.5 to 8.7 m wide that meanders south to the West Fork Tolovana River. This creek flows over a 0.3% gradient and drains an area above the pipeline route of approximately 130 km^2 (Ref. 11). In the vicinity of the proposed pipeline crossing many deep (~ 64 cm) pools and shallow riffle areas provide excellent fish habitat. Stream substrate is 50% gravel and 50% sand. The banks are stable and vegetated with willow, alder, grasses and spruce.

Grayling, slimy sculpin, and whitefish have been observed in Lost Creek in spring and grayling have also been reported in summer (Ref. 11 and 121). An extensive electrofishing effort during the fall survey did not yield any fish. It is possible that any fish present in fall may have migrated downstream to overwintering areas prior to the mid-September sampling effort.

The documented fish use in spring and summer (Ref. 11 and 121) and the excellent habitat available during September 1980 indicate that Lost Creek may provide a fall migration route and rearing area in the vicinity of the proposed crossing.

FISH

Date 15 September 1980

Fish Present No

Gear/Effort EF (0/1662 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	2.5-8.7
Depth (cm)	6-64
Discharge (m^3/s)	0.60
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	4.0
Conductivity (umhos/cm)	25
pH (pH units)	6.4
Color (color units)	170
Turbidity (NTU)	17
T. Hardness (mg $CaCO_3$/1)	46
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	50 gravel, 50 sand
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	50 willow/alder, 30 grasses, 20 spruce
Cover (%)	15
Fish Block(s)	None observed

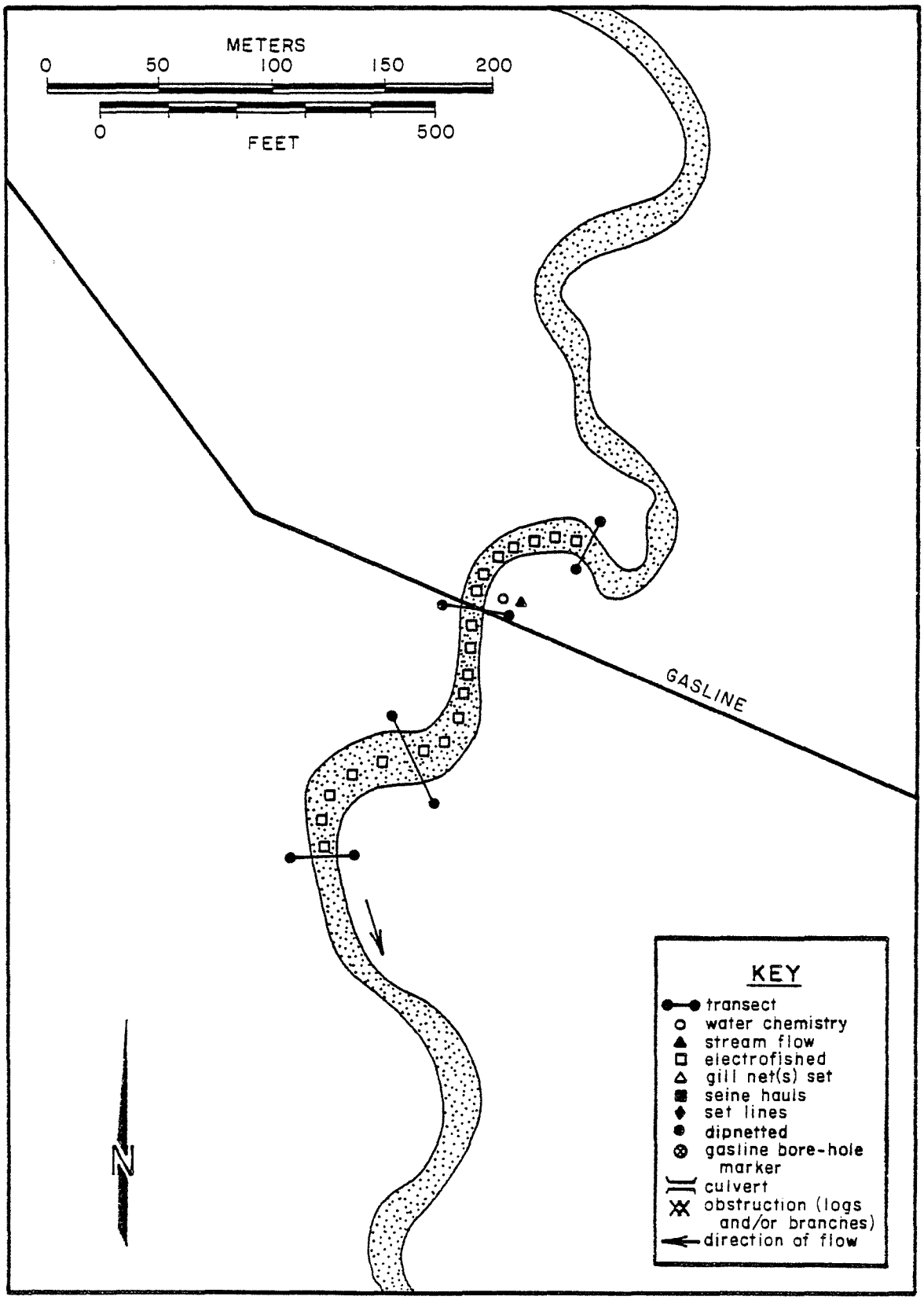

Fig. 30. Fall survey. Lost Creek, 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody West Fork Erickson Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 31 Gradient 1.3% Elevation 184 m

NPAS 69 NPMP 393.0 NPRX 069-1 AHMP NA

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

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

West Fork Erickson Creek is a dark, humic-stained stream that drains an area upstream of the crossing of approximately 208 km^2 (Ref. 11) and flows north to its confluence with Hess Creek. During the recent fall survey this stream varied in width from 1.3 m to 10 m and depth from 14 cm to 200 cm. Substrate consists of sand, gravel and pebbles and banks are moderately stable and lined with willow, alder, spruce and grasses. Numerous deep pools and shallow riffle areas provide good fish habitat and fallen logs and debris offer some cover.

Although fish habitat appeared suitable, fish use of West Fork Erickson Creek during the recent fall survey was low to non-existent. Fish were not captured or observed in the vicinity of the proposed pipeline crossing. Since grayling and longnose sucker have been observed in upstream regions in spring and summer (Ref. 30), downstream migration may have occurred prior to this survey.

FISH

Date 15 September 1980

Fish Present No

Gear/Effort EF (0/1136 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	1.3-10
Depth (cm)	14-200
Discharge (m^3/s)	0.14
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	2.0
Conductivity (umhos/cm)	25
pH (pH units)	6.4
Color (color units)	150
Turbidity (NTU)	6.5
T. Hardness (mg $CaCO_3$/1)	63
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	50 gravel, 30 pebble, 20 sand
Bank Stability (%)	75
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	60 willow/alder, 30 spruce, 10 grasses
Cover (%)	10
Fish Block(s)	None observed

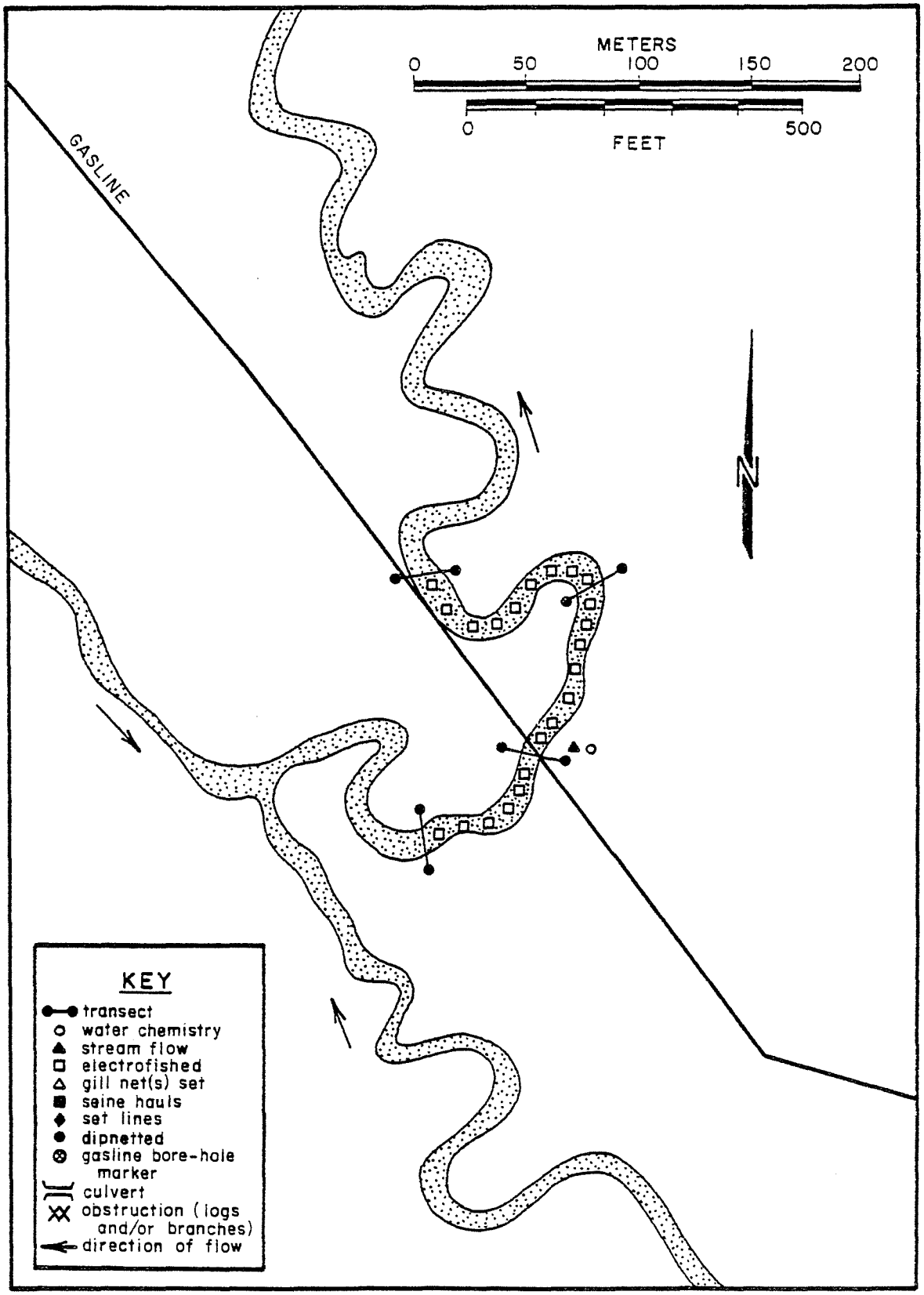

Fig. 31. Fall survey. West Fork Erickson Creek, 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Hess Creek Tributary (oxBow) Source Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 32 Gradient 0.1% Elevation 143 m

NPAS 68 NPMP 387.0 NPRX 068-5 AHMP NA

USGS Map Reference Livengood, AK T 10N R 7W Sec. 29

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Hess Creek Tributary is an inactive oxbow of the main channel of Hess Creek. Stream substrate is gravel, and willow cover portions of the channel bed and the stable banks. The only water found in this channel during the fall 1980 survey was contained in several isolated depressions in the vicinity of the proposed pipeline crossing. Low dissolved oxygen of the pooled water indicates that flow in this channel is infrequent and probably restricted to periods of very high runoff.

Fall fish habitat of Hess Creek Tributary is poor and fish use non-existent in the vicinity of the proposed pipeline crossing due to the absence of flowing water to this area and low dissolved oxygen and pH levels found in the water present.

FISH

Date 14 September 1980

Fish Present No

Gear/Effort EF (0/128 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	0-15
Depth (cm)	0-10
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	2.6
Temperature (^oC)	4.5
Conductivity (umhos/cm)	90
pH (pH units)	5.8
Color (color units)	120
Turbidity (NTU)	15
T. Hardness (mg $CaCO_3$/1)	69
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 gravel
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 willow
Cover (%)	5
Fish Block(s)	Isolated pools, no inlet or outlet at this time.

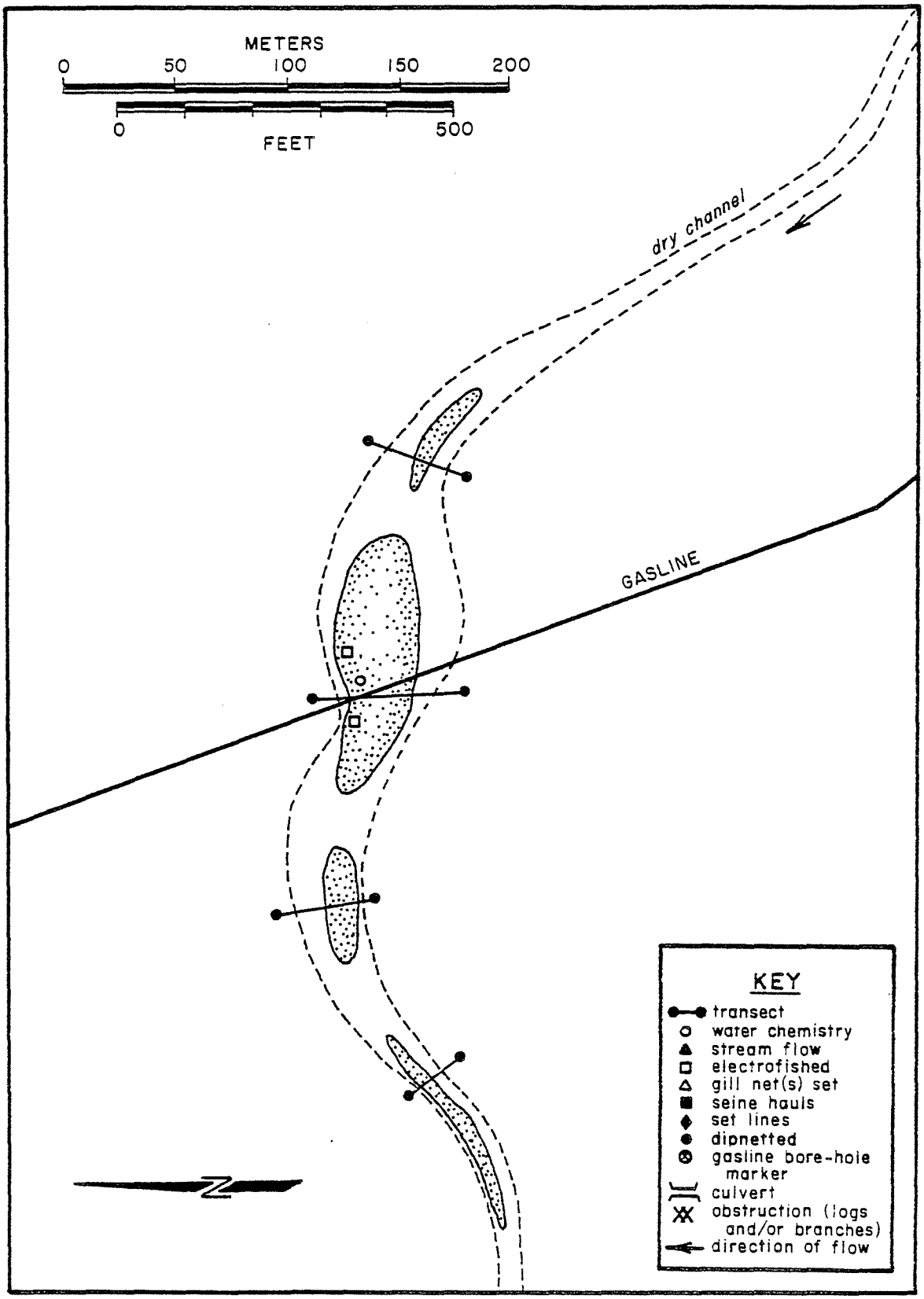

Fig. 32. Fall survey. Hess Creek Tributary (NPMP 387.0), 14 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Hess Creek Tributary ? Source Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 33 Gradient 0.1% Elevation 143 m

NPAS 68 NPMP 386.4 ? NPRX _____ AHMP NA

USGS Map Reference Livengood, AK T 10N R 7W Sec. 19

Site Access Helicopter

Section Surveyed Entire length of channel (approximately 650 m)

ASSESSMENT

Hess Creek Tributary is an old channel of Hess Creek that is dry and overgrown with terrestrial grasses. The channel is approximately 30 m wide and lined with willow, alder, spruce and birch. No inlet or outlet to the channel was observed during the fall 1980 survey suggesting that there has not been flowing water at the proposed crossing for many years. Hess Creek Tributary should not be considered fish habitat at any time of year.

FISH

Date 14 September 1980

Fish Present

Gear/Effort None - streambed dry

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	Streambed dry
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	100 mud/soil
Bank Stability (%)	Undefined bank
Aquatic Vegetation (P/A)	A (terrestrial)
Riparian Vegetation (%)	50 willow/alder, 30 birch, 20 spruce
Cover (%)	90
Fish Block(s)	stream bed dry - no inlet or outlet

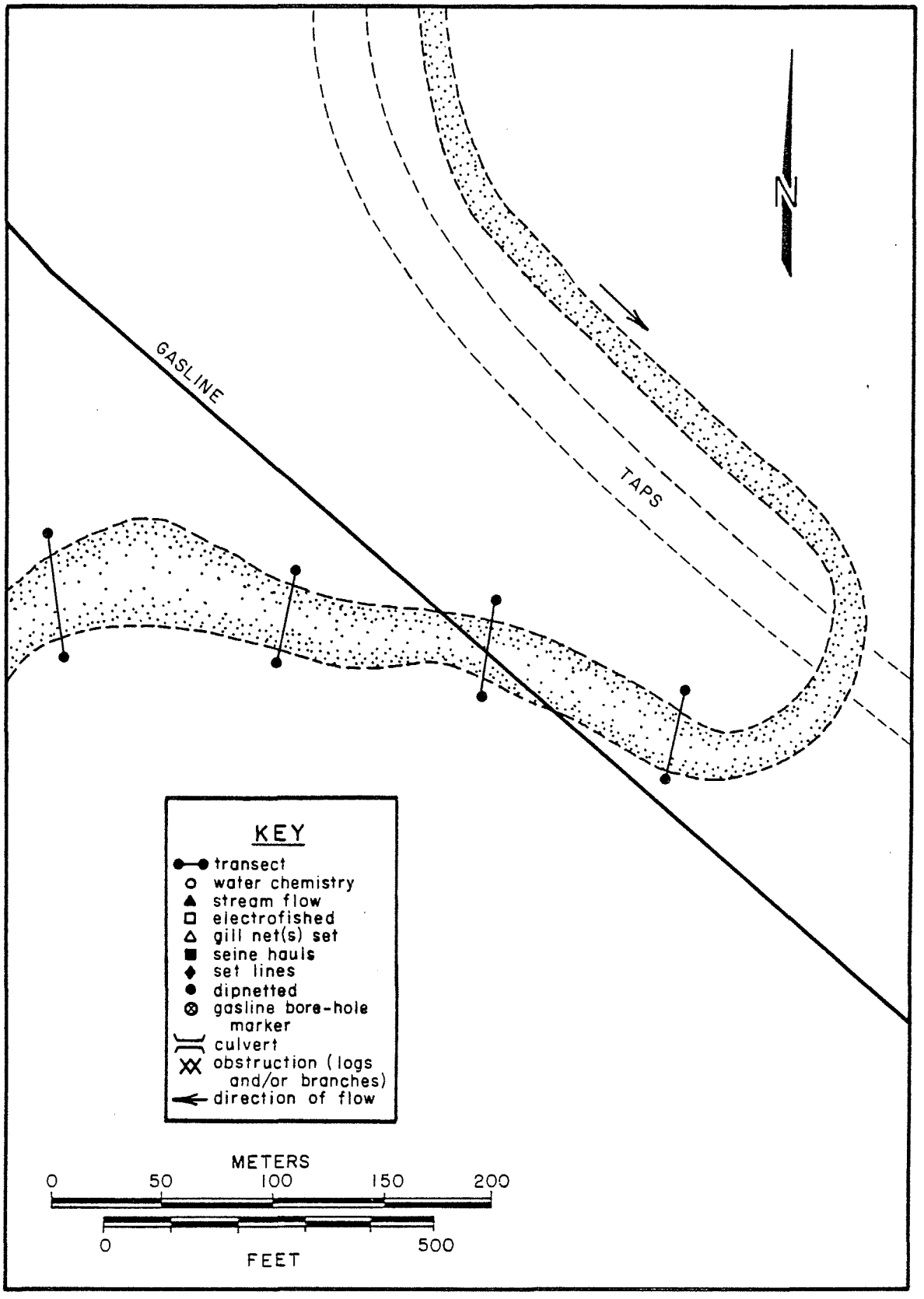

Fig. 33. Fall survey. Hess Creek Tributary (NPMP 386.4), 14 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Two-Bank Creek Source Taiga Drainage

Main Drainage Hess Creek Tributary to Unnamed Creek 381.4

Figure 34 Gradient 5.0% Elevation 244 m

NPAS 67 69 NPMP 382.4 NPRX 068-2 AHMP NA

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

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Two-Bank Creek is a very small stream that drains a marshland area (~1.6 km^2) and flows over a steep gradient (~5.0% southwest to join Unnamed Creek 381.4, a tributary to Hess Creek (Ref. 11). This intermittent stream varies in width from 0.3 to 2.8 m and is choked with many fallen branches and resultant log jams. Bottom substrate consists of fines, sand, gravel and pebbles. Riparian vegetation consists of spruce, willow, alder, aspen, sedge and grass.

Fall fish use of Two-Bank Creek is low to non-existent at the proposed pipeline crossing. Fish habitat is not available due to its small size, shallow (0-7 cm), intermittent nature and log and branch obstructions.

FISH

Date 15 September 1980

Fish Present

Gear/Effort None - stream very small and tangled with logs and branches

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	0.3-2.8
Depth (cm)	0-7
Discharge (m^3/s)	0.01
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	4.5
Conductivity (umhos/cm)	140
pH (pH units)	8.2
Color (color units)	100
Turbidity (NTU)	10
T. Hardness (mg $CaCO_3$/1)	205
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	75 fines, 2 sand, 20 gravel, 3 pebble
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 grasses, 20 sedge, 5 willow, 5 alder, 5 aspen, 5 spruce
Cover (%)	30
Fish Block(s)	Numerous log jams and branches and resultant falls up and downstream of crossing may impede fish movement

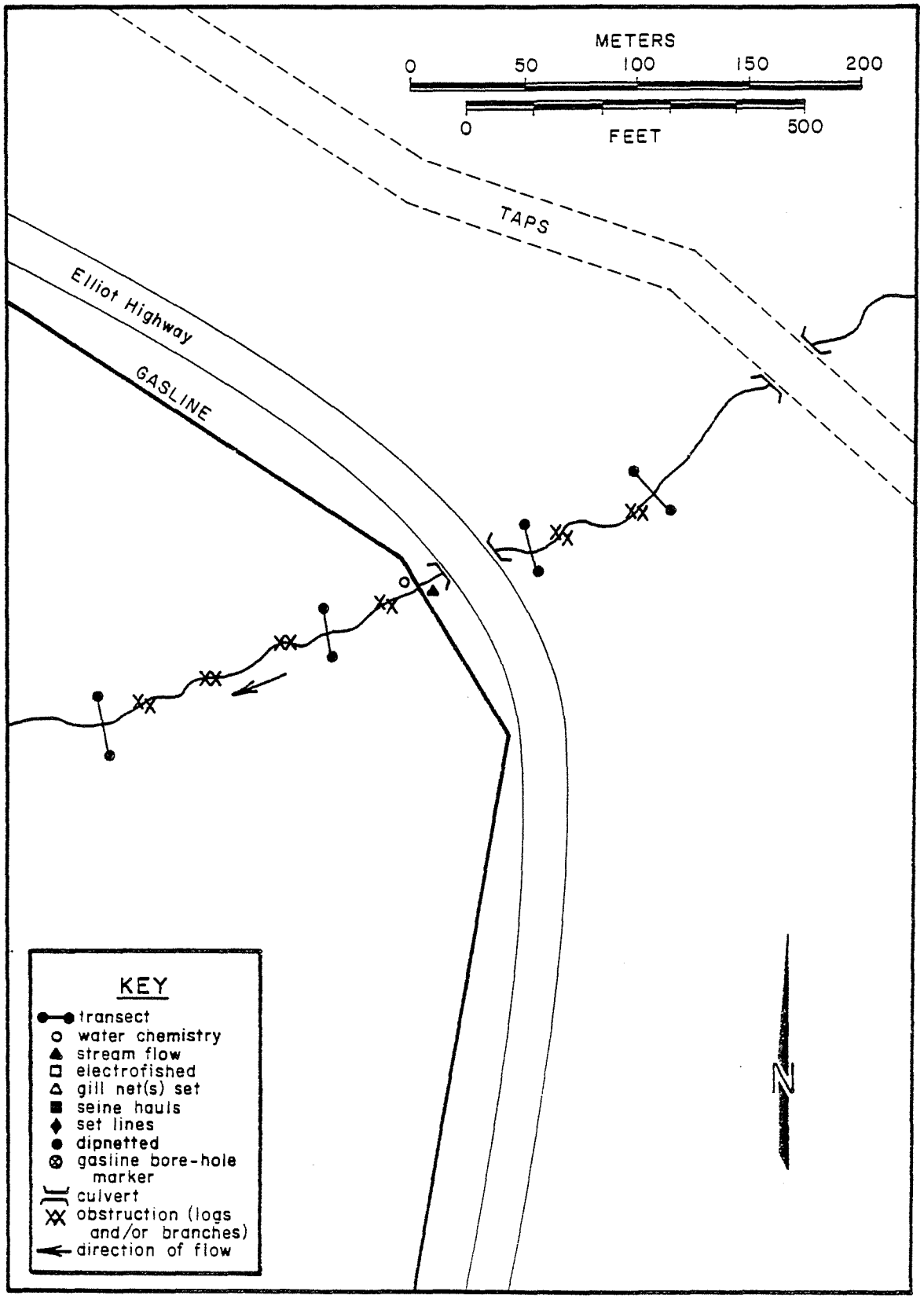

Fig. 34. Fall survey. Two-Bank Creek, 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Taiga Drainage

Main Drainage Hess Creek Tributary to Two-Bit Creek

Figure 35 Gradient 2.3% Elevation 216 m

NPAS 68 NPMP 381.8 NPRX 068-1 AHMP NA

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

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek is an intermittent (0-13 cm deep), dark-stained stream that flows into Two-Bit Creek, a tributary to Hess Creek, below the proposed gas line crossing. This small stream has a relatively steep gradient and drains an approximate 1.5 km^2 area (Ref. 11) through a poorly defined marshland area. Near the crossing this creek has been channeled through a perched CMP at the Elliott Highway. This perched culvert created a 0.3 m falls thus representing a substantial fish block. The surrounding riparian area is vegetated by spruce, willow and sedge. Substrate consists of fines.

This stream was considered poor fish habitat during the fall survey because its channel was very shallow and poorly defined surface flow was intermittent.

FISH

Date 15 September 1980

Fish Present

Gear/Effort None - stream channel undefined and intermittent

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	0-3.2
Depth (cm)	0-13
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	4.8
Conductivity (umhos/cm)	65
pH (pH units)	8.3
Color (color units)	200
Turbidity (NTU)	7.2
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	Undefined banks
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 sedge, 10 willow, 10 spruce
Cover (%)	95
Fish Block(s)	Channel undefined and intermittent and a 0.3 m falls created by a perched culvert.

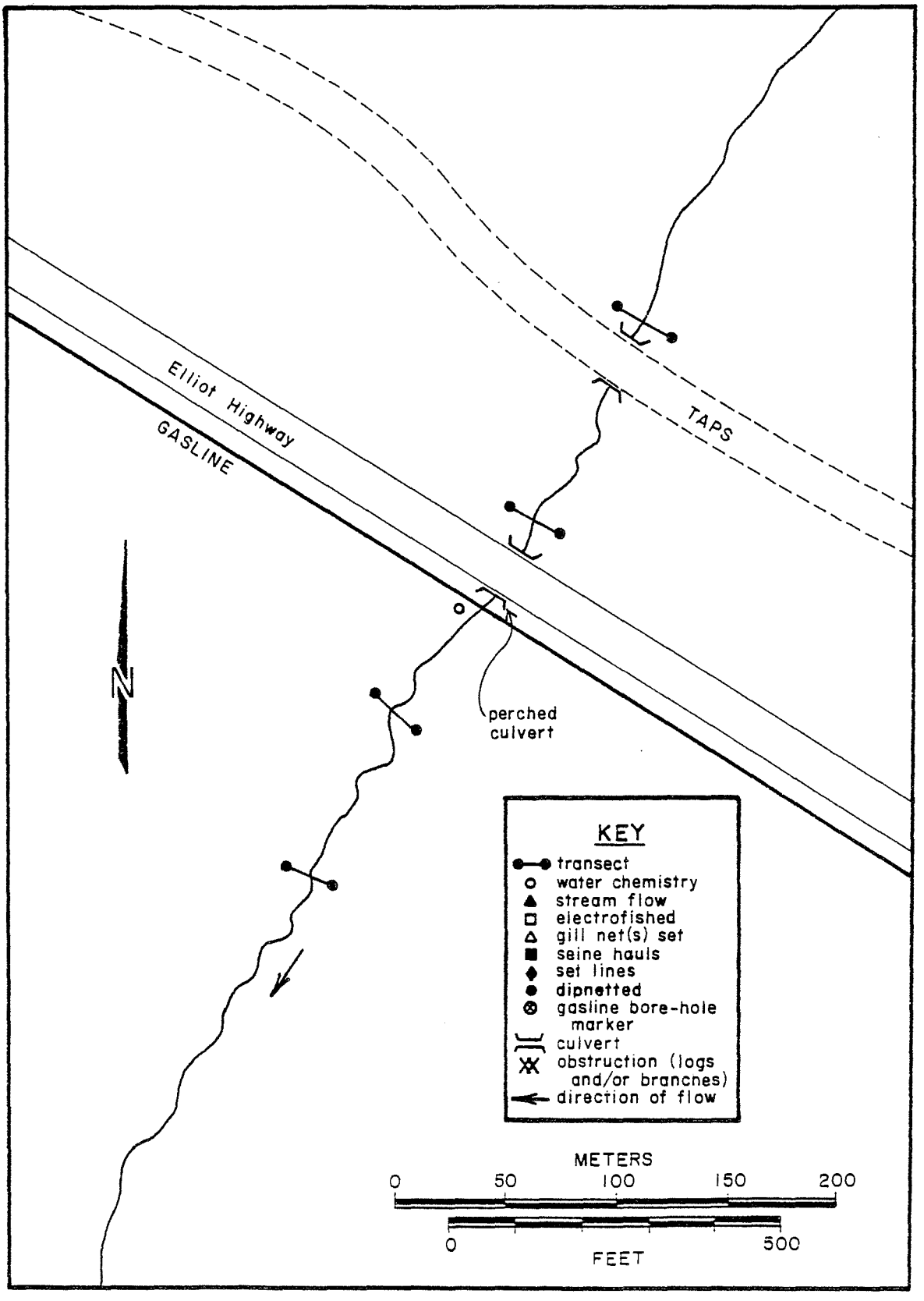

Fig. 35. Fall survey. Unnamed Creek (NPMP 381.8), 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Two-Bit Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 36 Gradient 5.0% Elevation 210 m

NPAS 67 NPMP 381.4 NPRX 067-5 AHMP NA

USGS Map Reference Truck T 10N R 8W Sec. 3

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipelin crossing

ASSESSMENT

Two-Bit Creek is a small tributary to Hess Creek that drains an area of approximately 13 km^2 over steep gradient (~5.0%) (Ref. 11). Stream substrate is sand and fines, and banks are vegetated with grass, alder, spruce and dense willow. During the fall 1980 investigations, stream width varied from 0.3 to 6.3 m and depth ranged from 9 to 14 cm. Numerous instream willow branches and deadfalls have created small log jams and falls which could impede fish movement to this area.

During the fall 1980 survey no fish were captured or observed in Two-Bit Creek. This waterbody provides marginal habitat and fish use during fall is considered to be low or non-existent.

FISH

Date 15 September 1980

Fish Present No

Gear/Effort DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	0.3 m - 6.3 m
Depth (cm)	9-14
Discharge (m^3/s)	0.05
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	3.8
Conductivity (umhos/cm)	115
pH (pH units)	8.5
Color (color units)	100
Turbidity (NTU)	1.6
T. Hardness (mg $CaCO_3$/1)	239
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 sand, 90 fines
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	5 grass, 40 willow, 50 spruce, 5 alder
Cover (%)	15
Fish Block(s)	Numerous log jams and branches in water forming small falls.

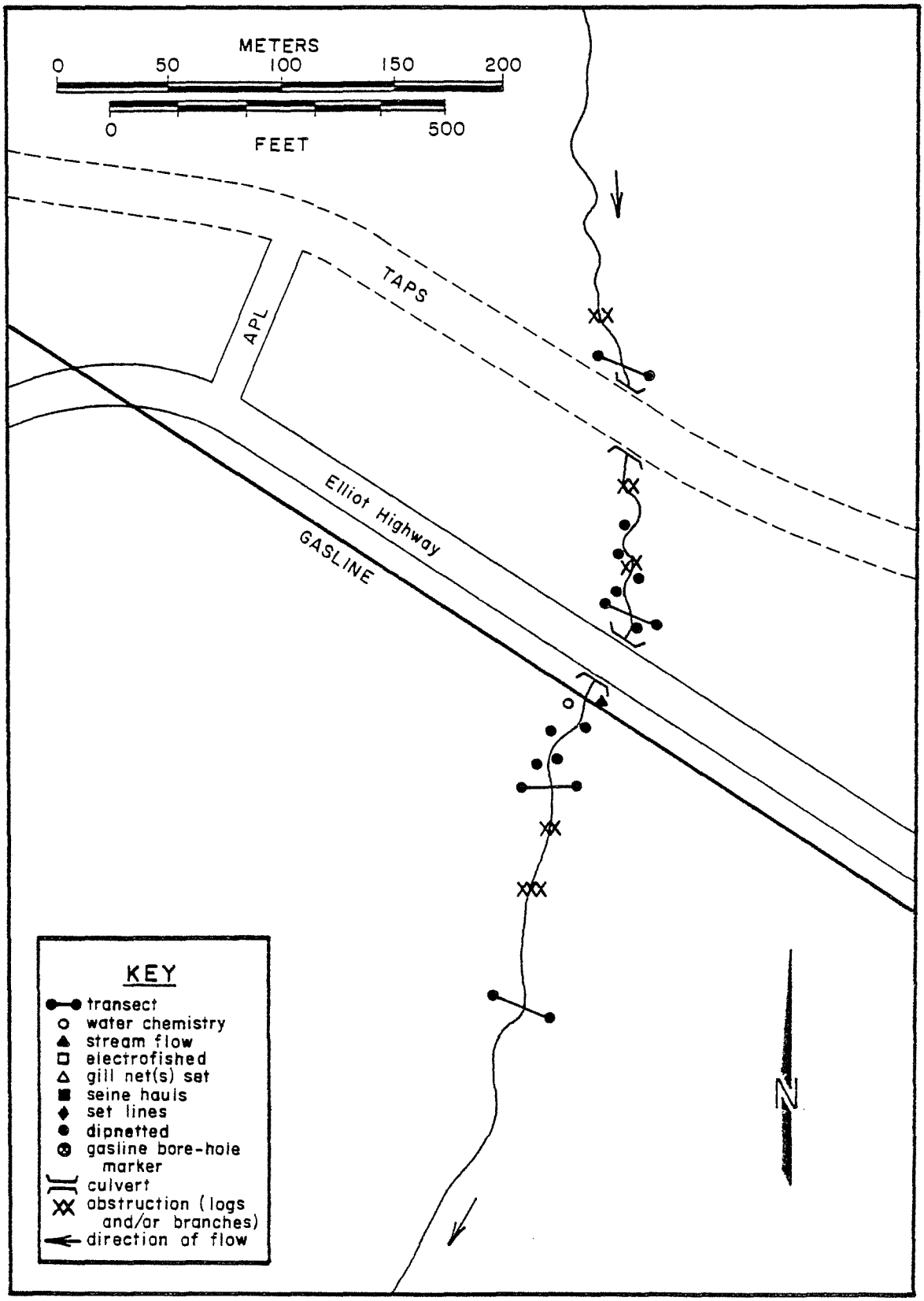

Fig. 36. Fall survey. Two-Bit Creek (NPMP 381.4), 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 37 Gradient 2.5% Elevation 198 m

NPAS 67 NPMP 379.5 NPRX 067-3 AHMP NA

USGS Map Reference Livengood, AK T 10N R 8W Sec. 5

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek is a very narrow (0.1-1.0 m wide) stream that meanders through a well-defined channel consisting of alternating chutes and pools. It is bordered by grasses, willow, alder and spruce. Stream substrate is gravel and pebbles that have eroded somewhat forming many series of 10 cm falls (approximately 3/m).

Fish use of Unnamed Creek was low to non-existent during the fall 1980 investigations. Water depth, cover and stream flow provide suitable habitat; however, fish of this stream in the vicinity of the proposed crossing is unlikely due to the steep gradient.

FISH

Date 14 September 1980

Fish Present No

Gear/Effort EF (0/360 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	0.1-1.0
Depth (cm)	6-10
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	8.6
Temperature (^oC)	2.5
Conductivity (umhos/cm)	270
pH (pH units)	6.2
Color (color units)	70
Turbidity (NTU)	18
T. Hardness (mg $CaCO_3$/1)	291
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 gravel/pebbles
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	20 grass, 79 willow/alder, 1 spruce
Cover (%)	30
Fish Block(s)	Shallow water, narrow width with approximately 6-10 cm drops/m in most areas.

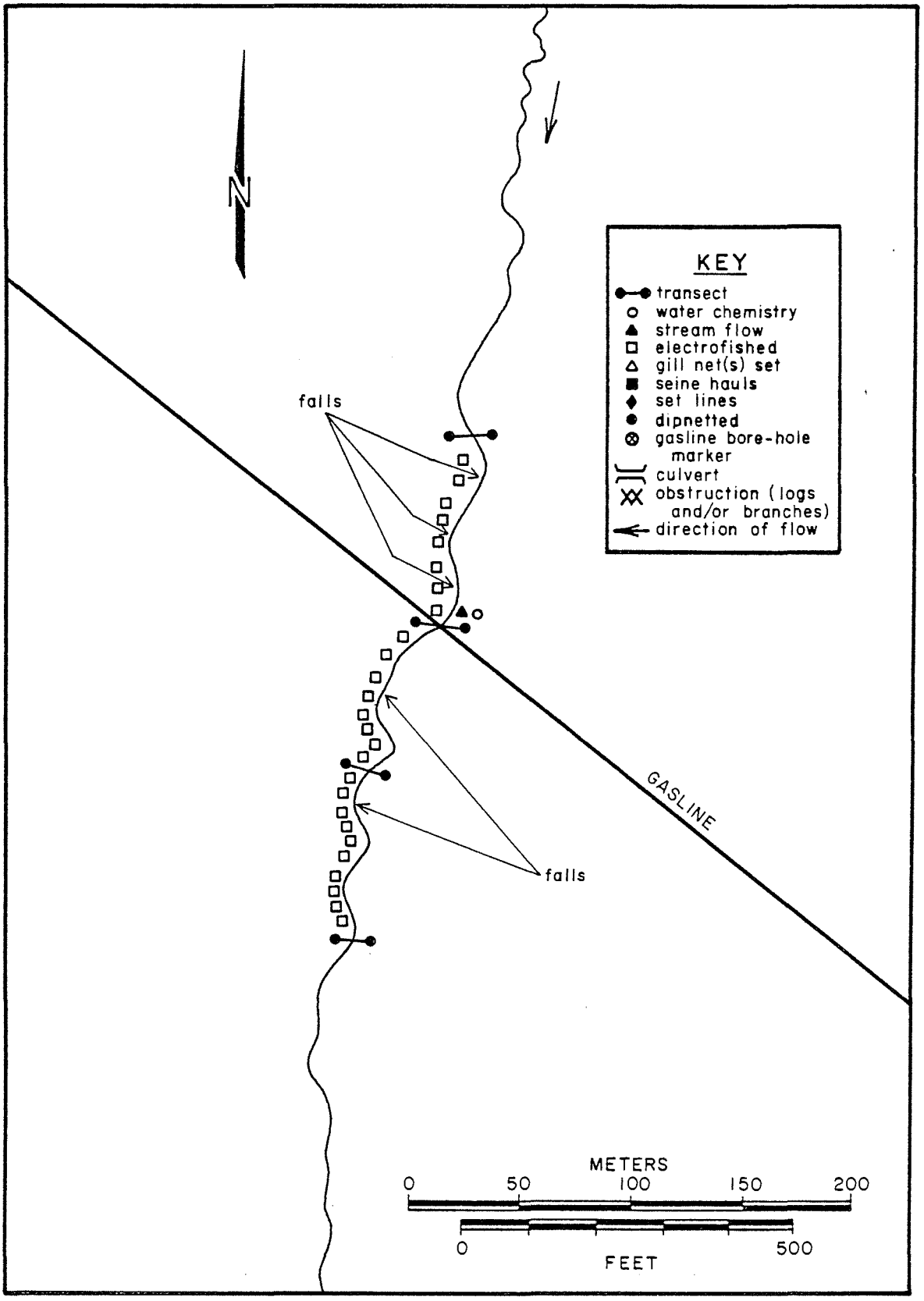

Fig. 37. Fall survey. Unnamed Creek (NPMP 379.5), 14 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Hot Cat Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 38 Gradient 2.5% Elevation 171 m

NPAS 67 NPMP 378.5 NPRX 067-2 AHMP NA

USGS Map Reference Livengood, AK T 11N R 8W Sec. 31

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Hot Cat Creek is a moderately fast-flowing, humic-stained stream that flows south to Hess Creek in a series of small pools and narrow chutes. During the September 1980 investigation this stream was approximately 1.5-3.2 m wide and 12-49 cm deep. Banks are vegetated with grasses, herbaceous plants, willow, alder and spruce. Some erosion has occurred causing trees and branches to clog portions of the stream.

Deep pools and good cover in Hot Cat Creek provide good fall habitat although instream debris in the vicinity of the proposed crossing may be a barrier to fish movement at this time. Gillnetting efforts in September 1980 indicate fish use of Hot Cat Creek is low to non-existent in fall. Grayling have been reported present in summer (Ref. 30).

FISH

Date 15 September 1980

Fish Present No

Gear/Effort 15 m GN (0/24 h)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	1.5-3.2
Depth (cm)	12-49
Discharge (m^3/s)	0.20
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	4.5
Conductivity (umhos/cm)	145
pH (pH units)	8.8
Color (color units)	90
Turbidity (NTU)	8.5
T. Hardness (mg $CaCO_3$/1)	239
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	60 sand and fines, 30 gravel, 10 pebble
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	20 grass, 30 willow, 10 alder, 20 spruce, 20 herbaceous plants
Cover (%)	10
Fish Block(s)	Numerous log jams up and downstream of proposed crossing may impede fish passage

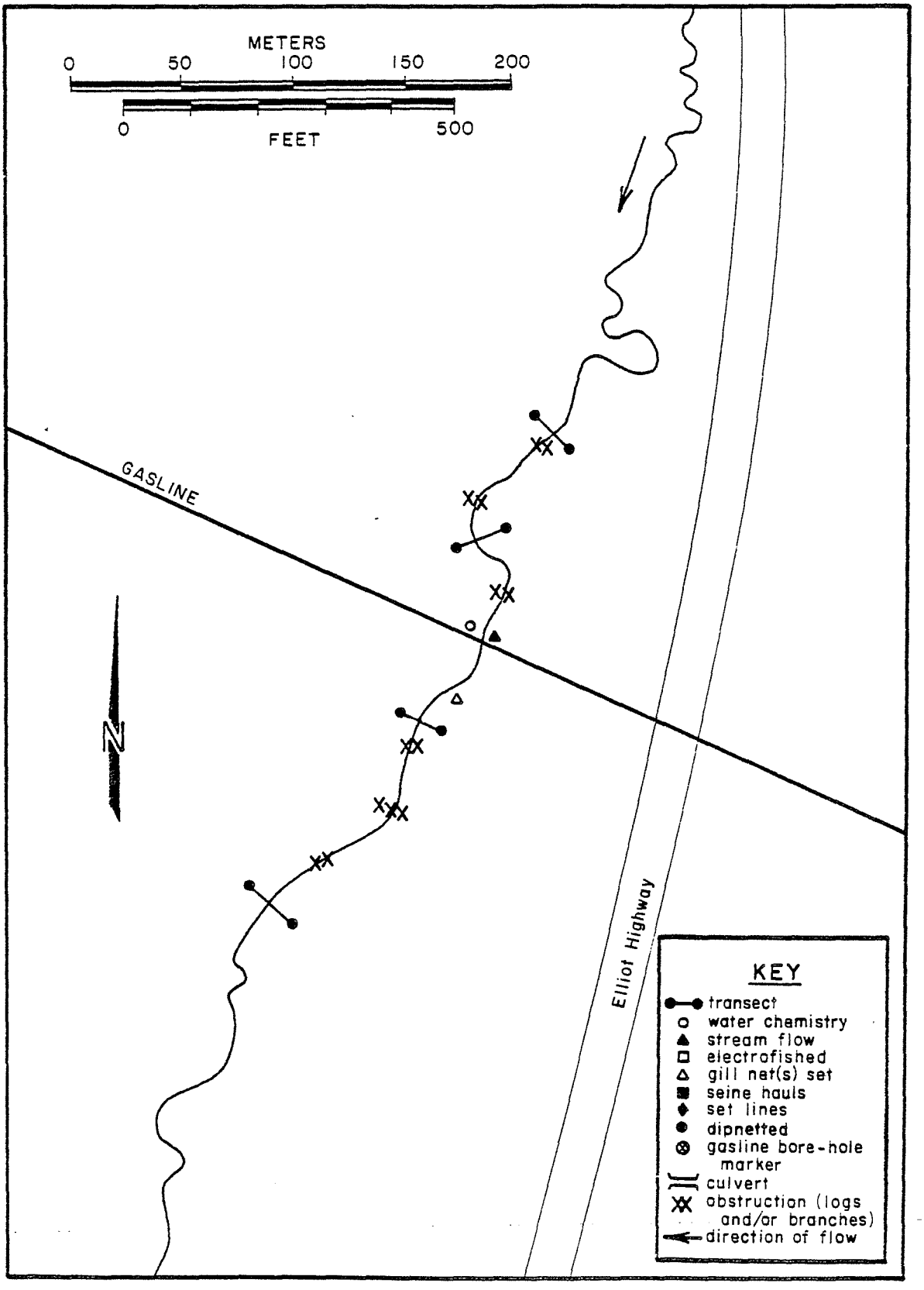

Fig. 38. Fall survey. Hot Cat Creek, 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Hot Cat Creek

Figure 39 Gradient 3.0% Elevation 264 m

NPAS 67 NPMP 375.9 NPRX 067-1 AHMP NA

USGS Map Reference Livengood, AK T 11N R 9W Sec. 26

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek is a narrow, humic-stained stream which flows south to its confluence with Hot Cat Creek. Stream substrate is composed of fines and heavily littered with vegetative debris. Banks are stable and covered with spruce, alder, willow and grass. Numerous log jams, created by debris and deadfalls, likely prevent any fish from migrating in to this area from Hot Cat Creek.

During the recent fall survey this stream provided marginal fish habitat. No fish were captured or observed at this time and it is suspected that fish use of this stream at any time of year is low to non-existent.

FISH

Date 15 September 1980

Fish Present No

Gear/Effort DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	15 September 1980
Wetted Width (m)	0.6-3.6
Depth (cm)	10-36
Discharge (m^3/s)	0.03
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	4
Conductivity (umhos/cm)	135
pH (pH units)	8.5
Color (color units)	80
Turbidity (NTU)	5.4
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil and debris
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	20 grass, 10 willow, 20 alder, 50 spruce
Cover (%)	20
Fish Block(s)	Numerous log jams up and downstream of proposed crossing may impede fish movement

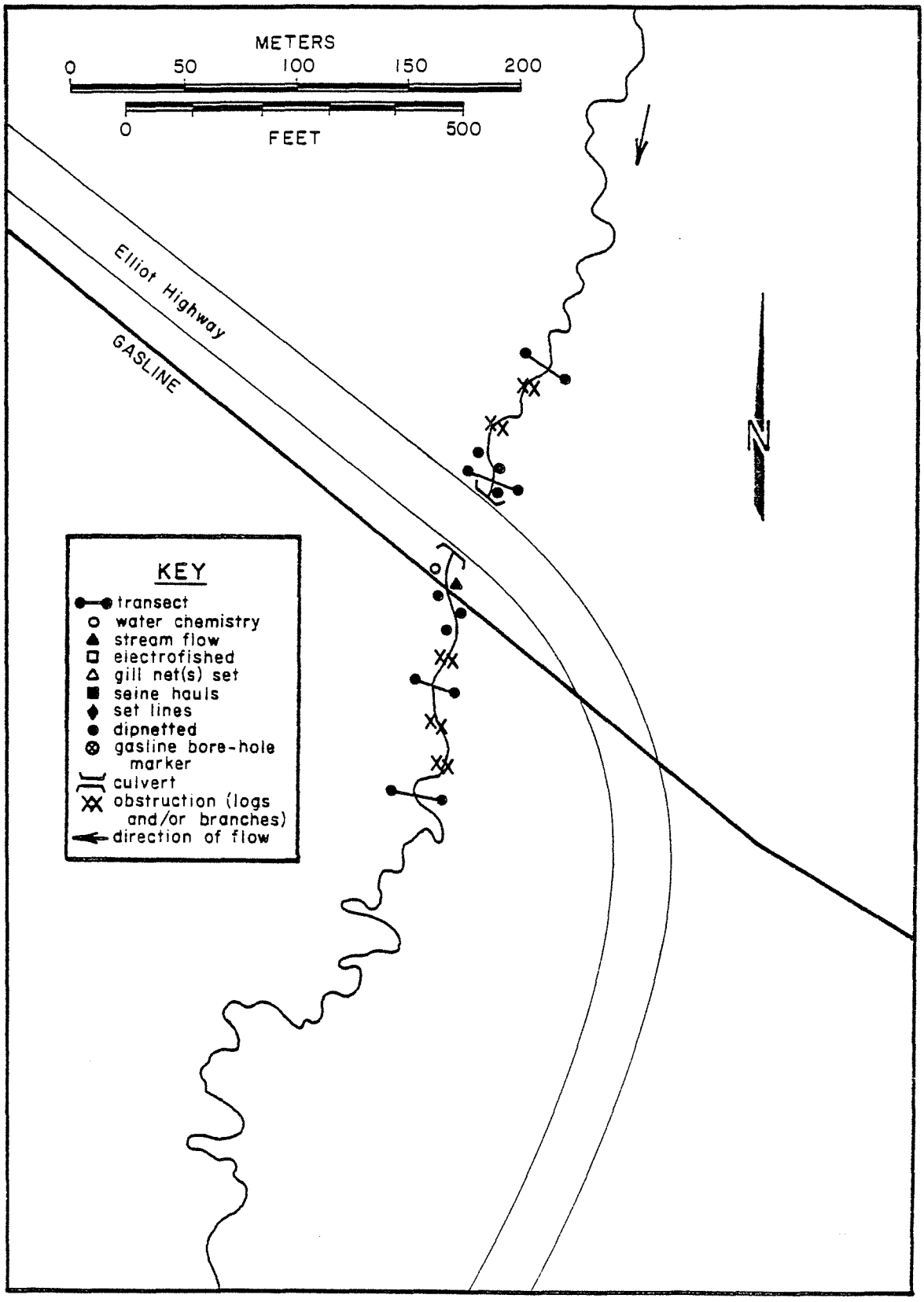

Fig. 39. Fall survey. Unnamed Creek (NPMP 375.9), 15 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Hess Creek

Figure 40 Gradient 7.5% Elevation 244 m

NPAS 66 NPMP 374.3 NPRX 066-4 AHMP NA

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

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek is a shallow (11-13 cm), darkly-stained tributary to Hess Creek that drains south through a low-lying marsh area. Stream substrate consists of fines and detritus and banks are densely vegetated with spruce, willow, alder, birch and grass. In the area of the proposed crossing, numerous log jams created by instream debris and deadfalls likely prevent fish movement to this area.

During the recent fall survey no fish were captured or observed. Sampling efforts were limited by the dense, overhanging vegetation; however, due to the small size of this stream and poor habitat available, fish use at any time of the year is probably low or non-existent.

FISH

Date 12 September 1980

Fish Present No

Gear/Effort DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	1.5-3.3
Depth (cm)	11-13
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	2.5
Conductivity (umhos/cm)	81
pH (pH units)	7.5
Color (color units)	100
Turbidity (NTU)	12
T. Hardness (mg $CaCO_3$/1)	171
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	90 fines, 10 debris and soil
Bank Stability (%)	80
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	10 grass, 20 willow, 10 alder, 10 birch, 50 spruce
Cover (%)	15
Fish Block(s)	30 cm falls 60 m downstream and numerous log jams may impede fish mvoement.

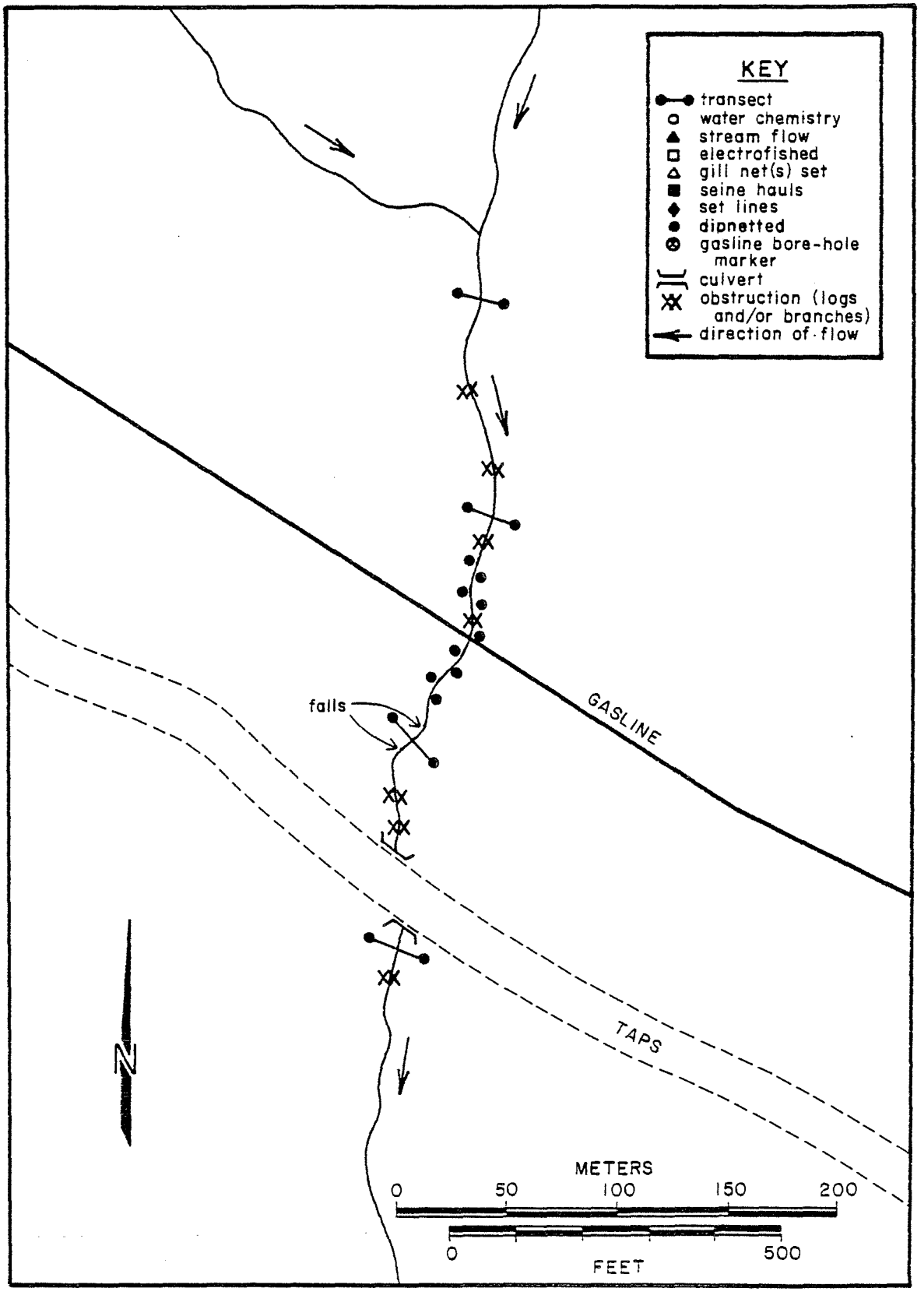

Fig. 40. Fall survey. Unnamed Creek (NPMP 374.3), 12 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Isom Creek #1 Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Yukon River

Figure 41 Gradient 2.0% Elevation 293 m

NPAS 66 NPMP 371.4 NPRX 066-3 AHMP NA

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

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Isom Creek is a deep (50-150 cm), humic-stained stream that drains a 26 km^2 area above the proposed pipeline crossing (Ref. 11). Stream width varies from 0.5 m to 3.0 m and substrate consists of fines. High (3 m) banks are vegetated with grass, herbaceous plants and overhanging willow and alder. A few spruce have fallen into the stream channel creating occasional falls approximately 10 cm high.

Fish use of Isom Creek during the fall 1980 survey was low to non-existent although fish habitat appeared to be favorable. Isom Creek has been reported to be a rearing area for grayling during the open water season (Ref. 11 and 76). Fish present during summer may have migrated downstream prior to this survey, but it is suspected that this stream is only occasionally used during the open water season.

FISH

Date 17 September 1980

Fish Present No

Gear/Effort EF (0/361 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	17 September 1980
Wetted Width (m)	0.5-3
Depth (cm)	50-150
Discharge (m^3/s)	0.41
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	1.0
Conductivity (umhos/cm)	45
pH (pH units)	7.0
Color (color units)	190
Turbidity (NTU)	1.1
T. Hardness (mg $CaCO_3$/1)	86
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	30 grasses, 20 herbaceous plants, 50 willow/alder
Cover (%)	45
Fish Block(s)	None observed

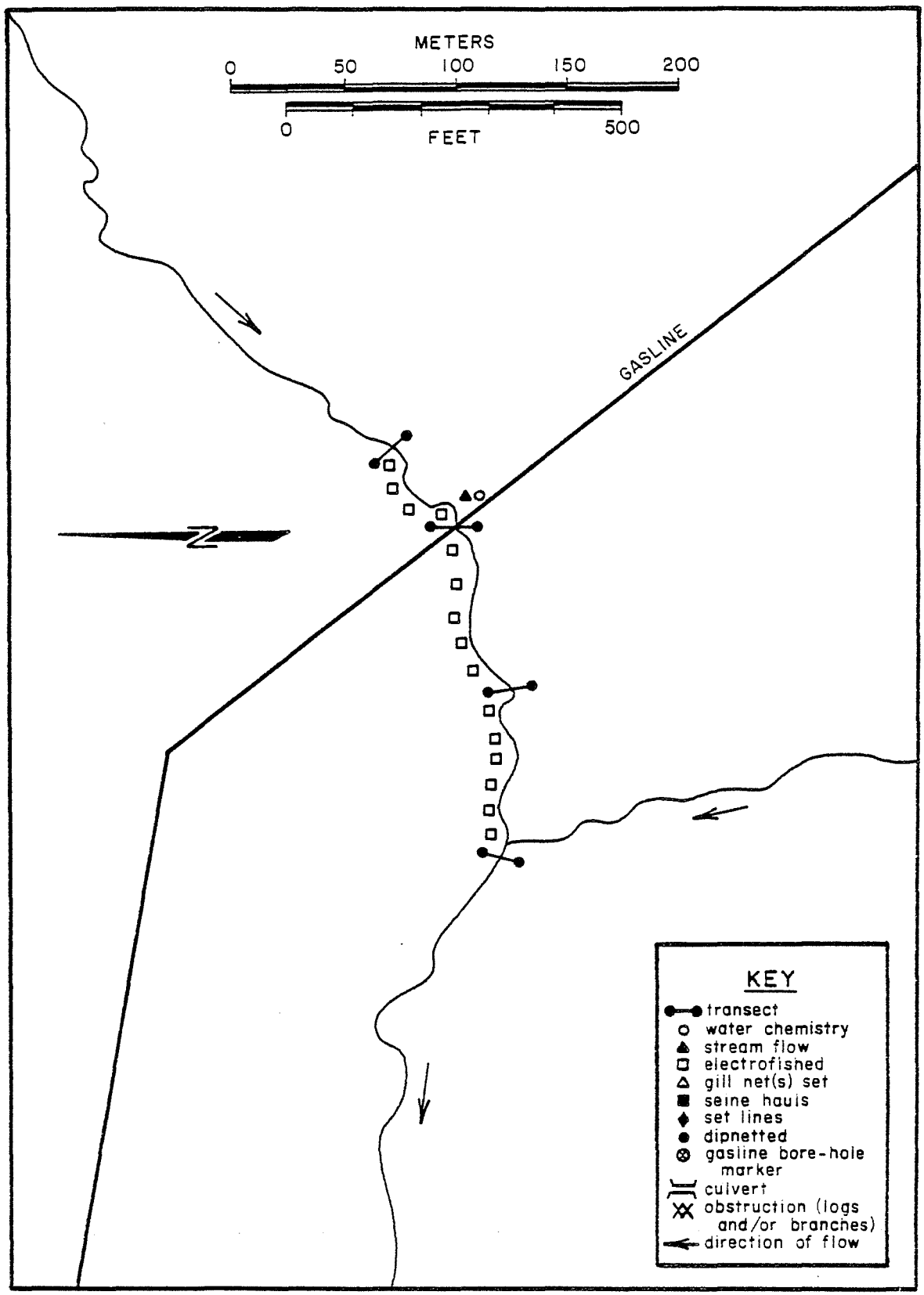

Fig. 41. Fall survey. Isom Creek, 17 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Tributary to Isom Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Isom Creek

Figure 42 Gradient 5.0% Elevation 290 m

NPAS 66 NPMP 370.6 NPRX 066-2 AHMP NA

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

Site Access Helicopter

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Tributary to Isom Creek is a small (0.2-2.9 m wide), slow moving stream that crosses the proposed pipeline route about 900m north of Isom Creek. Its humic-stained waters flow south to Isom Creek over mud and detritus substrate in a series of pools and narrow chutes.
Sloughing banks are vegetated with grasses, moss, willow, alder and spruce. In the vicinity of the proposed crossing several falls 0.3-0.5 m high have been created by erosion of the stream channel. This stream drains an area above the pipeline crossing of 2.8 km^2 (Ref. 11).

Grayling are suspected to use this area during the open water season (Ref. 11). Fall 1980 investigations indicate that fish use at this time is low to non-existent, although water depth, flow and cover provide suitable habitat.

FISH

Date 17 September 1980

Fish Present No

Gear/Effort EF (0/453 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	17 September 1980
Wetted Width (m)	0.2-2.9
Depth (cm)	10-100
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	10
Temperature (^oC)	1.5
Conductivity (umhos/cm)	100
pH (pH units)	6.0
Color (color units)	170
Turbidity (NTU)	1.8
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/detritus
Bank Stability (%)	60
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	50 grasses/moss, 40 willow/alder, 10 spruce
Cover (%)	45
Fish Block(s)	0.3-0.5 m falls potential barrier to fish movement

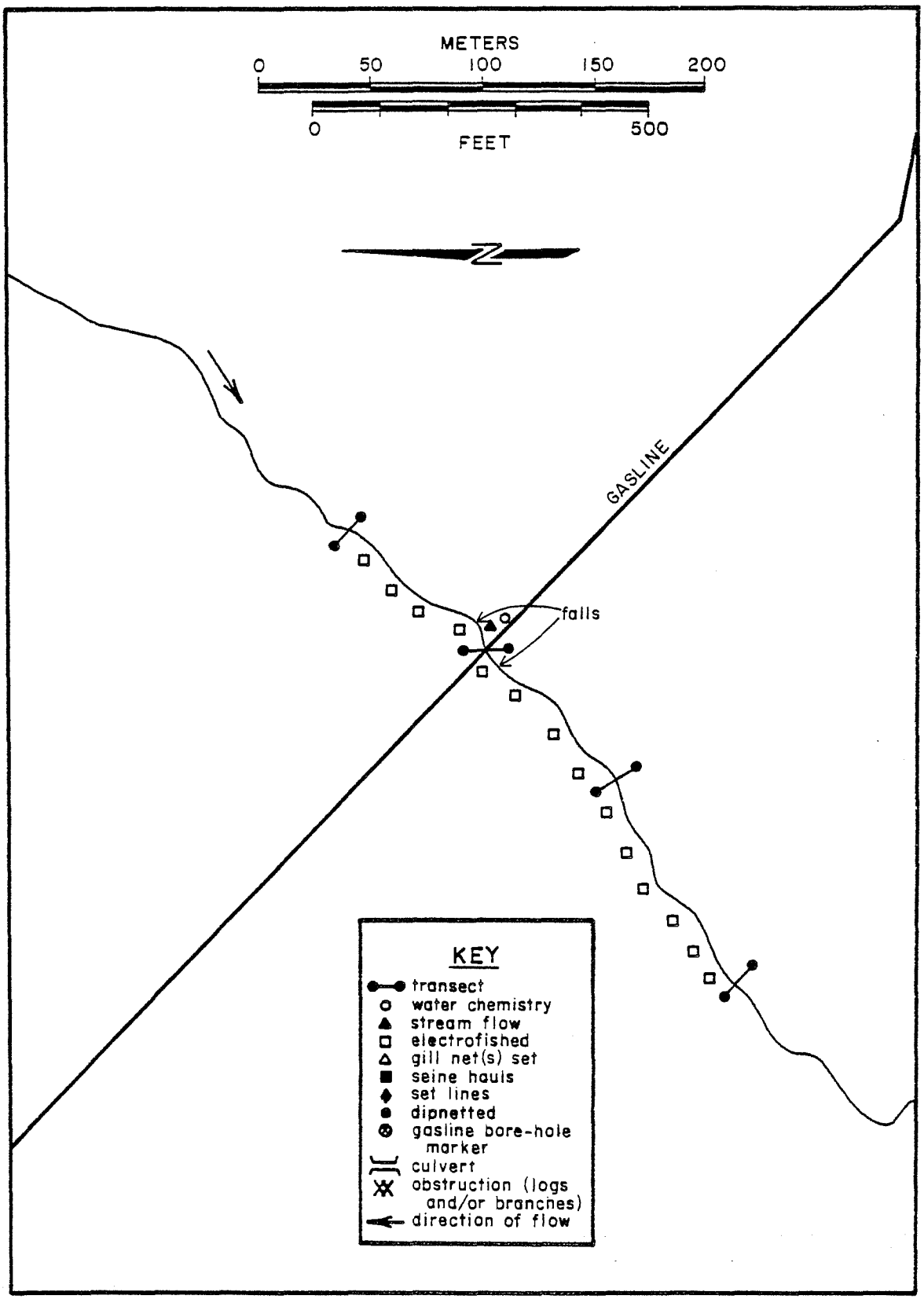

Fig. 42. Fall survey. Tributary to Isom Creek, 17 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Ray River

Figure 43 Gradient 3.2% Elevation 168 m

NPAS 62 NPMP 351.1 NPRX 062-3 AHMP NA

USGS Map Reference Livengood, AK T 13N R 11W Sec. 7

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of the proposed pipeline crossing

ASSESSMENT

Unnamed Creek is a small stream with a poorly defined channel, that flows through a tundra marsh area to the Ray River. Substrate is detrital material and sphagnum moss. Riparian vegetation consists of a dense growth of spruce, willow, sedge, grass and sphagnum moss.

Fish habitat in Unnamed Creek in the vicinity of the proposed crossing was poor during the 1980 fall investigation. Instream debris, subterranean flow, and deadfalls have created potential barriers to fish movement to this area. No fish were captured or observed during the fall survey, although sampling efforts were limited by the dense streamside vegetation. Additional information concerning fish use of this stream is not available at this time, however, it is believed to be low or non-existent at any time of year.

FISH

Date 12 September 1980

Fish Present No

Gear/Effort DN (0/30 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	0.25-5.4
Depth (cm)	1-6
Discharge (m^3/s)	<0.01
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	1.0
Conductivity (umhos/cm)	270
pH (pH units)	7.9
Color (color units)	90
Turbidity (NTU)	9.9
T. Hardness (mg $CaCO_3$/1)	342
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil and sphagnum moss
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	20 sedge/grass, 20 moss, 40 willow, 20 spruce
Cover (%)	20
Fish Block(s)	Debris, subterranean flow and deadfalls may be potential barrier to fish movement.

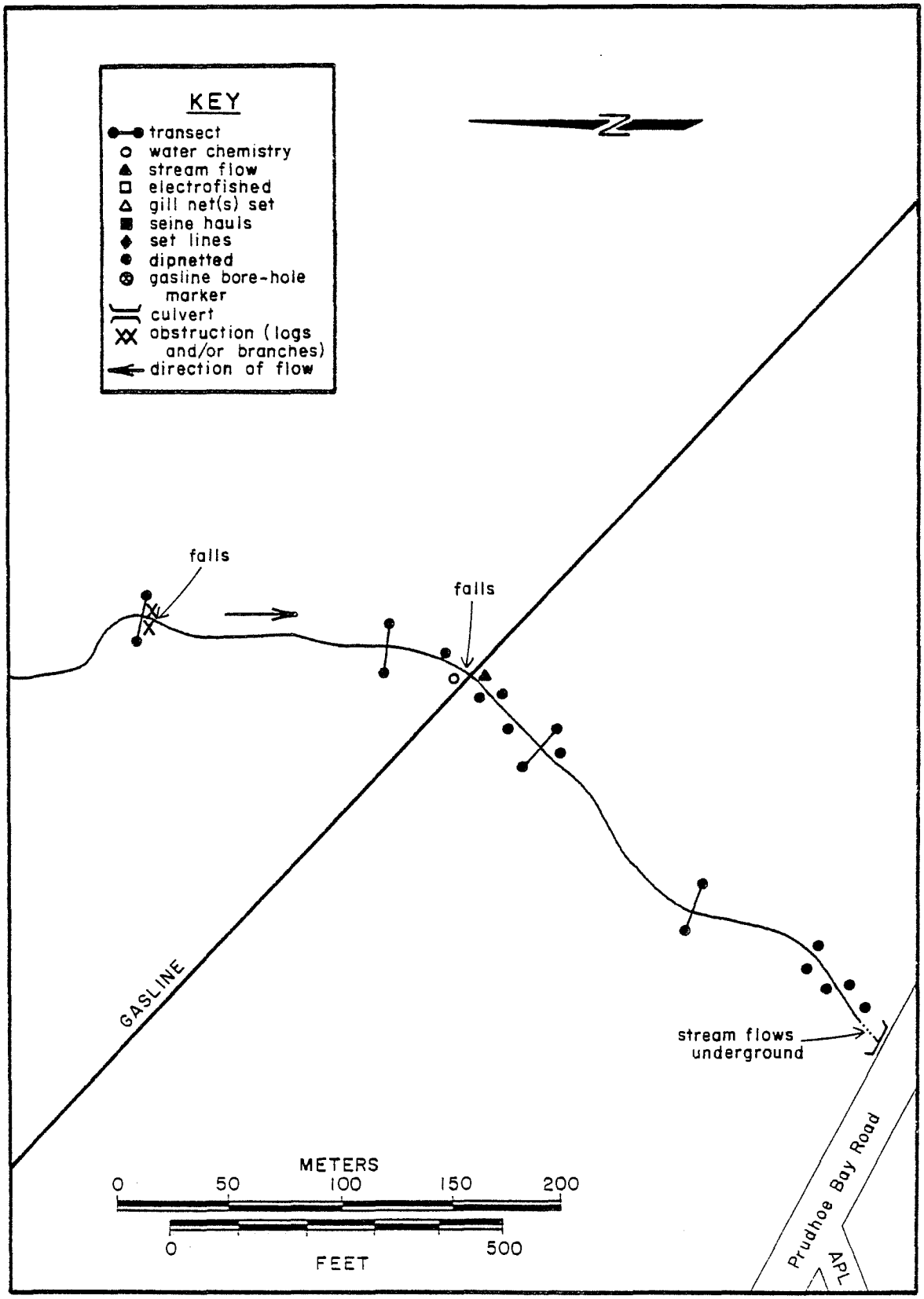

Fig. 43. Fall survey. Unnamed Creek (NPMP 351.1), 12 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Ray River

Figure 44 Gradient 3.0% Elevation 186 m

NPAS 62 NPMP 350.0 NPRX 062-2 AHMP NA

USGS Map Reference Livengood, AK T 13N R 12W Sec. 1

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek is a small stream that drains a shallow forested valley. The stream in the vicinity of the proposed crossing consists of fast, narrow, steep-banked chutes connecting wider, gently flowing pools. Many of the pools are clogged with logs and branches. Riparian vegetation consists of willow, alder, spruce, grass and moss. Portions of the sample area upstream of the proposed crossing show signs of recent fire.

Sampling efforts during the fall 1980 investifations were confined to electrofishing open pools and dipnetting in chutes. No fish were captured or observed. Fish habitat at this time appeared marginal due to clogged instream debris that may provide barriers to fish movement to this area.

FISH

Date 12 September 1980

Fish Present No

Gear/Effort EF (0/90 sec), DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	0.5-2.1
Depth (cm)	10-22
Discharge (m^3/s)	0.05
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	1.7
Conductivity (umhos/cm)	78
pH (pH units)	7.5
Color (color units)	50
Turbidity (NTU)	4.5
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	30 gravel, 60 sand, 10 pebble
Bank Stability (%)	50
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	20 moss/grass, 60 willow/alder, 20 spruce
Cover (%)	30
Fish Block(s)	Numerous log jams and instream debris areas up and downstream of crossing may impede fish movement.

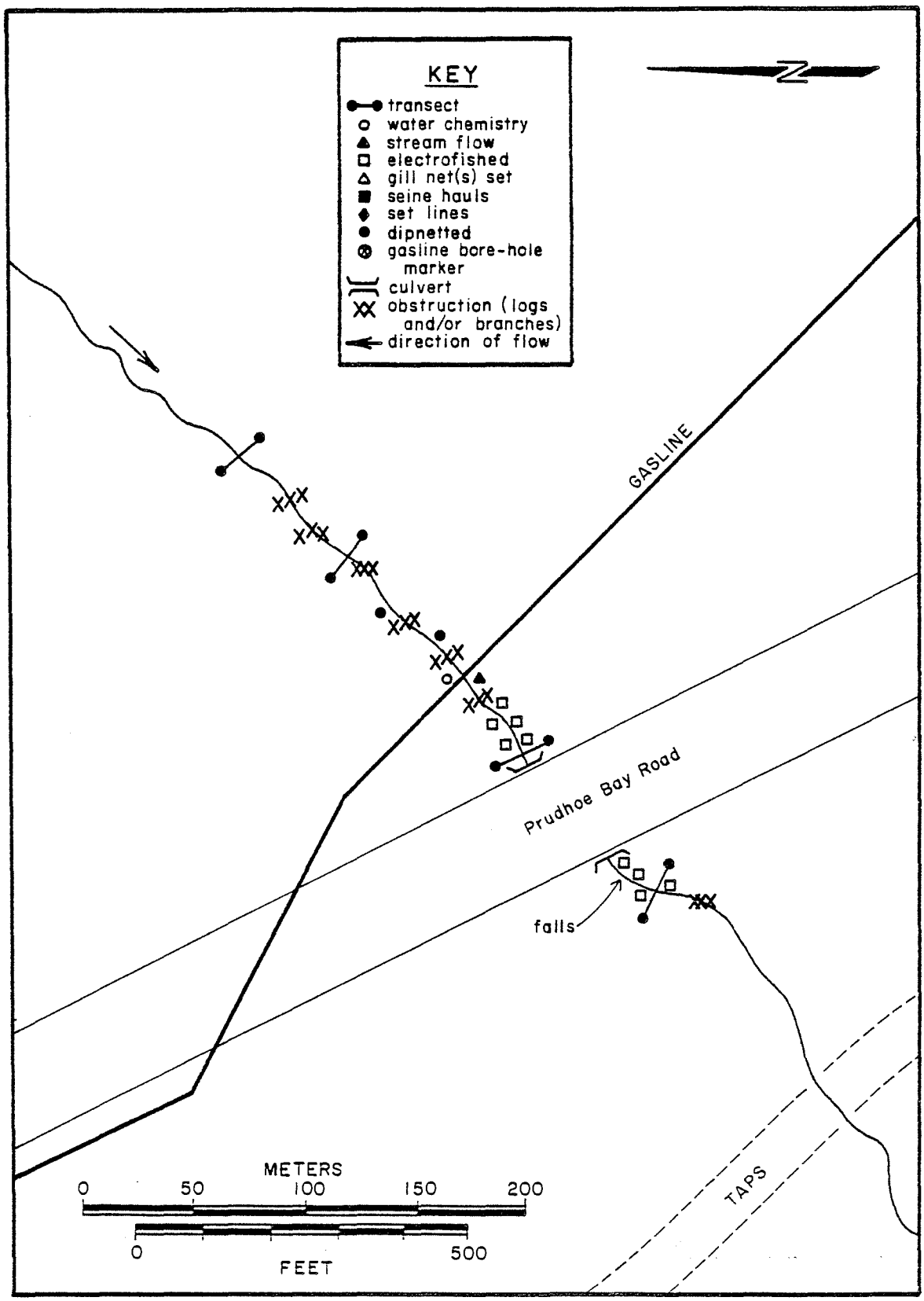

Fig. 44. Fall survey. Unnamed Creek (NPMP 350.0), 12 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Stumblin Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Ray River

Figure 45 Gradient 3.0% Elevation 209 m

NPAS 62 NPMP 348.6 NPRX 062-1 AHMP NA

USGS Map Reference Bettles, AK T 14N R 12W Sec. 35

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Stumblin Creek is a narrow, shallow stream that flows west to its confluence with the Ray River. This stream is characterized by short runs, chutes and numerous small falls created by debris and deadfalls. Riparian vegetation consists of overhanging willow, spruce, moss and grass. About 25% of the stream bank shows sign of erosion and bank slumping.

Fall fish use of this stream is probably low or non-existent. Fish habitat appeared to be marginal due to numerous instream debris and log jams that may impede fish movement to this area. No fish were captured or observed during the recent fall survey although sampling efforts were hindered by dense streamside vegetation and small stream size.

FISH

Date 12 September 1980

Fish Present No

Gear/Effort DN (0/30 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	0.25-2.1
Depth (cm)	5-8
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	13.8
Temperature (^oC)	3
Conductivity (umhos/cm)	85
pH (pH units)	7.6
Color (color units)	55
Turbidity (NTU)	6.0
T. Hardness (mg $CaCO_3$/1)	171
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	45 fines, 30 sand, 25 gravel
Bank Stability (%)	75
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	5 grass, 15 moss, 30 spruce, 50 willow
Cover (%)	30
Fish Block(s)	Numerous log jams and much debris in stream which may impede fish passage.

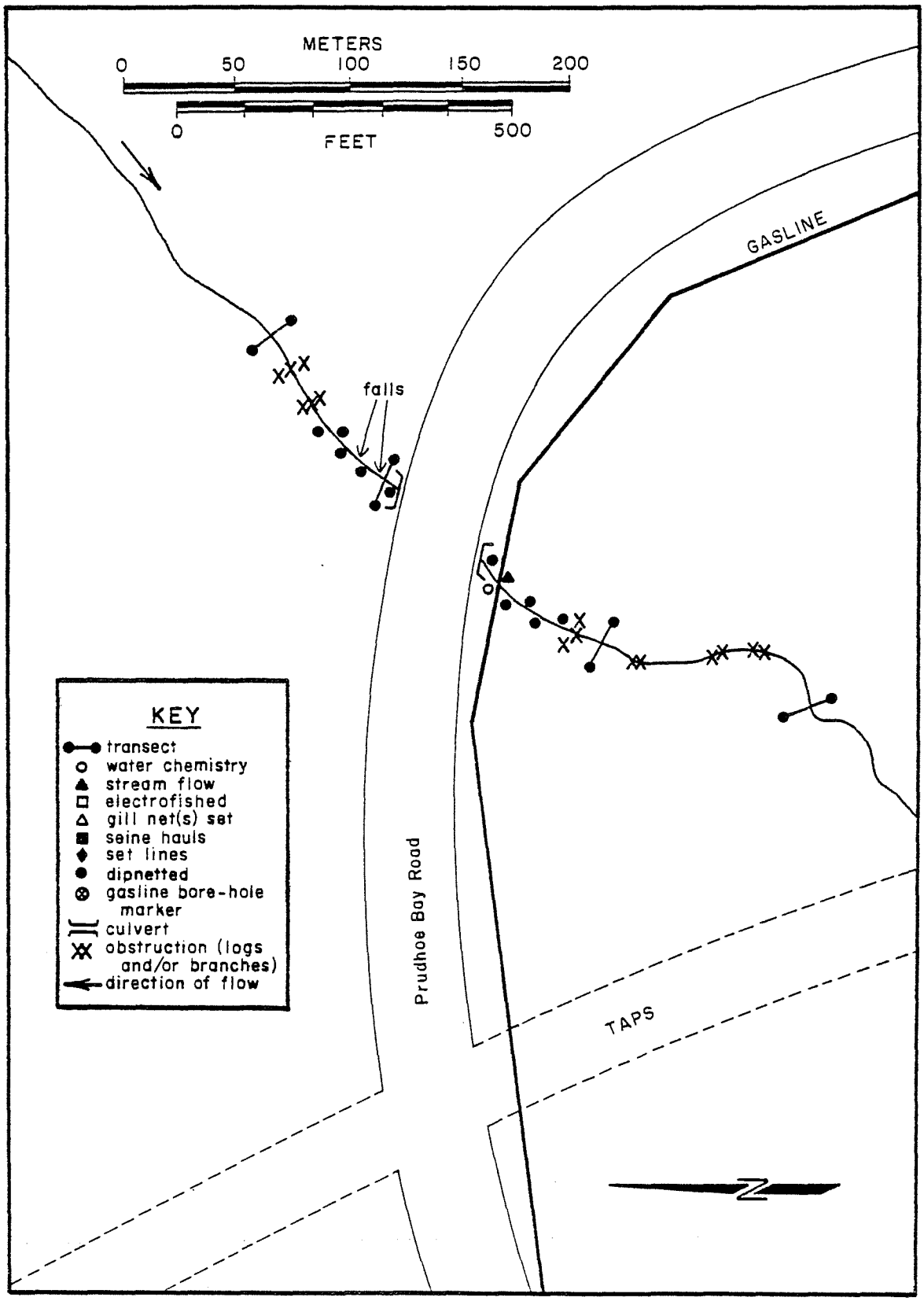

Fig. 45. Fall survey. Stumblin Creek, 12 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Taiga Drainage

Main Drainage Yukon River Tributary to Ray River

Figure 46 Gradient 2.5% Elevation 139 m

NPAS 61 NPMP 345.4 NPRX 061-2 AHMP NA

USGS Map Reference Bettles, AK T 14N R 12W Sec. 28

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek is a small, darkly stained stream that drains an 7.7 km^2 area (Ref. 11) above the proposed pipeline crossing. It flows westerly over sand, gravel and pebble substrate to its confluence with the Ray River. This stream was 0.3 to 0.7 m wide and 8 to 10 cm deep during recent fall investigations. Willow, spruce, sedge, grass and herbaceous plants densely vegetate the stable banks. Instream debris and deadfalls have created numerous jams that may impede fish movement to this area.

Unnamed Creek offers poor fall fish habitat; fish use at this time is likely non-existent. The narrow, shallow nature of this stream in September 1980 precluded sampling efforts by electrofisher, seine or gillnet. Dipnetting efforts did not yield fish and no fish were observed at the time of this survey. Previous reports have suggested that grayling and slimy sculpin use this stream during some portion of the open water season (Refs. 11, 20 and 30). Actual documentation, however, is not available.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort DN (0/5m^2)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	0.3 - 0.7
Depth (cm)	8-10
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	4.3
Conductivity (umhos/cm)	27
pH (pH units)	7.0
Color (color units)	175
Turbidity (NTU)	4.0
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	40 sand, 40 gravel, 20 pebble
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	10 sedge/grass, 20 herbacious plants, 50 willow,20 spru
Cover (%)	30 (deadfall)
Fish Block(s)	Numerous log jams may impede fish movement.

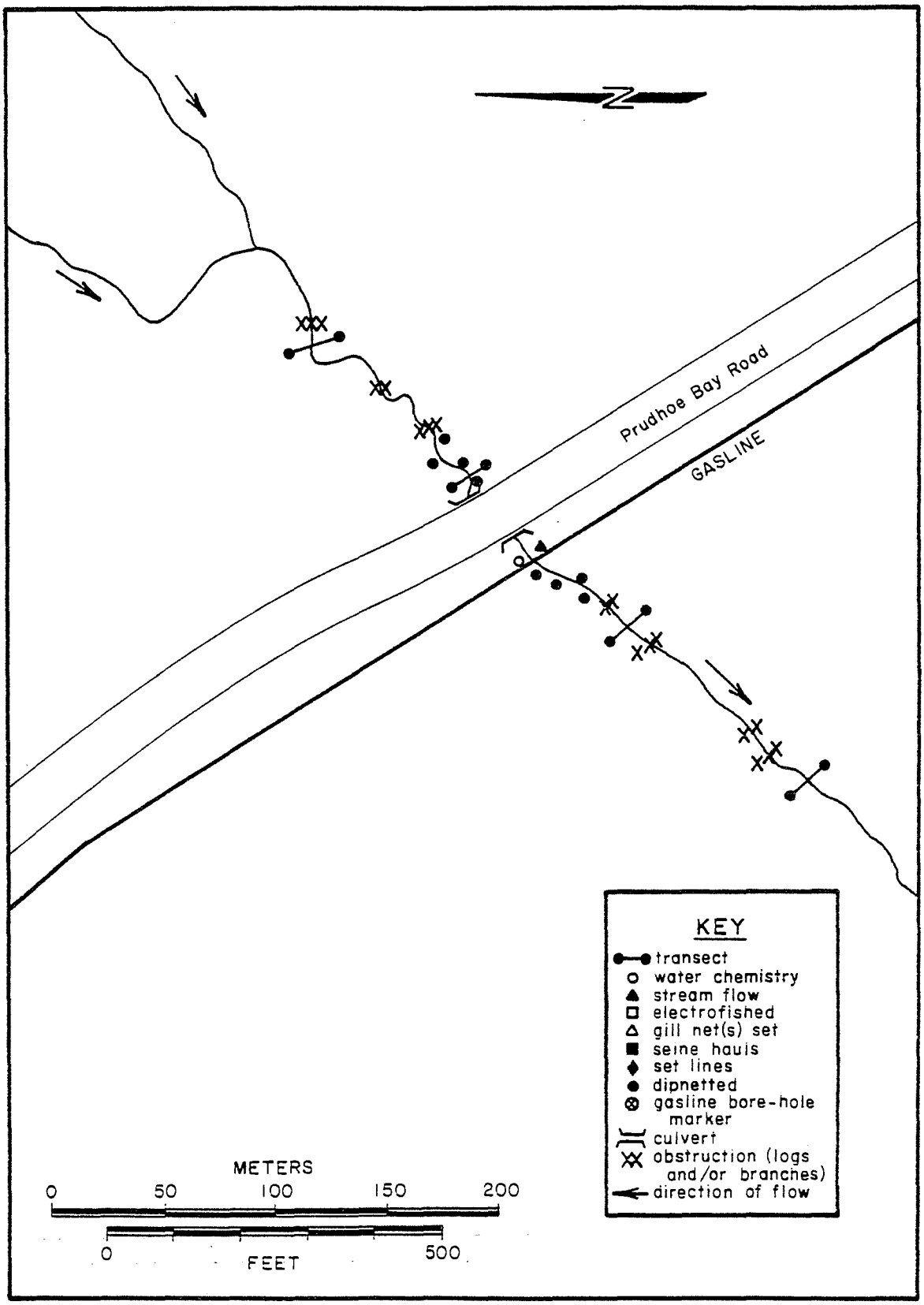

Fig. 46. Fall survey. Unnamed Creek (NPMP 345.4), 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Knowater Creek Source Taiga/Muskeg Drainage

Main Drainage Ray River Tributary to North Fork Ray River

Figure 47 Gradient 1.0% Elevation 168 m

NPAS 60 NPMP 341.3 NPRX 060-2 AHMP NA

USGS Map Reference Bettles, AK T 14N R 12W Sec. 6

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Knowater Creek is a small, humic-stained stream that flows southwest into the North Fork of the Ray River. This stream drains muskeg and forest through many small channels. The stream is channelized through a culvert at the Prudhoe Bay road and a low water crossing at the TAPS workpad, 100 m upstream of the proposed crossing. The culvert at the road has buckled in the middle and the corrugations form a long riffle.

Fall fish habitat within the sample area was poor and sampling yielded no fish. Numerous Notonectids (backswimmers) were observed in this waterbody. These aquatic insects inhabit slowly flowing or stagnant waters (Ref. 127).

Due to its poorly defined channel and bowed CMP, it is unlikely that this stream provides adequate fish habitat during any season.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort EF (0/42 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	1.4 - 2.7
Depth (cm)	34-58
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	3.0
Conductivity (umhos/cm)	59
pH (pH units)	7.1
Color (color units)	100
Turbidity (NTU)	8.5
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil and debris
Bank Stability (%)	80
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	10 sedge, 50 willow, 20 spruce, 10 birch, 10 herbaceous plants
Cover (%)	90 (tussock overhang)
Fish Block(s)	CMP bowed in center section may impede fish movement during periods of low flow

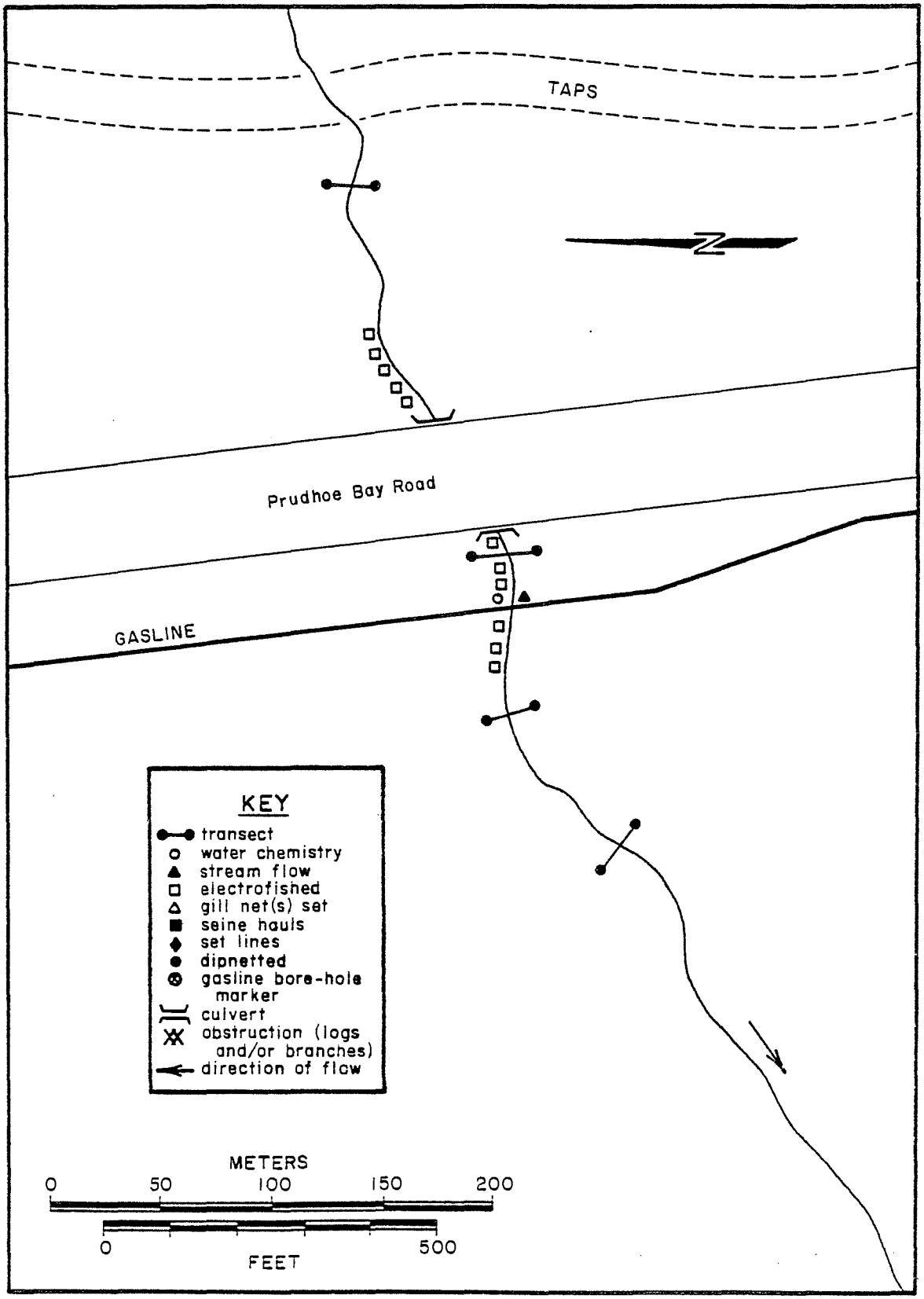

Fig. 47. Fall survey. Knowater Creek, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Fed Creek Source Taiga Drainage

Main Drainage Ray River Tributary to North Fork Ray River

Figure 48 Gradient 2.0% Elevation 302 m

NPAS 59 NPMP 333.2 NPRX 059-1 AHMP NA

USGS Map Reference Bettles, AK T 16N R 13W Sec. 25

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Fed Creek is a small slow-flowing, humic-stained stream that meanders southeast across the proposed pipeline to its confluence with the North Fork of the Ray River. This stream flows down a moderate gradient (2.0%) and over many log jams (Ref. 11). Vegetation in this area is spruce-deciduous woodlands.

Past sampling efforts to document fish in Fed Creek did not locate any fish (Refs. 11, 20 and 21), and no fish were observed during the fall 1980 survey. Fish use of Fed Creek during fall or any other time of the year is low to non-existent, due to the poor habitat caused by numerous log jams.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort DN (0/5m^2)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	0.2 - 4.0
Depth (cm)	13-29
Discharge (m^3/s)	0.05
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	3.0
Conductivity (umhos/cm)	30
pH (pH units)	7.5
Color (color units)	100
Turbidity (NTU)	3.0
T. Hardness (mg $CaCO_3$/1)	120
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil
Bank Stability (%)	50
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	30 willow, 20 alder, 20 sedgegrass, 30 spruce
Cover (%)	50
Fish Block(s)	Numerous log jams, one 40 cm falls 30 m downstream of crossing may impede fish movement

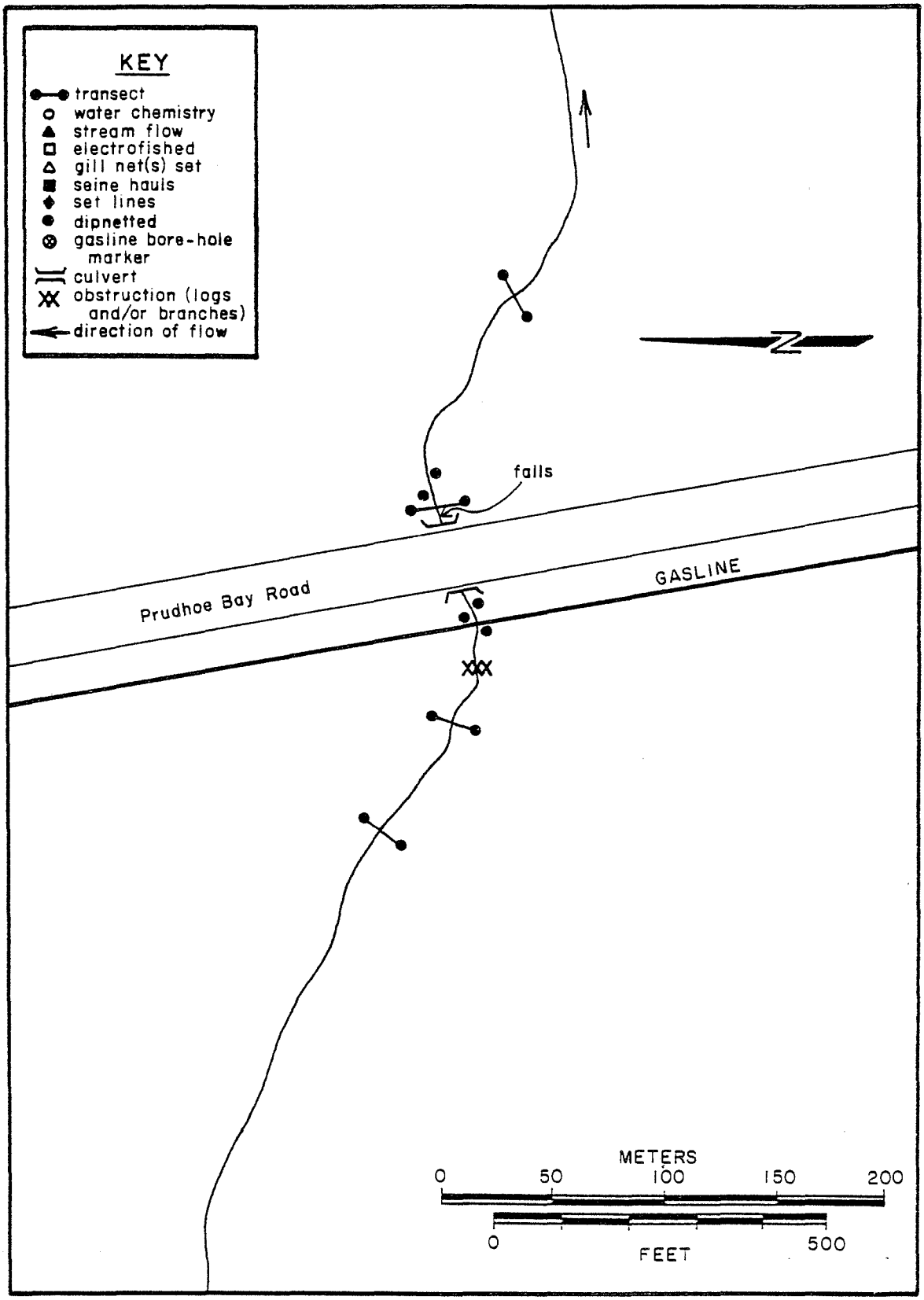

Fig. 48. Fall survey. Fed Creek, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Smoky Creek Source Montane/Taiga Drainage

Main Drainage West Fork Dall River Tributary to Middle Branch West Fork Dall River

Figure 49 Gradient 2.5% Elevation 512 m

NPAS 57 NPMP 322.7 NPRX 57-1 AHMP NA

USGS Map Reference Bettles, AK T 17N R 13W Sec. 7

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Smoky Creek is a small, lightly humic-stained stream that flows southeasterly to its confluence with the West Fork of the Dall River. Adjacent to the proposed gas line crossing, this stream varies from 0.9-6.3 m in width and water depths are approximately 15 cm. Banks are bordered by spruce, birch, moss, sedge, and herbaceous plants, and the substrate consists of soil and silt. The stream flows down a moderate gradient and has many log jams in the channel.

Past sampling efforts to document fish in Smoky Creek did not locate any fish (Refs. 11, 20 and 21) and no fish were captured or observed during the recent fall survey. Fish use of Smoky Creek during fall or any other time of the year is likely low or non-existent, due to the poor habitat created by numerous log jams.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort EF (0/193 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	0.9-6.3
Depth (cm)	14-16
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	2.2
Conductivity (umhos/cm)	8.0
pH (pH units)	6.2
Color (color units)	95
Turbidity (NTU)	2.4
T. Hardness (mg $CaCO_3$/1)	129
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil and silt
Bank Stability (%)	Undefined banks
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	40 moss, 10 sedge, 10 herbaceous plants, 20 birch, 20 spruce
Cover (%)	50
Fish Block(s)	50 cm falls upstream of crossing, 40 cm falls downstream of crossing both caused by log jams

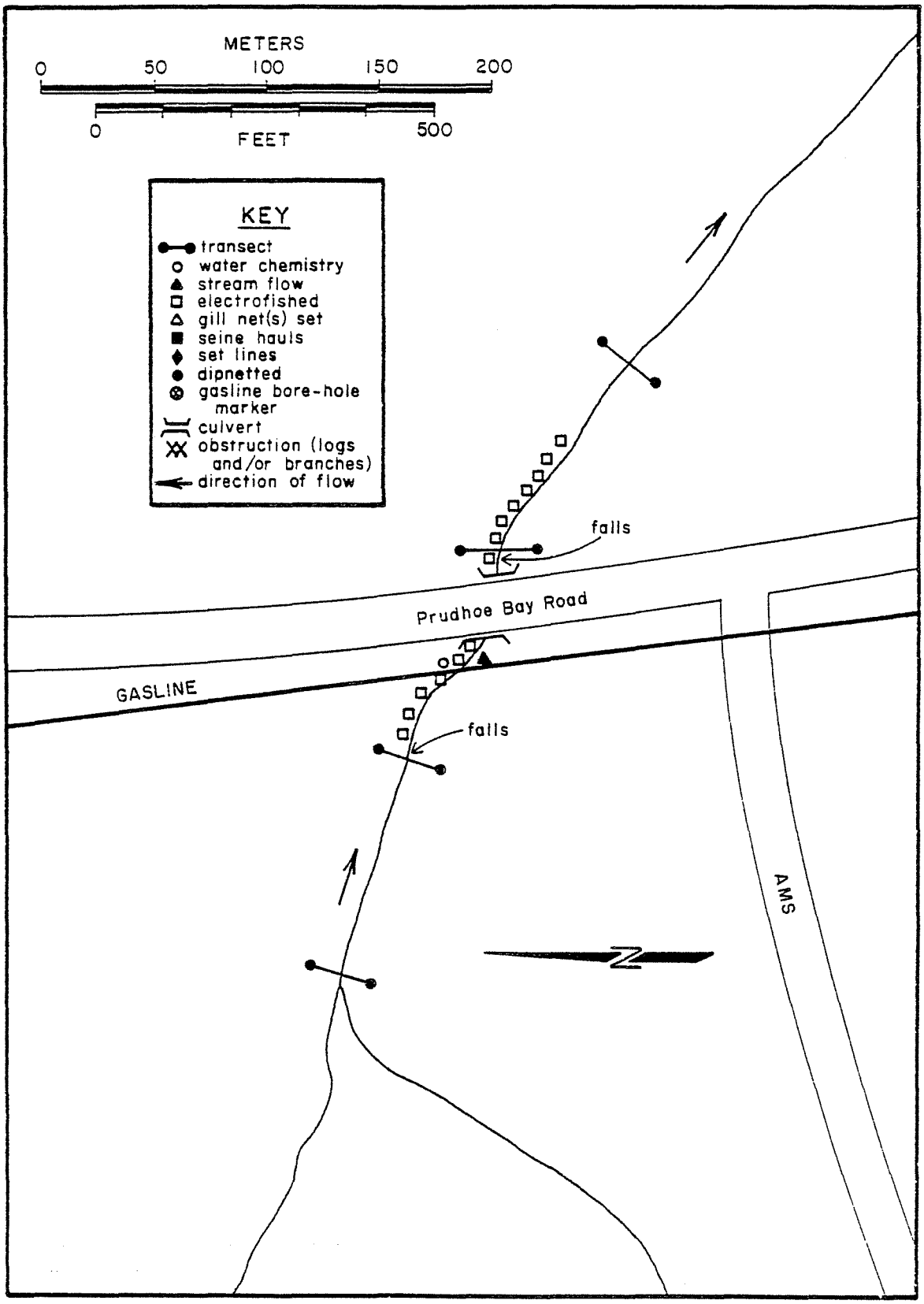

Fig. 49. Fall survey. Smoky Creek, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek ? fish Data? Source Taiga Drainage

Main Drainage West Fork Dall River Tributary to North Fork West Fork Dall River

Figure 50 Gradient 4% Elevation 524 m

NPAS 56 NPMP 321.1 NPRX 056-3 AHMP NA

USGS Map Reference Bettles, AK T 17N R 13W Sec. 6

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Creek flows northeast and crosses the proposed pipeline and the TAPS oil line approximately 1.3 km upstream of its confluence with the North Branch of the West Fork of the Dall River. This small humic-stained stream is 0.5-7 m wide and 10-22 cm deep. The riparian vegetation along the poorly defined channel consists of dense, overhanging willow, dwarf birch and alder. The stream drains an area above the proposed alignment of about 2.5 km^2 (Ref. 11). In the vicinity of the crossing, the stream bottom consists primarily of mud and detritus.

Grayling and sculpin are suspected to be present in this stream during some portion of the open water season (Ref. 11, 20, 21 and 118). However, sampling efforts during the fall 1980 investigations indicate that fish use at this time is low to non-existent. No fish were captured or observed in the vicinity of the crossing although sampling efforts were limited by the dense vegetative growth. Unusually low pH levels perhaps compounded by low flow probably preclude fish use at this time.

FISH

Date 13 September 1980

Fish Present No

Gear/Effort EF (0/190 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	13 September 1980
Wetted Width (m)	0.5-7
Depth (cm)	10-22
Discharge (m^3/s)	0.03
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	3.0
Conductivity (umhos/cm)	32
pH (pH units)	4.0
Color (color units)	95
Turbidity (NTU)	1.8
T. Hardness (mg $CaCO_3$/1)	5
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud and detritus
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	65 willow, 15 alder, 15 grass, 5 dwarf birch
Cover (%)	5
Fish Block(s)	None observed

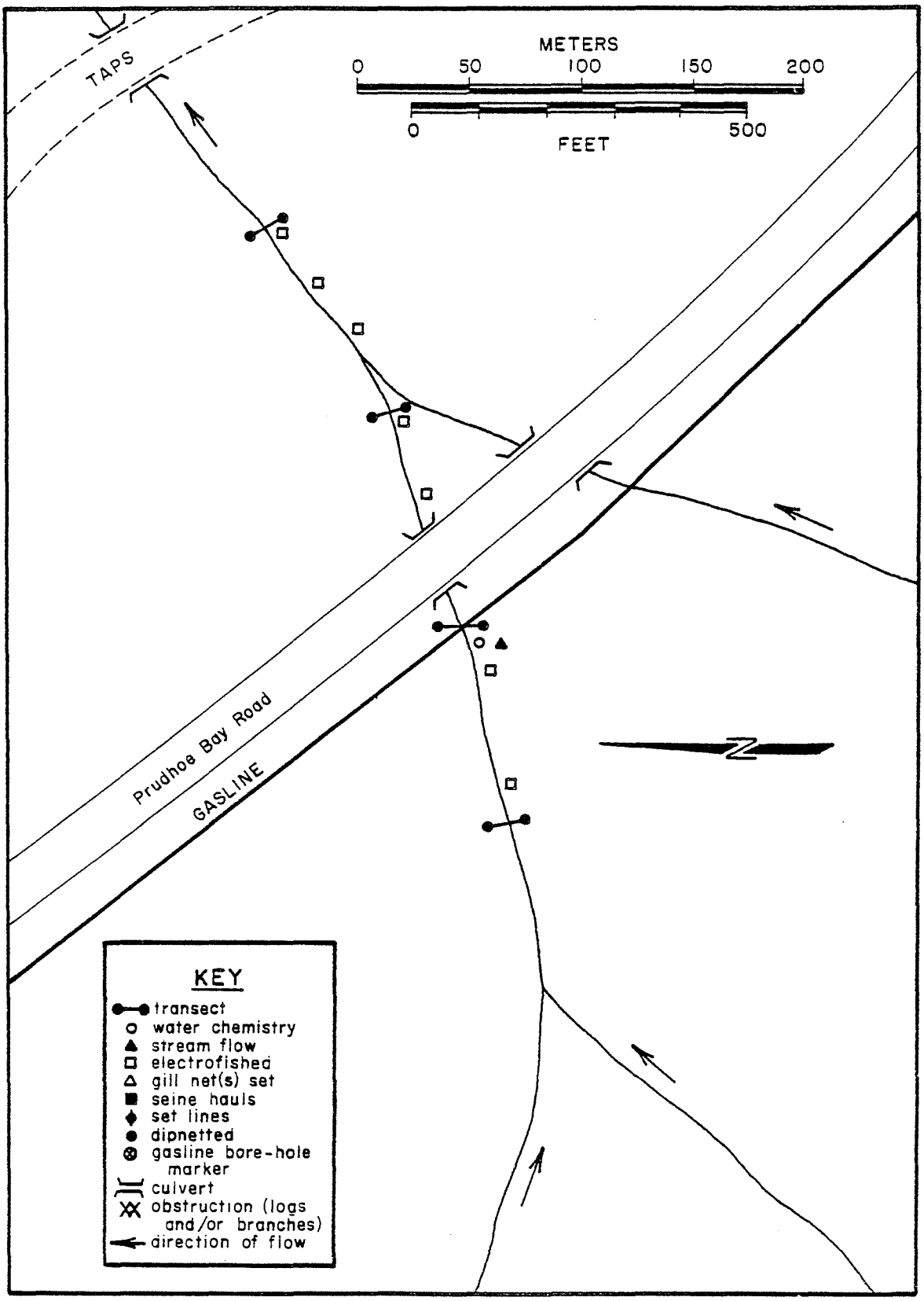

Fig. 50. Fall survey. Unnamed Creek (NPMP 321.1), 13 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Netsch's Creek Tributary #1 Source Montane/Taiga Drainage

Main Drainage Koyukuk River Tributary to Kanuti River

Figure 51 Gradient 2.0% Elevation 463 m

NPAS 54 NPMP 309.1 NPRX 054-3 AHMP NA

USGS Map Reference Bettles, AK T 19N R 15W Sec. 13

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Netsch's Creek Tributary #1 is a small headwater tributary to the Kanuti River. This crossing is approximately 0.5 km north of Old Man Camp. During fall 1980 the stream was 0.5-4.5 m wide and 16-23 cm deep although pools and wetland areas along side this streams suggest that it is significantly wider and probably deeper during periods of high water. Stream substrate is sand and detrital materials and approximately 80% cover is provided by willow that densely vegetate the stream bank.

No fish were captured or observed in this stream during September 1980; however, electrofishing and other sampling methods were only partially effective due to the dense vegetation. Netsch's Creek Tributary #1 provides good fall fish habitat and fish have been observed in areas downstream of the proposed pipeline crossing (Ref. 11). No site specific documentation is available for these observations. It is suspected that fish use this stream during much of the open water season and may have migrated downstream prior to this survey.

FISH

Date 13 September 1980

Fish Present No

Gear/Effort EF (0/144 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	13 September 1980
Wetted Width (m)	0.5-4.5
Depth (cm)	16-23
Discharge (m^3/s)	.02
Dissolved Oxygen (mg/1)	8.9
Temperature (^oC)	3
Conductivity (umhos/cm)	20
pH (pH units)	5.7
Color (color units)	75
Turbidity (NTU)	8.0
T. Hardness (mg $CaCO_3$/1)	13
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	80 sand, 20 detritus
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 willow
Cover (%)	80
Fish Block(s)	None observed

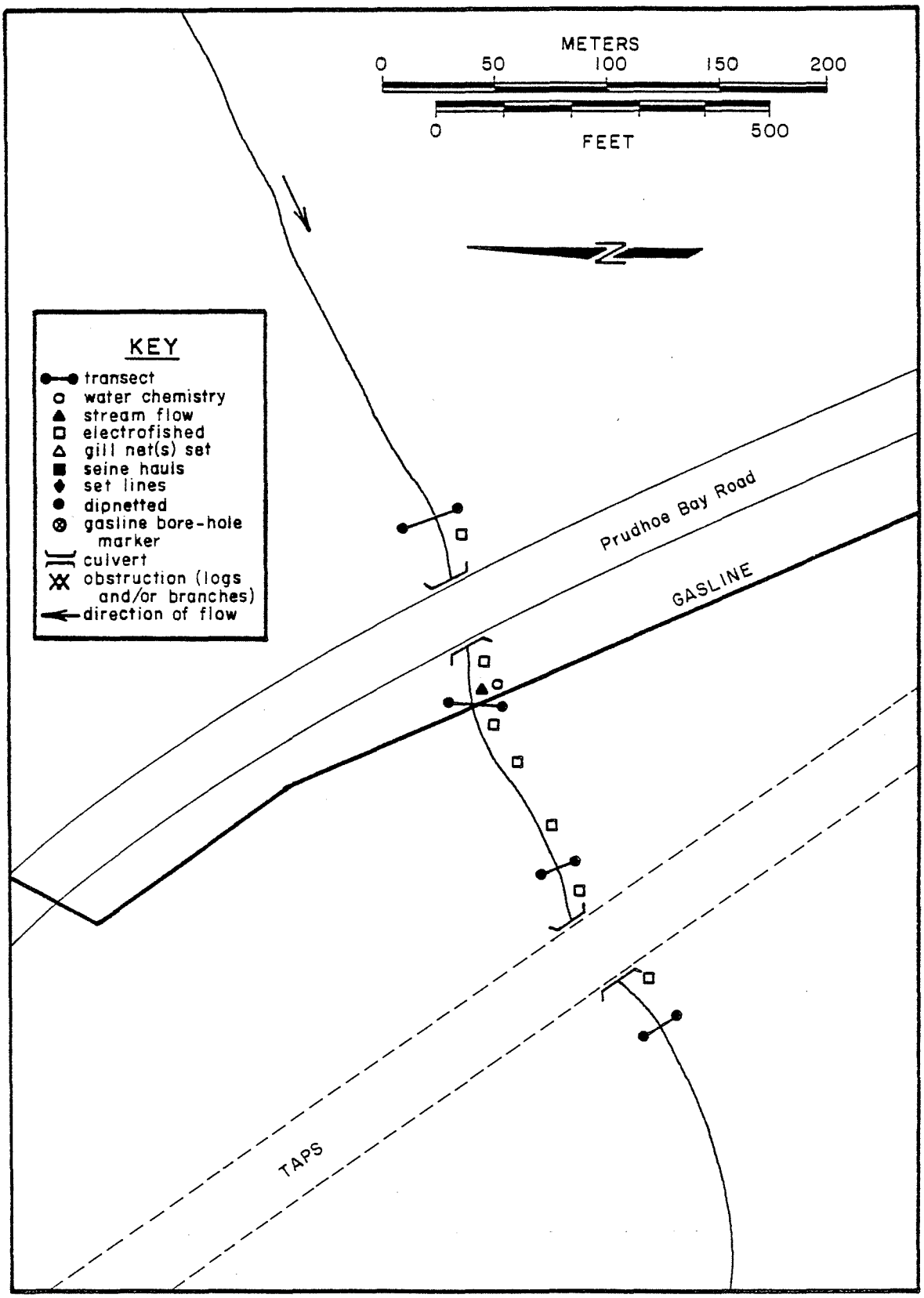

Fig. 51. Fall survey. Netsch's Creek Tributary #1, 13 September 1980. Revision 2 alignment is shown.

FALL SURVEY FORM

WATERBODY

Waterbody Grizzly Creek Source Spring-fed Drainage

Main Drainage South Fork Koyukuk River Tributary to Bonanza Creek

Figure 52 Gradient 0.9% Elevation 264 m

NPAS 52 NPMP 293.7 NPRX 052-2 AHMP NA

USGS Map Reference Bettles, AK T 21N R 15W Sec. 8

Site Access Truck

Section Surveyed From 75 m upstream to confluence with Bonanza Creek (175 m total)

ASSESSMENT

Grizzly Creek is a moderate-sized, slow-moving stream that flows from its spring source 0.4 km to the South Fork Bonanza Creek. Stream width varies from 1 m to 8 m and depth varies 10 cm to 20 cm except in several still pools where stream depths were to 1.0 m. During the late September 1980 survey water temperatures in Grizzly Creek were higher (4.3° C) than in South Fork Bonanza Creek (0.5° C). Riparian vegetation consists of willow, spruce, grasses and dense mats of moss indigenous to warm spring water areas.

Numerous fish were observed and captured throughout the entire length of Grizzly Creek. Thus it appears that this stream is a significant fall feeding area for adult slimy sculpin and grayling and rearing area for young-of-the-year and juvenile grayling. Round whitefish, burbot, longnose sucker and northern pike found in South Fork Bonanza Creek may also utilize this area. Warm temperature and adequate depth in Grizzly Creek may provide overwintering habitat for the eggs of fall spawning fish. Grizzly Creek provides excellent fish habitat and should be considered important to fish in fall.

FISH

Date 28 September 1980

Fish Present Yes

Gear/Effort EF (21/651 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling	1	6	62	115-132
Slimy Sculpin		14		47-100

PHYSICAL CONDITIONS

Date	28 September 1980
Wetted Width (m)	1-8
Depth (cm)	10-100
Discharge (m^3/s)	0.04
Dissolved Oxygen (mg/1)	16
Temperature (^oC)	4.3
Conductivity (umhos/cm)	10
pH (pH units)	8.0
Color (color units)	35
Turbidity (NTU)	45
T. Hardness (mg $CaCO_3$/1)	17.1
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 organic, 70 fines, 10 gravel
Bank Stability (%)	95
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	30 willow, 10 spruce, 40 grasses, 20 mosses
Cover (%)	40
Fish Block(s)	None observed

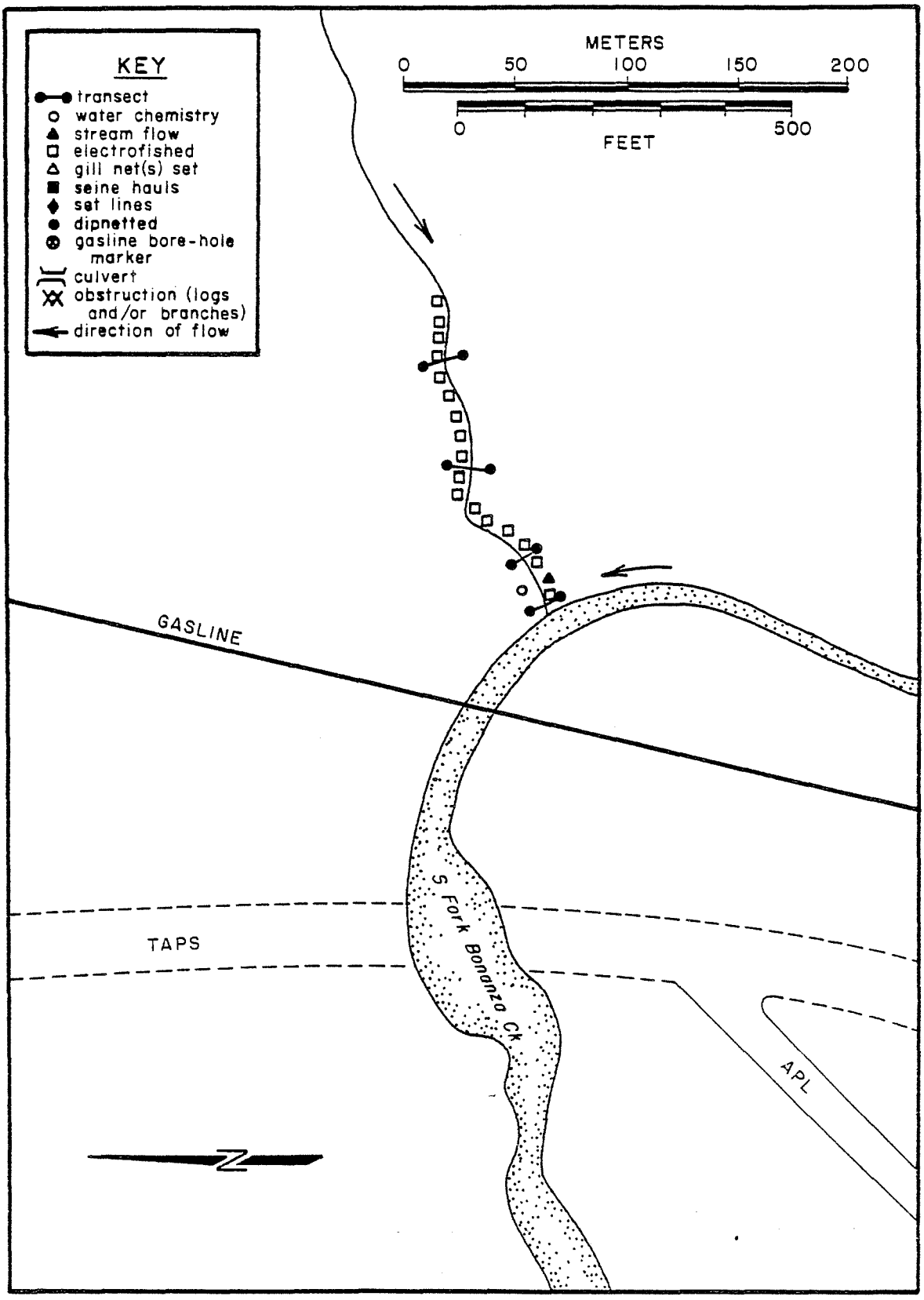

Fig. 52. Fall survey. Grizzly Creek, 28 September 1980.

FALL SURVEY FORM

WATERBODY

S.F. Bonanza Cr. Highwater Cutoff (fish list)

Waterbody Unnamed Bonanza Creek Channel Source Muskeg/Taiga Drainage

Main Drainage Bonanza Creek Tributary to South Fork Bonanza Creek

Figure 53 Gradient 0.9% Elevation 262 m

NPAS 52 NPMP 293.7 NPRX 052-1 AHMP NA

USGS Map Reference Bettles, AK T 21N R 14W Sec. 8

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Unnamed Bonanza Creek Channel is an inactive channel of South Fork Bonanza Creek. The channel is dry upstream of the proposed pipeline crossing. At the crossing a small (0.3 m wide) stream of water percolates from a groundwater source and is ponded (5 m wide) in a wide undefined channel by the TAPS workpad. This channel is completely cut off from the South Fork Bonanza Creek.

Due to the lack of an inlet or outlet Unnamed Bonanza Creek Channel should not be considered fish habitat during fall.

FISH

Date 11 September 1980

Fish Present

Gear/Effort None - no inlet or outlet

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	0.3-5
Depth (cm)	10-100
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	5.3
Temperature (^oC)	4.0
Conductivity (umhos/cm)	40
pH (pH units)	5.2
Color (color units)	25
Turbidity (NTU)	0.8
T. Hardness (mg $CaCO_3$/1)	13
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud and detritus
Bank Stability (%)	95
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	35 spruce, 40 grasses, 25 willow/alder
Cover (%)	1
Fish Block(s)	No inlet or outlet

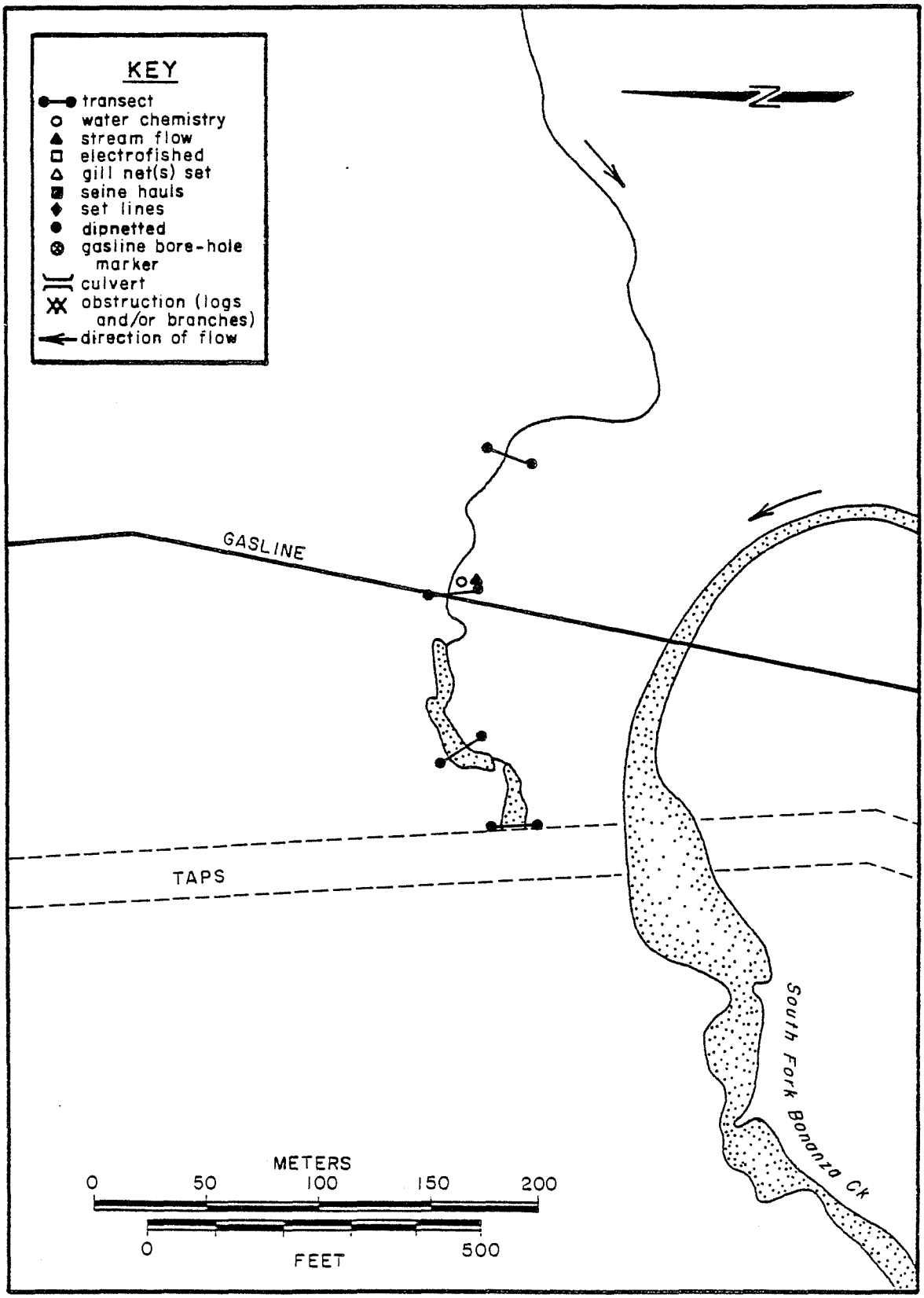

Fig. 53. Fall survey. Unnamed Bonanza Creek Channel, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Oxbow Lake System Source Muskeg/Taiga Drainage

Main Drainage Bonanza Creek Tributary to North Fork Bonanza Creek

Figure 54 Gradient 0.0% Elevation 259 m

NPAS 51 NPMP 293.2 NPRX 051-5 AHMP NA

USGS Map Reference Bettles, AK T 21N R 14W Sec. 5 and 6

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Oxbow Lake System is a series of moderately sized pockets of water 500-300 cm deep that drain into Oxbow Pond of Bonanza Creek. At the proposed pipeline crossing this waterbody is approximately 15-20 m across and 400 m long. Substrate consists of mud and detritus, and tall grasses are in and along the waterbody. Stable banks are vegetated with grass, willow, alder and some spruce.

Access by fish to Oxbow Lake System is restricted by the lack of an inlet or outlet and low dissolved oxygen (5.9 mg/ℓ) and low pH (4.5) would provide marginal habitat for resident fish if any. Fish were not captured or observed in September 1980. Grayling have been reported present in the Oxbow Lake System on 24 June 1976 (Ref. 11); however, information concerning the location of the sighting is not available.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort GN (0/80 h); EF (0/380 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	15-20
Depth (cm)	50-300
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	5.9
Temperature (^oC)	8
Conductivity (umhos/cm)	30
pH (pH units)	4.5
Color (color units)	85
Turbidity (NTU)	0.8
T. Hardness (mg $CaCO_3$/1)	15
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/detritus
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	90 grass, 8 willow/alder, 2 spruce
Cover (%)	1
Fish Block(s)	No inlet or outlet observed

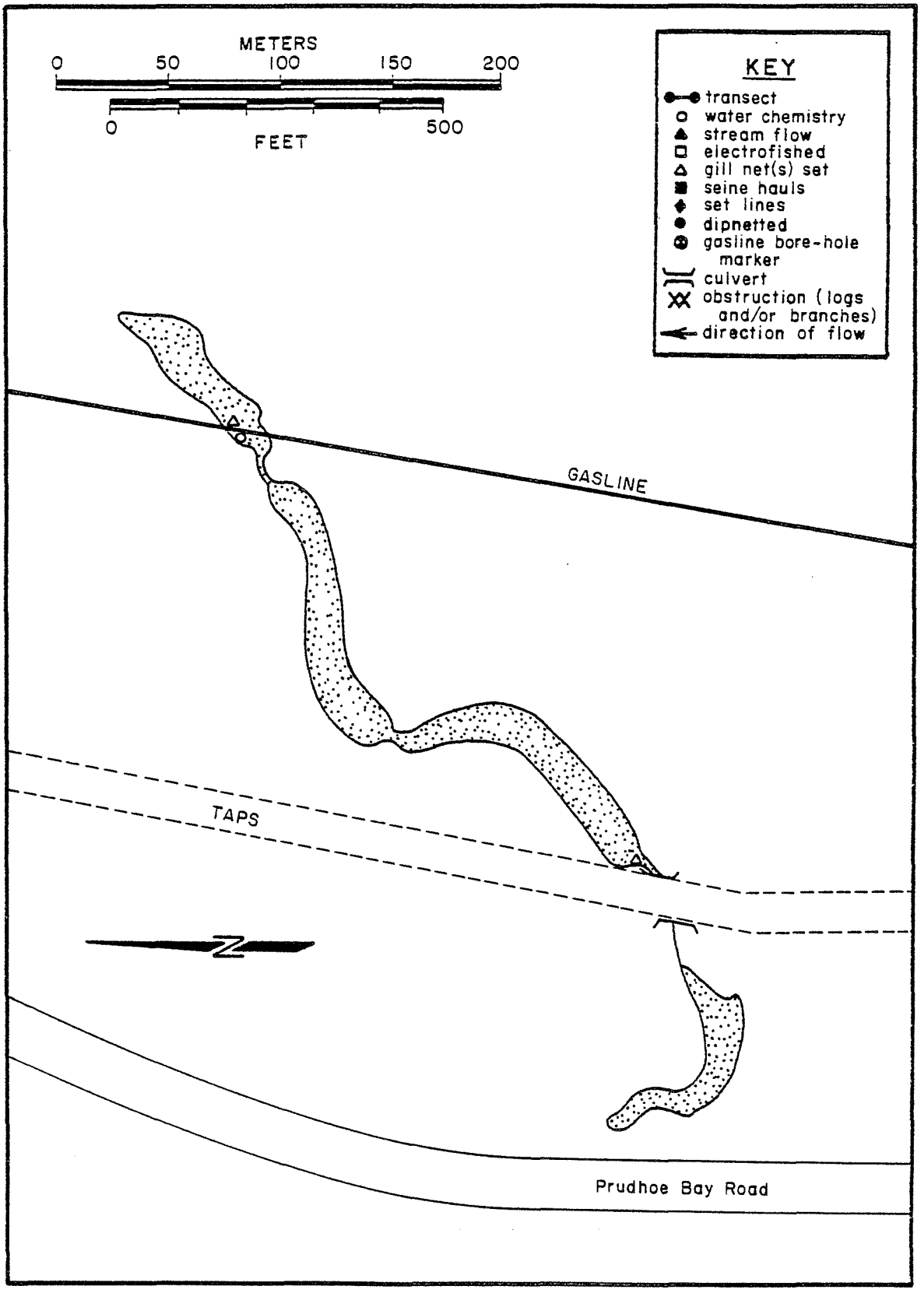

Fig. 54. Fall survey. Oxbow Lake System, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody North Fork Little Nasty Creek Source Taiga Drainage

Main Drainage Bonanza Creek Tributary to The Little Nasty Creek

Figure 55 Gradient 2.5% Elevation 296 m

NPAS 51 NPMP 289.6 NPRX 051-1 AHMP NA

USGS Map Reference Bettles, AK T 22N R 14W Sec. 19

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

The North Fork Little Nasty Creek drains an area of approximately 4 km^2 east of the proposed pipeline crossing and flows west to Little Nasty Creek. Upstream of the proposed pipeline crossing this waterbody becomes an intermittent series of pools and trickles. Downstream 100-200 m the stream channel is undefined and lost in the muskeg. Stream substrate is moss and detritus; the banks are low and vegetated with grasses, moss and willows.

In the vicinity of the proposed crossing, the North Fork Little Nasty Creek provides poor fish habitat due to its intermittent nature. No fish were caught during the September 1980 investigation.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort GN (46 h)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	15-25
Depth (cm)	50-300
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	10
Temperature (^oC)	0.5
Conductivity (umhos/cm)	25
pH (pH units)	6.2
Color (color units)	110
Turbidity (NTU)	2.4
T. Hardness (mg $CaCO_3$/1)	44
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 detritus
Bank Stability (%)	99
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 muskeg
Cover (%)	25
Fish Block(s)	Intermittent flow may impede fish movement

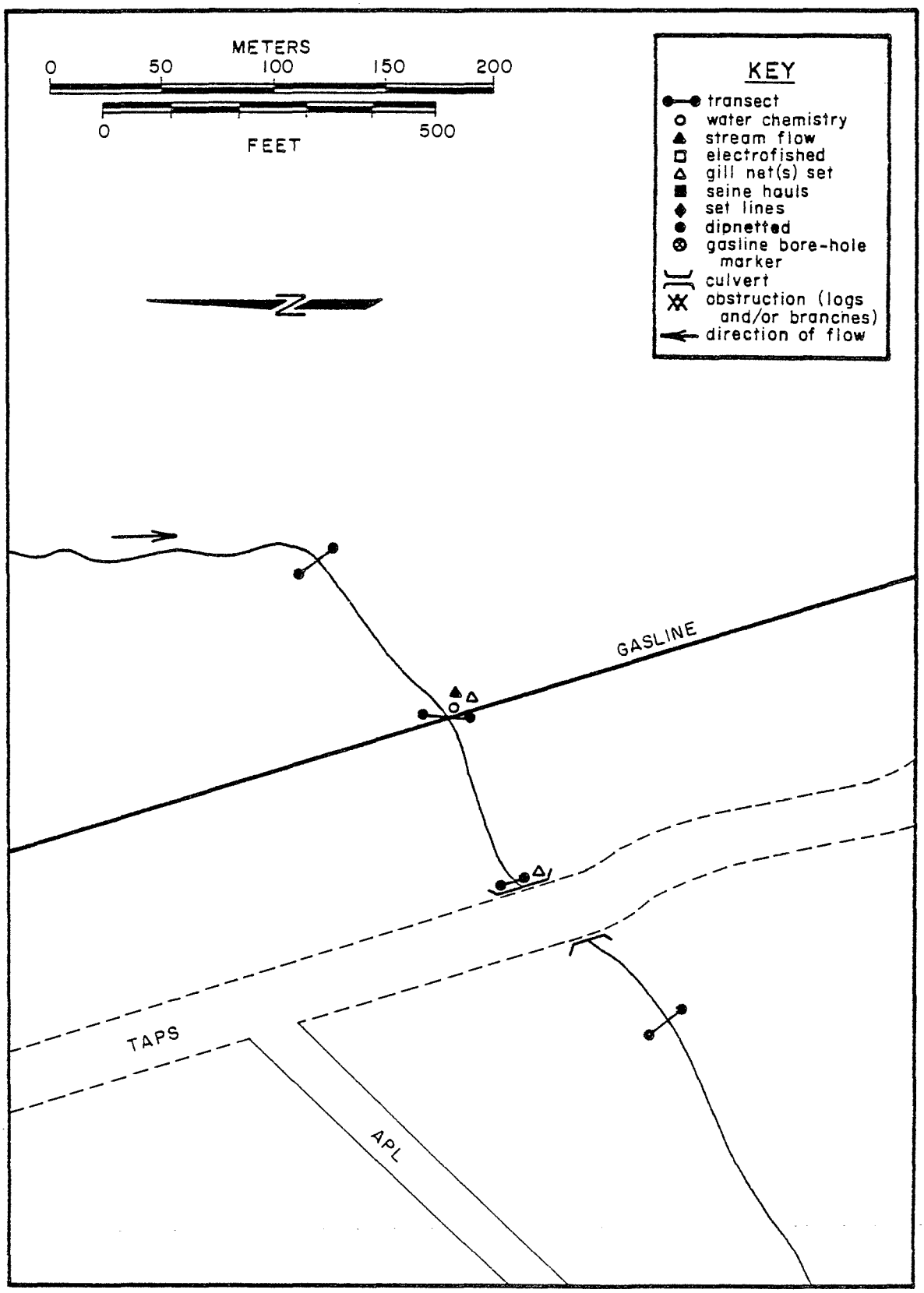

Fig. 55. Fall survey. North Fork Little Nasty Creek, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Catch 22 Springs ? not on fish list Source Spring-fed

Main Drainage Jim River Tributary to Prospect Creek

Figure 56 Gradient 0.05% Elevation 287 m

NPAS 50 NPMP N/A NPRX FH-050-2 AHMP NA

USGS Map Reference Bettles, AK T 23N R 14W Sec. 31

Site Access Truck

Section Surveyed Entire length of stream and spring source (~ 40 m)

ASSESSMENT

Catch 22 Springs is a series of three spring basins located approximately 200 m above the TAPS line crossing of Prospect Creek. Three small channels, one from each basin, join together approximately 6 m upstream of the confluence with Prospect Creek. Substrate is sand, gravel, pebble and cobble with some moss and green algae; banks are stable and vegetated primarily with spruce, willow, grass and sedge.

Catch 22 Springs provides excellent habitat and should be considered important fall rearing habitat for slimy sculpin and possibly other species. Additional information concerning fish use of this spring area is not available.

FISH

Date 14 September 1980

Fish Present Yes

Gear/Effort DN (0/5 m^2)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Sculpin		4		75

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	1.3-6.1
Depth (cm)	6-11
Discharge (m^3/s)	0.03
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	6.5
Conductivity (umhos/cm)	62
pH (pH units)	6.2
Color (color units)	26
Turbidity (NTU)	3.8
T. Hardness (mg $CaCO_3$/1)	171
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	5 sand, 40 gravel, 50 pebble, 5 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	50 willow, 20 spruce, 20 grass & sedge, 10 herbaceous plants
Cover (%)	5
Fish Block(s)	None observed

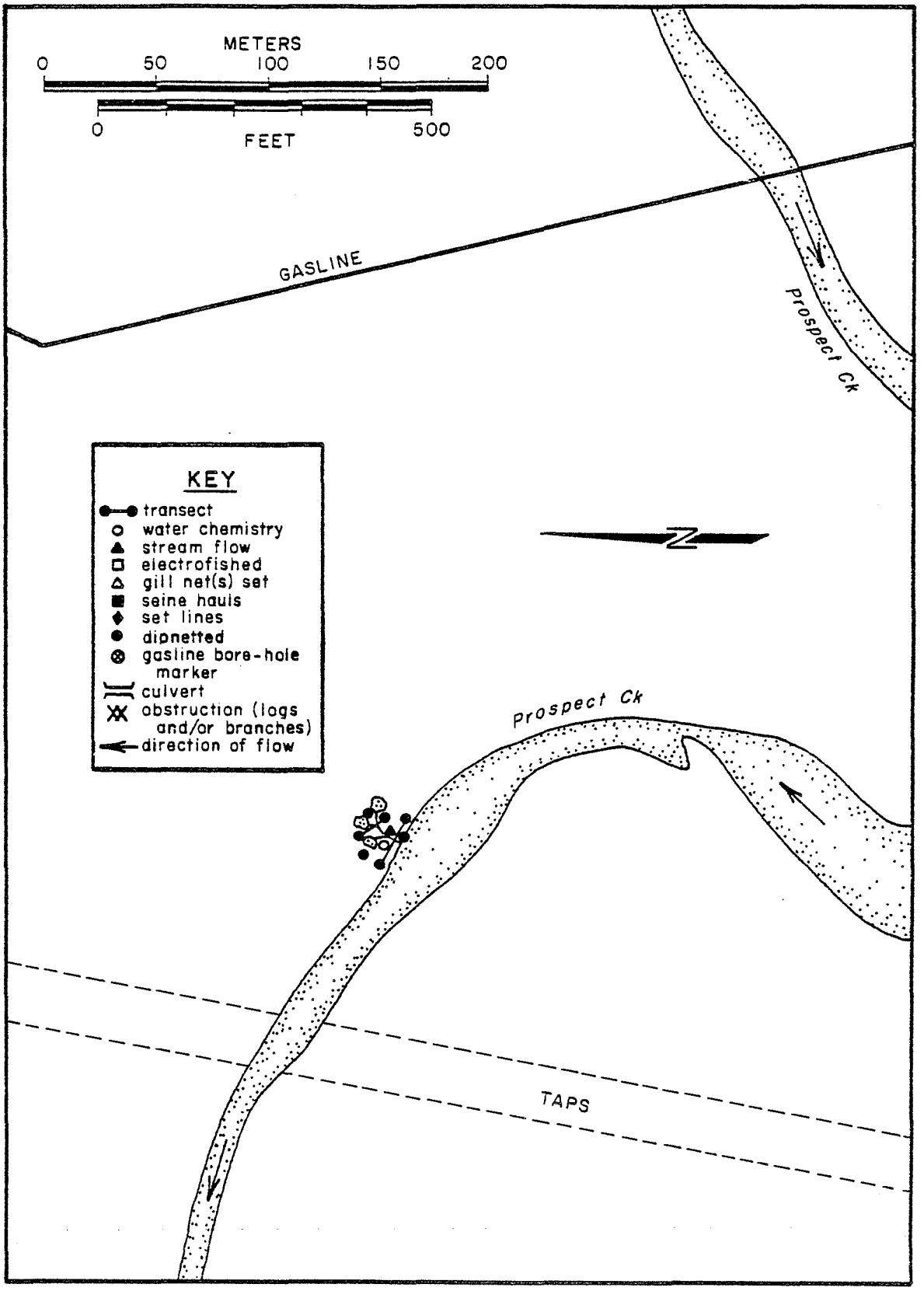

Fig. 56. Fall survey. Catch 22 Springs, 14 September 1980.

FALL SURVEY FORM

WATERBODY

woods Willow (fish list)

Waterbody 1-Acre Lake Source Montane/Taiga Drainage

Main Drainage Grayling Lake Tributary to Grayling Lake

Figure 57 Gradient 0.0% Elevation 396 m

NPAS 47 NPMP 269.7 NPRX 047-6 AHMP NA

USGS Map Reference Bettles, AK T 25N R 13W Sec. 27

Site Access Truck

Section Surveyed Entire area (approximately 1.4 km^2)

ASSESSMENT

1-Acre Lake has a drainage area of approximately 0.6 km^2 (Ref. 11) and drains into Grayling Lake through a Haul Road CMP. It is approximately 30 m x 45 m in width and 50-300 cm deep. The shoreline is vegetated with grass and willow. Pond substrate consists of mud and detritus with some tailings near the CMP.

1-Acre Lake provides adequate fall habitat although fish use of this area was not detected during the fall 1980 investigations. Grayling reported in the inlet to Grayling Lake during spring (Ref. 11) likely use this pond for rearing at that time. However, fall fisheries information in inconclusive and until further investigation this pond should be considered suitable habitat for fish in fall.

FISH

Date 11 September 1980

Fish Present No

Gear/Effort GN

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	Approximately 30x45
Depth (cm)	50-300
Discharge (m^3/s)	0
Dissolved Oxygen (mg/1)	11
Temperature (^oC)	5.0
Conductivity (umhos/cm)	75
pH (pH units)	6.2
Color (color units)	95
Turbidity (NTU)	3.8
T. Hardness (mg $CaCO_3$/1)	83
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/detritus
Bank Stability (%)	98
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 grass, 20 willow
Cover (%)	1
Fish Block(s)	None observed

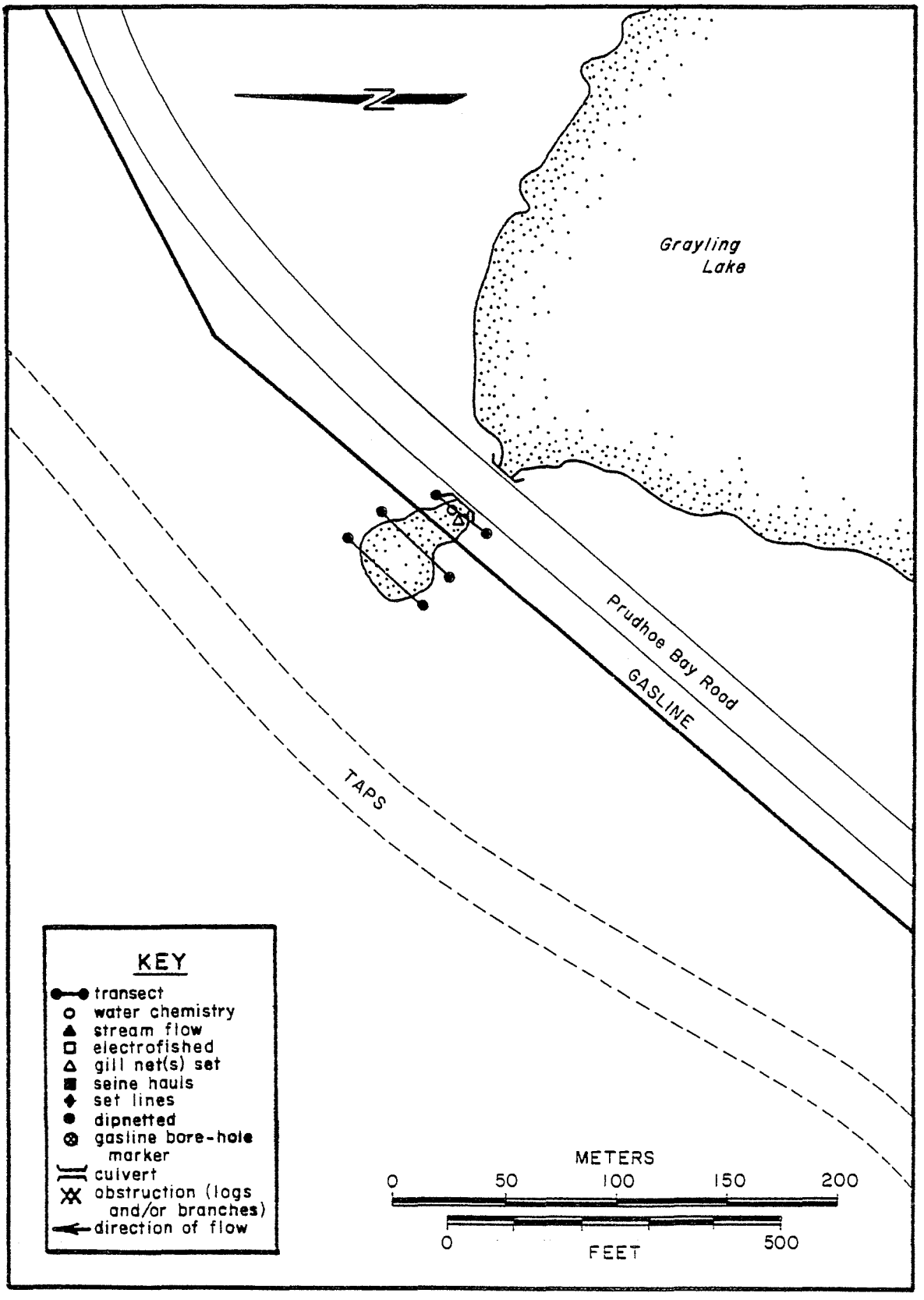

Fig. 57. Fall survey. 1-Acre Lake, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Abba-Dabba Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to South Fork Koyukuk River

Figure 58 Gradient 1.0% Elevation 369 m

NPAS 47 NPMP 266.5 NPRX 047-2 AHMP NA

USGS Map Reference Bettles, AK T 25N R 13W Sec. 13

Site Access Truck

Section Surveyed 200 m upstream to 600 m downstream of proposed pipeline crossing

ASSESSMENT

Abba-Dabba Creek is a shallow (6-20 cm), spring-fed stream that varies in width from 1 m to 5 m and is reported to contain water year round (Ref. 77). It parallels the Prudhoe Bay Haul Road and flows 4.6 km north to the Koyukuk River. Steep banks (1-2.5 m high) are heavily vegetated with grass and willows. Several areas are partially clogged with willow branches and sloughed trees. Substrate is comprised of cobble and boulders with small amounts of sand and gravel in the backwaters and eddies.

Previous open water surveys have documented grayling and slimy sculpin in Abba-Dabba Creek (Refs. 11 and 64) and an early winter investigation in 1979 documented the presence of slimy sculpin and suggested year round use of this stream (Ref. 77). Fall sampling yielded only one slimy sculpin indicating that fish use of this stream at this time was low. Potential spring spawning gravels are located in an area from the TAPS workpad to a point approximately 500 m upstream (Fig. 58).

FISH

Date 29 September 1980

Fish Present Yes

Gear/Effort EF (1/3619 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Slimy Sculpin		1		104

PHYSICAL CONDITIONS

Date	29 September 1980
Wetted Width (m)	1.0-5.0
Depth (cm)	6-20
Discharge (m^3/s)	0.04
Dissolved Oxygen (mg/1)	Undetermined - equipment failure
Temperature (^oC)	0.25
Conductivity (umhos/cm)	10
pH (pH units)	8.2
Color (color units)	5
Turbidity (NTU)	3.5
T. Hardness (mg $CaCO_3$/1)	20
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 fines, 20 sand, 70 cobble/boulder
Bank Stability (%)	95
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	30 grass, 70 willow
Cover (%)	35
Fish Block(s)	None observed

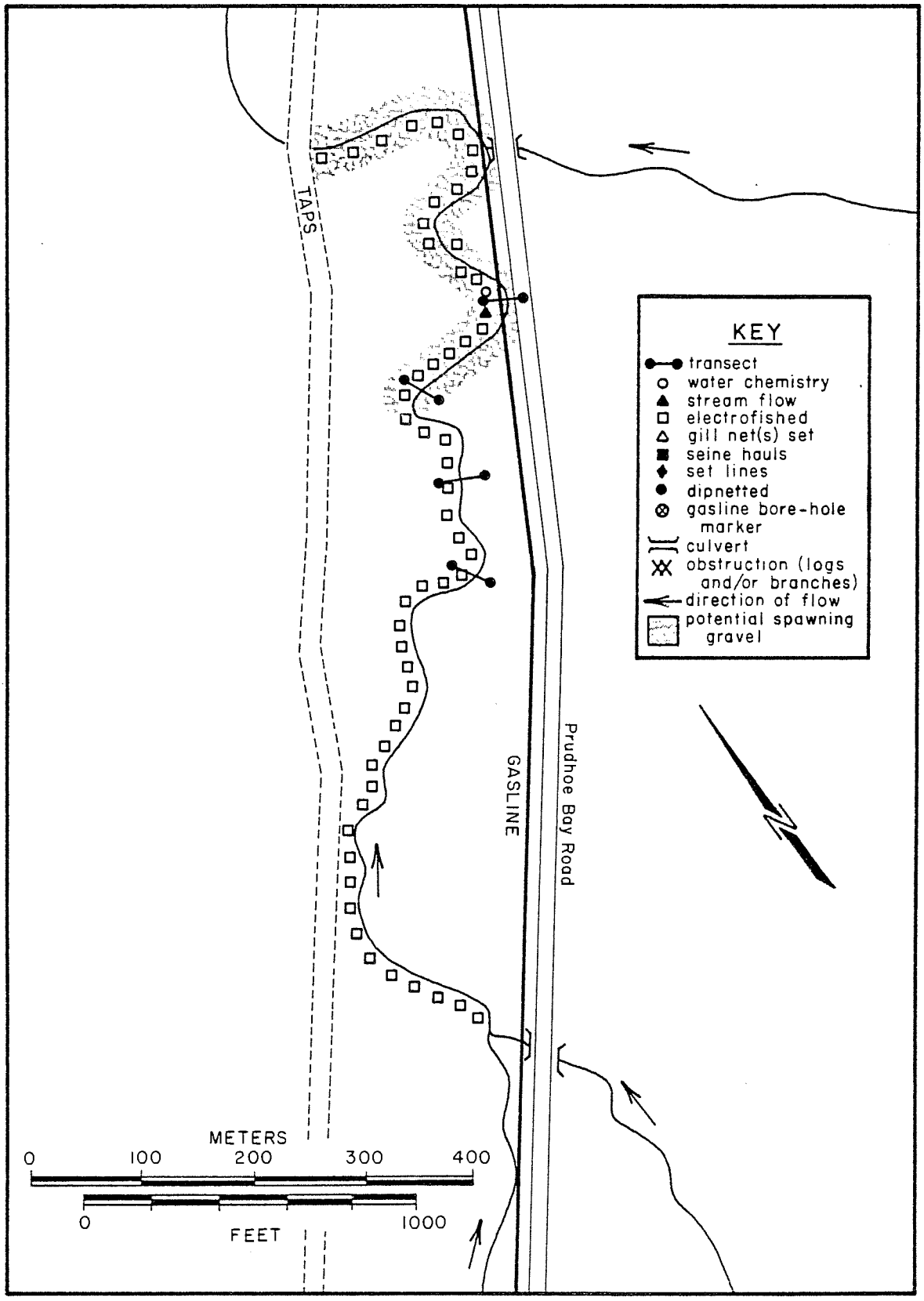

Fig. 58. Fall survey. Abba-Dabba Creek, 29 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Crossroads Creek #1 Source Taiga Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Chapman Creek

Figure 59 Gradient 5.0% Elevation 308 m

NPAS 46 NPMP 259.6 NPRX 046-3 AHMP NA

USGS Map Reference Wiseman, AK T 26N R 13W Sec. 14

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Crossroads Creek #1 flows northwesterly through a marshy area to its confluence with Chapman Creek. The stream is narrow with a poorly defined channel congested with sedge and grass. Stream substrate is soil.

Past investigations have been unsuccessful in documenting the presence of fish in Crossroads Creek #1 (Refs. 11 and 21). No fish were captured or observed during the recent fall survey. Due to the congested channel and low flow, fish use of the proposed crossing is likely low or non-existent during fall.

FISH

Date 10 September 1980

Fish Present No

Gear/Effort Visual observation ~400 m*

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	0.9 m
Depth (cm)	27.5 cm at culvert, 3.1 downstream from culvert
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	11
Temperature (^oC)	6.7
Conductivity (umhos/cm)	114
pH (pH units)	7.7
Color (color units)	50
Turbidity (NTU)	43
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil
Bank Stability (%)	Undefined bank - marsh area
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 sedge, 20 willow, 10 birch, 5 spruce, 5 herbaceous plants
Cover (%)	96
Fish Block(s)	None observed

* No formal fishing effort could be made due to the shallow and undefined channel of this stream.

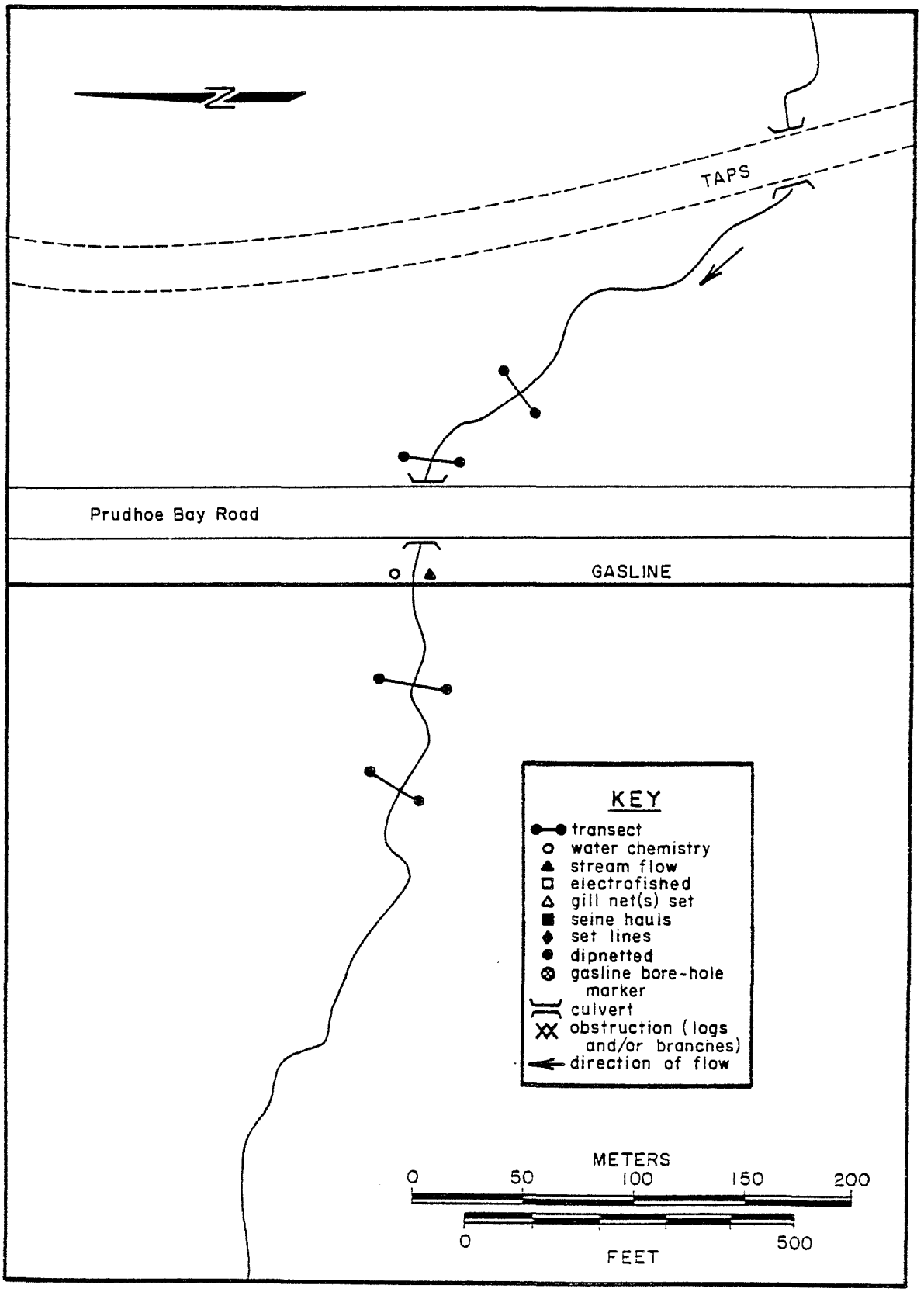

Fig. 59. Fall survey. Crossroads Creek #1, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Trent's Trickle Source Taiga Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 60 Gradient 1.0% Elevation 288 m

NPAS 45 NPMP 254.0 NPRX 045-4 AHMP NA

USGS Map Reference Wiseman, AK T 27N R 13W Sec. 23

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Trent's Trickle is a light-brown stained stream which flows northerly through wetlands to its confluence with Middle Fork Koyukuk River. In the vicinity of the proposed pipeline crossing its channel is poorly defined. Substrate is silt and aquatic vegetation (grass) is present. Bank vegetation is spruce, willow, sedge, and herbaceous plants.

Grayling were abundant near the proposed crossing in spring (Refs. 20 and 21). During the recent fall survey, several young grayling were captured from a large school of about 33 fish.

Trent's Trickle is a fall rearing area and migration route in the area of the proposed crossing and should be considered a rearing area for grayling throughout the open water period. Winter use is unlikely as this size stream usually freezes solid in winter.

FISH

Date 14 September 1980

Fish Present Yes

Gear/Effort DN (3/5 m^2), Visual (~ 30/20 m)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling	33		~47-75	

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	0.7-30.0 (wide marshy area)
Depth (cm)	29-40
Discharge (m^3/s)	0.06
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	4.0
Conductivity (umhos/cm)	193
pH (pH units)	7.6
Color (color units)	25
Turbidity (NTU)	1.4
T. Hardness (mg $CaCO_3$/1)	188
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 soil
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	30 spruce, 50 willow, 15 sedge, 5 herbaceous plants
Cover (%)	40
Fish Block(s)	.5 m falls near confluence with the Middle Fork of the Koyukuk River. All fish seen were above the falls.

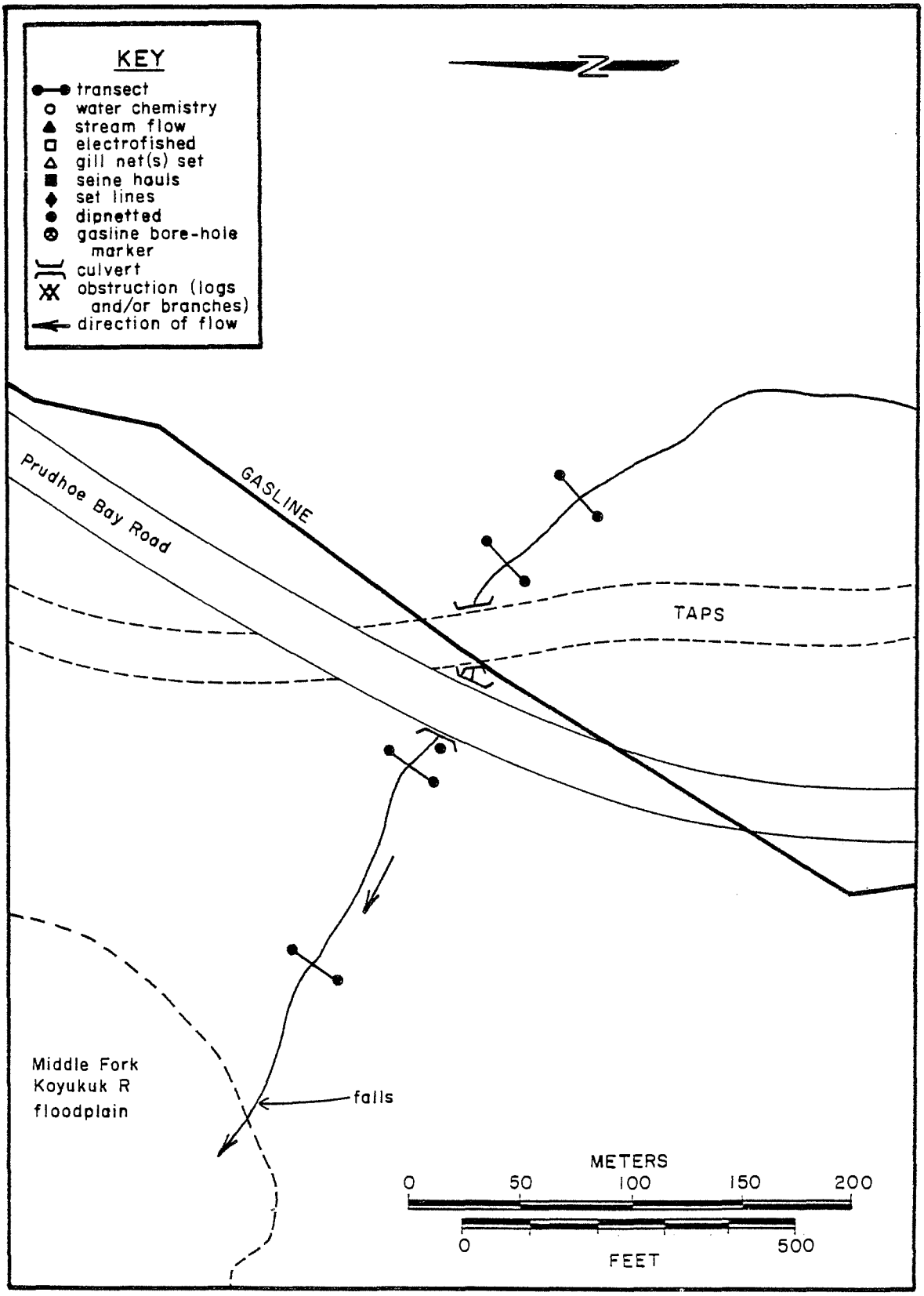

Fig. 60. Fall survey. Trent's Trickle, 14 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Cathedral Mountain Creek #2 Source Montane/Taiga Drainage

Main Drainage Middle Fork Koyukuk Tributary to Cathedral Mountain Creek #1

Figure 61 Gradient 2.0% Elevation 332 m

NPAS 44 NPMP 252 NPRX 044-6 AHMP NA

USGS Map Reference Wiseman, AK T 27N R 13W Sec. 12

Site Access Truck

Section Surveyed 100 m upstream to 160 m downstream of proposed pipeline crossing.

ASSESSMENT

Cathedral Mountains Creek #2 is a small runoff channel that drains Cathedral Mountain east of the proposed pipeline crossing. It is confined by high banks vegetated with willow, alder, birch and spruce. Stream substrate consists of cobble and boulder overlain with sand and gravel.

In September 1980 Cathedral Mountain Creek #2 was dry to approximately 160 m downstream of the proposed pipeline crossing. In this area water percolates from a groundwater source and flows a short distance before joining Cathedral Mountain Creek #1. Cathedral Mountain Creek #2 does not provide fall fish habitat and fish use at any time is unlikely.

FISH

Date 10 September 1980

Fish Present

Gear/Effort None-stream bed dry

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	Stream bed dry
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	10 sand, 30 gravel, 60 cobble/boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	90 willow/alder, 10 birch/spruce
Cover (%)	75
Fish Block(s)	Stream dry at crossing to ~160m downstream where it joins Cathedral Mountain Creek #2

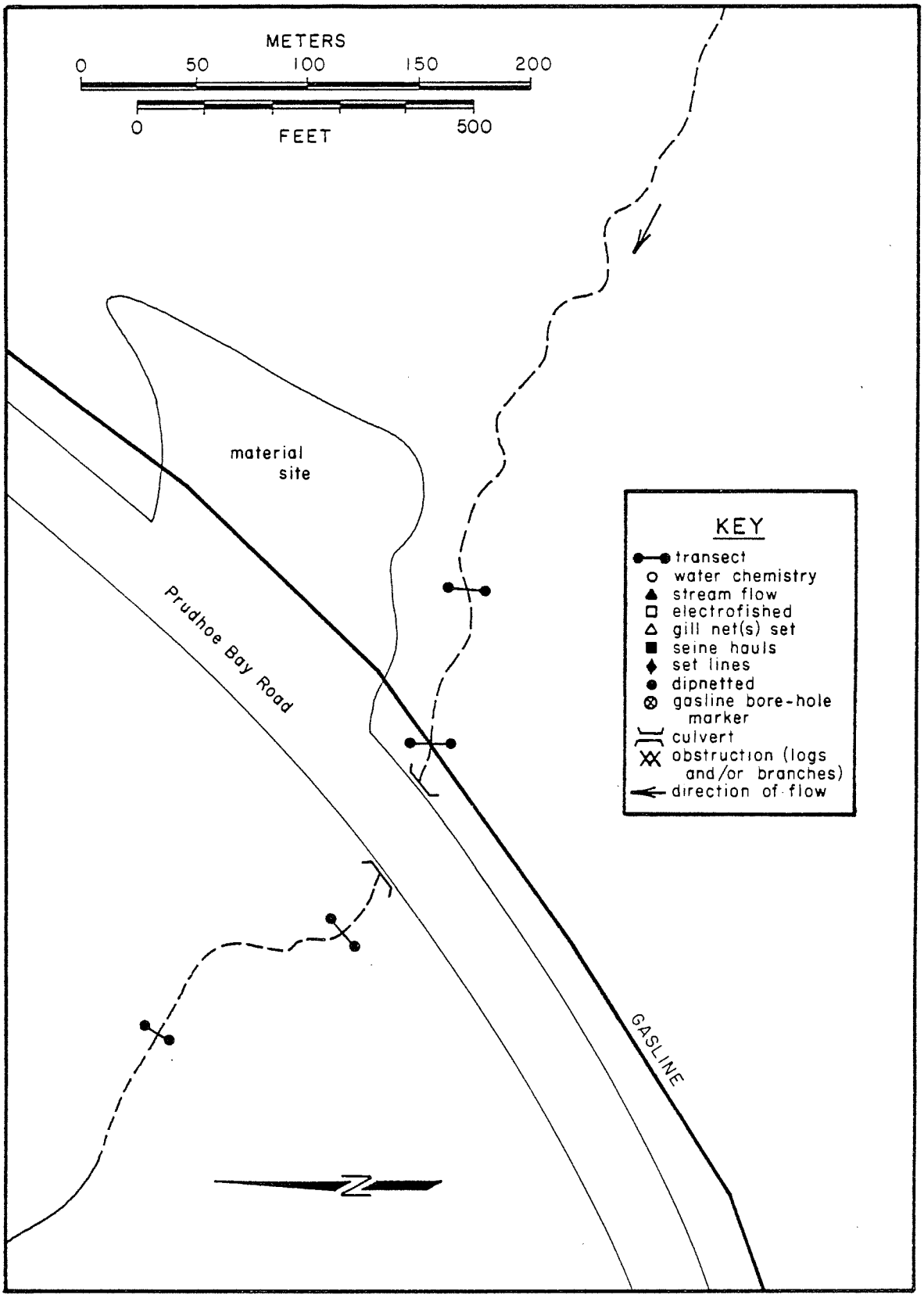

Fig. 61. Fall survey. Cathedral Mountain Creek #2, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Cathedral Mountain Creek #1 Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 62 Gradient 2.0% Elevation 332 m

NPAS 44 NPMP 251.8 NPRX 044-6 AHMP NA

USGS Map Reference Wiseman, AK T 27N R 13W Sec. 12

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of the proposed pipeline crossing

ASSESSMENT

Cathedral Mountain Creek #1 is a narrow (0.6-1.8 m) clearwater stream that drains the western slope of Cathedral Mountain and flows west to the Middle Fork Koyukuk River. This stream is joined by Cathedral Mountain Creek #2 approximately 150 m downstream of the proposed pipeline crossing. Stream banks are 0.5 m and heavily vegetated with moss, willow and a mixed forest. Substrate consists of sand, gravel and cobble. Discharge in September 1980 was minimal.

Sampling efforts during the fall 1980 investigations did not yield fish. Fall fish use of this stream in the vicinity of the proposed pipeline crossing is probably non-existent.

FISH

Date 10 September 1980

Fish Present No

Gear/Effort EF (0/430 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	0.6-1.8
Depth (cm)	6-8
Discharge (m^3/s)	<0.01
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	1.5
Conductivity (umhos/cm)	35
pH (pH units)	6.7
Color (color units)	25
Turbidity (NTU)	4.8
T. Hardness (mg $CaCO_3$/1)	29
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 sand, 60 gravel, 20 cobble
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	55 moss, 25 willow, 20 mixed forest
Cover (%)	70
Fish Block(s)	None observed

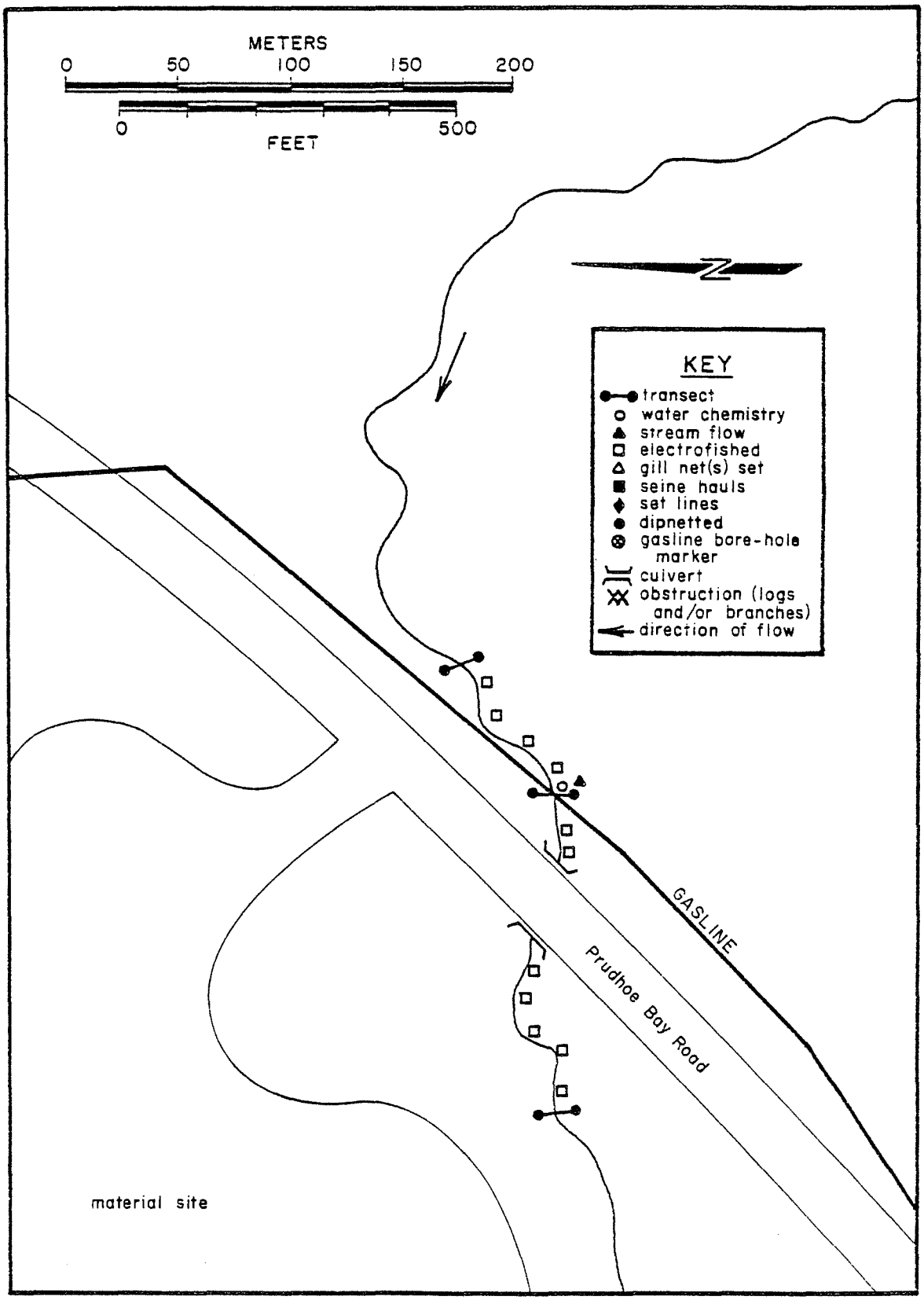

Fig. 62. Fall survey. Cathedral Mountain Creek #1, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Slate Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Koyukuk River

Figure 63 Gradient 0.48% Elevation 357 m

NPAS 43 NPMP 245.0 NPRX 043-8 AHMP

USGS Map Reference Wiseman, AK T 28N R 12W Sec. 15

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Slate Creek is large (8.7-16 m wide), clear, swiftly flowing stream which meanders westerly to the Koyukuk River. Substrate is sand, gravel, pebble, and cobble; banks vary in height (up to 1.5 m) and are vegetated with spruce, willow, alder and some aspen and birch.

Extensive documentation of fish use in Slate Creek in summer exists (Refs. 11, 20, 30, 34 and 76). During the recent fall survey, grayling were present and two spawned-out female chum salmon carcasses were observed within 200 m downstream of the proposed crossing.

Slate Creek is an important fall migration route and rearing area for grayling and provides spawning areas for chum salmon. Spawning gravel is distributed throughout the survey area and extends downstream to the Middle Fork Koyukuk River. It is likely that other species, which have been reported in summer, such as slimy sculpin, Dolly Varden and round whitefish (Refs. 11, 20, 30, 34 and 76), use Slate Creek for rearing and migration during fall.

FISH

Date 14 September 1980

Fish Present Yes

Gear/Effort 15 m GN (0/18 h), Visual (22/300 m)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Chum Salmon		2 spawned out ♀		~ 550
Grayling		20		~ 100-300

PHYSICAL CONDITIONS

Date	14 September 1980
Wetted Width (m)	8.7-16
Depth (cm)	16-50
Discharge (m^3/s)	2.81
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	5.0
Conductivity (umhos/cm)	60
pH (pH units)	7.6
Color (color units)	15
Turbidity (NTU)	1.9
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 sand, 10 gravel, 60 pebble, 20 cobble
Bank Stability (%)	85
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	50 spruce, 20 willow, 10 alder, 10 aspen, 10 birch
Cover (%)	5
Fish Block(s)	None observed

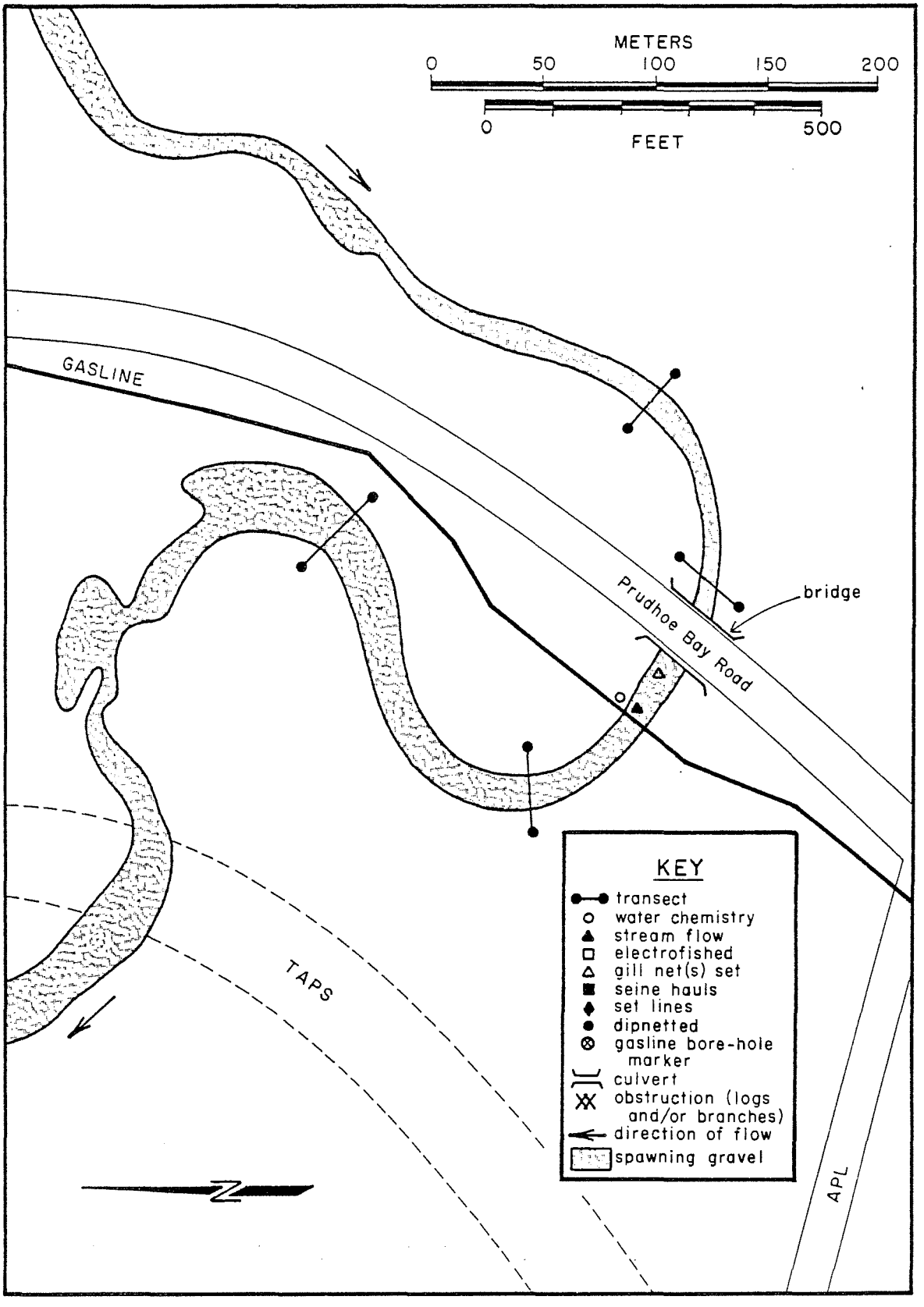

Fig. 63. Fall survey. Slate Creek, 14 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Marion Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 64 Gradient 0.75% Elevation 334 m

NPAS 42 NPMP 240.3 NPRX 042-6 AHMP NA

USGS Map Reference Wiseman, AK T 29N R 12W Sec. 23

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Marion Creek is a moderate sized clear water stream (~ 4.5-18.0 wide, 10-31 cm) that flows west across the pipeline route to the Middle Fork of the Koyukuk River. The stream is partially shaded by overhanging spruce, birch, alder, willow and aspen. Substrate consists primarily of pebbles and cobbles. There is a low water crossing at the TAPS workpad.

During spring Marion Creek is used as a spawning, rearing and migration area for several species of fish. Past investigations have reported slimy sculpin, Dolly Varden, and grayling (Ref. 11, 20, 21, 30, 31 and 34). Previously fish had not been documented in Marion Creek in fall, however during the recent survey grayling were captured and the presence of spawning gravels were noted throughout the entire survey area. Marion Creek, in fall, is a migration route and rearing area for grayling. It is likely that slimy sculpin and Dolly Varden are also present but have yet to be documented.

FISH

Date 13 September 1980

Fish Present Yes

Gear/Effort 15 m GN (2/18 h)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling		2		160-168

PHYSICAL CONDITIONS

Date	13 September 1980
Wetted Width (m)	4.5-18
Depth (cm)	10-31
Discharge (m^3/s)	1.62
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	6.3
Conductivity (umhos/cm)	115
pH (pH units)	7.6
Color (color units)	5
Turbidity (NTU)	1.4
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	5 sand, 10 gravel, 40 pebble, 40 cobble, 5 boulder
Bank Stability (%)	40
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	30 alder, 30 willow, 20 spurce, 10 birch, 10 grasses
Cover (%)	10
Fish Block(s)	None observed

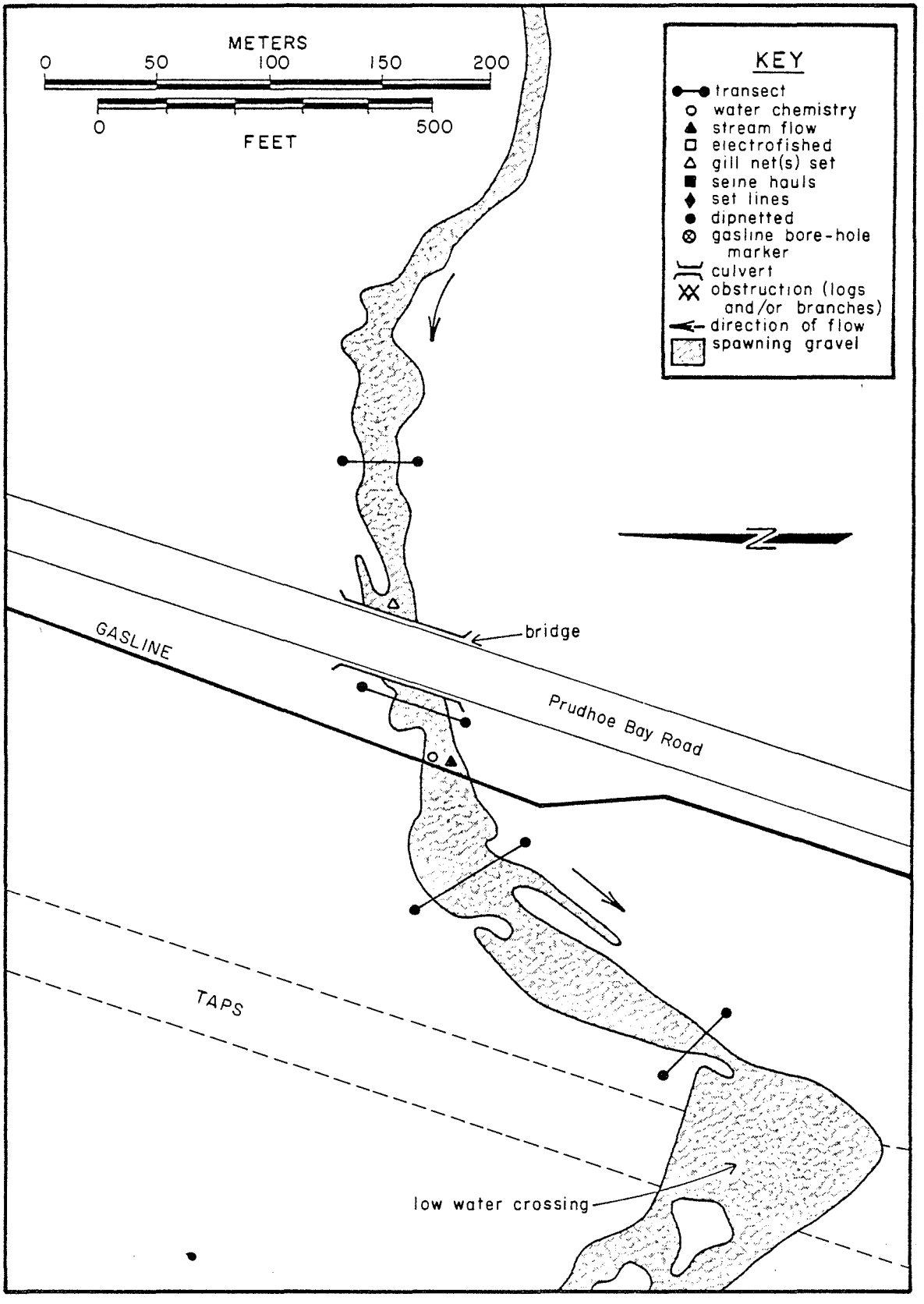

Fig. 64. Fall survey. Marion Creek, 13 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody North Marion Creek Overflow #1 Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 65 Gradient 0.8% Elevation 334 m

NPAS 42 NPMP 240.2 NPRX 042-5 AHMP NA

USGS Map Reference Wiseman, AK T 29N R 12W Sec. 23

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

North Marion Creek Overflow #1 is a small highwater runoff channel which is crossed by the Haul Road about 135 m north of the Marion Creek crossing. In the vicinity of the proposed pipeline crossing, the channel is poorly defined and vegetated with grass, moss, spruce, birch and willow. The channel was dry during the fall 1980 fisheries investigations and it is doubtful that it would contain water even during periods of high run-off. North Marion Creek Overflow #1 does not provide fish habitat during fall and it is unlikely that it is used by fish at any time of the year.

FISH

Date 10 September 1980

Fish Present

Gear/Effort None-stream bed dry

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	Stream bed dry
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	90 gravel, 10 sand
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	50 birch, 40 spruce, 10 willow
Cover (%)	40
Fish Block(s)	Stream bed dry

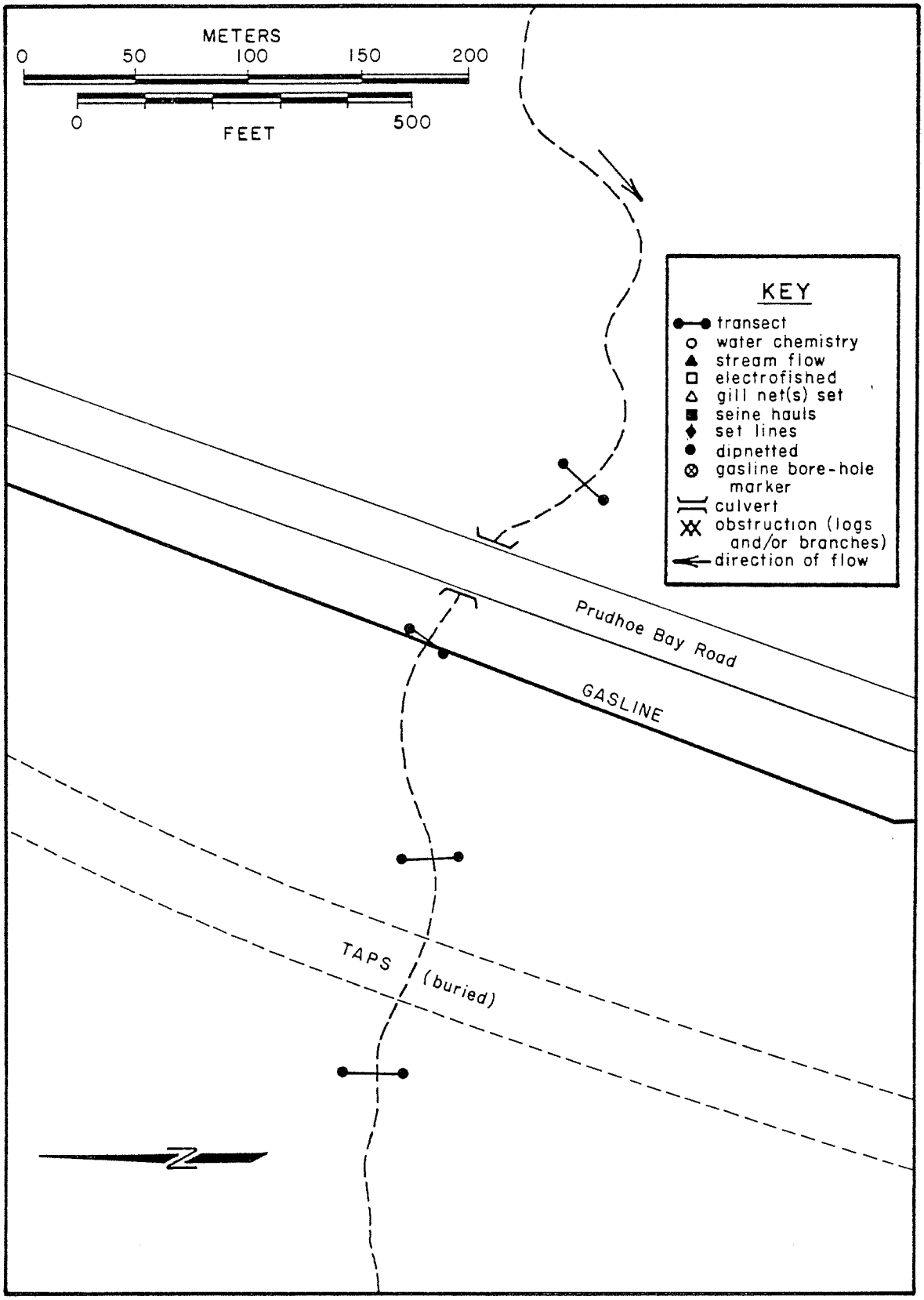

Fig. 65. Fall survey. North Marion Creek Overflow #1, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Cushing Creek Source Montane/Taiga Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 66 Gradient 2.6% Elevation 402 m

NPAS 39 NPMP 222.9 NPRX 039-4 AHMP NA

USGS Map Reference Chandalar, AK T 31N R 10W Sec. 18

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Cushing Creek is a small tributary of Middle Fork Koyukuk River. It flows westerly through pools (1-2 m deep) and small falls in a defined channel from 100 m upstream of the proposed pipeline crossing to the TAPS crossing. Below the TAPS line Cushing Creek meanders through tall grass and sedge in a series of pools, narrow channels and marshlands. Stream substrate is generally sand, fines and detritus with cobble and boulder at the low water crossing of the TAPS work pad. Streamside vegetation consists of grass, willow and birch.

During the fall 1980 investigations habitat in Cushing Creek appeared suitable for fish use; however, no fish were captured or observed during this investigation. Downstream migration of fish present may have occurred prior to this survey. A previous investigation reported an unidentified fish species in this stream, but specific information on location or time of year is not available (Ref. 11).

FISH

Date 11 September 1980

Fish Present No

Gear/Effort EF (0/317 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	11 September 1980
Wetted Width (m)	0.3-2.5
Depth (cm)	4-8, pools 100-200
Discharge (m^3/s)	0.01
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	2
Conductivity (umhos/cm)	95
pH (pH units)	6.8
Color (color units)	65
Turbidity (NTU)	5.5
T. Hardness (mg $CaCO_3$/1)	115
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	5 organic, 50 fines, 20 sand, 15 gravel, 10 cobble/boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	60 birch/willow, 40 sedge/grass
Cover (%)	40
Fish Block(s)	None observed

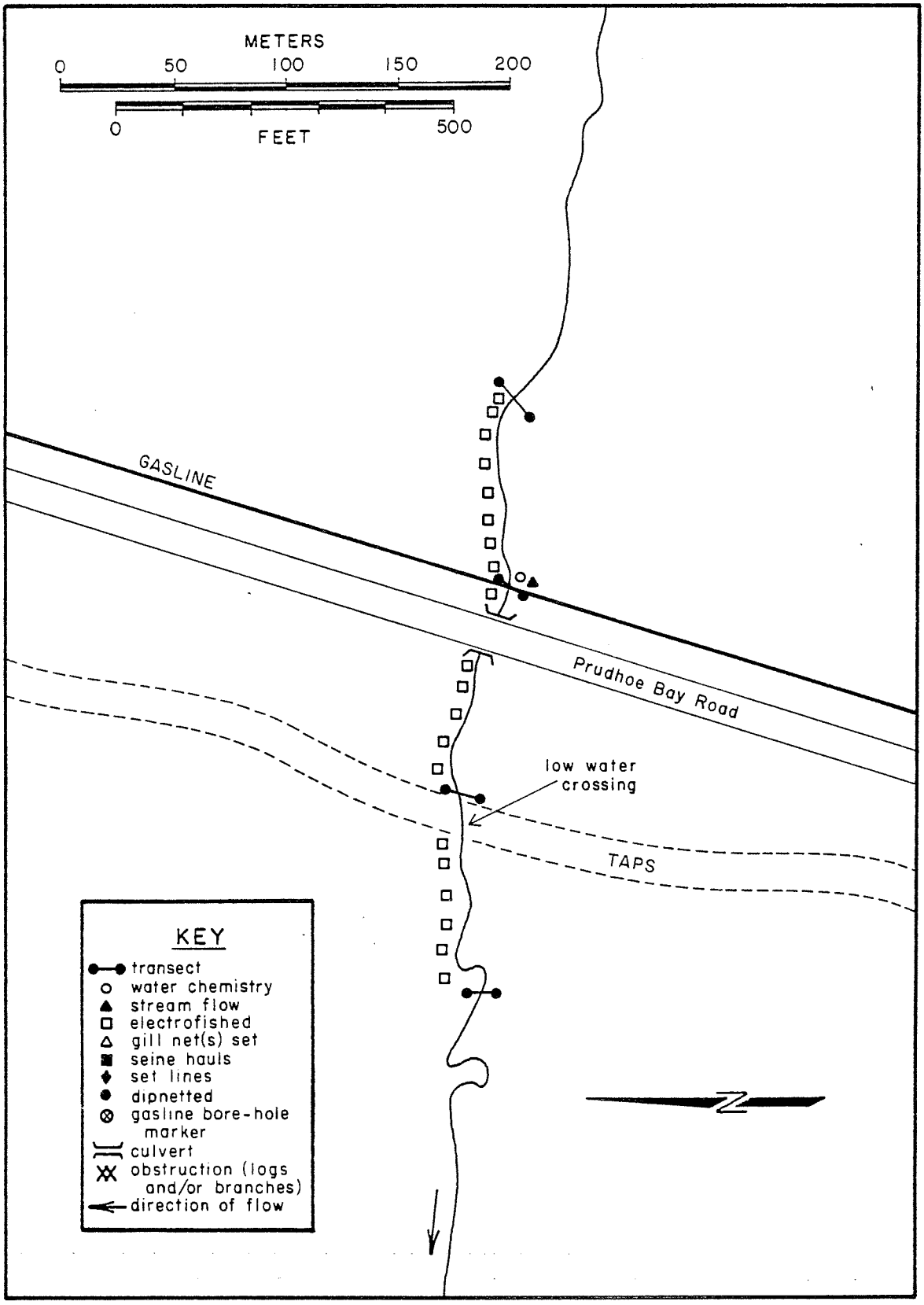

Fig. 66. Fall survey. Cushing Creek, 11 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody North Fork Sukakpak Creek Source Montane Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 67 Gradient 0.9% Elevation 425 m

NPAS 38 NPMP 215.7 NPRX FH-038-7 AHMP NA

USGS Map Reference Chandalar, AK T 32N R 10W Sec. 16

Site Access Truck

Section Surveyed From 100 m upstream to 200 m downstream of proposed crossing

ASSESSMENT

North Fork Sukakpak Creek is a small runoff channel that drains a mountain slope east of the proposed pipeline route and continues in several channels to the Haul Road. The stream was dry at the proposed pipeline crossing on 8 September 1980.

Standing water was observed between the Haul Road and the TAPS oil line. No flow was detected in this area. Grayling and sculpin (Refs. 11 and 20) have been reported in North Fork Sukakpak Creek during the open water season; however, the presence of these fish has not been verified. North Fork Sukakpak Creek should not be considered fish habitat during fall.

FISH

Date 08 September 1980

Fish Present

Gear/Effort None-stream bed dry at crossing and standing water only below crossing

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	08 September 1980
Wetted Width (m)	Stream bed dry at crossing
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	80 gravel, 20 mud
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 grass
Cover (%)	20
Fish Block(s)	Stream bed dry

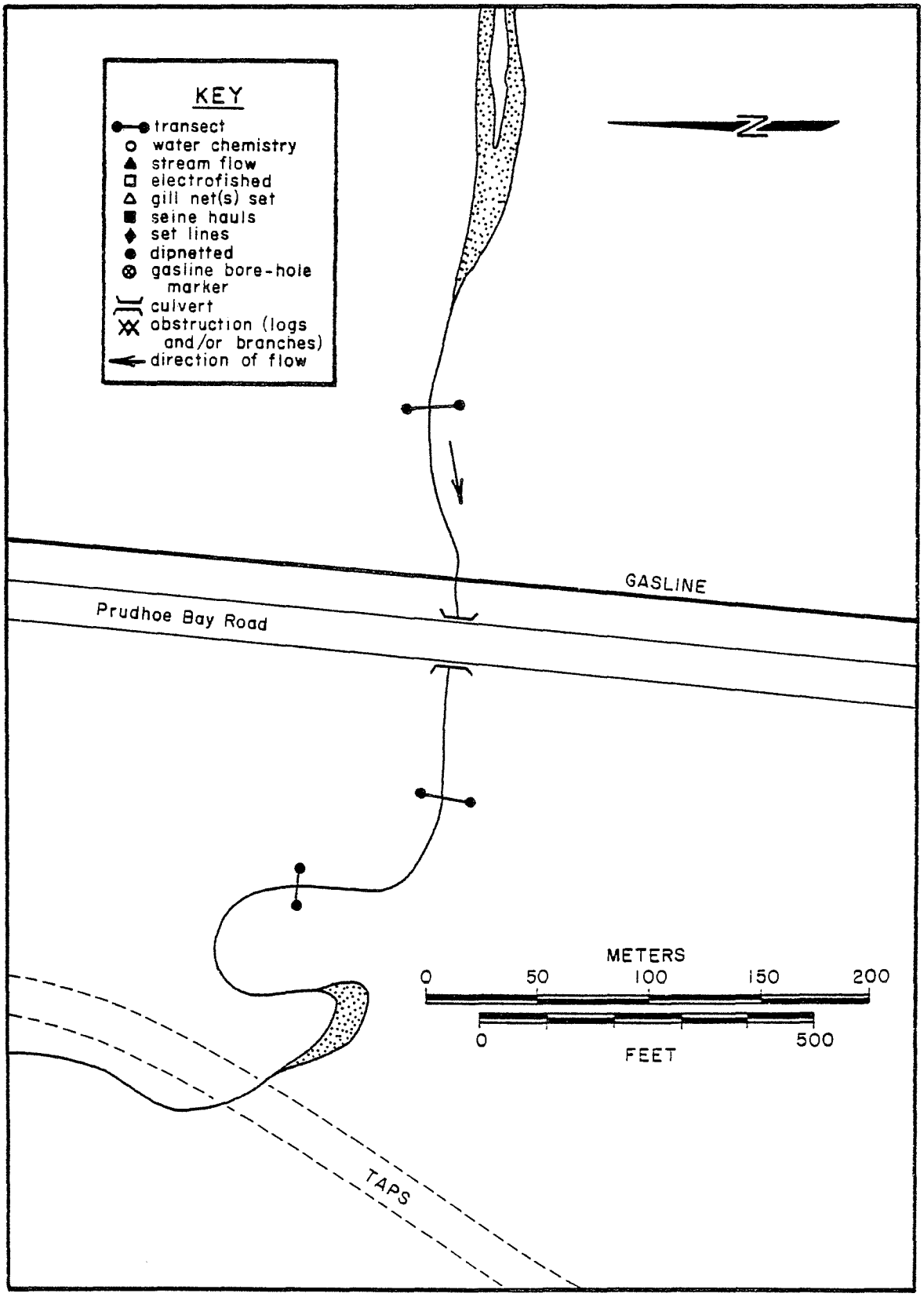

Fig. 67. Fall survey. North Fork Sukakpak Creek, 08 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Snowden Creek Source Montane Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 68 Gradient 1.5% Elevation 482 m

NPAS 36 NPMP 205 NPRX 036-4 AHMP NA

USGS Map Reference Chandalar, AK T 34N R 10W Sec. 26

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Snowden Creek drains a mountainous area of approximately 43 km^2 east of the proposed pipeline route. The lower portion of the stream, where the crossing is located, is wide (floodplain 30 m; stream 5.4 wide in fall), fast flowing and braided (Refs. 11 and 34). Substrate consists of sand, gravel, cobble and pebble. The banks are vegetated with alder, spruce, willow, aspen and sedge. Fish passage is hindered at Prudhoe Bay by a perched CMP.

Grayling and slimy sculpin have been observed in Snowden Creek during spring and summer (Refs. 20 and 64), and during the recent fall survey grayling were observed in the scour pool below the perched culvert. Potential spawning gravels are located within the entire survey area. Snowden Creek in fall, as well as spring and summer, provides good rearing habitat for grayling and slimy sculpin.

FISH

Date 13 September 1980

Fish Present Yes

Gear/Effort 15 m GN (1/24 h), DN (0/10 m^2), Visual (2/10 m)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling		3		212-~250

PHYSICAL CONDITIONS

Date	13 September 1980
Wetted Width (m)	3.5-5.4
Depth (cm)	5-28
Discharge (m^3/s)	0.55
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	4.7
Conductivity (umhos/cm)	800
pH (pH units)	8.3
Color (color units)	5
Turbidity (NTU)	0.7
T. Hardness (mg $CaCO_3$/1)	838
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	50 pebble, 20 cobble, 20 gravel, 10 sand
Bank Stability (%)	50
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	40 willow, 20 spruce, 10 aspen, 19 alder, 11 sedge
Cover (%)	10
Fish Block(s)	Perched culvert .30 m falls downstream side of Haul Road.

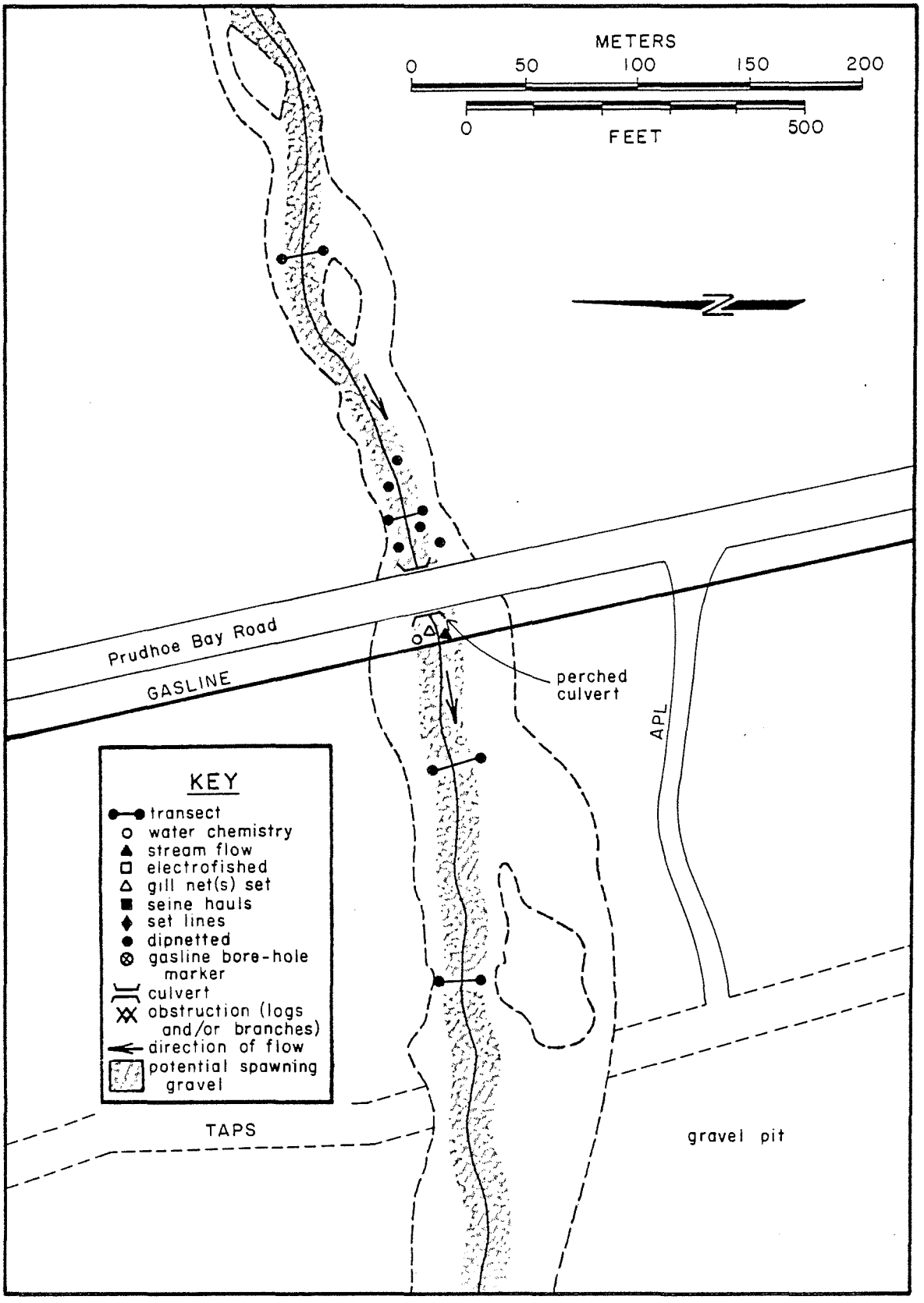

Fig. 68. Fall survey. Snowden Creek, 13 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Steep Creek Sauna Montane Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 69 Gradient 2.0% Elevation 533 m

NPAS 35 NPMP 198.3 NPRX 35-4 AHMP NA

USGS Map Reference Chandalar, AK T 35N R 10W Sec. 28

Site Access Truck

Section Surveyed 100 m upstream to confluence with the Dietrich River (~600 m)

ASSESSMENT

Steep Creek is a stream that drains a mountainous area of approximately 19 km^2. Its clear waters flow through a single channel to below the proposed crossing where it is braided until its confluence with the Dietrich River. At the pipeline crossing the stream is 1.8-4.3 m wide, 10-17 cm deep and flows over cobble and boulder substrate forming many riffle areas and few pools. The stable alluvial banks are occasionally vegetated with spruce and willow. A scour pool has formed at the downstream end of the Prudhoe Bay Road culvert which is perched approximately 45 cm above the channel bottom.

Steep Creek provides adequate fish habitat in September, although no fish were captured or observed at this time. It is possible that fish movement to the Dietrich River had occurred prior to this survey. References 11 and 30 indicate that much of the waters of Steep Creek percolate into the alluvial fan above the Dietrich River. Should this occur, fish movement would be blocked during periods of low water; however, during the fall 1980 investigation no such block was evident. Although few studies have been conducted on Steep Creek fish use of this stream is suspected to be low to non-existent. If fish were present during fall they would migrate to other areas for wintering as the stream likely dries up or freezes solid.

FISH

Date 08 September 1980

Fish Present None

Gear/Effort EF (0/960 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	08 September 1980
Wetted Width (m)	1.8-4.3
Depth (cm)	10-17
Discharge (m^3/s)	0.09
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	5.0
Conductivity (umhos/cm)	600
pH (pH units)	7.7
Color (color units)	<5
Turbidity (NTU)	1.5
T. Hardness (mg $CaCO_3$/1)	650
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	5 fines, 1 sand, 55 gravel, 39 cobble/boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	5 willow, 10 spruce, 40 alder, 15 aspen, 30 sedge
Cover (%)	0
Fish Block(s)	CMP perched ~0.3 m at Haul Road may impede fish movement.

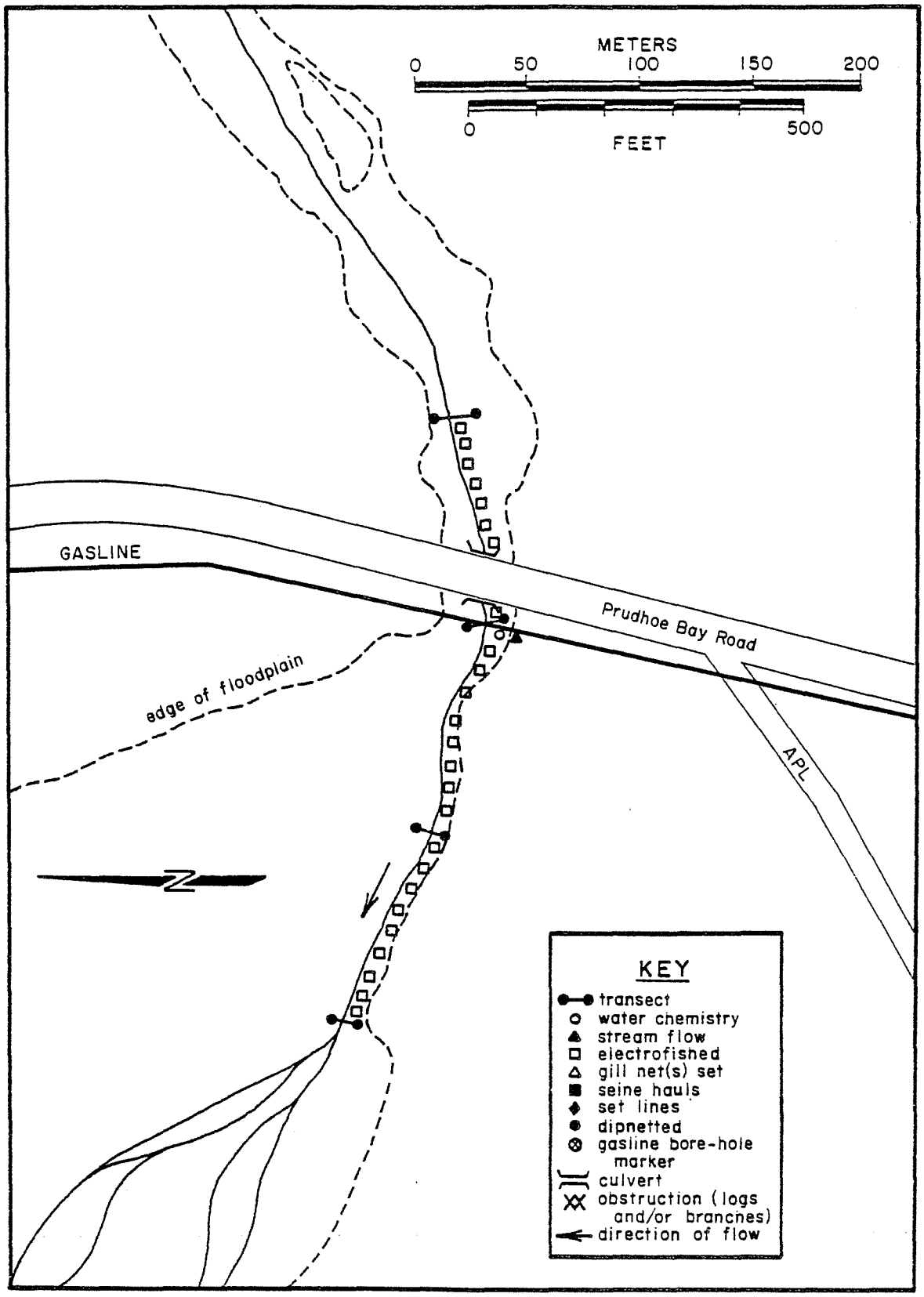

Fig. 69. Fall survey. Steep Creek, 08 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Buff Creek Source Montane Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 70 Gradient 4.9% Elevation 533 m

NPAS 35 NPMP 196.8 NPRX 035-3 AHMP NA

USGS Map Reference Chandalar, AK T 35N R 10W Sec. 21

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Buff Creek is a steep, mountain stream that varies in width (1.7-7 m) and depth (8-17 cm) in the vicinity of the proposed pipeline crossing. Its clear waters flow westerly through braided channels to its confluence with the Dietrich River approximately 0.5 km downstream of the crossing. The banks of Buff Creek are stable and lined with spruce, birch, willow and alder. Stream substrate is cobble and boulder with some gravel, sand and fines. Anchor ice was observed throughout the area surveyed in September 1980 and water temperatures approached freezing.

Although no fish were captured or observed during the fall 1980 field investigations, fish habitat in Buff Creek appeared to be favorable. It is possible that fall migration occurred prior to the investigation. Grayling have been reported to be present in this stream (Refs. 11 and 30) but actual documentation of this is not available. Previous reports have suggested that fish use of Buff Creek may be restricted due to its intermittent nature (Ref. 11). During the fall 1980 surveys, however, sufficient water was available for fish use.

FISH

Date 08 September 1980

Fish Present None

Gear/Effort EF (0/749 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	08 September 1980
Wetted Width (m)	1.7-7
Depth (cm)	8-17
Discharge (m^3/s)	0.05
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	1.0
Conductivity (umhos/cm)	610
pH (pH units)	7.9
Color (color units)	5
Turbidity (NTU)	5.2
T. Hardness (mg $CaCO_3$/1)	735
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 fines, 10 sand, 20 gravel, 60 cobble/boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	0
Riparian Vegetation (%)	5 spruce, 15 birch, 25 willow, 25 alder, 30 sedge
Cover (%)	5
Fish Block(s)	None observed

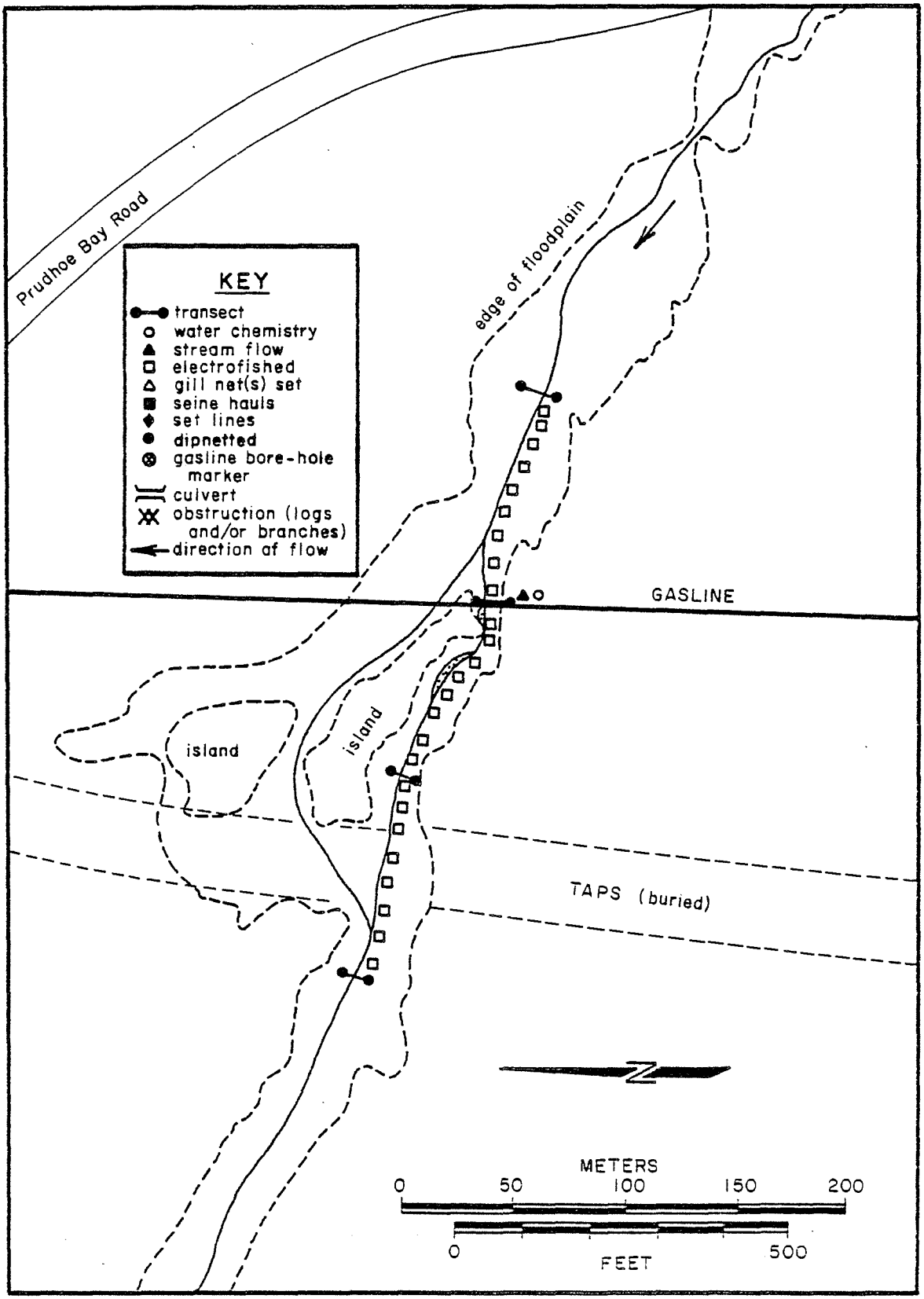

Fig. 70. Fall survey. Buff Creek, 08 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Burger's Bayou Source Spring-fed

Main Drainage Dietrich River Tributary to Drainage M.S. 106

Figure 71 Gradient 0.1% Elevation 530 m

NPAS 35 NPMP 196.3 NPRX 035-2 AHMP NA

USGS Map Reference Chandalar, AK T 35N R 10W Sec. 16

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Burger's Bayou is a shallow, slow-flowing, spring-fed stream originating approximately 150 m upstream of the proposed pipeline crossing and flows into the Dietrich River 650 m downstream. Water temperature (8.0° C) at the time of sampling was higher than similar nearby creeks. It has been reported to remain open all year (Ref. 11) and unusually high water temperatures have been recorded during the winter (Ref. 77). Substrate within the sample area consists of gravel with numerous silty areas especially where stream flow is reduced. A portion of this stream near the TAPS workpad has been channelized. Downstream riparian vegetation consists of a few willows and some sedge while upstream vegetation is more luxurient and includes several tall spruce.

Burger's Bayou provides excellent fish habitat and is a feeding area for grayling, burbot and slimy sculpin during fall. Dolly Varden, which use this waterbody during spring (Refs. 30) may also be present in fall. Documentation of the presence of slimy sculpin in early winter (Ref. 77) indicates that this stream is important to fish throughout the fall season.

FISH

Date 13 September 1980

Fish Present Yes

Gear/Effort EF (14/111 sec), Visual (12/100 m.)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Burbot		1		430
Grayling		18		78-100
Slimy Sculpin		7		44-105

PHYSICAL CONDITIONS

Date	13 September 1980
Wetted Width (m)	1.5-4
Depth (cm)	7-13
Discharge (m^3/s)	0.09
Dissolved Oxygen (mg/1)	11
Temperature (^oC)	8.0
Conductivity (umhos/cm)	525
pH (pH units)	7.4
Color (color units)	5
Turbidity (NTU)	1.5
T. Hardness (mg $CaCO_3$/1)	496
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	60 gravel, 40 fines
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	5 spruce, 80 willow, 15 sedge
Cover (%)	15
Fish Block(s)	None observed

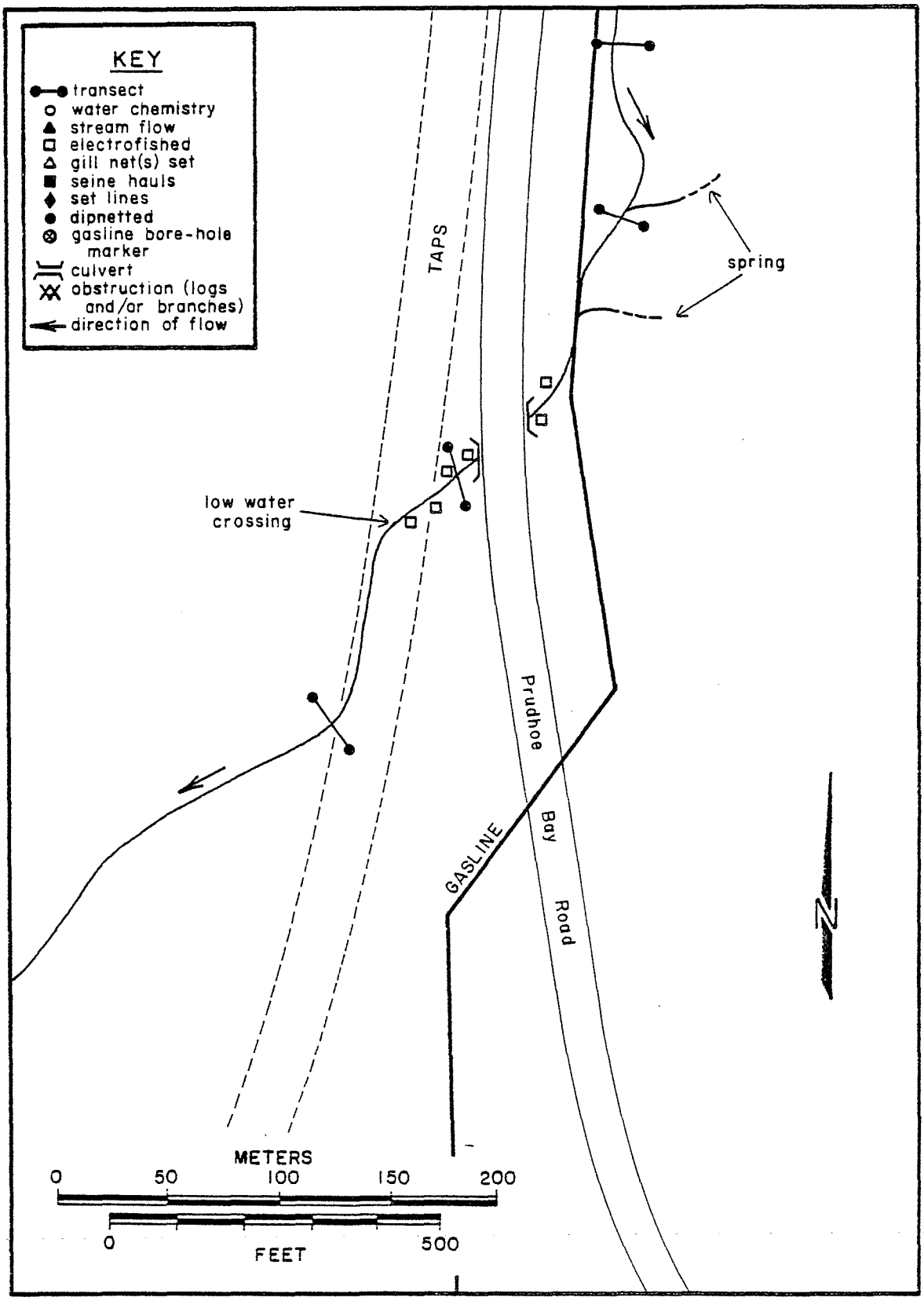

Fig. 71. Fall survey. Burger's Bayou, 13 September 1980

FALL SURVEY FORM

WATERBODY

Waterbody Beaver Dam Brook #1 Source Montane/Taiga Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 72 Gradient 0.01% Elevation 579 m

NPAS 34 NPMP 192.4 NPRX 034-7 AHMP NA

USGS Map Reference Chandalar, AK T 36N R 10W Sec. 28

Site Access Truck

Section Surveyed From 1200 m upstream to 200 m downstream of Prudhoe Bay Haul Road

ASSESSMENT

Beaver Dam Brook is a clear water stream that is joined by a small spring east of the Prudhoe Bay Haul Road and flows southerly in a series of pools and marsh areas across the Haul Road to join the Dietrich River. It is contained by high banks on the east that are vegetated with overhanging willow and alder. The west banks are low and sparsely vegetated with willow. Stream substrate near the Haul Road consists of gravel and fines. In the upstream marsh and pool areas substrate is mud and detritus. Beaver have constructed numerous dams throughout the stream beginning approximately 50 m upstream of the Haul Road CMP. These dams are effective barriers to fish passage (Refs, 20, 64 and 122).

Beaver Dam Brook #1 provides excellent fish habitat in the vicinity of the Haul Road CMP and is important to a number of species during fall. Numerous grayling, round whitefish and slimy sculpim were observed and captured in September 1980. Grayling were observed in a pond created by a beaver dam approximately 50 m upstream of the CMP. It is believed that these fish entered the pond through the marsh area west of the beaver dam during periods of high water. During the recent survey the dam appeared to be an effective block to fish passage. Fish use of the pond during winter is uncertain.

FISH

Date 12 September 1980

Fish Present Yes

Gear/Effort EF (47/1491 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling		41		94-275
Round Whitefish		4		208-246
Slimy Sculpin	1	1	7	60

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	2-11
Depth (cm)	5-250
Discharge (m^3/s)	Unable to detect at proposed crossing
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	5.5
Conductivity (umhos/cm)	320
pH (pH units)	7.2
Color (color units)	<5
Turbidity (NTU)	1.4
T. Hardness (mg $CaCO_3$/1)	377
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	60 fines, 30 gravel, 10 fines (mud and detritus in ponds)
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 willow/alder
Cover (%)	2
Fish Block(s)	Beaver dams ~50 m upstream of CMP

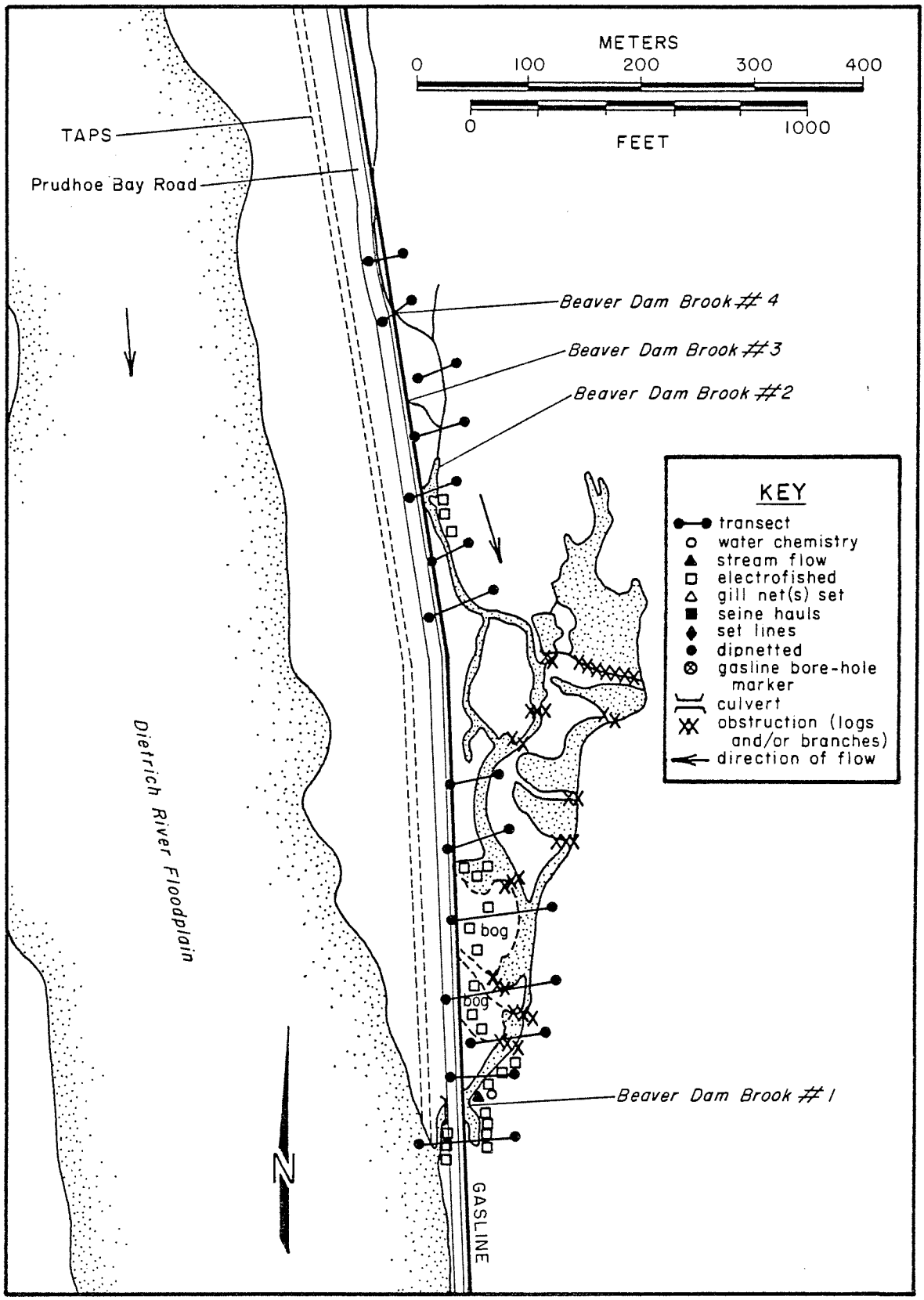

Fig. 72. Fall survey. Beaver Dam Brook #1-4, 12 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Beaver Dam Brook #2 Source Montane/Taiga Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 72 Gradient 0.01% Elevation 579 m

NPAS 34 NPMP 192.0 NPRX 034-6 AHMP NA

USGS Map Reference Chandalar, AK T 36N R 10W Sec. 28

Site Access Truck

Section Surveyed From 1200 m upstream to 200 m downstream of Prudhoe Bay Haul Road

ASSESSMENT

Beaver Dam Brook is a clear water stream that is joined by a small spring east of the Prudhoe Bay Haul Raod and flows southerly in a series of pools and marsh areas across the Haul Road to join the Dietrich River. It is contained by high banks on the east that are vegetated with overhanging willow and alder. The west banks are low and sparsely vegetated with willow. Stream substrate near the Haul Road consists of gravel and fines. In upstream marsh and pool areas substrate is mud and detritus. Beaver have constructed numerous dams throughout the stream beginning approximately 50 m upstream of the Haul Road CMP. These dams are effective barriers to fish passage (Refs. 20, 64 and 122).

Beaver Dam Brook #2 provides excellent fall habitat for fish; however, beaver dams downstream of this crossing are effective barriers to fish movement to this area. No fish were captured or observed in September 1980, thus utilization by fish near this crossing is low to non-existent in fall.

FISH

Date 12 September 1980

Fish Present No

Gear/Effort EF (0/361)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	2-8
Depth (cm)	50-250
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	*
Temperature (^oC)	
Conductivity (umhos/cm)	
pH (pH units)	
Color (color units)	
Turbidity (NTU)	
T. Hardness (mg $CaCO_3$/1)	
Nitrate (mg/1 N)	
Phosphate (mg/1 P)	
Bottom Type (%)	100 mud and detritus
Bank Stability (%)	90
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 willow/alder
Cover (%)	2
Fish Block(s)	Beaver dams downstream of proposed crossing

* No data obtained from this site. See physical conditions section of Beaver Dam #1 for water quality data of this stream.

FALL SURVEY FORM

WATERBODY

Waterbody Beaver Dam Brook #3 Source Montane/Taiga Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 72 Gradient 0.01% Elevation 579 m

NPAS 34 NPMP 191.8 NPRX 034-5 AHMP NA

USGS Map Reference Chandalar, AK T 36N R 10W Sec. 28

Site Access Truck

Section Surveyed From 1200 m upstream to 200 m downstream of Prudhoe Bay Haul Road

ASSESSMENT

Beaver Dam Brook is a clear water stream that is joined by a small spring east of the Prudhoe Bay Haul Road and flows southerly in a series of pools and marsh areas across the Haul Road to join the Dietrich River. It is contained by high banks on the east that are vegetated with overhanging willow and alder. The west banks are low and sparsely vegetated with willow. Stream substrate near the Haul Road consists of gravel and fines. In upstream marsh and pool areas substrate is mud and detritus. Beaver have constructed numerous dams throughout the stream beginning approximately 50 m upstream of the Haul Road CMP. These dams are effective barriers to fish passage (Refs. 20, 64 and 122).

Beaver Dam Brook #3 is a small intermittent stream that flows into Beaver Dam Brook. Small ponds were the only water found in September 1980. Due to its intermittent nature, fish habitat is marginal and fish use low to non-existent in fall.

FISH

Date 12 September 1980

Fish Present

Gear/Effort None - intermittent stream

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	None - stream intermittent
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	50 gravel, 40 cobble, 10 sand
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	100 willow/alder
Cover (%)	0
Fish Block(s)	Stream intermittent

FALL SURVEY FORM

WATERBODY

Waterbody Beaver Dam Brook #4 Source Montane/Taiga Drainage

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 72 Gradient 0.01% Elevation 579 m

NPAS 34 NPMP 191.8 NPRX 034-4 AHMP NA

USGS Map Reference Chandalar, AK T 36N R 10W Sec. 28

Site Access Truck

Section Surveyed From 1200 m upstream to 200 m downstream

ASSESSMENT

Beaver Dam Brook is a clearwater stream that is joined by a small spring east of the Prudhoe Bay Haul Road and flows southerly in a series of pools and marsh areas across the Haul Road to join the Dietrich River. It is contained by high banks on the east that are vegetated with overhanging willow and alder. The west banks are low and sparsely vegetated with willow. Stream substrate near the Haul Road consists of gravel and fines. In upstream marsh and pool areas substrate is mud and detritus. Beaver have constructed numerous dams throughout the stream beginning approximately 50 m upstream of the Haul Road CMP. These dams are effective barriers to fish passage (Refs. 20, 64, and 122).

Beaver Dam Brook #4 is a very small stream that is intermittent in nature. Downstream approximately 50 m it is joined by a small spring. Numerous beaver dams constructed downstream of Beaver Dam Brook #4 provide effective barriers to fish movement to this reach. Due to its intermittent nature and the numerous beaver dams fish use of this stream is low to non-existent in fall.

FISH

Date 12 September 1980

Fish Present

Gear/Effort None - intermittent stream

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	Intermittent stream
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	AN
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	80 gravel, 10 cobble, 10 sand
Bank Stability (%)	95
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	100 willow/alder
Cover (%)	0
Fish Block(s)	stream intermittent

FALL SURVEY FORM

WATERBODY

Waterbody Nutirwik Creek Source Montane Drainage/Spring-fed

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 73 Gradient 2.9% Elevation 604 m

NPAS 34 NPMP 190.8 NPRX 034-3 AHMP NA

USGS Map Reference Chandalar, AK T 36N R 10W Sec. 21

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Nutirwik Creek is a clear water stream that varies in width from 3.9-14 m and in depth from 17-24 cm. It is fed by spring water sources and flows into the Dietrich River just west of the Prudhoe Bay Haul Road. Stream substrate is cobble and boulder with some gravel; aquatic vegetation is lacking. Banks are stable and essentially void of vegetative cover on the wide alluvial fan. Off the alluvium, vegetation consists of alder, grasses and some spruce.

Nutirwik Creek provides good fall habitat and is a feeding and rearing area for juvenile and young-of-the-year Dolly Varden. Grayling have been reported present in Nutirwik Creek during June and July and may also occur here during the fall season (Refs. 11, 20, 21 and 30). Other species suspected to be present include sculpin and round whitefish (Refs. 11 and 21). Fish were captured during the fall 1980 fisheries investigation only downstream of the Prudhoe Bay road CMP. During this survey this culvert was perched and may be a barrier to upstream fish movement.

FISH

Date 07 September 1980

Fish Present Yes

Gear/Effort EF (2/591 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Dolly Varden	2		66-73	

PHYSICAL CONDITIONS

Date	07 September 1980
Wetted Width (m)	3.9-14
Depth (cm)	17-24
Discharge (m^3/s)	0.59
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	5.5
Conductivity (umhos/cm)	600
pH (pH units)	7.6
Color (color units)	5
Turbidity (NTU)	0.8
T. Hardness (mg $CaCO_3$/1)	632
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 gravel, 80 cobble/boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	0
Cover (%)	0
Fish Block(s)	CMP at Haul Road may be barrier to fish movement.

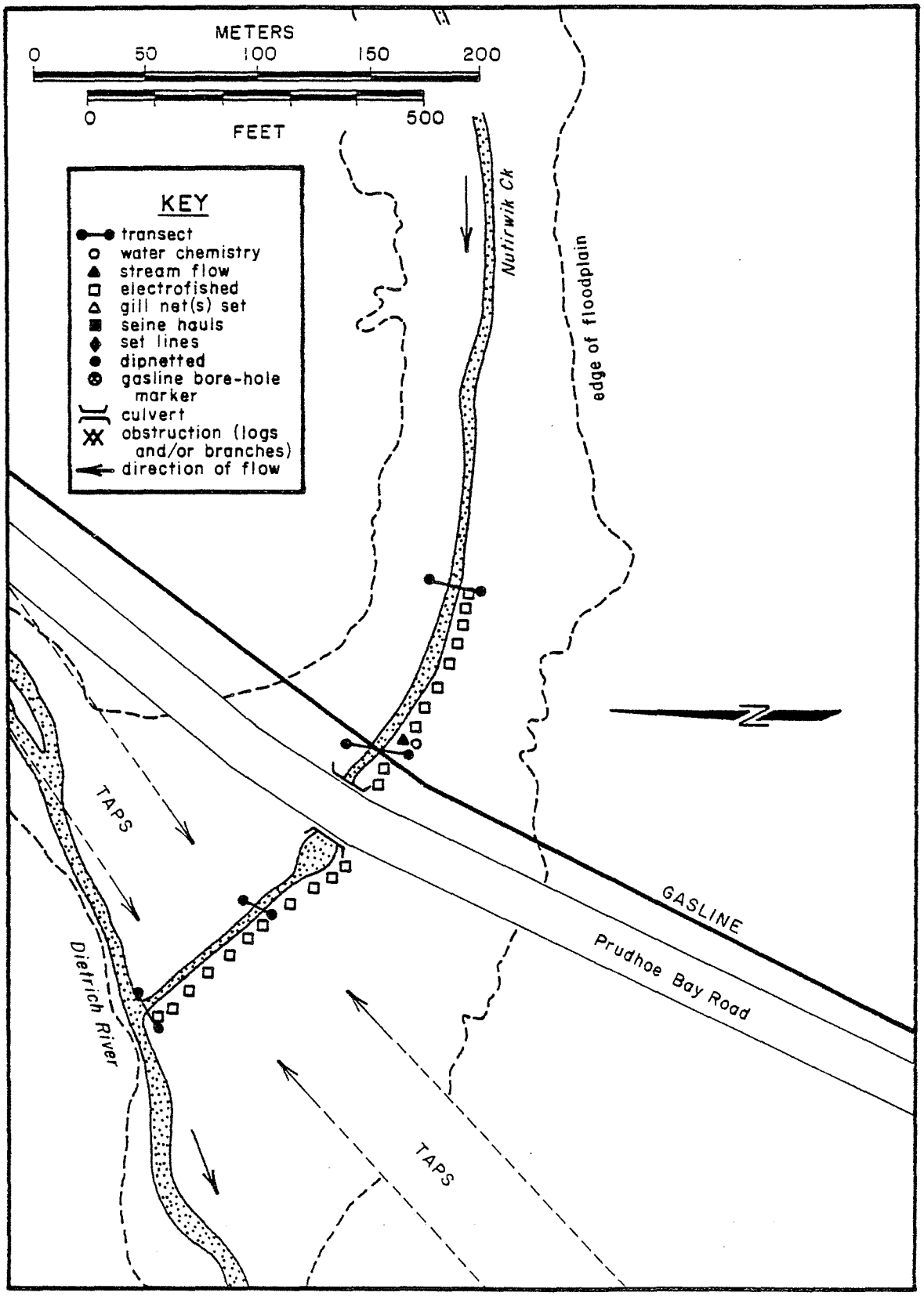

Fig. 73. Fall survey. Nutirwik Creek, 07 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Homewood Spring

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 74 Gradient 0.05% Elevation 640 m

NPAS 34 NPMP 188.3 NPRX 034-2 AHMP NA

USGS Map Reference Chandalar, AK T 36N R 10W Sec. 10

Site Access Truck

Section Surveyed 400 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Homewood Spring originates from several spring sources approximately 170 m east of the vicinity of the proposed pipeline crossing. These springs form a shallow (3-24 cm) stream 2-4 m in width that flows approximately 0.5 km before reaching the Dietrich River. Stream substrate consists of sand and gravel with some fines and cobbles. Aquatic vegetation is scant. Stable banks are variable (low sloping to incised) and sparsely vegetated with willow which provides little or no cover.

Homewood Spring provided excellent habitat and was a feeding and rearing area for a variety of species. At the time of this survey young-of-the-year Dolly Varden, juvenile and adult grayling and adult slimy sculpin were captured in the vicinity of the proposed pipeline crossing. Grayling have also been observed in this spring although investigations conducted in April 1979 found the spring frozen solid (Ref. 55).

Homewood Spring should be considered important to fish in the fall season.

FISH

Date 12 September 1980

Fish Present Yes

Gear/Effort EF (52/1035 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Dolly Varden	1	1	71	127
Grayling		41		100-206
Slimy Sculpin		9		86-112

PHYSICAL CONDITIONS

Date	12 September 1980
Wetted Width (m)	2-4
Depth (cm)	3-24
Discharge (m^3/s)	0.08
Dissolved Oxygen (mg/1)	9.4
Temperature (^oC)	5.0
Conductivity (umhos/cm)	165
pH (pH units)	7.8
Color (color units)	<5
Turbidity (NTU)	1.2
T. Hardness (mg $CaCO_3$/1)	376
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 fines, 30 sand, 40 gravel, 20 cobble/boulder
Bank Stability (%)	95
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	75 willow/alder, 25 sedge
Cover (%)	0
Fish Block(s)	None observed

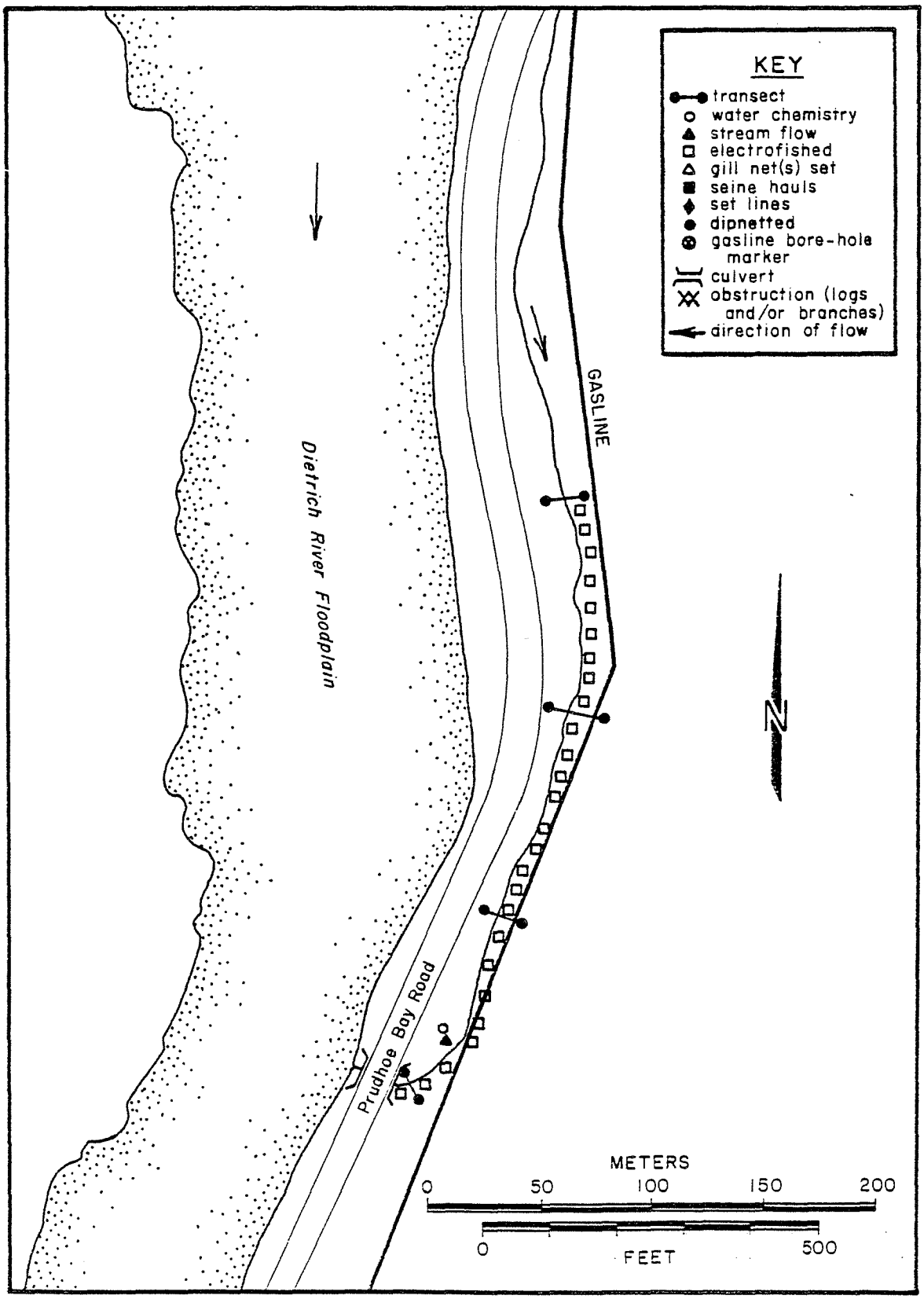

Fig. 74. Fall survey. Homewood Spring, 12 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Wetfoot Creek Source Montane Drainage/Spring-fed

Main Drainage Middle Fork Koyukuk River Tributary to Dietrich River

Figure 75 Gradient 7.3% Elevation 710 m

NPAS 33 NPMP 184.0 NPRX 033-2 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 16S R 10E Sec. 36

Site Access Truck

Section Surveyed 100 m upstream of proposed pipeline crossing to confluence with Dietrich (~150 m) downstream of crossing)

ASSESSMENT

Wetfoot Creek is a spring-fed stream that originates in the Endicott Mountains and flows southeasterly to join the Dietrich River approximately 150 m downstream of the proposed pipeline crossing. In the vicinity of the crossing the stream is primarily a riffled area 1.5-25 cm deep. Substrate is gravel, cobble, and boulder with some sand. Stream banks are stable alluvium sparsely vegetated with willow and alder and few herbaceous plants.

Investigations conducted during September 1980 reported Dolly Varden, grayling, and round whitefish. During fall this stream provides good rearing habitat and a migration route to overwintering areas in the Dietrich River.

Winter use of Wetfoot Creek is thought to be low to non-existent due to its small size, however this stream is spring-fed and winter investigations are necessary to fully assess potential winter habitat.

FISH

Date 07 September 1980

Fish Present Yes

Gear/Effort EF (8/1286 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Dolly Varden		3		95-108
Grayling		4		136-268
Round Whitefish		1		230

PHYSICAL CONDITIONS

Date	07 September 1980
Wetted Width (m)	4-13
Depth (cm)	1.5-25
Discharge (m^3/s)	0.61
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	1.0
Conductivity (umhos/cm)	290
pH (pH units)	7.2
Color (color units)	5
Turbidity (NTU)	0.1
T. Hardness (mg $CaCO_3$/1)	308
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	2 sand, 38 gravel, 60 cobble/boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	15 herbaceous plants, 85 willow/alder
Cover (%)	2
Fish Block(s)	None observed

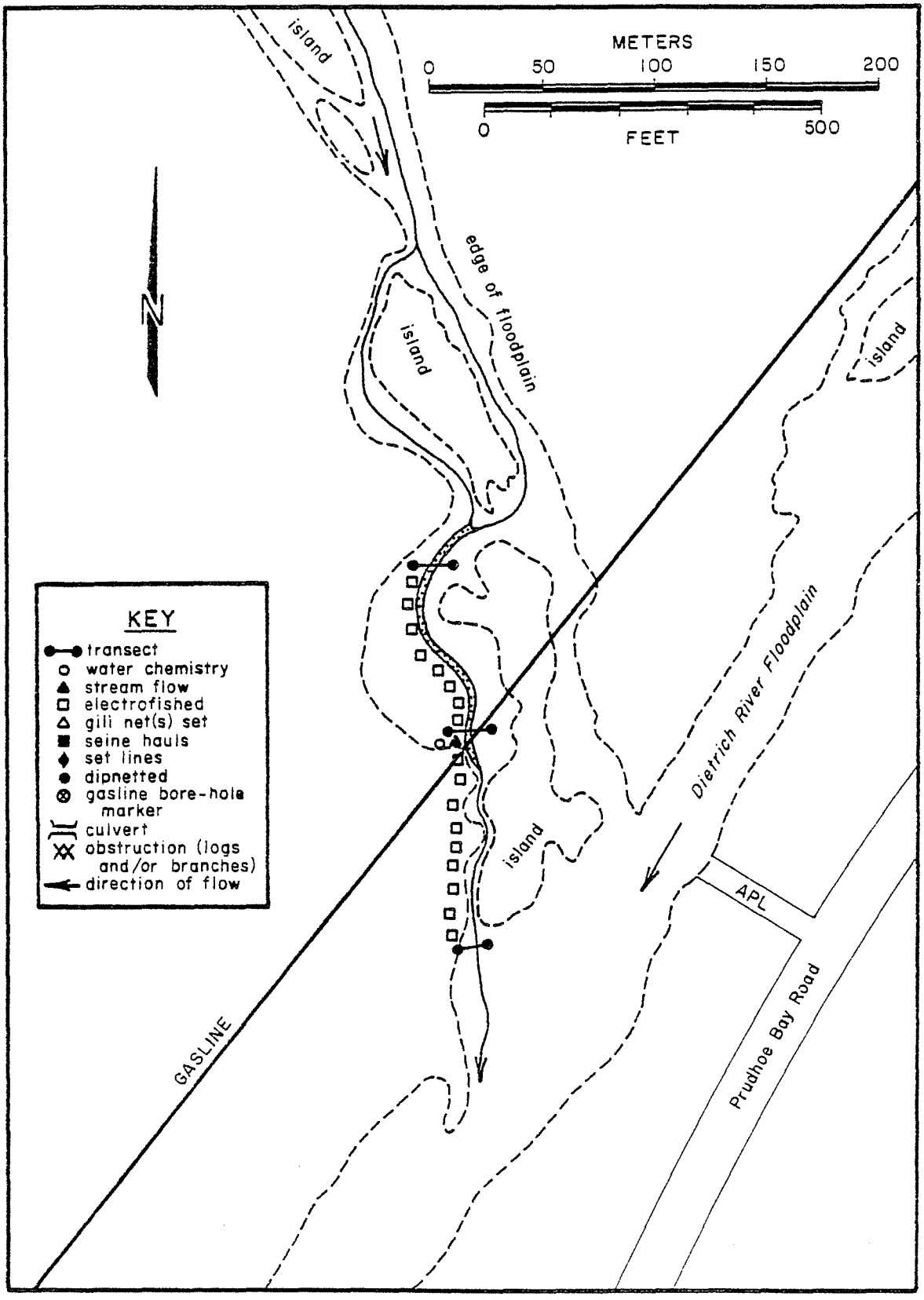

Fig. 75. Fall survey. Wetfoot Creek, 07 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Dietrich River #3 Source Montane Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 76 Gradient 4.5% Elevation 789 m

NPAS 32 NPMP 182.1 NPRX 032-3 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 16S R 11E Sec. 19 and 20

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

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. Three crossings occur within approximately 0.6 km at the base of the Chandalar Shelf, 6-7 km downstream of the Dietrich River headwaters in the Endicott Mountains. Dietrich River #3 is located approximately 320 m downstream of crossing #2. In this vicinity the Dietrich River is joined by a spring-fed stream. The main channel is approximately 6 m wide and confined within a 30-100 m floodplain. Willow and alder are present but provide little cover over the river. At the confluence of the spring a pool is formed, separated from the main channel by a gravel bar (~ 6 m wide). Stream depth varies from 8-14 cm in the main channel and 10-150 cm in the spring outfall pool. Bottom type is gravel, cobble and boulder in the main channel and mud and gravel in the pool area. Aquatic vegetation is absent in the Dietrich River.

Numerous juvenile and adult Dolly Varden and grayling were captured or observed in the vicinity of crossing #3 during the fall investigations. Round whitefish and slimy sculpin were found upstream of this crossing at Dietrich River #1 and #2 (Ref. 122). Dietrich River #3 provides excellent fall fish habitat and is a feeding and rearing area. The spring outfall pool may be used as a spawning area although fall spawning species were not in spawning condition at the time of our sampling.

FISH

Date 09 September 1980

Fish Present Yes

Gear/Effort EF(8/625 sec) pool; 5m Seine (1 haul @ 6/50m), EF(27/199 sec) main channel

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Dolly Varden		6		115-215
Grayling		35		109-263

PHYSICAL CONDITIONS

Date	09 September 1980
Wetted Width (m)	3.5-10.2
Depth (cm)	8-150
Discharge (m^3/s)	0.14 (main channel); <0.01 (pool)
Dissolved Oxygen (mg/1)	11 (main channel); 9.4 (pool)
Temperature (^oC)	4.0 (same in both)
Conductivity (umhos/cm)	350 (main channel), 775 (pool)
pH (pH units)	7.8 (main channel); 7.9 (pool)
Color (color units)	<5 (same in both)
Turbidity (NTU)	0.2 (same in both)
T. Hardness (mg $CaCO_3$/1)	356 (main channel); 958 (pool)
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	15 sand, 35 gravel, 50 cobble
Bank Stability (%)	95
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	90 willow/alder, 10 dwarf birch
Cover (%)	2
Fish Block(s)	None observed

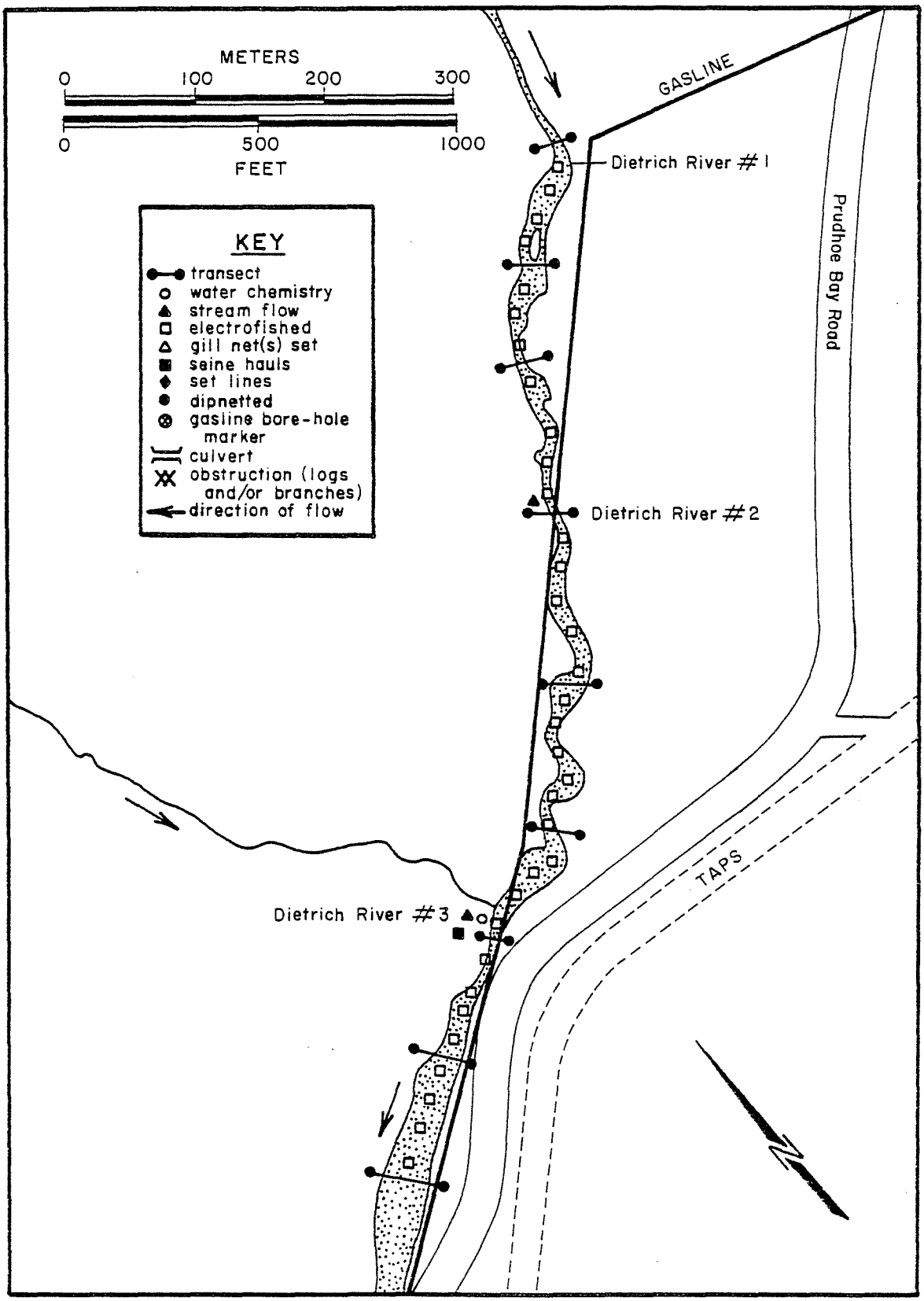

Fig. 76. Fall survey. Dietrich River #1-3, 09 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Dietrich River #2 Source Montane Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyukuk River

Figure 76 Gradient 4.5% Elevation 789 m

NPAS 32 NPMP 182.3 NPRX 032-3 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 16S R 11E Sec. 20

Site Access Truck

Section Surveyed 100 m upstream to 300 m downstream of proposed pipeline crossing

ASSESSMENT

The proposed route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and floodplain a number of times. Three crossings occur within approximately 0.6 km at the base of the Chandalar Shelf, 6-7 km downstream of the Dietrich River headwaters in the Endicott Mountains. Dietrich River #2 is located approximately 250 m downstream of crossing #1. In this region the well defined channel is confined by steep banks vegetated with willow and alder. The stream width ranged from 3.1-9.6 m and depth from 12 to 21 cm at the time of the fall survey. Some cover is provided for fish by overhanging riparian vegetation. Bottom type is gravel, cobble and boulder and little aquatic vegetation is present. Pools and riffles in the area provide a variety of fish habitat.

Fish captured during the recent fall survey show that the Dietrich River at crossing #2 provides good fall fish habitat and is a feeding and rearing area for Dolly Varden, grayling and slimy sculpin. Round whitefish and burbot are also reported to occur in the area (Refs. 11 and 30). Dolly Varden are known to spawn in tributary streams in this area (Ref. 11 and 30) and may spawn in the river itself. Mature Dolly Varden were captured during the present study but none were in spawning condition. This crossing should be considered important to fish during fall.

FISH

Date 10 September 1980

Fish Present Yes

Gear/Effort EF (17/726 sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Dolly Varden		7		109-189
Grayling		9		152-253
Slimy Sculpin		1		116

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	3.1-9.6
Depth (cm)	12-21
Discharge (m^3/s)	0.04
Dissolved Oxygen (mg/1)	11
Temperature (^oC)	3.5
Conductivity (umhos/cm)	350
pH (pH units)	7.8
Color (color units)	Dietrich River #3
Turbidity (NTU)	0.2
T. Hardness (mg $CaCO_3$/1)	342
Nitrate (mg/1 N)	See Dietrich River #3
Phosphate (mg/1 P)	See Dietrich River #3
Bottom Type (%)	50 gravel, 50 cobble/boulder
Bank Stability (%)	95
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 willow/alder
Cover (%)	5
Fish Block(s)	None observed

FALL SURVEY FORM

WATERBODY

Waterbody Dietrich River #1 Source Montane Drainage

Main Drainage Yukon River Tributary to Middle Fork Koyokuk River

Figure 76 Gradient 4.5% Elevation 789 m

NPAS 32 NPMP 181.8 NPRX 032-3 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 16S R 11E Sec. 20

Site Access Truck

Section Surveyed 100 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

The proposed pipeline route follows the Dietrich River valley for approximately 48 km and crosses or encroaches upon the river and flood plain a number of times. Three crossings occur within approximately 0.6 km at the base of the Chandalar Shelf, 6-7 km downstream of the Dietrich River headwaters in the Endicott Mountains. Dietrich River #1 is the most upstream of the three crossings. In this region the channel is defined and confined by steep but stable banks. Riparian vegetation (willow and alder) provide some cover for fish. Stream width at this crossing varied from 3.5 to 9.3 m and was 4-19 cm deep during the 1980 fall survey. Substrate is gravel, cobble and boulder with no aquatic vegetation. Alternating pool and riffle areas provide a good variety of fish habitat at and adjacent to the proposed gasline crossing.

Dietrich River #1 provides excellent fall habitat and is a feeding and rearing area for several fish species. Sampling efforts during the September 1980 investigation produced adult grayling, round whitefish and slimy sculpin. Burbot and Dolly Varden are also reported to occur in the region (Refs. 11, 30 and this report). The shallow nature of the Dietrich River at this crossing indicates lack of winter habitat, so Dietrich River #1 likely serves as a fall migration route for fish moving downstream to wintering area.

FISH

Date 09 September 1980

Fish Present Yes

Gear/Effort EF (15/868 Sec)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling		12		130-230
Round Whitefish		2		268-275
Slimy Sculpin		1		130

PHYSICAL CONDITIONS

Date	09 September 1980
Wetted Width (m)	3.5-9.3
Depth (cm)	4-19
Discharge (m^3/s)	0.17
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	4.0
Conductivity (umhos/cm)	345
pH (pH units)	7.7
Color (color units)	See Dietrich River #3
Turbidity (NTU)	0.2
T. Hardness (mg $CaCO_3$/1)	308
Nitrate (mg/1 N)	See Dietrich River #3
Phosphate (mg/1 P)	See Dietrich River #3
Bottom Type (%)	50 gravel, 50 cobble/boulder
Bank Stability (%)	90
Aquatic Vegetation (P/A)	A
Riparian Vegetation (%)	100 alder/willow
Cover (%)	30
Fish Block(s)	None observed

FALL SURVEY FORM

WATERBODY

Waterbody Jill Creek Source Tundra Drainage

Main Drainage Colville River Tributary to Itkillik River

Figure 77 Gradient 3.0% Elevation 905 m

NPAS 25 NPMP 141.6 NPRX 025-9 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 10S R 11E Sec. 26

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Jill Creek is a small, beaded tundra stream that drains a marshland area and flows northwesterly to the Itkillik River. The channel is poorly defined and riparian vegetation consists of sedge and willow. Stream substrate is mud and silt.

Previous investigations documented grayling in Jill Creek during the open water season (Ref. 30). Due to cold weather Jill Creek was frozen over at the time of the fall 1980 field investigation. Ice thickness of approximately 5 cm precluded sampling efforts, but it appeared that adequate water depth was available under the ice to support fish use during fall. Winter fish use is unlikely since streams of this size freeze solid during winter.

FISH

Date 10 September 1980

Fish Present

Gear/Effort None-stream frozen over*

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	Unable to determine - poorly defined channel
Depth (cm)	Unable to determine - ice thickness ~5 cm
Discharge (m^3/s)	Unable to determine
Dissolved Oxygen (mg/1)	13*
Temperature (^oC)	0.1
Conductivity (umhos/cm)	20
pH (pH units)	7.8
Color (color units)	65
Turbidity (NTU)	5.1
T. Hardness (mg $CaCO_3$/1)	129
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 mud/silt
Bank Stability (%)	Poorly defined bank; shallow depression
Aquatic Vegetation (P/A)	Unable to determine
Riparian Vegetation (%)	95% sedge, 5% willow
Cover (%)	Unable to determine
Fish Block(s)	None observed

* Water quality data obtained from small opening through ice.

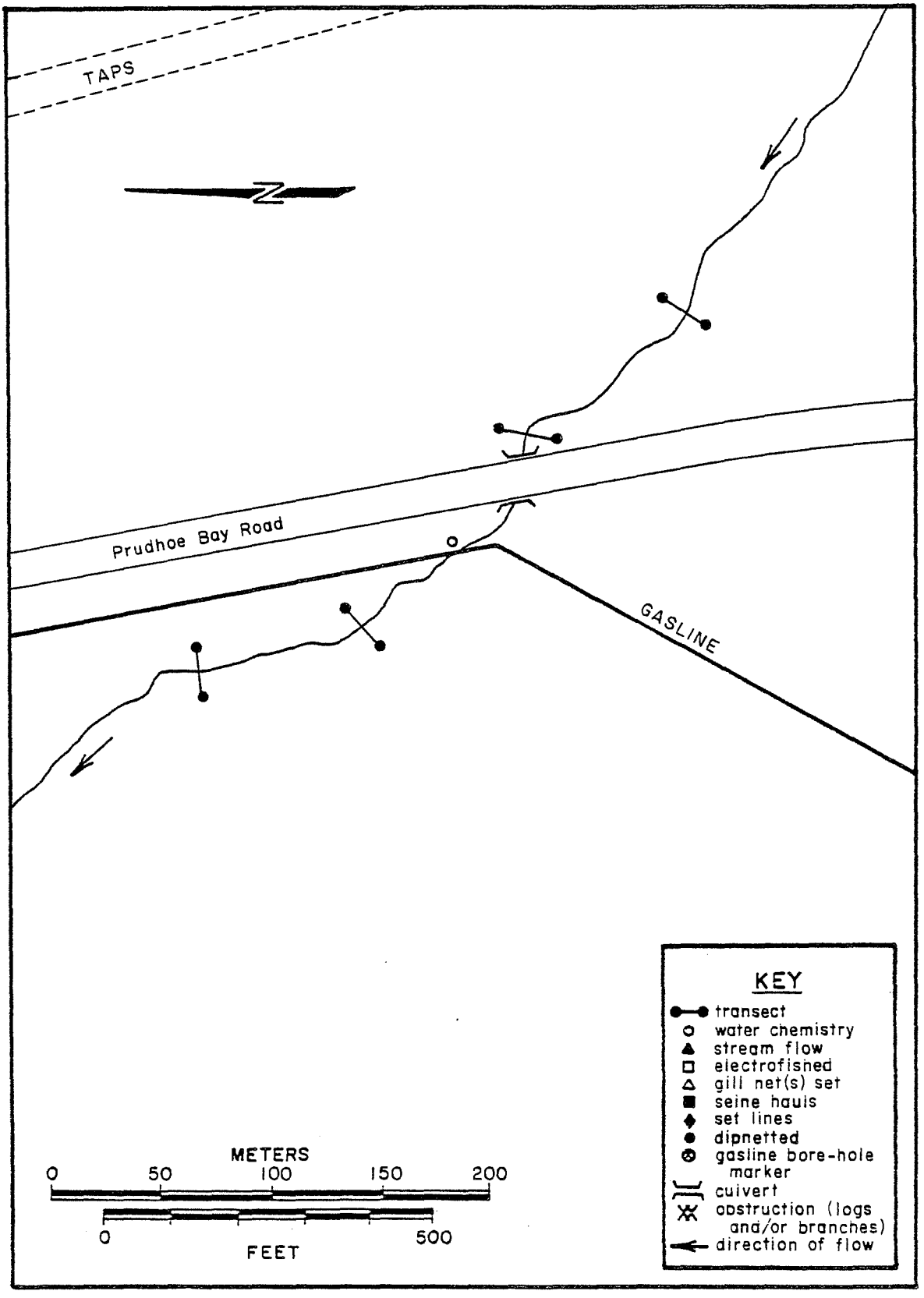

Fig. 77. Fall survey. Jill Creek, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Ed Creek Source Tundra Drainage

Main Drainage Kuparuk River Tributary to Toolik Lake

Figure 78 Gradient 3.6% Elevation 896 m

NPAS 25 NPMP 140.9 NPRX 025-7 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 10S R 11E Sec. 26

Site Access Truck

Section Surveyed 200 m upstream to 200 m dwonstream of proposed pipeline crossing

ASSESSMENT

Ed Creek is a small beaded tundra stream that drains a tundra marshland and flows northwesterly to Toolik Lake. The channel is poorly defined and streamside vegetation consists of sedges. Substrate in this area is generally mud and silt.

Ed Creek was frozen over at the time of the fall stream survey. Unseasonably cold weather caused formation of an ice layer approximately 5 cm thick which precluded fish sampling efforts at this time. Adequate water depth was available under the ice to provide fish habitat for some species but the extent of fall fish use is not known. During the summer 1980 investigations grayling were documented in Ed Creek (Ref. 123).

FISH

Date 10 September

Fish Present

Gear/Effort None-stream frozen*

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	Unable to determine
Depth (cm)	Unable to determine
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	13*
Temperature (^oC)	0.1
Conductivity (umhos/cm)	16
pH (pH units)	7.8
Color (color units)	65
Turbidity (NTU)	3.0
T. Hardness (mg $CaCO_3$/1)	154
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	Unable to determine
Bank Stability (%)	Banks undefined; shallow tundra depression
Aquatic Vegetation (P/A)	Unable to determine
Riparian Vegetation (%)	100 sedge
Cover (%)	Unable to determine
Fish Block(s)	None observed

* Water quality data obtained from small opening in ice at Haul Road culvert.

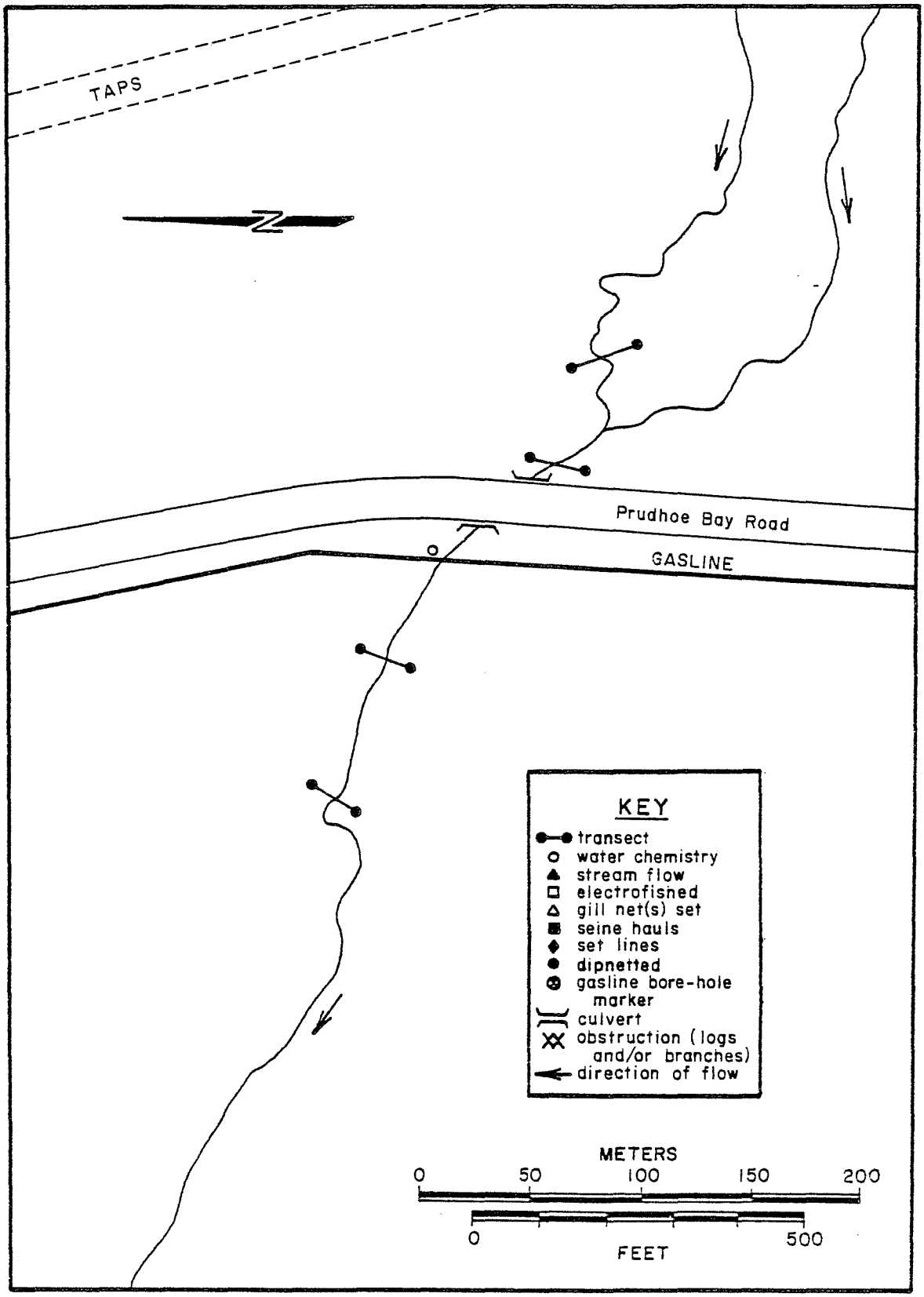

Fig. 78. Fall survey. Ed Creek, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Mack Creek Source Tundra Drainage

Main Drainage Toolik Lake Tributary to Ed Creek

Figure 79 Gradient 4.1% Elevation 896 m

NPAS 25 NPMP 140.6 NPRX 025-6 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 10S R 11E Sec. 26

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Mack Creek is a beaded, clear water stream that flows through tundra marshlands through an incised channel. This stream is one of several that feed into Toolik Lake. Stream banks are vegetated with sedge and willow.

Little is known about the use of Mack Creek by fish. During August 1980 many juvenile grayling were observed in several pools in the vicinity of MS 25-1 (Ref. 123).

Unlike other streams in this area Mack Creek was completely frozen over at the time of the fall stream survey, thus precluding a sampling effort. The extent of fish use during fall is unknown but winter useage can be excluded since streams of this size usually freeze solid.

FISH

Date 10 September 1980

Fish Present

Gear/Effort None-stream frozen over; >5.0 cm thick ice

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	Unable to determine
Depth (cm)	NA
Discharge (m^3/s)	NA
Dissolved Oxygen (mg/1)	NA
Temperature (^oC)	NA
Conductivity (umhos/cm)	NA
pH (pH units)	NA
Color (color units)	NA
Turbidity (NTU)	NA
T. Hardness (mg $CaCO_3$/1)	NA
Nitrate (mg/1 N)	NA
Phosphate (mg/1 P)	NA
Bottom Type (%)	NA
Bank Stability (%)	Banks undefined, drains bog area
Aquatic Vegetation (P/A)	Unable to determine
Riparian Vegetation (%)	95 sedge, 5 willow
Cover (%)	Unable to determine
Fish Block(s)	None observed

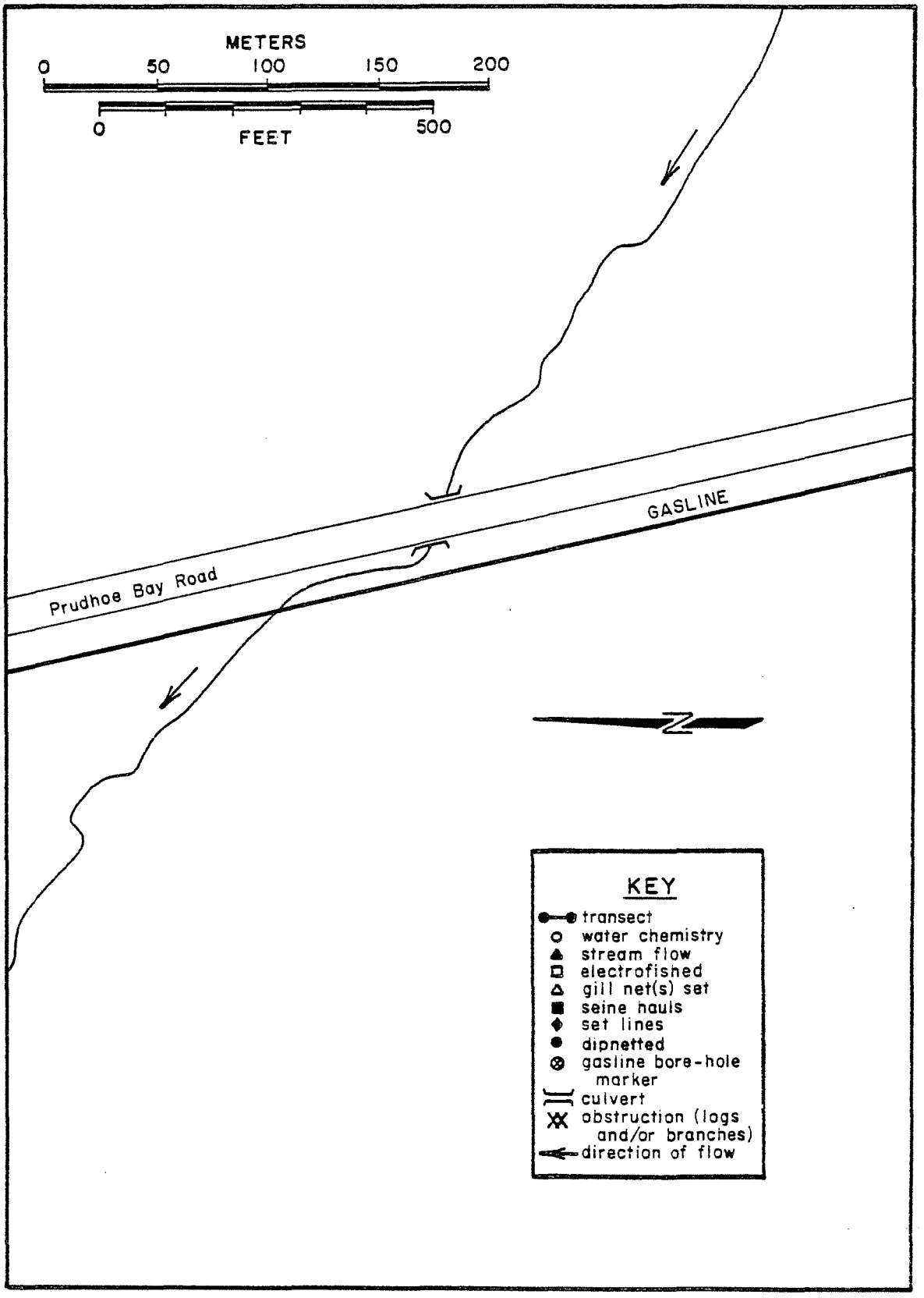

Fig. 79. Fall survey. Mack Creek, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Yan Creek Source Tundra Drainage

Main Drainage Kuparuk River Tributary to Toolik Lake

Figure 80 Gradient 4.3% Elevation 837 m

NPAS 25 NPMP 137.0 NPRX 025-1 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 10S R 11E Sec. 3

Site Access By truck from Haul Road

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Yan Creek is a small beaded tundra stream that drains a marshland area. During the recent fall survey the stream varied from 0.7 to 2.0 m in width and 17-19 cm in depth.

Ice cover precluded sampling efforts on 10 September 1980. Adequate water depth was available under the ice to provide fish habitat for some species such as sculpin which have been documented to use this stream during summer (Ref. 11). However, the extent of fall fish use is not known.

FISH

Date 10 September 1980

Fish Present

Gear/Effort None-stream frozen over*

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	0.7-2 m
Depth (cm)	17-19 (+ ~5 cm ice)
Discharge (m^3/s)	0.06
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	0.0
Conductivity (umhos/cm)	35
pH (pH units)	8.1
Color (color units)	70
Turbidity (NTU)	2.2
T. Hardness (mg $CaCO_3$/1)	171
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 gravel, 40 pebble, 40 cobble
Bank Stability (%)	Bank undefined; shallow tundra depression
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	100 sedge
Cover (%)	10
Fish Block(s)	None observed

* Water quality data obtained by breaking holes in the ice at the proposed gas lin crossing and at 4 other transects. This technique precluded effective fishing technique.

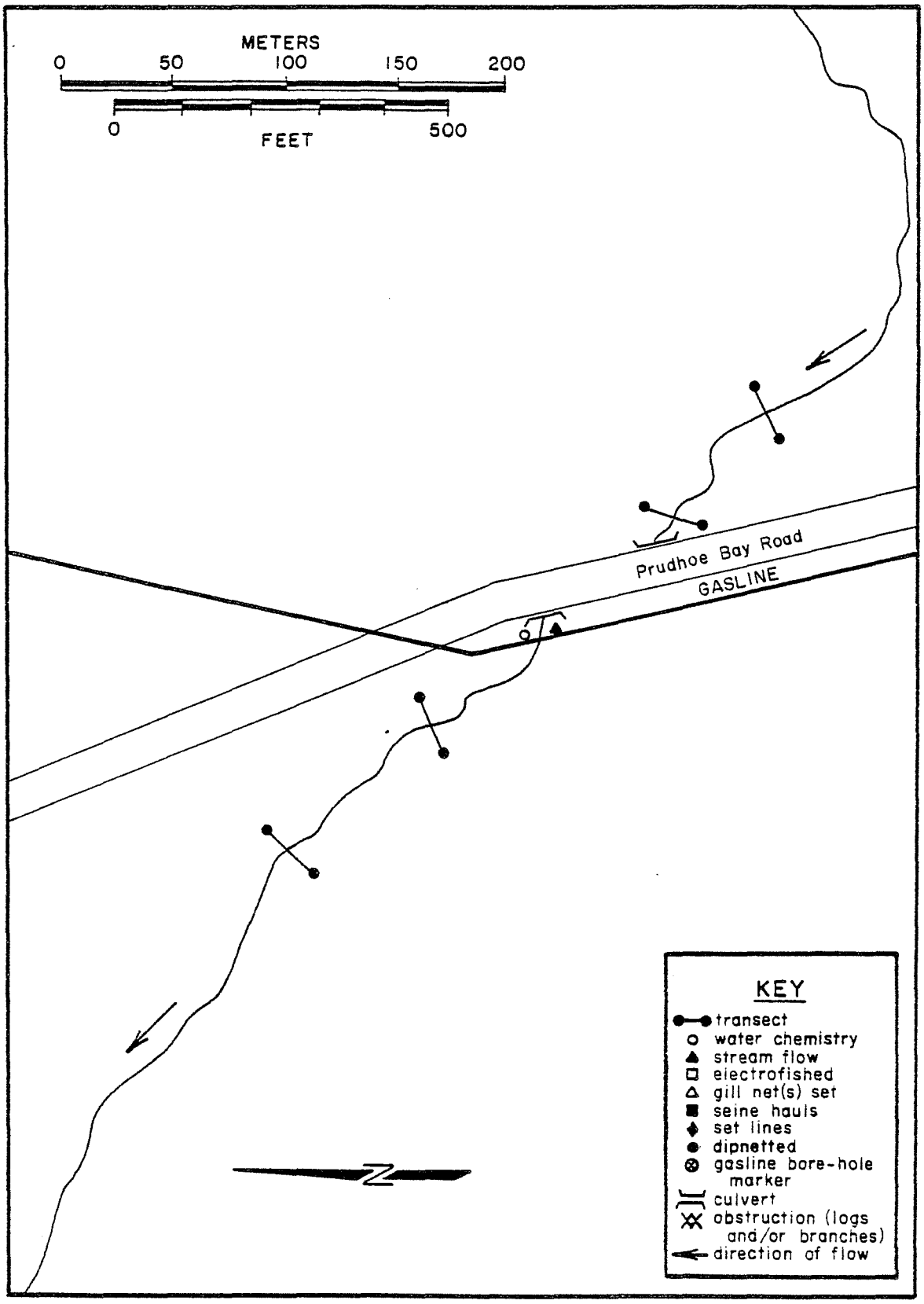

Fig. 80. Fall survey. Yan Creek, 10 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Toolik River Source Tundra Drainage

Main Drainage Kuparuk River Tributary to Kuparuk River

Figure 81 Gradient 1.9% Elevation 844 m

NPAS 23 NPMP 130.1 NPRX 023-2 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 9S R 12E Sec. 21

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Toolik River is a lightly stained, beaded tundra stream 2-8.3 m wide which flows north to the Kuparuk River. Substrate is composed primarily of fines. Banks are less than 0.5 m high and vegetated with sedge, willow and dwarf birch. Maximum pool depths are about 1.8 m (Ref. 11).

During the 1980 fall survey this stream was partially frozen thereby precluding effective sampling efforts with an electrofisher. No fish were captured by dipnetting open pools; however, grayling and Arctic char have been recorded during the summer (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 does not appear to provide suitable overwintering habitat.

FISH

Date 06 September 1980

Fish Present

Gear/Effort DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	06 September 1980
Wetted Width (m)	2-8.3
Depth (cm)	20-33 pools to 1.8 m (Ref. 11)
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	13
Temperature (^0C)	0.0
Conductivity (umhos/cm)	38
pH (pH units)	6.8
Color (color units)	45
Turbidity (NTU)	2.7
T. Hardness (mg $CaCO_3$/1)	154
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	95 fines, 5 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	90 sedge, 9 willow, 1 dwarf birch
Cover (%)	40
Fish Block(s)	None observed

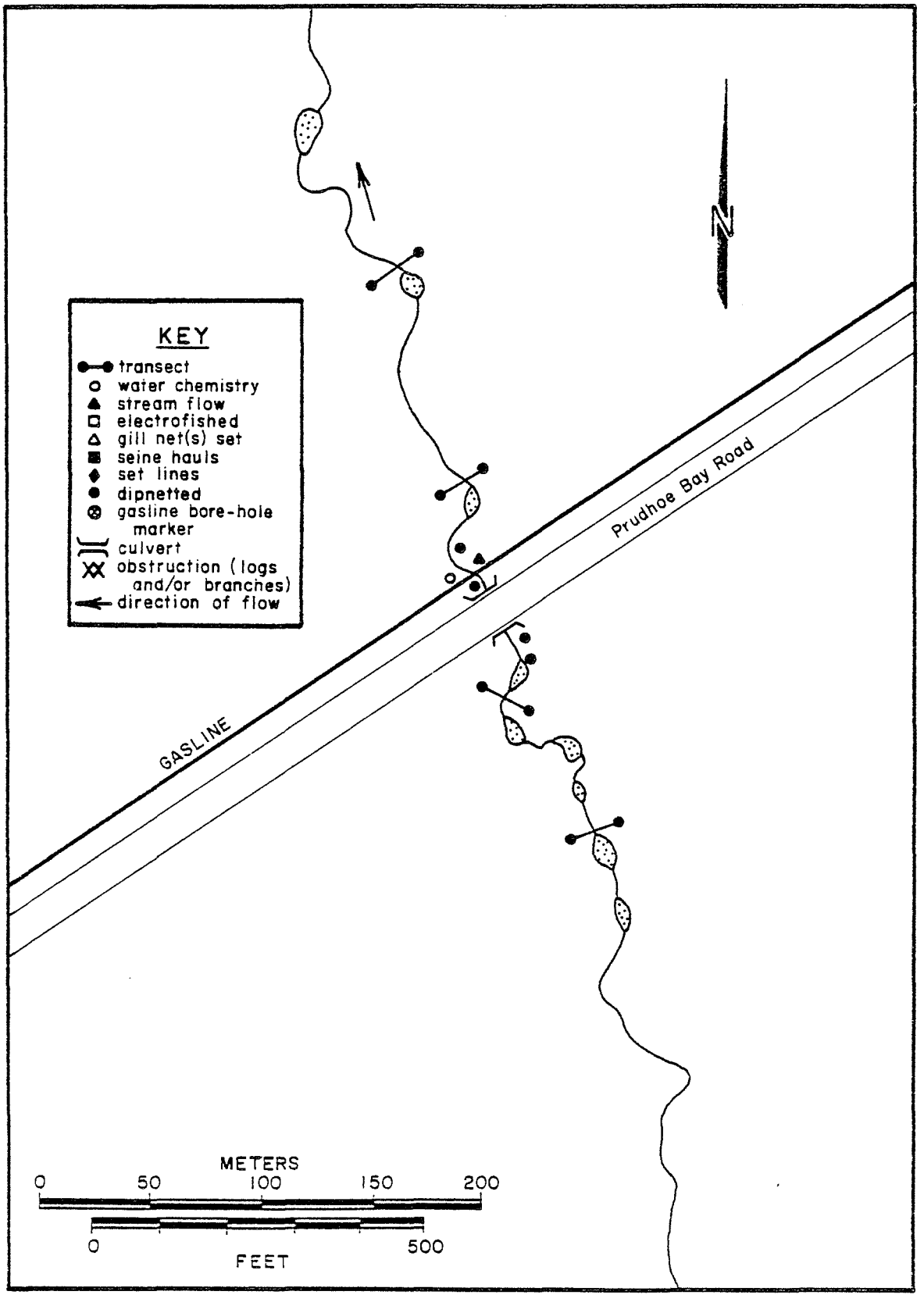

Fig. 81. Fall survey. Toolik River, 06 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody East Fork Toolik River Source Tundra Drainage

Main Drainage Kuparuk River Tributary to Toolik River

Figure 82 Gradient 2.4% Elevation 852 m

NPAS 23 NPMP 129.6 NPRX 023-1 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 9S R 12E Sec. 22

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

East Fork Toolik River is a small, beaded tundra stream with banks less than 0.5 m high vegetated with sedge, willow and dwarf birch. Streambed is approximately 0.6-2.0 m wide with a substrate of fines.

During the 1980 fall survey the majority of East Fork Toolik River in the vicinity of the proposed crossing was covered with surface ice approximately 5 cm thick, thus limiting sampling efforts to dipnetting in open areas. No fish were captured or observed although habitat appeared favorable for fall use especially in pool areas where sufficient water depth (22-29 cm) was available and aquatic vegetation provided some cover. Winter fish use is unlikely as streams of this size tend to freeze solid.

FISH

Date 06 September 1980

Fish Present No

Gear/Effort DN (0/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	06 September 1980
Wetted Width (m)	0.6-2.0
Depth (cm)	22-29 (+ ice ~5 cm)
Discharge (m^3/s)	Unable to detect
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	0.3
Conductivity (umhos/cm)	13
pH (pH units)	7.2
Color (color units)	15
Turbidity (NTU)	1.5
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	95 sedge, 4 willow, 1 dwarf birch
Cover (%)	15
Fish Block(s)	None observed

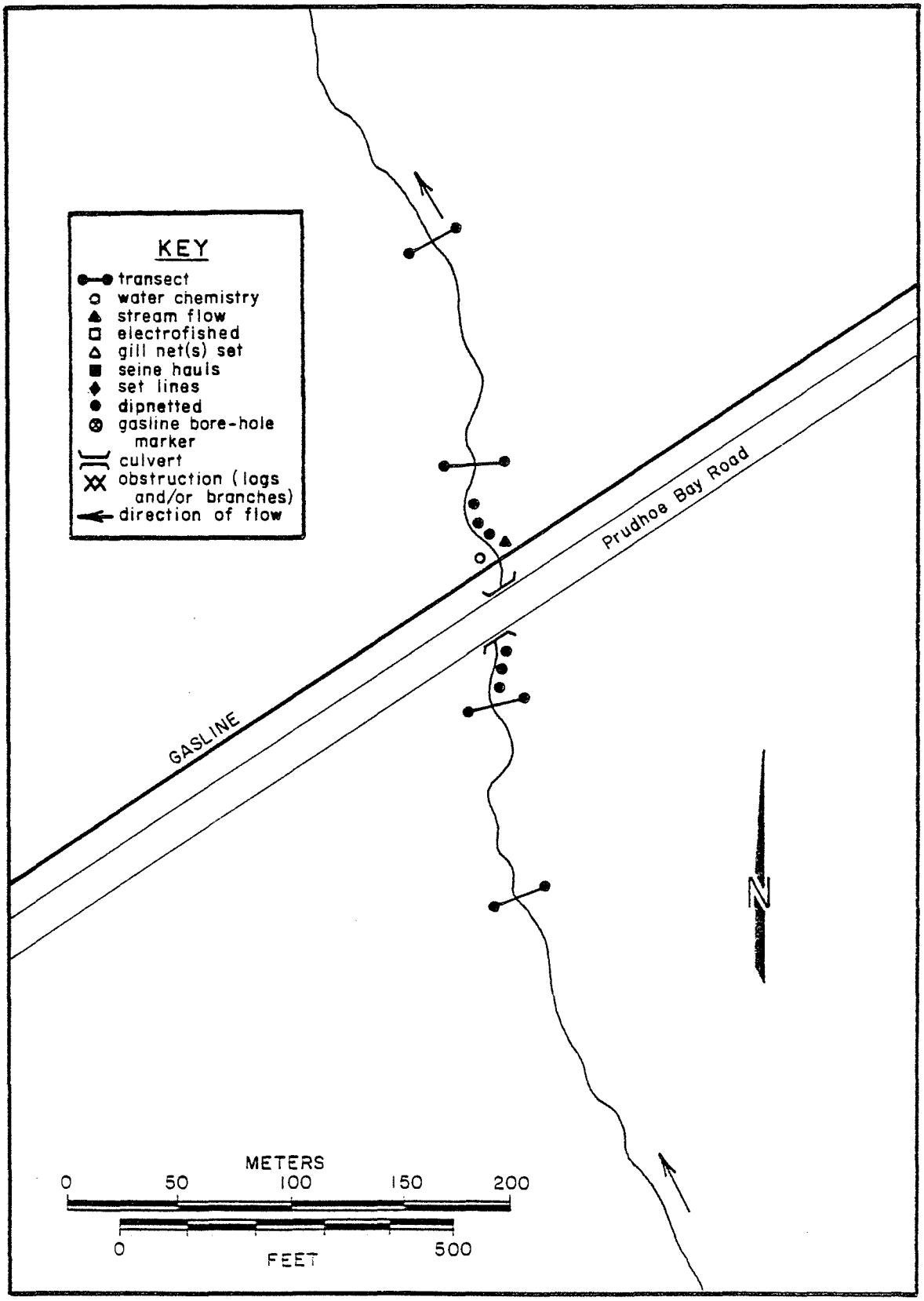

Fig. 82. Fall survey. East Fork Toolik River, 06 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Rudy Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Oksrukuyik Creek

Figure 83 Gradient 1.14% Elevation 418 m

NPAS 19 NPMP 108.6 NPRX 019-6 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 7S R 14E Sec. 5

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

Rudy Creek is a moderate sized, humic-stained stream which meanders easterly through tundra to its confluence with Oksrukuyik Creek. Banks are stable, up to 1 m high, and vegetated with sedge, willow, dwarf birch and herbaceous plants. The stream flows over a sand to cobble substrate and through small pools and riffle areas which provide excellent fish habitat.

In spring and summer, Rudy Creek provides rearing habitat for grayling and Arctic char (Refs. 11, 30 and 121). In the area of the proposed crossing, Rudy Creek provides good fall rearing habitat for grayling, and the stream is a fall migration route for fish moving downstream to Oksrukuyik Creek and the Sagavanirktok River. Winter fish use is unlikely since streams of this size freeze solid.

FISH

Date 09 September 1980

Fish Present Yes

Gear/Effort 5 m seine (1/300 m^2), GN (2/6h)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling		3		114-125

PHYSICAL CONDITIONS

Date	09 September 1980
Wetted Width (m)	2.4-17
Depth (cm)	27-46
Discharge (m^3/s)	0.27
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	2.0
Conductivity (umhos/cm)	20
pH (pH units)	8.0
Color (color units)	75
Turbidity (NTU)	2.4
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 sand, 15 gravel, 30 pebble, 35 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 sedge, 10 willow, 5 dwarf birch, 5 herbaceous plants
Cover (%)	5
Fish Block(s)	None observed

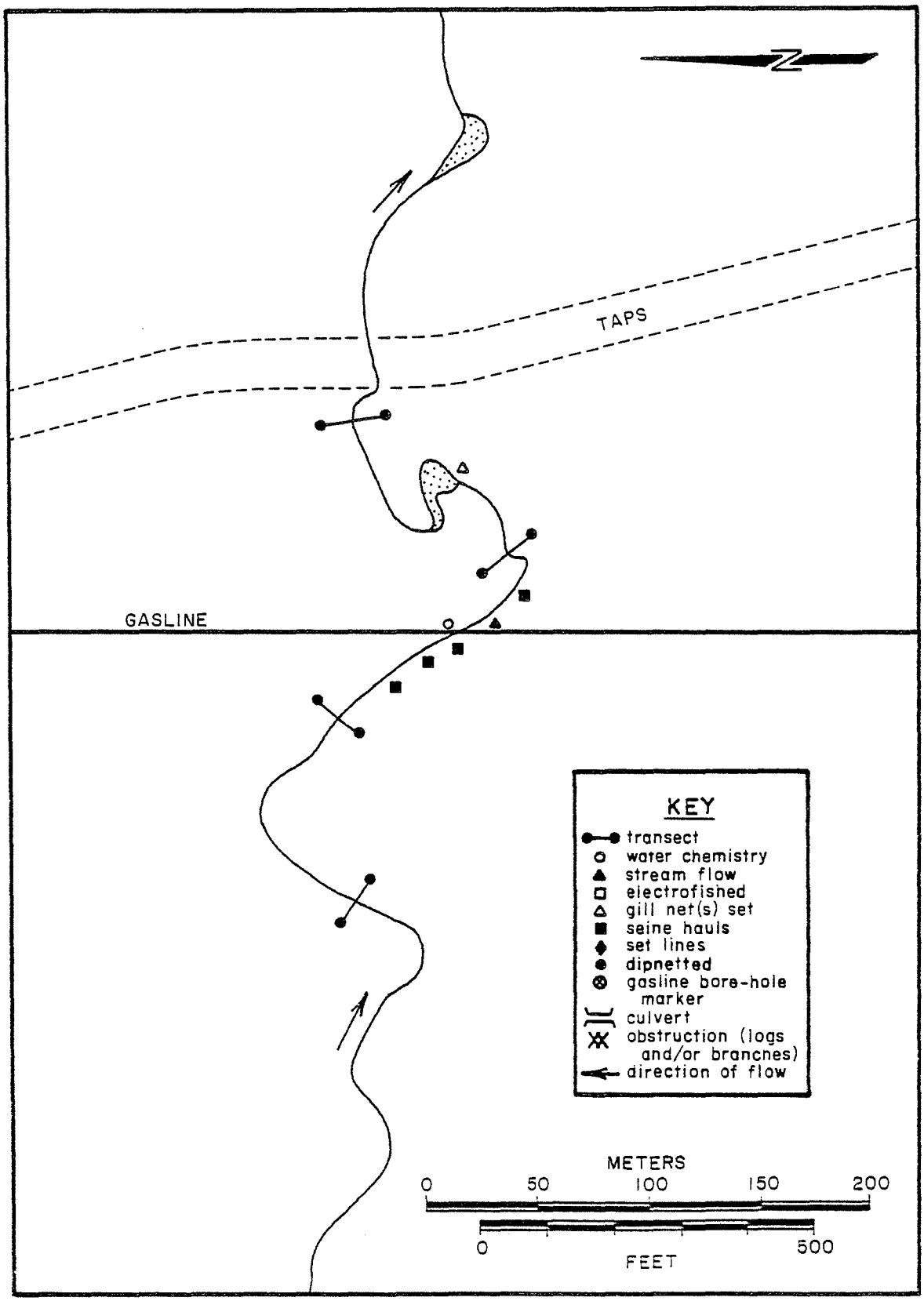

Fig. 83. Fall survey. Rudy Creek, 09 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Dennis Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 84 Gradient 3.0% Elevation 424 m

NPAS 19 NPMP 106.9 NPRX 019-4 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 6S R 14E Sec. 29

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed crossing

ASSESSMENT

Dennis Creek is a small beaded tundra stream that drains an area of approximately 1.9 km^2 upstream of the proposed pipeline crossing (Ref. 11). The poorly defined channel is a braided series of small pools choked with aquatic vegetation. Banks are non-existent and streamside vegetation consists primarily of sedge with some willow. Stream substrate consists of fines and detritus.

In the area of the proposed crossing, Dennis Creek is a fall migration route and rearing area for grayling. During the present survey two adult grayling were captured by dipnetting small pools in the vicinity of the proposed crossing. Previous reports have documented grayling and Arctic char use Dennis Creek in spring and summer (Refs. 11, 30 and 121). Winter fish use is unlikely as streams of this size tend to freeze solid.

FISH

Date 10 September 1980

Fish Present Yes

Gear/Effort EF (0/355 sec); DN (2/10 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling		2		132-192

PHYSICAL CONDITIONS

Date	10 September 1980
Wetted Width (m)	1-2 m
Depth (cm)	20-40
Discharge (m^3/s)	0.08
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	2.9
Conductivity (umhos/cm)	19
pH (pH units)	7.4
Color (color units)	60
Turbidity (NTU)	3.7
T. Hardness (mg $CaCO_3$/1)	120
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	No bank,beaded tundra stream
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	90 sedge, 10 willow
Cover (%)	40
Fish Block(s)	None observed

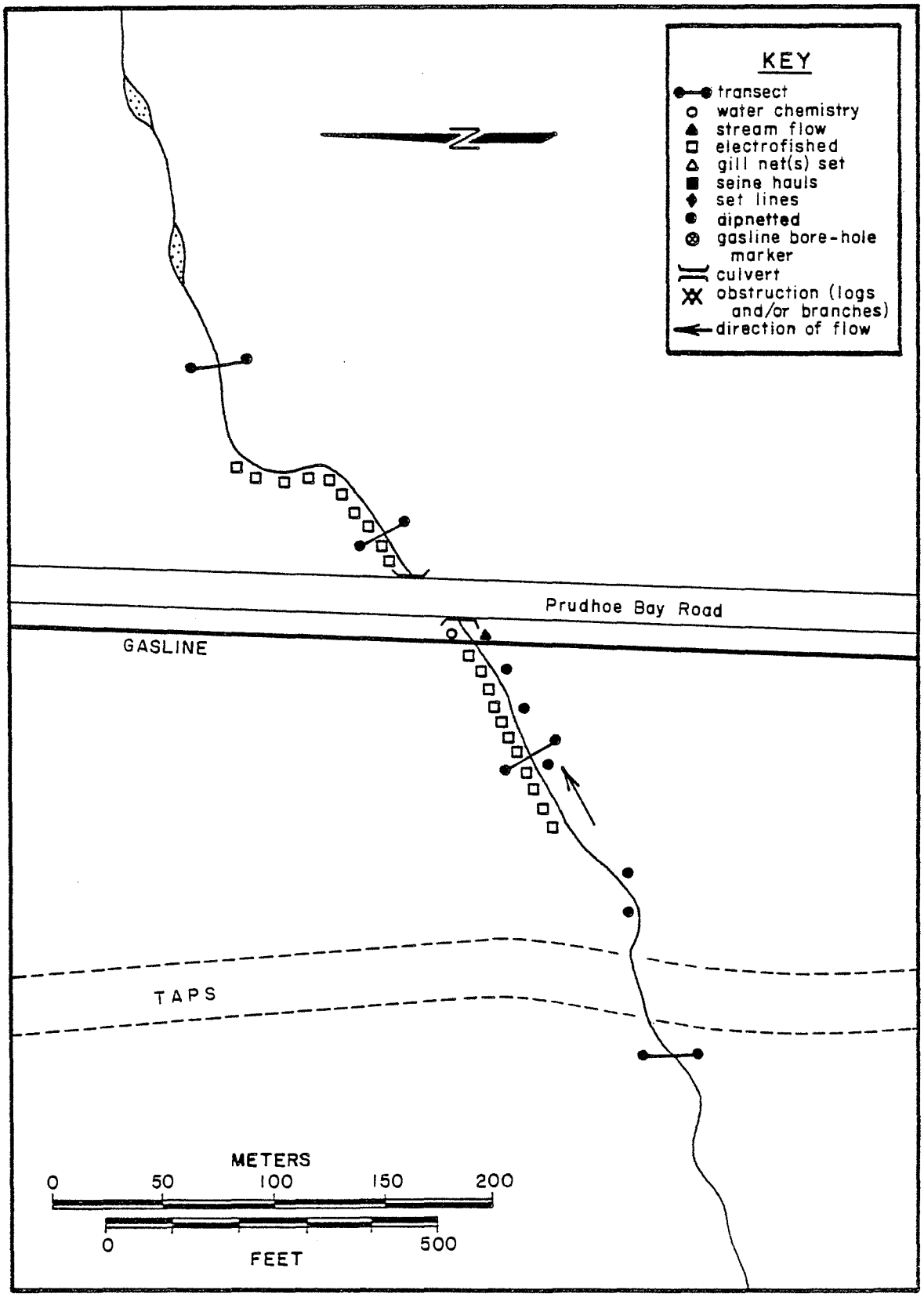

Fig. 84. Fall survey. Dennis Creek, 09 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Polygon Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 85 Gradient 1.1% Elevation 405 m

NPAS 19 NPMP 105.1 NPRX 019-1 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 6S R 14E Sec. 17

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Polygon Creek is a small tundra stream with a narrow, winding channel of gravel and cobble. Its banks are vegetated with sedges, willow and herbaceous plants.

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 were documented in the spring of 1977 and/or the summer of 1977 and 1979 (Refs. 11, 30 and 64).

During the fall 1980 sampling effort, juvenile grayling were captured. Aside from two 10 cm high falls, habitat appeared favorable, with many small pools and riffles. During fall, Polygon Creek is considered an important rearing area and migration route for grayling, but winter use is excluded since streams of this size usually freeze solid.

FISH

Date 09 September 1980

Fish Present Yes

Gear/Effort EF (1/883 sec); visual observation (4/400 m)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling	4	1	~40	114

PHYSICAL CONDITIONS

Date	09 September 1980
Wetted Width (m)	0.6-4.0
Depth (cm)	9-26
Discharge (m^3/s)	0.18
Dissolved Oxygen (mg/1)	13
Temperature (^oC)	2.8
Conductivity (umhos/cm)	20
pH (pH units)	8.0
Color (color units)	90
Turbidity (NTU)	2.4
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 sand, 20 gravel, 20 pebble, 40 cobble
Bank Stability (%)	95
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	85 sedge, 10 willow, 5 herbaceous plants
Cover (%)	7
Fish Block(s)	Falls 10 cm high located 40 m downstream of crossing and 50 m upstream of the proposed crossing.

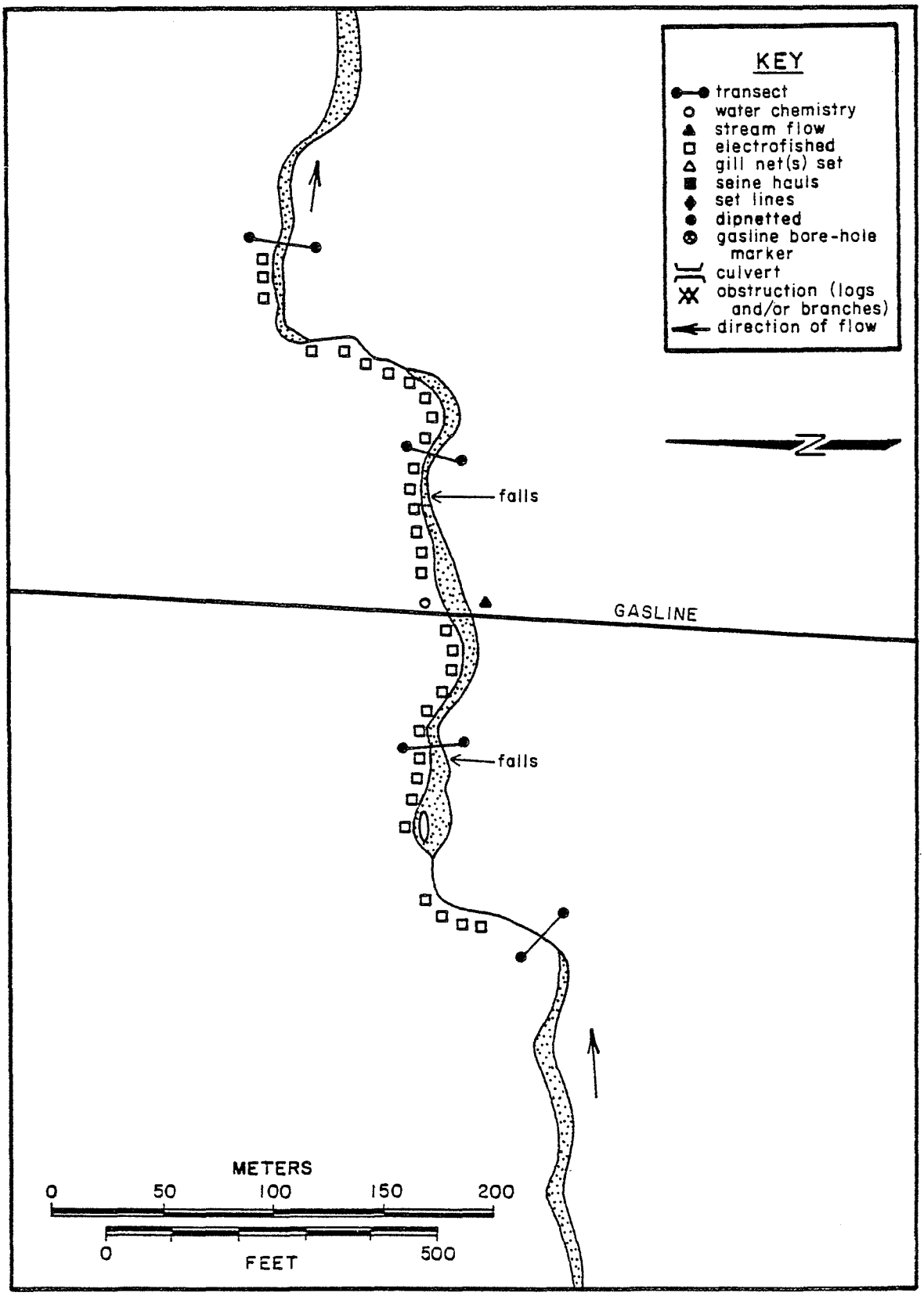

Fig. 85. Fall survey. Polygon Creek, 09 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Gustafson Gulch Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 86 Gradient 4.0% Elevation 375 m

NPAS 18 NPMP 102.3 NPRX 018-4 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 6S R 14E Sec. 5

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Gustafson Gulch is a small, beaded tundra stream with 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. Pools (to 2 m deep) are present with alternating stretches of shallow riffles.

In the vicinity of the proposed crossing, Gustafson Gulch is a summer rearing area for Arctic char and grayling (Refs. 11 and 30) and provides good spawning habitat for grayling during spring (Ref. 121).

No fish were observed in the creek during a September 1979 survey, although fish habitat appeared to be good (Ref. 63). During the present survey several grayling were caught. Gustafson Gulch may provide a fall migration route and rearing area for grayling and possibly Arctic char but a 1.5 m terraced falls located 100 m upstream of the gas pipeline crossing may inhibit upstream migration by some species. A deep pool (~ 2.0 m) located 30 m downstream of the proposed crossing was marked as a potential overwintering area.

FISH

Date 07 September 1980

Fish Present Yes

Gear/Effort EF (5/155 sec); visual observation (15/400 m)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling		20		50-150

PHYSICAL CONDITIONS

Date	07 September 1980
Wetted Width (m)	1.6-16
Depth (cm)	50-200
Discharge (m^3/s)	0.24
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	3.5
Conductivity (umhos/cm)	35
pH (pH units)	6.2
Color (color units)	20
Turbidity (NTU)	2.8
T. Hardness (mg $CaCO_3$/1)	137
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	50 fines/mud, 20 sand, 10 gravel, 10 pebbles, 5 cobble, 5 boulder
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	90 sedge, 9 willow, 1 herbaceous plants
Cover (%)	20
Fish Block(s)	A terraced falls dropping 1.5 m in a 9 m run. Located about 100 m upstream of crossing.

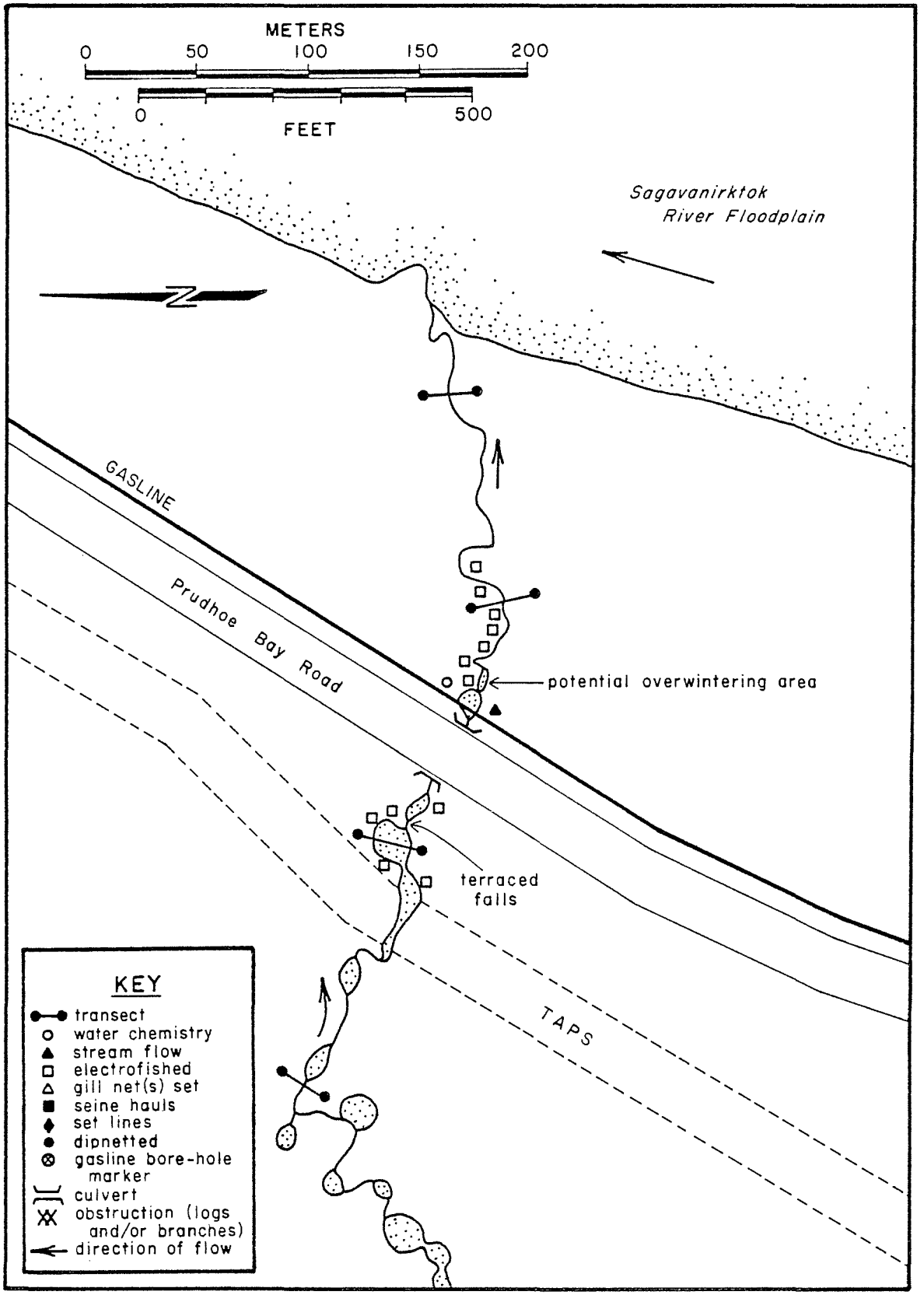

Fig. 86. Fall survey. Gustafson Gulch, 07 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Arthur Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 87 Gradient 0.87% Elevation 362 m

NPAS 18 NPMP 101.9 NPRX 018-3 AHMP NA

USGS Map Reference Philip Smith Mountains, AK T 5S R 14E Sec. 32

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Arthur Creek is a small, clear stream that flows over gravel, cobble and boulders to the Sagavanirktok River. Pools providing good fish habitat, are found scattered along this 7.5 km long stream. Stream banks are vegetated with sedge, willow, dwarf birch and herbaceous plants.

In the vicinity of the proposed pipeline crossing, Arthur Creek is a rearing area and migration route for Arctic char, burbot, slimy sculpin and grayling during spring and summer (Refs. 11 and 30). The presence of grayling fry and adults during July 1977 and 1979 surveys (Refs. 30 and 64) suggest that spring spawning occurs in this stream. No fish were observed in this stream during September 1979 when water levels were low (2-5 cm deep) (Ref. 63). However, grayling were observed and captured during the fall 1980 survey. Arthur Creek serves as a fall migration route and rearing area for grayling and possibly Arctic char, burbot and slimy sculpin, but winter use is excluded since streams of this size tend to freeze solid.

FISH

Date 07 September 1980

Fish Present Yes

Gear/Effort EF (2/111 sec); visual observation (8/400 m)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Grayling		10		125-166

PHYSICAL CONDITIONS

Date	07 September 1980
Wetted Width (m)	2.1-5.5
Depth (cm)	5-40
Discharge (m^3/s)	0.15
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	3
Conductivity (umhos/cm)	41
pH (pH units)	7.6
Color (color units)	70
Turbidity (NTU)	3.0
T. Hardness (mg $CaCO_3$/1)	120
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	20 sand, 50 gravel, 20 pebble, 10 boulder
Bank Stability (%)	95
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	85 sedge, 10 willow, 4 dwarf birch, 1 herbaceous plants
Cover (%)	10
Fish Block(s)	None observed

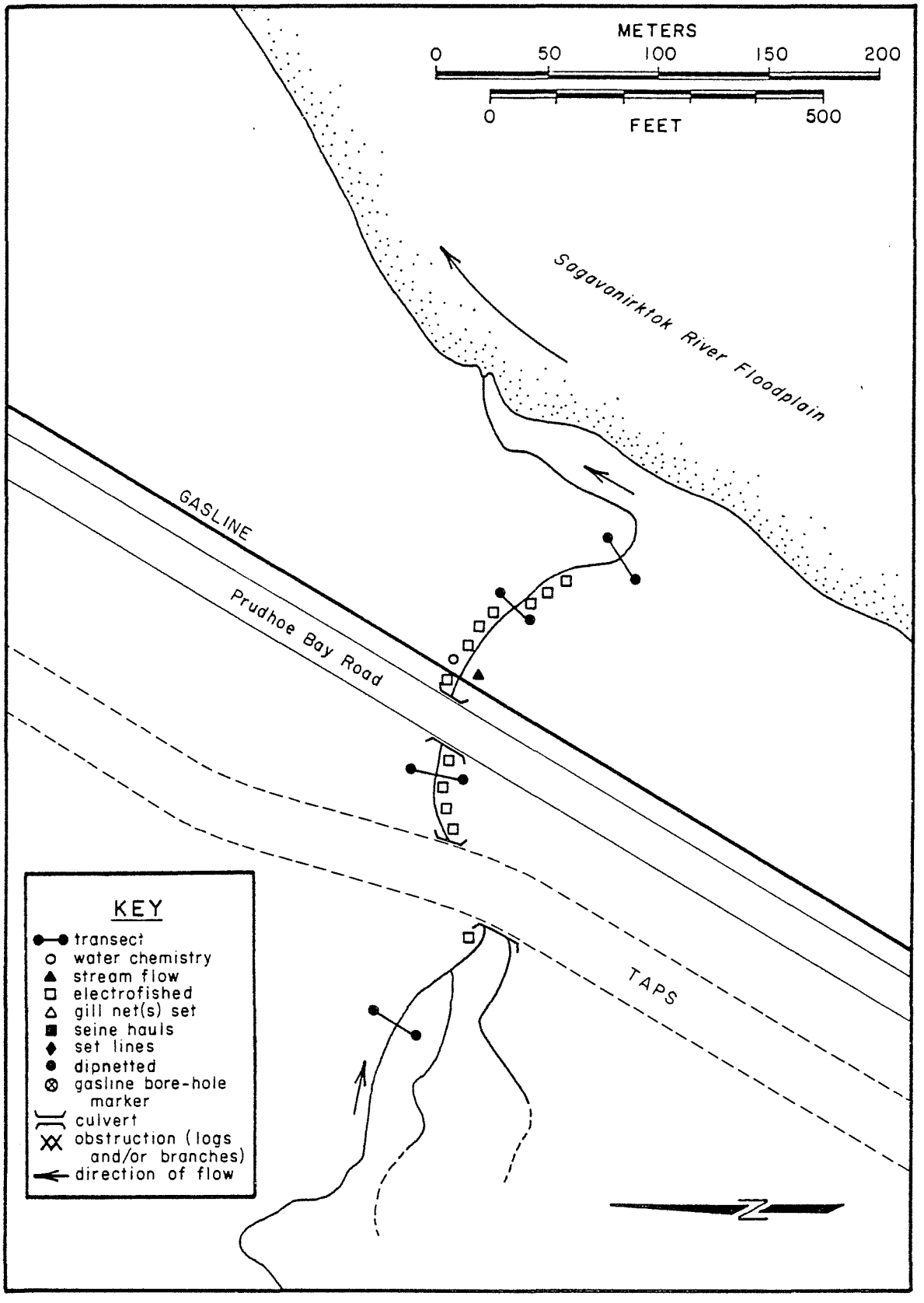

Fig. 87. Fall survey. Arthur Creek, 07 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Charlotte Creek Source Tundra Lake

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 88 Gradient 1.9% Elevation 305 m

NPAS 16 NPMP 91.5 NPRX 016-3 AHMP NA

USGS Map Reference Sagavanirktok, AK T 4S R 14E Sec. 18

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

Charlotte Creek is a stable stream with humic-stained waters that drains a headwater lake. Its low banks are heavily vegetated with grass, sedge and willow. This stream is characterized by short pools and long riffles, and flows swiftly over sand, gravel and large cobbles.

Charlotte Creek provides several kilometers of good fish habitat and is considered to be one of the most productive fish streams crossed by the Haul Road on the North Slope (Ref. 64). Arctic char, slimy sculpin, ninespine stickleback and grayling use this stream during the open water season (Refs. 11, 30 and 64).

Documentation of fall fish use in Charlotte Creek was previously not available; however, sampling efforts during the recent survey indicate that it provides good fall rearing habitat and serves as a migration route for grayling and round whitefish, however a 25 cm falls located 50 m downstream of the proposed crossing may inhibit upstream migration during periods of low water. Arctic char, slimy sculpin and ninespine stickleback may also use this stream during fall but winter use may be restricted as streams of this size tend to freeze solid.

FISH

Date 07 September 1980

Fish Present Yes

Gear/Effort EF (0/264 sec), 15 m GN (7/24 h)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling		3		170-294
Round whitefish		4		215-265

PHYSICAL CONDITIONS

Date	07 September 1980
Wetted Width (m)	3.6-14
Depth (cm)	15-42
Discharge (m^3/s)	0.96
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	1.5
Conductivity (umhos/cm)	31
pH (pH units)	7.5
Color (color units)	55
Turbidity (NTU)	5.0
T. Hardness (mg $CaCO_3$/1)	120
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	60 sand, 20 gravel, 10 pebble, 10 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	90 sedge, 8 willow, 2 herbaceous plants
Cover (%)	5
Fish Block(s)	Falls, ~25 cm drop, located 50 m downstream of crossing may be a barrier to fish movement.

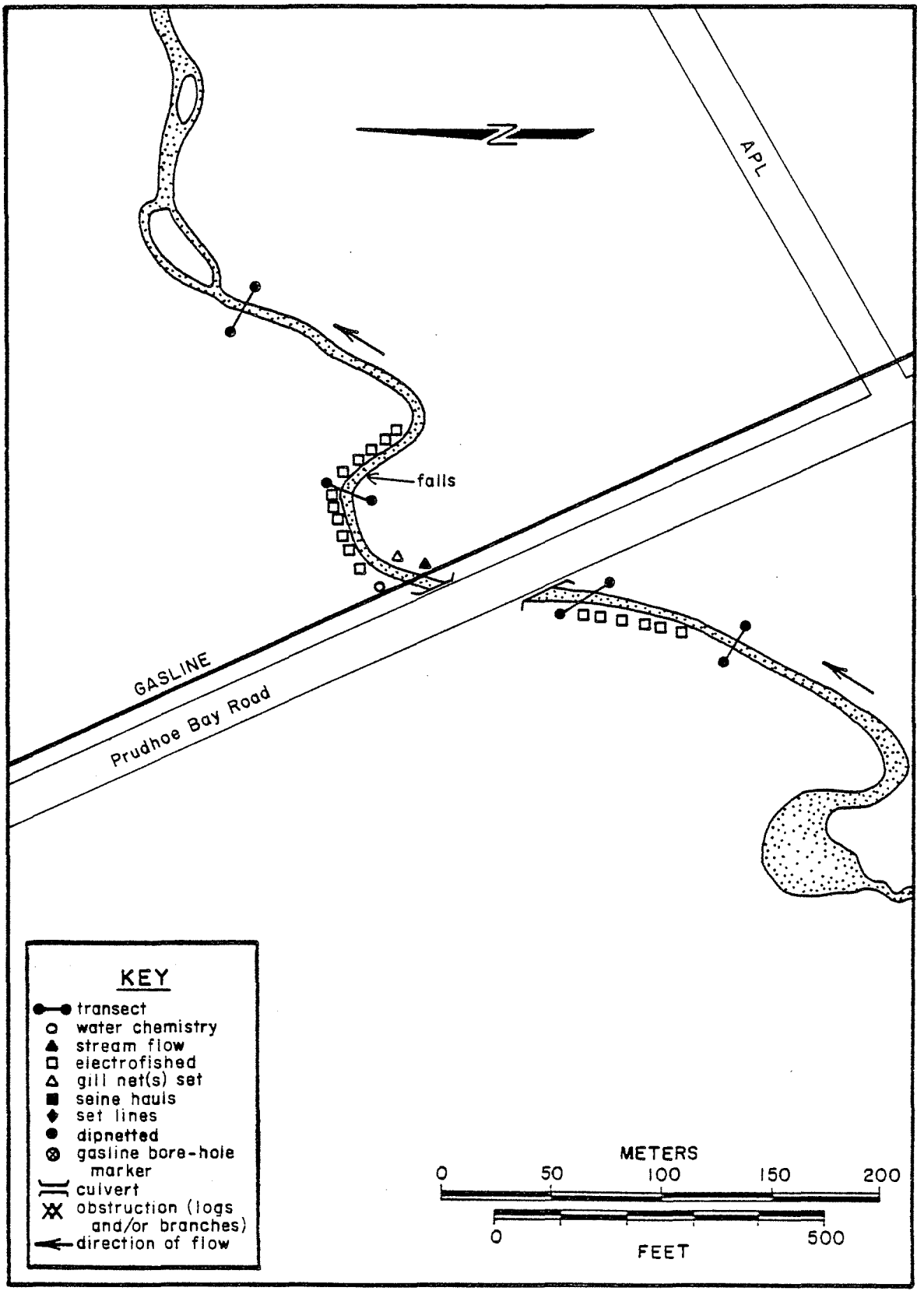

Fig. 88. Fall survey. Charlotte Creek, 07 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Happy Valley Camp Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 89 Gradient 0.78% Elevation 290 m

NPAS 16 NPMP 87.6 NPRX 016-2 AHMP NA

USGS Map Reference Sagavanirktok, AK T 3S R 14E Sec. 30

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

In the area of the proposed crossing Happy Valley Camp Creek is a moderate sized foothill stream confined by low banks vegetated with sedge, willow, alder and a few herbaceous plants. The humic-stained waters flow over a stable substrate of gravel, pebble and cobble. The straight channel is characterized by shallow riffles and a few pools.

Happy Valley Camp Creek is a rearing and spawning area for grayling during spring and summer (Refs. 11 and 64). Spawning gravels are distributed throughout the entire survey area. During the 1980 fall survey grayling, round whitefish, Arctic char and slimy sculpin were recorded. During fall, this stream is a migration route downstream to winter habitat and provides good rearing habitat for the species mentioned above. Although Happy Valley Camp Creek is one of the larger streams in this area, no potential overwintering sites were located and winter fish use is doubtful.

FISH

Date 08 September 1980

Fish Present Yes

Gear/Effort EF (0/13 sec), 5 m seine (1/320 m^2), 15 m GN (12/6 h), Visual (1/50m

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling	1	7	60	168-187
Round whitefish		4		195-215
Arctic char		1		131
Slimy sculpin		1		~100

PHYSICAL CONDITIONS

Date	08 September 1980
Wetted Width (m)	2.5-18
Depth (cm)	22-33
Discharge (m^3/s)	0.51
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	2.3
Conductivity (umhos/cm)	15
pH (pH units)	6.9
Color (color units)	95
Turbidity (NTU)	Not available
T. Hardness (mg $CaCO_3$/1)	120
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	40 gravel, 30 pebble, 30 cobble
Bank Stability (%)	100 stable
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	85 sedge, 10 willow, 3 alder, 2 herbaceous plants
Cover (%)	5
Fish Block(s)	None observed

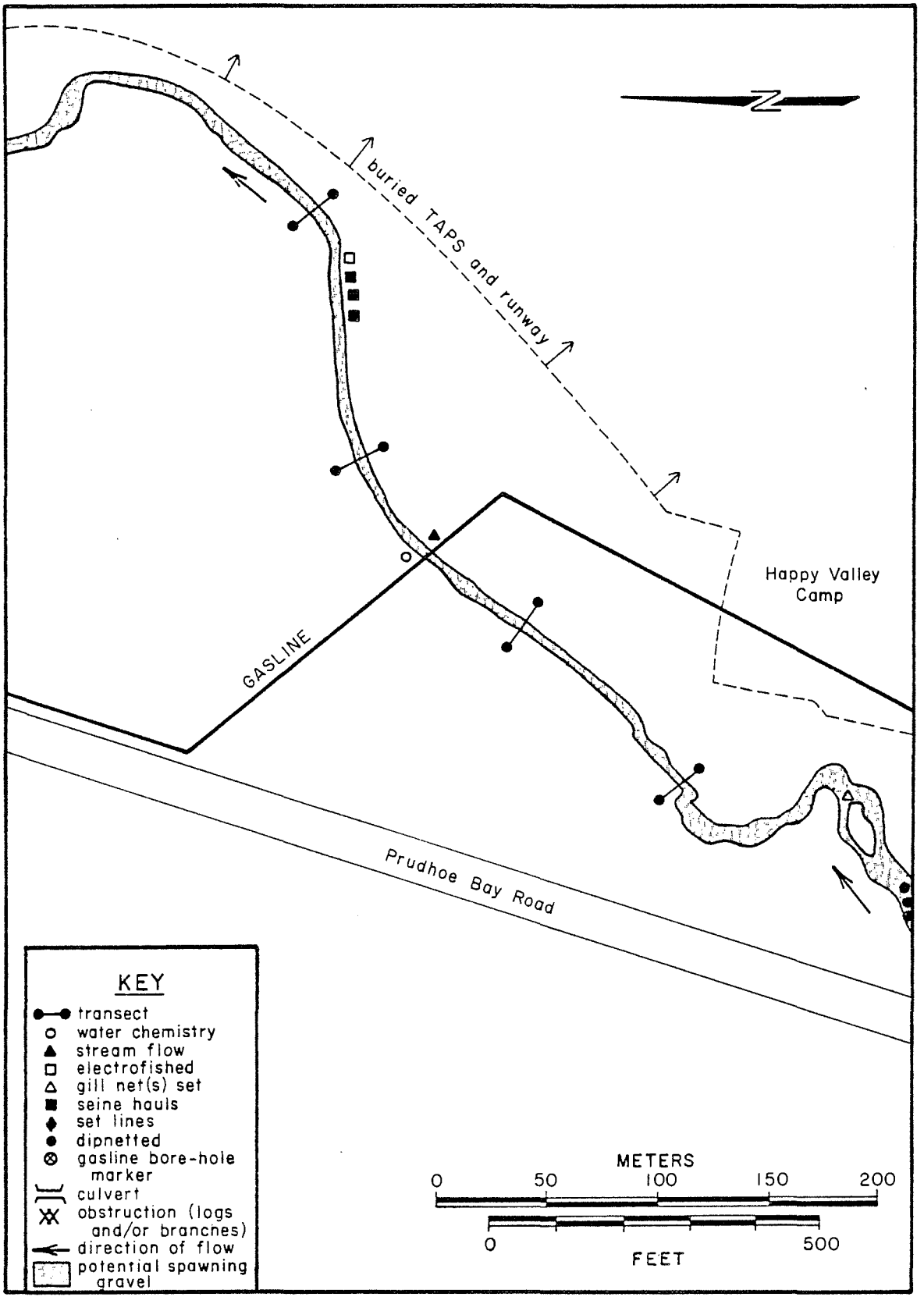

Fig. 89. Fall survey. Happy Valley Camp Creek, 08 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Stout Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 90 Gradient 2.28 Elevation 270 m

NPAS 15 NPMP 83.6 NPRX 015-2 AHMP NA

USGS Map Reference Sagavanirktok, AK T 3S R 14E Sec. 5

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

Stout Creek is a moderate sized stream that drains several small lakes and flows over sand, gravel and cobble substrate to the Sagavanirktok River. Numerous small pools and riffle areas provide excellent fish habitat. Debris in areas upstream of the proposed crossing may create barriers to fish movement during periods of low flow; however, during the fall 1980 survey this appeared to be no problem.

The presence of Arctic char, burbot, slimy sculpin and grayling has been documented in spring and/or summer (Ref. 11, 30, 64 and 70). During the present survey many juvenile and adult grayling were captured or observed. Stout Creek is an important migration corridor to and from overwintering areas and provides excellent rearing habitat for fish throughout the open water period.

FISH

Date 08 September 1980

Fish Present Yes

Gear/Effort EF (1/61 sec), Visual (29/200 m)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Grayling	6	24	~50	~98-200

PHYSICAL CONDITIONS

Date	08 September 1980
Wetted Width (m)	1.2-7.0
Depth (cm)	14-24
Discharge (m^3/s)	0.18
Dissolved Oxygen (mg/1)	12
Temperature (^oC)	5.0
Conductivity (umhos/cm)	58
pH (pH units)	7.8
Color (color units)	85
Turbidity (NTU)	6.8
T. Hardness (mg $CaCO_3$/1)	103
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	30 fines, 20 sand, 20 gravel, 20 pebble, 10 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	1 moss, 90 sedge, 9 willow
Cover (%)	10
Fish Block(s)	60 m downstream of gasline -- numerous willow branches in stream may form a potential fish block for some species.

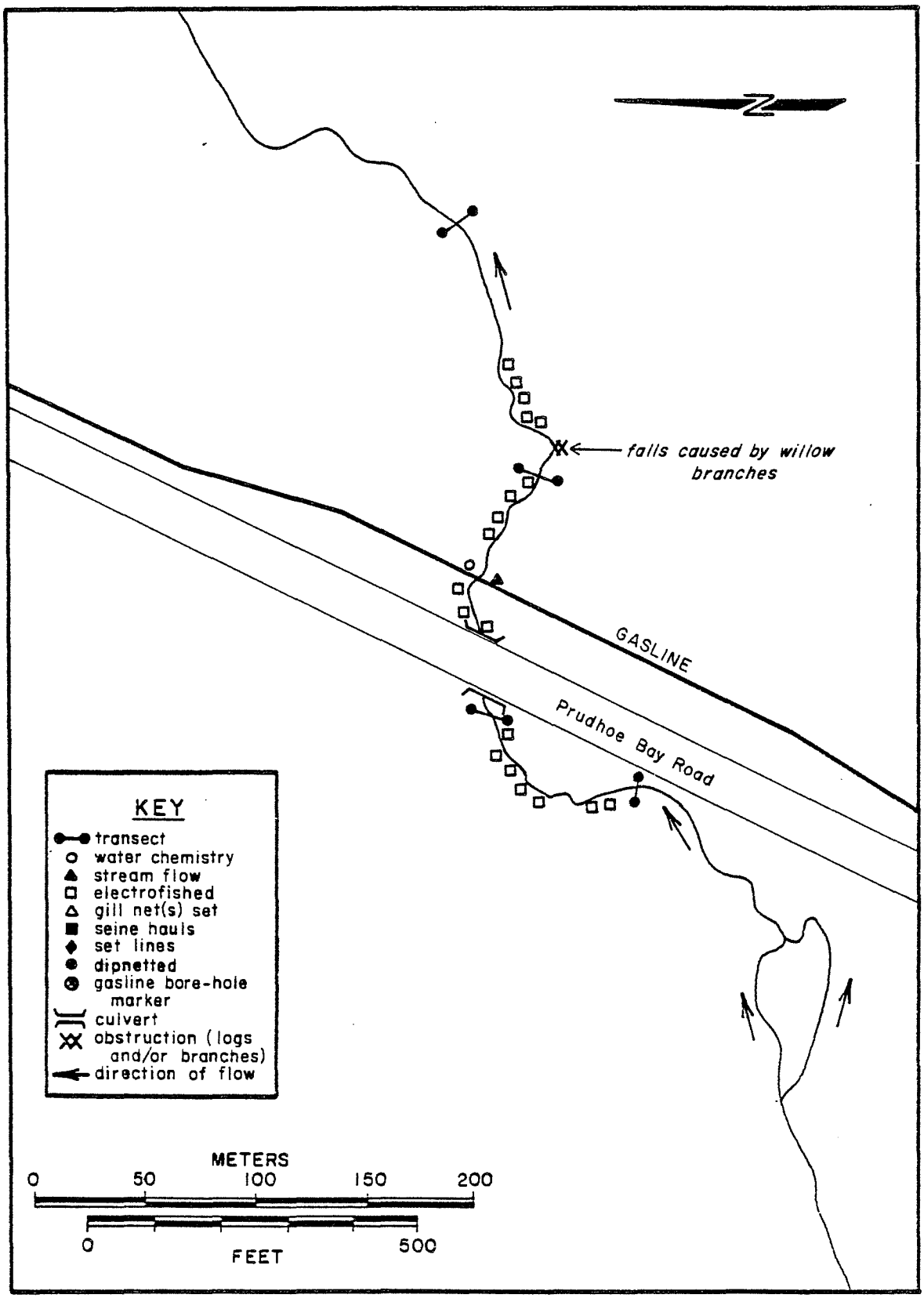

Fig. 90. Fall survey. Stout Creek, 08 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Spoiled Mary Creek Source Spring Fed

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 91 Gradient 1.12% Elevation 262 m

NPAS 15 NPMP 82.4 NPRX 015-1 AHMP NA

USGS Map Reference Sagavanirktok River T 2S R 14E Sec. 32

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

Spoiled Mary Creek is a shallow spring fed stream, which winds through a narrow (0.7-5.0 m) channel over gravel and cobble substrate. Banks are low and vegetated with sedge, willow, sphagnum moss and herbaceous plants. Pools (to 0.5 m deep) provide excellent fish habitat, but shallow, undefined channels may limit migration of some species.

Fall fish use in Spoiled Mary Creek has not been documented; however, other investigators have reported Arctic char, slimy sculpin, grayling and grayling fry during the open water periods (Refs. 11 and 30). This stream provides good fall habitat although electrofishing efforts during the recent survey indicate fish use is low to non-existent. Spoiled Mary Creek should be considered a potential fall migration route and rearing area as it is possible downstream migration may have occurred prior to this survey. Winter fish use should nto be discounted since this stream is spring fed.

FISH

Date 08 September 1980

Fish Present No

Gear/Effort EF (0/482 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	08 September 1980
Wetted Width (m)	0.7-5.0
Depth (cm)	5-10 pools to 50
Discharge (m^3/s)	0.02
Dissolved Oxygen (mg/1)	12.3
Temperature (^oC)	3.0
Conductivity (umhos/cm)	61
pH (pH units)	7.4
Color (color units)	35
Turbidity (NTU)	2.0
T. Hardness (mg $CaCO_3$/1)	154
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	10 fines, 10 sand, 10 gravel, 30 pebble, 40 cobble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 sedge, 10 willow, 5 moss, 5 herbaceous plants
Cover (%)	30
Fish Block(s)	Undefined channel through marsh area downstream of proposed crossing may provide barrier to some species

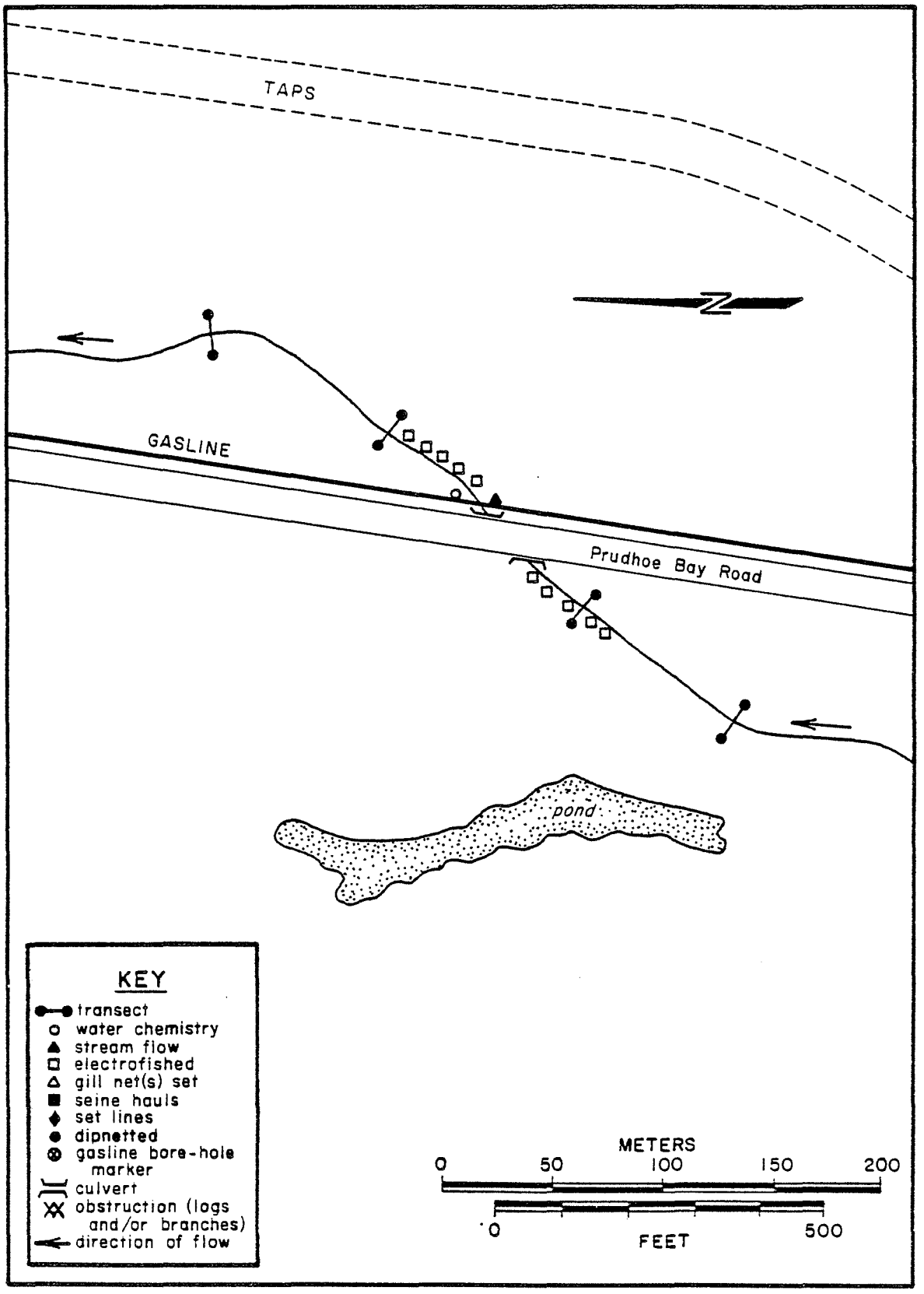

Fig. 91. Fall survey. Spoiled Mary Creek, 08 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Unnamed Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 92 Gradient 0.09% Elevation 192 m

NPAS 12 NPMP 64.3 NPRX 012-1 AHMP NA

USGS Map Reference Beechey Point, AK T 1N R 14E Sec. 12

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

Unnamed Creek (RX 012-1) is a clear, narrow tundra stream with a poorly defined channel. It drains a tundra marshland area immediately west of the Haul Road. The streambed is composed of fines, and dense growths of aquatic sedges are present. Stream banks are low and are vegetated with sedge, willow, and herbaceous plants.

During the recent fall survey partial ice cover precluded effective sampling efforts. Habitat in this stream appeared marginal, i.e., shallow and choked with aquatic vegetation. Fall fish use of this stream is likely to be low or non-existent.

FISH

Date 06 September 1980

Fish Present

Gear/Effort None; stream frozen over, Visual (0/400 m)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other

PHYSICAL CONDITIONS

Date	06 September 1980
Wetted Width (m)	1-31 m (widest area was measured across marsh)
Depth (cm)	10-20
Discharge (m^3/s)	0.03
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	0.0
Conductivity (umhos/cm)	73
pH (pH units)	7.2
Color (color units)	55
Turbidity (NTU)	2.2
T. Hardness (mg $CaCO_3$/1)	239
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 sedge, 15 willow, 5 herbaceous plants/moss
Cover (%)	80
Fish Block(s)	None observed

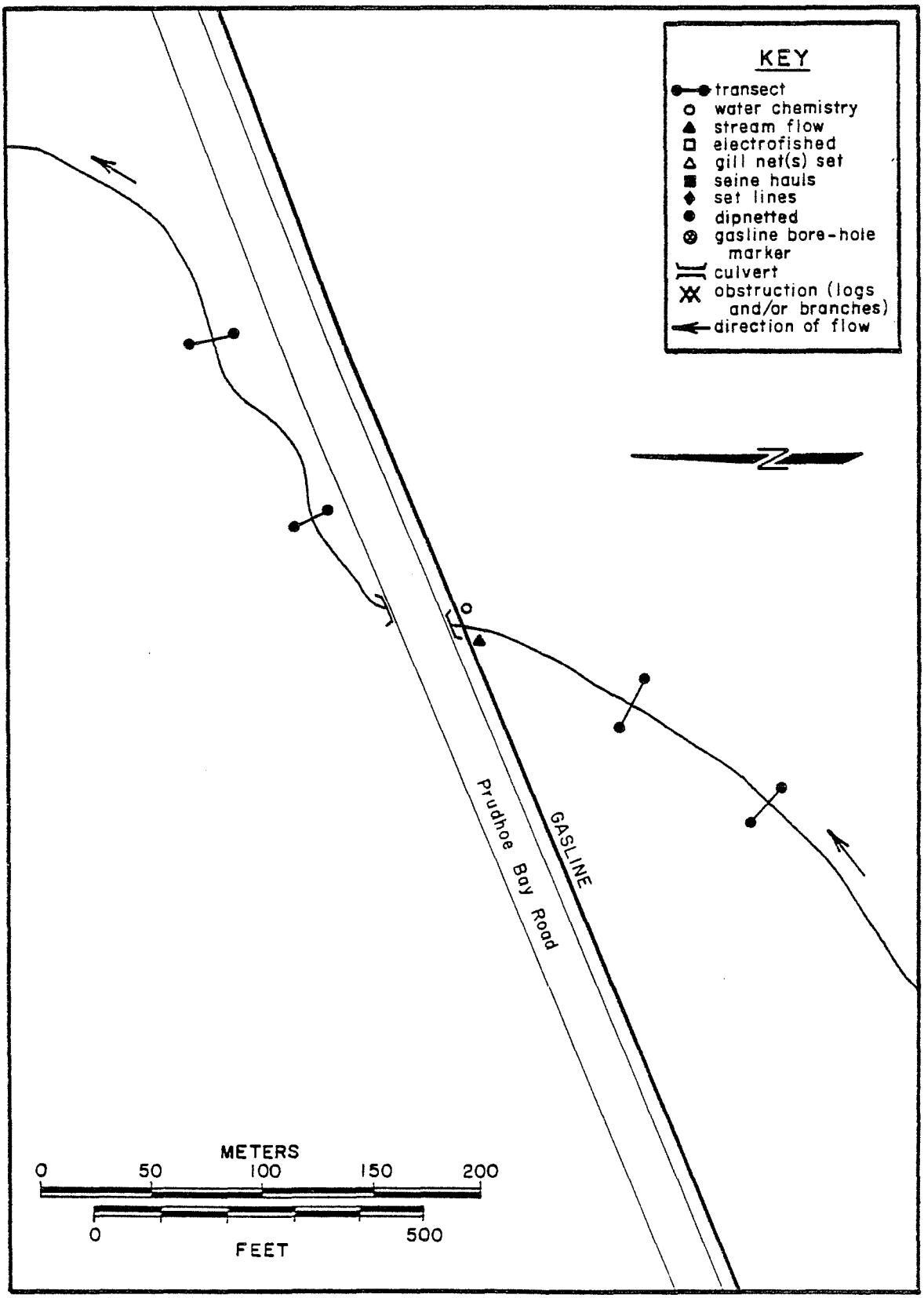

Fig. 92. Fall survey. Unnamed Creek (NPMP 064.3), 06 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody East Fork Sylvia Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sylvia Creek

Figure 93 Gradient 0.1% Elevation 87 m

NPAS 7 NPMP 39.3 NPRX 007-5 AHMP NA

USGS Map Reference Sagavanirktok, AK T 5N R 14E Sec. 18

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

In the area of the proposed crossing, East Fork Sylvia Creek is a marsh with no detectable discharge. Substrate consists of fines.

The only available water was found at a low water crossing of the pipeline with no apparent inlet or outlet, and was probably limited to periods of high run-off.

FISH

Date 05 September 1980

Fish Present No

Gear/Effort 5 m seine (0/50 m^2)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	05 September 1980
Wetted Width (m)	2.0-8.6
Depth (cm)	5-22
Discharge (m^3/s)	Unable to detect (<0.1)
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	0
Conductivity (umhos/cm)	315
pH (pH units)	5.9
Color (color units)	10
Turbidity (NTU)	4.2
T. Hardness (mg $CaCO_3$/1)	393
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	no banks - shallow tundra depression
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 sedge, 18 willow, 2 moss
Cover (%)	45
Fish Block(s)	Intermittent flow

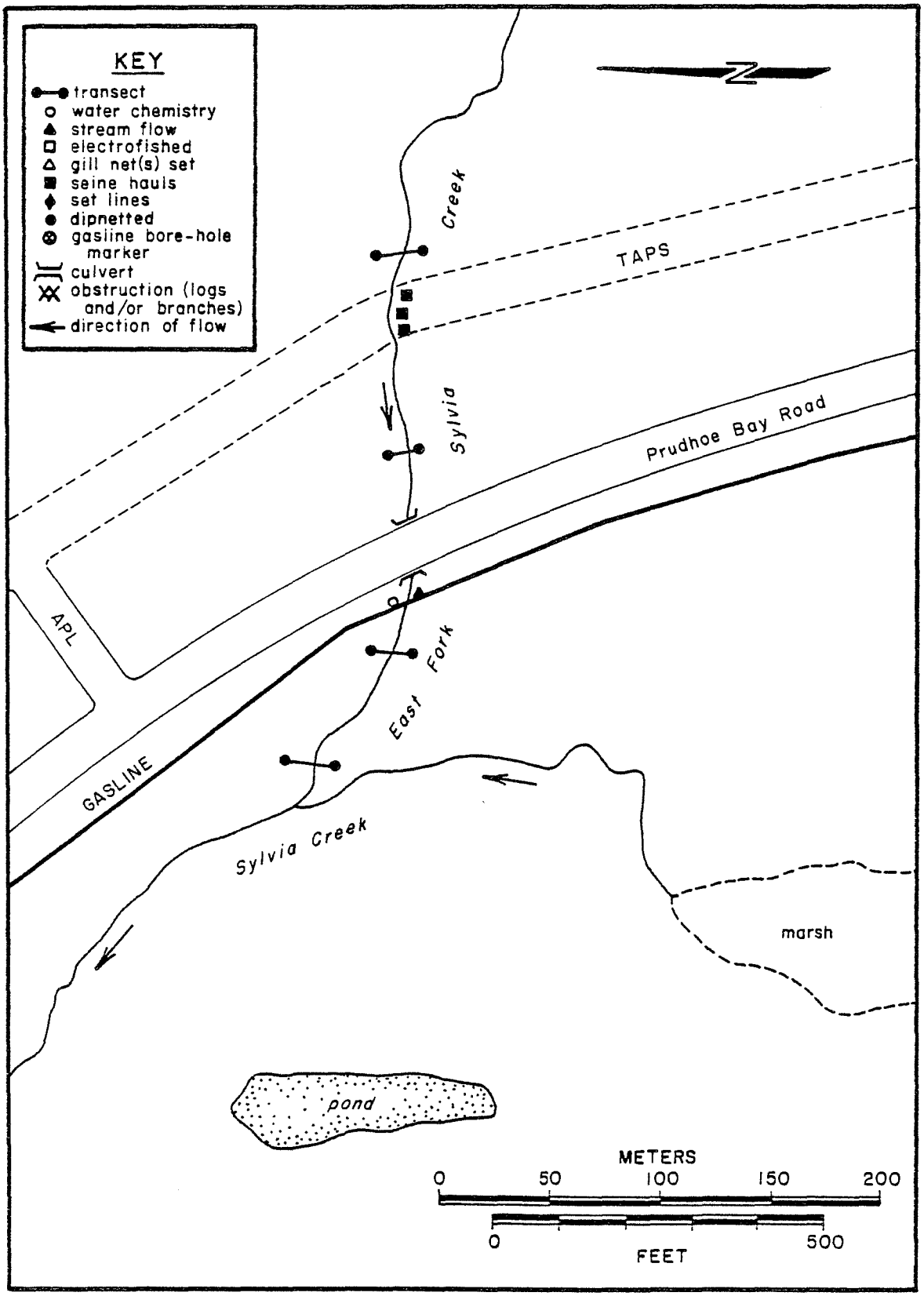

Fig. 93. Fall survey. East Fork Sylvia Creek, 05 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Telma Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 94 Gradient 0.5% Elevation 76 m

NPAS 7 NPMP 35.8 NPRX 007-1 AHMP NA

USGS Map Reference Sagavanirktok, AK T 6N R 13E Sec. 25

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Telma Creek is a small, clear tundra stream that drains a marshland area, just west of the Haul Road, to the Sagavanirktok River. Near its origin the channel is poorly defined and choked with horsetails; lower areas are more distinct with stable banks vegetated with sedges and willows.

Near the proposed crossing, Telma Creek provides good fall habitat and is a rearing area for ninespine stickleback. Habitat in lower areas appeared favorable for other species, however, none were caught. It is likely that species present in the Sagavanirktok River use Telma Creek in the fall as well. Winter fish use is unlikely as streams of this size tend to freeze solid.

FISH

Date 04 September 1980

Fish Present Yes

Gear/Effort EF (18/102 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Ninespine stickleback	1	17	17	22-42

PHYSICAL CONDITIONS

Date	04 September 1980
Wetted Width (m)	0.7-5.0
Depth (cm)	35-40
Discharge (m^3/s)	<0.1
Dissolved Oxygen (mg/1)	15
Temperature (^oC)	0.0
Conductivity (umhos/cm)	170
pH (pH units)	7.2
Color (color units)	20
Turbidity (NTU)	6.0
T. Hardness (mg $CaCO_3$/1)	274
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	70 fines, 10 sand, 10 gravel, 10 pebble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	80 sedge, 15 willow, 5 saxifraga
Cover (%)	5
Fish Block(s)	None observed

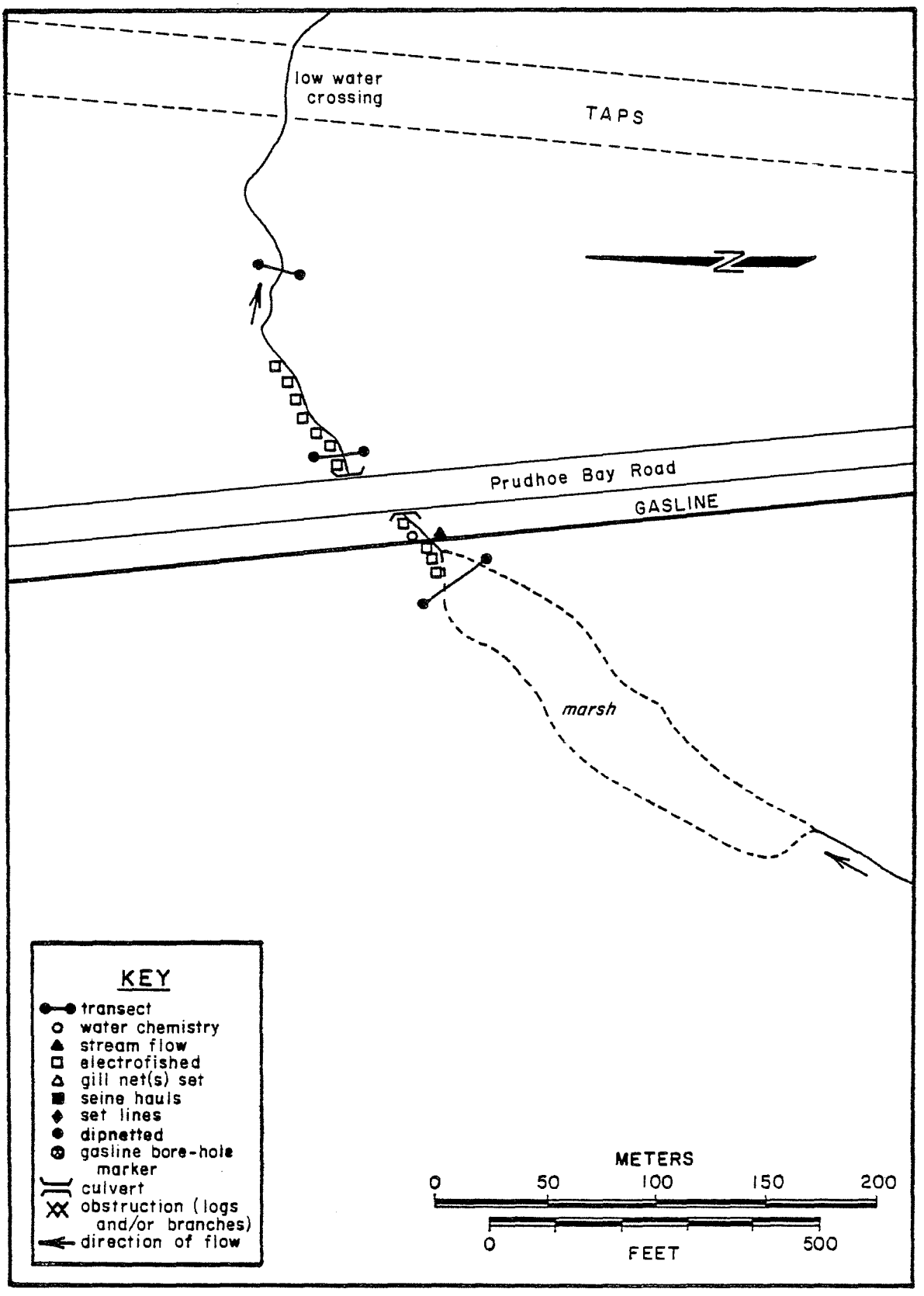

Fig. 94. Fall survey. Telma Creek, 04 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Pescado Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 95 Gradient 0.3% Elevation 55 m

NPAS 5 NPMP 27.4 NPRX 005-2 AHMP NA

USGS Map Reference Beechey Point, AK T 7N R 14E Sec. 19

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Pescado Creek is a small, clear tundra stream that originates from several small ponds west of the Haul Road. The channel is characteristized by alternating pool and riffle areas, with a few small falls (0.1-0.25 m) Substrate consists of fines, gravel and pebbles; some aquatic vegetation is present. The channel is poorly defined near its origin, but in downstream regions it becomes more distinct and is confined by low banks (<1.0 m high) vegetated with sedges and willows.

Pescado Creek provides good fish habitat and is a rearing area for ninespine stickleback. Other species indigenous to the Sagavanirktok River may use this stream as well.

FISH

Date 04 September 1980

Fish Present Yes

Gear/Effort EF (8/150 sec)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other
Ninespine stickleback	2	6	15-17	25-50

PHYSICAL CONDITIONS

Date	04 September 1980
Wetted Width (m)	0.7-8.7
Depth (cm)	3-10
Discharge (m^3/s)	0.07
Dissolved Oxygen (mg/1)	15
Temperature (^oC)	0.0
Conductivity (umhos/cm)	155
pH (pH units)	7.2
Color (color units)	50
Turbidity (NTU)	5.0
T. Hardness (mg $CaCO_3$/1)	291
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	80 fines, 10 gravel, 10 pebble
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	85 sedge, 15 willow
Cover (%)	0
Fish Block(s)	Several falls 0.1-0.25 m high located ~150 m downstream of crossing.

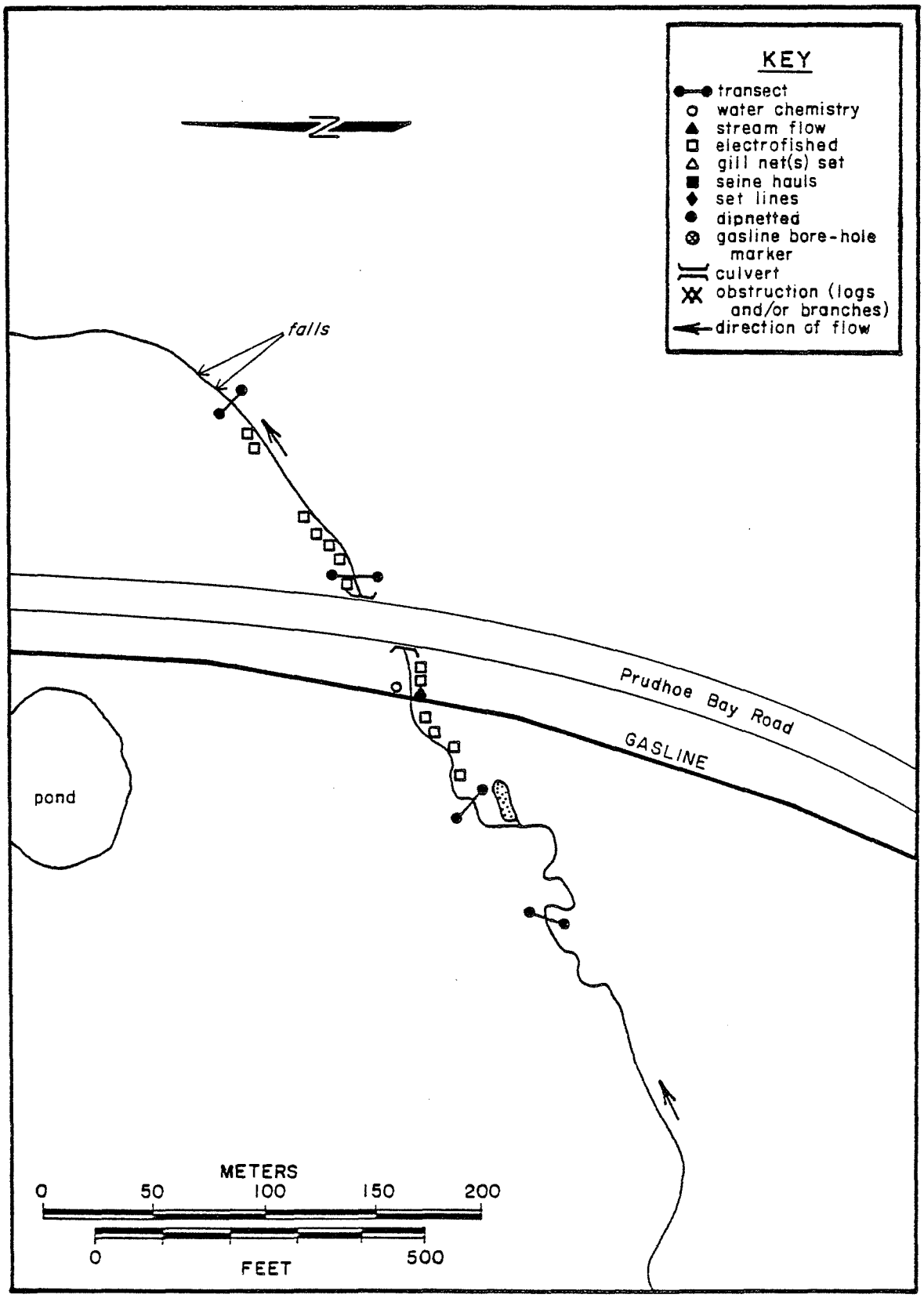

Fig. 95. Fall survey. Pescado Creek, 04 September 1980.

FALL SURVEY FORM

WATERBODY

Waterbody Low-Life Creek Source Tundra Drainage

Main Drainage Sagavanirktok River Tributary to Sagavanirktok River

Figure 96 Gradient 0.2% Elevation 35 m

NPAS 4 NPMP 23.1 NPRX 004-2 AHMP NA

USGS Map Reference Beechey Point, AK T 8N R 14E Sec. 28

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing

ASSESSMENT

Low-Life Creek varies in width from 2.0 to 15 m. The shallow (5-10 cm) poorly defined channel is lined with sedge and scattered willows. Stream substrate consists of fines with some gravel. Limited cover is provided by aquatic vegetation.

Low-Life Creek, at the proposed gas line crossing, provides good fall fish habitat and is a rearing area for ninespine sticklebacks. No additional information on fish use of this stream is presently available. Other species, indigenous to the Sagavanirktok River drainage, may use this creek as well.

FISH

Date 05 September 1980

Fish Present Yes

Gear/Effort EF (4/159 sec), DN (0/200 m)

Species Present	Quantity Fry	Quantity Other	Length (mm) Fry	Length (mm) Other
Ninespine stickleback		4		30

PHYSICAL CONDITIONS

Date	05 September 1980
Wetted Width (m)	2.0-15
Depth (cm)	5-10
Discharge (m^3/s)	<0.01
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	1.0
Conductivity (umhos/cm)	175
pH (pH units)	7.5
Color (color units)	10
Turbidity (NTU)	5.5
T. Hardness (mg $CaCO_3$/1)	291
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	95 fines, 5 gravel
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	90 sedge, 10 willow
Cover (%)	10
Fish Block(s)	None observed

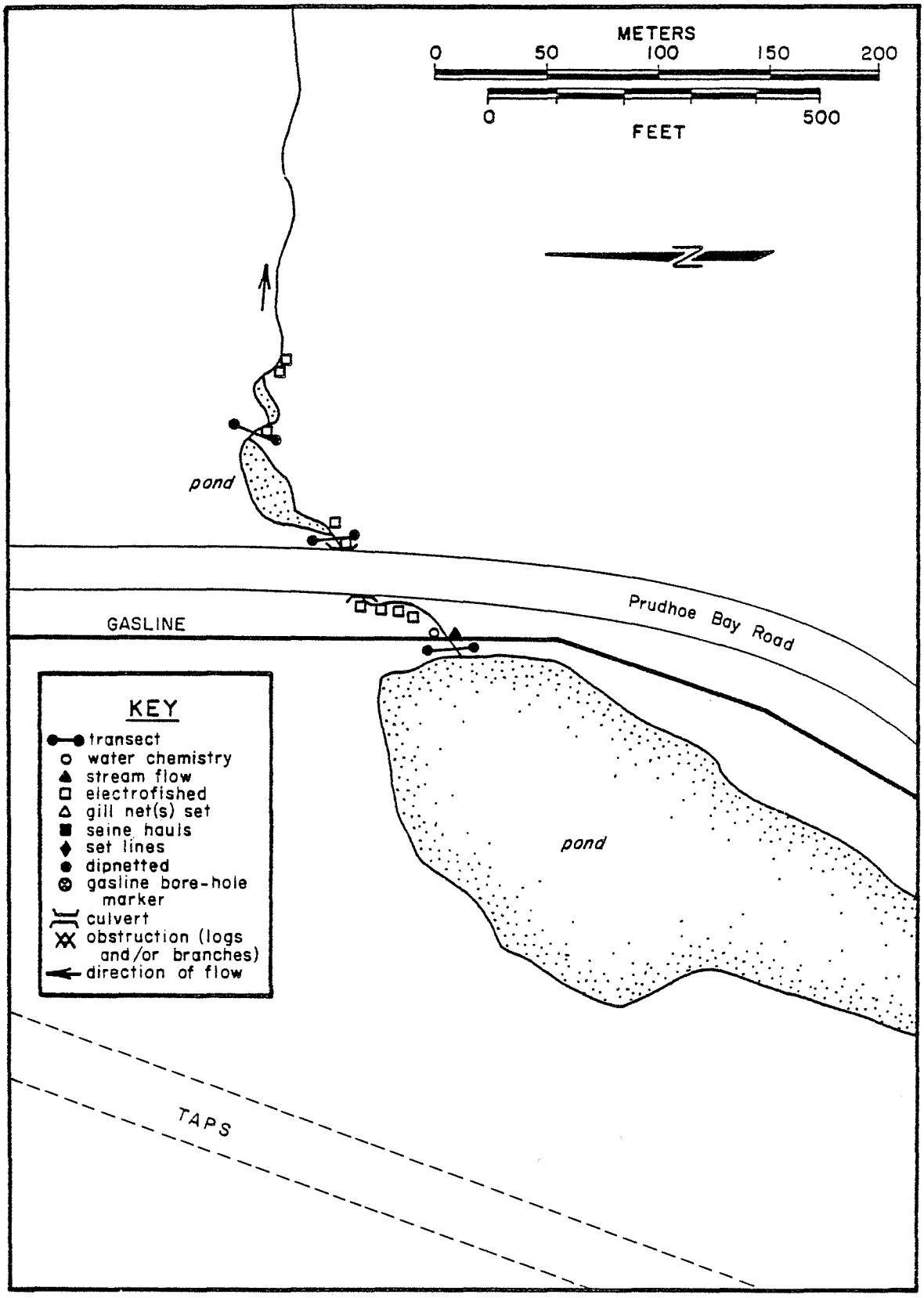

Fig. 96. Fall survey. Low-life Creek, 05 September 1980.

FALL SURVEY FORM

WATERBODY

GRAYLING Gulch - fish list

Waterbody Little Putuligayuk River Source Tundra Drainage

Main Drainage Prudhoe Bay Tributary to Putuligayuk River

Figure 97 Gradient 0.01% Elevation 15 m

NPAS 2 NPMP 9.4 NPRX 002-1 AHMP NA

USGS Map Reference Beechey Point, AK T 10N R 14E Sec. 20

Site Access Truck

Section Surveyed 200 m upstream to 200 m downstream of proposed pipeline crossing.

ASSESSMENT

Little Putuligayuk River is a beaded, tundra stream characterized by alternating channels and pools 40-90 cm deep. In the area of the proposed pipeline crossing, the low tundra banks are lined with sedges and some willow. Stream substrate consists entirely of fines. Abundant grasses within the stream provide cover.

Physical conditions in the Little Putuligayuk River appeared to be favorable for fish use at the time of the fall 1980 investigation; however, no fish were captured or observed. Results from previous fall sampling efforts were similar (Ref. 57). Ninespine stickleback have been reported to use the Putuligayuk River during fall (Ref. 57) and may use this waterbody as well.

FISH

Date 05 September 1980

Fish Present No

Gear/Effort EF (0/166 sec), DN (0/200 m)

Species Present	Quantity		Length (mm)	
	Fry	Other	Fry	Other

PHYSICAL CONDITIONS

Date	05 September 1980
Wetted Width (m)	0.8-5.0
Depth (cm)	40-90
Discharge (m^3/s)	0.11
Dissolved Oxygen (mg/1)	14
Temperature (^oC)	0.0
Conductivity (umhos/cm)	165
pH (pH units)	7.4
Color (color units)	20
Turbidity (NTU)	8.0
T. Hardness (mg $CaCO_3$/1)	291
Nitrate (mg/1 N)	<0.1
Phosphate (mg/1 P)	<0.1
Bottom Type (%)	100 fines
Bank Stability (%)	100
Aquatic Vegetation (P/A)	P
Riparian Vegetation (%)	95 sedge, 5 willow
Cover (%)	50
Fish Block(s)	None observed

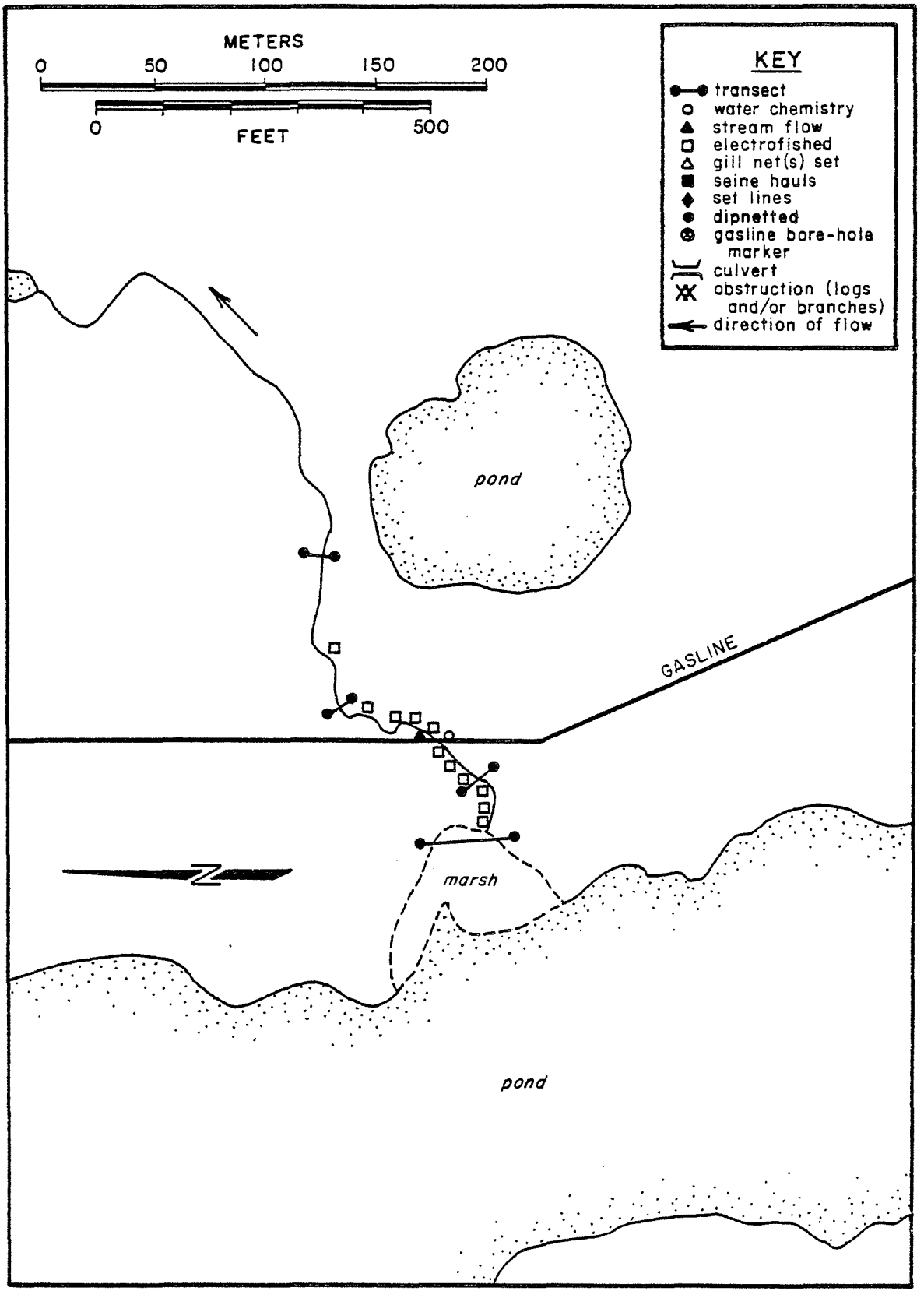

Fig. 97. Fall survey. Little Putuligayuk River, 05 September 1980.

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APPENDIX I

Calibration of Field Equipment

and

Accuracy of Measurements

NORTHERN TESTING LABORATORIES

600 UNIVERSITY PLAZA WEST, SUITE A FAIRBANKS, ALASKA 99701 907-479-3115

May 22, 1980

LGL Alaska
P. O.Box 80607
Fairbanks, Alaska 99708

Attention: Mr. Rod Neterer

Dear Sir:

For the purpose of quality control, six Taylor pocket thermometers were brought to our laboratory for calibration. The thermometers were tested against our laboratory thermometers and all six found to be accurate with the limits of the ± 1.0 degree increments for the normal (room termperature) and low temperature ranges. All, but thermometer #2 were accurate (± 1.0 degree) for the high termperature range and it was found to be within plus or minus 5% accuracy.

Very truly yours,

NORTHERN TESTING LABORATORIES

Teri Gardner Robus

Teri Gardner Robus
Environmental Biologist

TGR/cno

NORTHERN TESTING LABORATORIES
600 UNIVERSITY PLAZA WEST, SUITE A FAIRBANKS, ALASKA 99701 907-479-3115

September 3, 1980

LGL Alaska
P. O. Box 80607
Fairbanks, Alaska 99708

Attention: Mr. Rod Neterer

Dear Rod,

For the purpose of quality control, two Hach portable pH meters and two YSI S-C-T meters were brought to our laboratory for calibration. The Hach pH meters were cleaned and then found to be in good working condition, and their accuracy within the specifications of the manufacturer.

One of the YSI meters was found to have a 10% error for conductance, and was thusly marked. The other YSI meter was within a 2% conductivity error range.

Thank you for allowing us to be of service.

Very truly yours

NORTHERN TESTING LABORATORIES

Teri Gardner Robus
Environmental Biologist

TGR/deb

APPENDIX II

Provisional List of Waterbodies Crossed or Potentially Affected by the Northwest Alaska Pipeline Route

APPENDIX II. Provisional list of 388 waterbodies crossed or potentially affected by the Northwest Alaskan Pipeline including an evaluation of existing fall fisheries data for each. Data sources (see Literature Reviewed) and fall criteria (see Table 1) are listed by number. Primary data sources are underlined. Abbreviations: NPRX (Northwest Pipeline and Floodplain crossing), NPSI (Northwest Pipeline Stream Identification Number), NPAS (Northwest Pipeline Alignment Sheet), NPMP (Northwest Pipeline Milepost), AHMP (Alaska Highway Milepost), Alyeska AS (Alyeska Alignment Sheet), Sta. (Station). Reference 125 identified the alignment sheet series used.

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Unnamed Creek	131-2	6-227.03	131	740.6	1222.2				3	2,30,54,76,118
Scottie Creek	131-1	6-227	131	739.4	1223.4				1	5,6,7,8,9,10,17,22,26,29,30,54,55,57,59,60,72,73,76,77,118,123
Desper Creek	130-1	6-226	130	737.4	1225.6				1	5,6,7,9,10,17,26,29,30,54,55,57,60,68,72,73,76,118,121
Unnamed Creek	129-5	6-225.01	129	732.5	1232.1				3	2,30,54,76,118
Sweetwater Creek	129-4	6-225	129	730.2	1234.2				3	2,9,29,30,54,57,59,60,72,73,76,118
Unnamed Creek	129-3	6-224	129	729.7	1234.7				3	2,29,30,54,59,60,73,76,118
Unnamed Creek	129-2	6-223	129	728.6	1235.9				3	2,29,30,54,76,118
Unnamed Creek	129-1	6-222	129	728.2	1236.3				1	2,27,30,54,57,59,60,76,118
Unnamed Creek	128-2	6-221	128	724.2	1240.6				2	2
Unnamed Creek	128-1	6-220	128	723.6	1241.2				3	2
Gardiner Creek	127-1	6-219	127	718.5	1246.7				1	5,6,7,8,9,10,17,22,26,29,30,54 57,59,60,68,72,73,76,118
Tenmile Creek	126-1	6-218	126	712.5	1252.8				2	2,5,6,9,10,17,26,29,30,54,57,59,60,73,118
Silver Creek	125-1	6-217	125	706.5	1258.7				4	2,5,6,9,10,26,29,30,54,59,60,73,76,118,121
Unnamed Creek	124-3	6-216.01	124	703.5	1262.3				3	2,30,54,76,118
Lethe Creek	124-2	6-216	124	701.0	1266.5				3	2,29,30,54,57,59,60,72,76,118,123
Beaver Creek	124-1	6-215	124	699.2	1268.0				1	5,6,7,8,9,10,17,22,26,29,30
Unnamed Creek	123-2	6-214.01	123	697.0	1270.4				3	2,30,54,76,118
Unnamed Creek	123-1	6-213.01	123	694.6	1273.0				4	2,30,59,60,76,118
Unnamed Creek	122-2	6-213	122	690.1	1278.3				3	2,9,29,30,60,76,118
Bitters Creek	122-1	6-212	122	688.2	1280.2				1	5,6,9,10,26,29,30,54,57,59,60,69,72,73,76,118

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Unnamed Creek	121-2	6-210.02	121	685.5	1283.2				4	2,30,76,118
Unnamed Creek	121-1	6-210.01	121	683.5	1285.4				4	2,30,76,118
Unnamed Creek	119-2	6-210	119	672.6	1296.7				3	2,29,30,76,118
Unnamed Creek	119-1	6-209	119	671.4	1297.9				3	2,29,30,59,60,76,118
Tanana River	118-2	6-207	118	666.0	1303.3				1	3,5,6,7,9,10,13,17,22,26,29,30,54,57,60,69,72,76,118
Unnamed Creek	118-1	6-206	118	663.8	1305.6				3	2
Tok River	117-2	6-205	117	659.9	1309.4				1	3,5,6,7,9,10,17,22,26,29,30,54,55,57,59,60,72,73,76,118
Unnamed Creek	117-1	6-204	117	657.6-658.0	1311.4				2	2
Crystal Slough Creek	114-1	6-203.03	114	640.7	1328.2				1	2,9,26,30,54,55,57,60,73,76,118
Unnamed Creek	113-4	6-203.01	113	639.2	1329.5				3	2,30,60,76,118
Unnamed Creek	113-3	6-203	113	638.2	1330.5				3	2,30,54,59,60,76,118
Moon Lake Tributary #1	113-2	6-202	113	636.9	1331.9				2	2,6,29,30,59,69,76,118
Moon Lake Tributary #2	113-2	6-202	113	636.9	1331.9				2	2,6,29,30,59,69,76,118
Yerrick Creek	113-1	6-201	113	634.7	1333.7				1	3,5,6,7,8,9,10,17,22,26,29,54,55,57,64,68,69,72,73,76,77,118
Unnamed Creek	112-10	6-200.01	112	632.5	1336.9				2	2,29,30,54,59,60,69,76,118
Unnamed Creek	112-9	6-200	112	632.5	1336.9				2	2,29,30,54,59,60,69,76,118
Cathedral Rapids Creek #1	112-8	6-199	112	630.9	1338.1				3	2,4,7,22,29,30,60,68,69,73,118
Cathedral Rapids Creek #2	112-7	6-198	112	630.3	1338.7				3	2,4,7,22,29,30,59,60,68,69,76,118
Cathedral Rapids Creek #3	112-6	6-197B	112	630.2	1338.7				3	2,4,7,22,29,30,59,60,68,69,76,118
Cathedral Rapids Creek #4	112-5	6-197A	112	630.2	1338.8				3	2,4,7,22,29,30,59,60,68,69,76,118
Cathedral Rapids Creek #5	112-4	6-197	112	630.1	1338.9				3	2,4,7,22,30,60,68,69,76,118
Cathedral Rapids Creek #6	112-3	6-169	112	629.9	1339.0				3	2,4,7,22,29,30,59,60,68,69,76,118
Cathedral Rapids Creek #7	112-2	6-195	112	629.7	1339.2				3	2,4,7,22,29,30,60,68,69,76,118
Unnamed Creek	112-1	6-193.01	112	629.0	1339.8				3	2,5,6,10,26,29,30,54,57,69,72,76,118
Unnamed Creek	111-6	6-192.01	111	628.4	1340.5				2	2,30,54,76,118

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Unnamed Creek	111-5	6-192	111	628.0	1340.9				2	2
Sheep Creek	111-4	6-191	111	626.8-627.0	1342.2				3	3,5,6,7,8,10,22,29,30,54,68 69,72,76,118
Unnamed Creek	111-3	6-190	111	625.4	1343.7				2	2,29,30,54,76,118
Unnamed Creek	111-2	6-189	111	624.9	1344.0				2	2
Unnamed Creek	111-1	5-188	111	623.6	1345.3				2	2
Robertson River	110-4	5-187	110	621.2-621.5	1347.6				1	3,5,6,7,8,9,10,17,22,26,29, 30,54,55,57,73,75,76,77,118
Unnamed Creek	110-3	5-186	110	619.7	1349.3				4	2
Unnamed Creek	110-2	5-185.03	110	618.9	1350.1				2	2,30,54,76,118
Unnamed Creek	110-1	5-185.02	110	618.7	1350.2				2	2,30,54,76,118
Unnamed Creek	109-2	5-185.01	109	616.8	1352.3				2	2,30,54,76,118
Bear Creek	109-1	5-185	109	611.6	1357.3				1	3,5,6,7,8,9,10,17,22,26,29, 30,54,55,57,59,60,69,72,73, 76,77,118
Chief Creek	108-4	5-184	108	610.3	1358.6				3	3,5,6,7,8,9,10,17,22,26,29, 30,54,55,57,59,60,72,76,118
Unnamed Creek	108-3	5-183	108	607.1	1361.7				3	2,5,26,29,30,54,76,118
Unnamed Creek	108-2	5-182.01	108	606.8	1362.0				3	2,5,30,54,76,118
Unnamed Creek	108-1	5-182	108	605.8	1363.5				4	2
Unnamed Creek	107-2	5-181	107	604.8	1364.4				3	2,29,30,54,59,60,73,76,118
Sam Creek	107-1	5-180	107	603.3	1365.9				3	3,5,6,7,8,9,10,26,30,54,55, 76,118
Unnamed Creek	106-3	5-179	106	600.1	1369.1				1	3,5,6,9,10,26,29,30,54,57,59, 60,73,76,118
Berry Creek	106-2	5-178	106	597.9	1371.4				1	3,5,6,7,8,9,10,22,29,30,54, 57,59,60,69,72,73,76,77,118
Sears Creek	106-1	5-177	106	594.8	1374.4				1	3,5,6,7,8,9,10,17,22,29,30, 54,57,59,60,64,69,72,76,77,118
Unnamed Creek	105-2	5-176.01	105	592.3	1377.0				2	2,30,54,76,118
Dry Creek	105-1	5-176	105	591.2	1378.1				3	3,5,6,7,8,9,10,22,29,30,54,57, 59,60,68,69,72,73,76,118
Johnson River	104-1	5-175	104	588.6-588.8	1380.5				1	3,5,6,7,8,9,10,17,22,26,29,30, 54,57,60,69,72,73,76,77,118
Little Gerstle River	103-2	5-174	103	581.0	1388.4				4	3,5,6,7,8,9,10,17,22,26,29,30, 72,73,76,77,118
Dougherty River	103-1	5-173	103	579.0	1370.4				4	

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Gerstle River	102-1	5-172	102	576.3-576.7	1393.0				1	3,5,6,7,8,9,10,17,22,26,29,30,54,57,72,73,76,118
Sawmill Creek	100-2	5-171	100	565.4	1403.9				2	3,5,6,7,8,9,10,29,30,54,76,118
Rhoads Creek	100-1	5-170	100	561.2	1407.6				3	3,5,6,9,10,29,30,54,76,118
Granite Creek	099-1	5-169	99	559.4	1409.2				2	3,5,6,7,9,10,22,29,30,54,76,118
Tanana River	096-1	5-166	96	539.3	NA	47	9215+00		1	3,5,11,13,15,16,27,29,30,32,57,76,118
Tanana River Side Channel	095-1	5-165.01	95	538.7	NA	47			1	3,11,13,30,42,43,57,76,77,118,122
Shaw Creek	093-2	5-165	93	527.4	NA	49	9789+15		1	3,5,11,29,30,57,65,76,77,118
Lower Rosa Creek	093-1	5-164	93	526.4	NA	49	9800+40		3	5,11,29,30,76,122
Rosa Creek #2	092-10	5-162	92	521.5	NA				4	5,11,29,30,76,118
Rosa Creek #3	092-9	5-162.09	92	521.4	NA	50	10110+50		3	5,11,29,30,57,76,118
Rosa Creek #4	092-8	5-162.08	92	520.4	NA	50	10142+74		3	5,11,29,30,57,76,118
Rosa Creek #5	092-7	5-162.07	92	520.1	NA	50	10165+25		3	5,11,29,30,57,76,118
Rosa Creek #6	092-6	5-162.06	92	519.9	NA				4	
South Fork Minton Creek	092-5	5-161.032	92	518.2	NA				4	5,11,29,30,118
South Fork Minton Creek	092-4	5-161.031	92	518.0	NA				4	
East Fork Minton Creek #4	092-3	5-161.03	92	517.8	NA	51	10298+63		3	5,11,29,30,32,54,66,76,118
East Fork Minton Creek #3	092-2	5-161.02	92	517.4	NA	51	10305+90		3	5,11,29,30,32,54,66,76,118
East Fork Minton Creek #2	092-1	5-161.01	92	517.1	NA	51	10316+00		3	5,11,29,30,32,54,66,76,118
East Fork Minton Creek #1	091-6	5-161	91	517.0	NA				4	121
West Fork Minton Creek #1	091-5	5-160.02	91	516.0	NA	51	10393+01		3	5,11,30,32,54,76,118
West Fork Minton Creek #2	091-4	5-160.01	91	515.5	NA	51	10394+88		3	5,11,30,32,54,76,118
Gold Run Creek	091-3	5-160	91	514.3	NA	51	10407+62		3	3,5,11,29,30,54,76,118
Small Creek	091-2	5-159.02	91	512.9	NA	52	10561+41		2	11,30,54,57,76,118
Tributary to Small Creek	091-1	5-159.01	91	512.3	NA	52	10589+47		3	11,30,76,118
Redmond Creek	090-1	5-159	90	507.3	NA	53	10855+33		1	3,5,11,14,25,29,30,32,35,38,54,55,57,76,77,118
Tributary to Salcha River	089-2	4-158.03	89	504.5	NA	53	11037+79		2	11,30,54,76,118
Salcha River	089-1	4-158	89	503.5	NA	53A	19+00		1	3,5,11,13,14,25,29,30,32,35,38,76,118,123
Two-Nineteen Creek	088-4	4-157.01	88	499.9	NA	54	223+50		4	11,30,54,76,118
Little Salcha River	088-3	4-157	88	498.2	NA	54	281+71		1	3,5,11,13,29,30,31,38,55,57,76,77,83,118
Tributary to Little Salcha	088-2	4-156.05	88	497.3	NA	54	345+50		3	11,30,54,76,118

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Tributary to Million Dollar Creek	088-1	4-156.04	88	495.7	NA	54	417+00		3	11,29,30,31,54,76,118
Million Dollar Creek	087-2	4-156.03	87	493.4	NA	54	545+00		4	5,11,29,30,31,57,64,76,118, 126
French Creek	087-1	4-155	87	489.9	NA	55	643+55		1	3,5,11,19,29,30,31,38,55,57, 76,77,118
Knokanpeover Creek	086-5	4-154	86	487.5	NA	56	809+40		1	3,5,11,19,29,30,31,57,76,118
Drainage Ditch	086-2	4-148.07	86	486.9-486.5	NA				1	122
Unnamed Creek	086-4	4-148.06	86	485.6	NA				3	122
Unnamed Creek	086-3	4-148.05	86	485.1	NA				1	122
Unnamed Creek	086-2	4-148.04	86	484.7	NA				2	122
Unnamed Creek	086-1	4-148.03	86	483.7	NA				4	
Unnamed Creek	085-2	4-148.02	85	482.6	NA				4	
Moose Creek	085-1	4-148	85	482.0	NA				1	5,11,29,30,31,38,54,57,76,77, 118,122
Unnamed Creek	084-5	4-144.04	84	476.3	NA				4	
Unnamed Creek	084-4	4-144.03	84	476.2	NA				4	
Chena River Side Channel	084-3	4-144.02	84	475.8	NA				2	122
Chena River	084-2	4-144	84	475.3	NA				1	3,5,11,13,17,27,29,30,31,38, 59,76,118
Unnamed Creek	084-1	4-140.14	84	475.1	NA				4	
Potlatch Creek	083-5	4-140.13	83	472.7	NA				3	122
Tributary to Little Chena River #1	083-4	4-140.12	83	469.9	NA				2	122
Tributary to Little Chena River #2	083-3	4-140.11	83	469.2	NA				4	
Little Chena River	083-2	4-140.10	83	468.9	NA				4	122
Iowa Creek	083-1	4-140.9	83	468.3	NA				1	122
Tributary to Smallwood Creek	082-2	4-140.8	82	465.9	NA				4	122
Smallwood Creek	082-1	4-140.7	82	463.9	NA				1	122
Nugget Creek Tributary	081-5	4-140.6	81	460.5	NA				3	122
Rose Creek	081-4	4-140.5	81	459.3	NA				4	
Gilmore Creek	081-3	4-140.4	81	457.6	NA				4	
Pedro Creek	081-2	4-140.3	81	457.4	NA				4	
Gold Run Creek	081-1	4-140.2	81	456.9	NA				4	
Fox Creek	080-2	4-140.1	80	454.4	NA				3	122
Treasure Creek	080-1	4-140	80	450.1	NA	62	659+43		3	3,5,11,17,29,30,54,57,76,118
Chatanika River	079-4	4-139	79	446.5	NA	63	873+63		1	3,5,11,17,29,30,31,39,76,81,84, 89,113,118

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Shocker Creek	079-3	4-138	79	445.3	NA	63	914+00		1	5,11,29,30,54,57,76,118
Unnamed Tributary to Shocker Creek #1	079-2	4-137.06	79	445.0	NA	63			3	30,54,76,118
Unnamed Tributary to Shocker Creek #2	079-1	4-137.05	79	444.8	NA	63			3	30,54,76,118
Unnamed Tributary to Chatanika River #1	078-5	4-137.03	78	443.3	NA	63	1025+70		3	11,30,76,118
Unnamed Tributary to Chatanika River #2	078-4	4-137.02	78	443.2	NA	63	1027+70		3	11,30,76,118
Unnamed Tributary to Chatanika River #3	078-3	4-137.01	78	443.1	NA	63	1032+20		3	11,30,76,118
Washington Creek	078-2	4-137	78	439.8	NA	64	1209+62		1	1,3,5,11,17,29,30,31,38,54, 57,76,77,118
Unnamed Tributary to Washington Creek	078-1	4-136.01	78	439.6	NA	64	1220+00		4	11,30,76,118
South Fork Aggie Creek	076-5	4-136	76	432.5	NA	64	1595+00		3	1,3,5,11,17,29,30,31,38,54, 57,76,118
North Fork Aggie Creek	076-4	4-135	76	431.7	NA	65	1635+00		3	1,3,5,11,17,29,30,31,38,48, 54,57,76,118
Tributary to Little Globe Creek	076-3	4-134.01	76	430.0	NA	66	1740+00		4	11,30,76,118
Little Globe Creek	076-2	4-134	76	429.0	NA	66	1759+00		3	11,17,29,30,67,76,118,122
Unnamed Tributary to Little Globe Creek	076-1	4-133.01	76	428.9	NA	66	1796+00		4	11,30,76,118
Globe Creek	075-2	4-133	75	426.3	NA	66	1966+75		4	1,3,5,11,17,29,30,38,48,66, 76,118,121,122
Unnamed Tributary to Globe Creek	075-1	4-132.02	75	425.3	NA	67	1988+88		4	11,30,66,76,118
Unnamed Tributary to Tatalina River	074-2	4-132.01	74	422.0	NA	67	2167+00		4	11,30,48,76,118
Tatalina River	074-1	4-132	74	421.0	NA	67	2241+80		4	1,3,4,11,17,29,30,48,76,118, 121
Tributary to Slate Creek	073-5	4-131.01	73	416.8	NA	68	2456+31		2	11,30,76,118,122
Slate Creek	073-4	4-131	73	416.6	NA	68	2459+35		3	3,5,11,17,29,30,38,48,76,118, 121,122
Ski Jump Ramp Creek	073-3	4-130	73	414.9	NA	68	2550+00		3	11,20,30,76,122

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Wilber Creek	073-2	4-129	73	414.0	NA	68-9	2608+00		4	3,5,11,17,29,30,48,76,118
Tributary to Wilber Creek	073-1	4-128.04	73	412.7	NA	69	2666+35		3	11,30,76,118,122
Shorty Creek	072-3	4-128.03	72	408.5	NA	69	2855+73		3	11,30,76,118,122
Tributary to Tolovana River	072-2	4-128.01	72	407.5	NA	70	2924+55		2	11,30,76,118,122
Tolovana River	072-1	4-128	72	407.0	NA	70	2957+90		1	1,3,5,11,13,17,20,30,31,48, 57,74,76,118,121
Unnamed Tributary to West Fork Tolovana River	071-2	4-127.01	71	403.9	NA	70	3122+16		2	11,30,76,118,122
Lost Creek	071-1	4-127	71	400.7	NA	71	104+33		4	3,5,11,17,29,30,31,48,76, 118,121,122,123
Erickson Creek Tributary	070-1	4-126	70	396.3	NA	72	337+66		4	3,11,29,30,76,118,121
West Fork Erickson Creek	069-1	4-125	69	393.0	NA	72,73	513+62		4	3,5,11,17,29,30,31,48,76,118, 122,123
Hess Creek Tributary	068-5	4-123.05	68	387.0	NA	73	800+20		2	11,17,30,76,118,122
Hess Creek	068-4	4-123A.04	68	386.8	NA	73,74W	820+00		1	1,3,5,11,17,29,30,31,48,70, 76,118,121
Hess Creek Tributary			68	386.4	NA				2	122
Hess Creek and Tributary from Fish and Mastadon Creek	068-3	4-123.03	68	386-387.3	NA	73	829+65		1	3,5,11,29,30,31,48,76,118
Two-Bank Creek	068-2	4-123.02	68	382.4	NA	74	1040+40		3	11,30,76,118,122
Unnamed Creek	068-1	4-123.01	68	381.8	NA	74	1071+47		3	11,30,76,118,122
Two-Bit Creek	067-5	4-123	67	381.4	NA	74	1096+85		3	11,29,30,76,118,122
Unnamed Creek	067-4	3-122.05	67	380.2	NA	75	1150+15		4	11,17,30,76,118
Unnamed Creek	067-3	3-122.04	67	379.0	NA	75	1181+44		4	11,30,76,118,122
Hot Cat Creek	067-2	3-122.03	67	378.5	NA	75	1242+94		4	5,11,17,30,31,48,61,76,118, 121,122
Unnamed Creek	067-1	3-122.02	67	375.9	NA	75	1367+33		3	11,17,30,76,118,122
Unnamed Creek	066-4	3-122.01	66	374.3	NA	75	1447+20		3	11,17,30,76,118,122
Isom Creek	066-3	3-122	66	371.4	NA	76	1642+50		4	3,5,11,29,30,31,48,76,118, 122
Tributary to Isom Creek	066-2	3-121.02	66	370.6	NA	76	1649+50		3	3,5,11,17,29,30,31,48,76, 118,122
Tributary to Isom Creek	066-1	3-121.01	66	370.4-370.5	NA				4	
Tributary to Isom Creek	065-1	3-121	65	364.4	NA	76	1682+08		4	11,30,76,118

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Yukon River	064-2	3-120	64	361.3-361.7	NA	77-78	58+00		1	1,3,4,11,13,17,20,21,29,30,38,48,76,118
Burbot Creek	064-1	3-119	64	359.3	NA	78	158+21	1HR168+10	4	5,11,20,21,29,30,48,76,118
Woodchopper Creek	063-1	3-118	63	358.4	NA	78	215+30	1HR215+20	4	5,11,20,21,29,30,48,76,118
Phelps Creek	062-4	3-117	62	352.9	NA	79	508+70	1HR501+00	1	5,11,20,21,29,30,48,64,76,118
Unnamed Creek	062-3	3-116	62	351.1	NA	79	600+50	1HR578+10	3	122
Unnamed Creek	062-2	3-115	62	350.0	NA	80	665+00	1HR661+20	3	122
Stumblin Creek	062-1	3-114	62	348.6	NA	80	736+00	1HR736+12	3	122
Unnamed Creek	061-3	3-113	62	347.3	NA	80	811+25	1HR812+00	4	
Unnamed Creek	061-2	3-112	61	345.4	NA	80	899+00	1HR892+15	3	11,17,20,21,29,119,122
Fort Hamlin Hills Creek	061-1	3-111	61	344.1	NA	81	971+50	1HR1011+08	4	5,11,20,21,29,30,45,61,70,76,118
Knowater Creek	060-2	3-110.01	60	341.3	NA	81	1123+25	1HR1158+45	3	11,20,21,30,76,118,122
North Fork Ray River	060-1	3-110	60	337.9	NA	82	58+49	1HR1337+34	4	1,5,11,17,20,21,29,30,38,48,55,64,74,76,77,118
Fed Creek	059-1	3-109	59	333.2	NA	82	270+25	1HR1600+24	3	11,29,30,48,76,118,121,122
South Branch West Fork Dall River	057-3	3-108	57	325.8	NA	84	673+00	1HR2001+50	4	1,5,11,20,21,29,30,38,48,76,118
Middle Branch West Fork Dall River	057-2	3-107	57	323.4	NA	84	798+00	1HR2125+39	4	1,5,11,20,21,29,30,38,48,76,118
Smoky Creek	057-1	3-106.02	57	322.7	NA	84	818+75	1HR2163+02	3	11,20,21,30,76,118,121,122
Unnamed Creek	056-3	3-106.01	56	321.1	NA	85	915+75	1HR2245+45	4	11,20,21,30,76,118,121,122
Finger Mountain Creek	056-2	3-106	56	320.2	NA	85	961+66	1HR2291+88	4	5,11,20,29,30,48,76,118
Unnamed Creek	056-1	3-105.01	56	319.8	NA	85		1HR2313+24	4	
Olson's Lake Creek	055-3	3-105	55	316.9	NA	85	1149+38	1HR2469+77	4	5,11,29,30,48,70,76,118
Kristie's Creek	055-2	3-104.01	55	316.6	NA	85		1HR2485+18	4	
Caribou Mountain Creek	055-1	3-104	55	314.1	NA	86	56+03	1HR2609+50	4	5,11,29,30,31,48,76,118
Kanuti River	054-4	3-103	54	311.0	NA	86	231+00	1HR2777+75	4	1,3,5,11,13,17,20,21,29,30,31,32,37,55,67,74,76,118
Netsch's Creek Tributary #1	054-3	3-102	54	309.1	NA	87	331+60	1HR2875+90	4	11,29,30,76,118,122
Netsch's Creek Tributary #2	054-2	3-101	54	308.7	NA	87	349+00	1HR2894+95	4	11,29,30,76,118
Netsch's Creek Tributary #3	054-1	3-100.01	54	308.5	NA	87	370+80	1HR2944+05	4	11,30,76,118
South Fork Fish Creek	053-4	3-100	53	305.0	NA	87	520+50	1HR3255	4	1,3,5,11,20,21,29,30,48,76,118
Middle Fork Fish Creek	053-3	3-99	53	304.0	NA	87	577+90	1HR3255	1	1,3,5,11,20,21,29,30,48,76,118
Fish Creek	053-2	3-98	53	302.3	NA	88W	653+50	1HR3255+12	1	1,3,5,11,17,20,21,29,30,34,37,38,48,55,64,67,76,118,123
Alder Mountain Creek	053-1	3-97	53	300.7	NA	88W	742+50	2HR115+00	4	5,11,20,21,29,30,48,76,118

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Pung's Crossing Creek #1	052-4	3-96.01	52	297.6	NA	89	932+40	2HR363+36	4	5,11,20,21,30,76,118
South Fork Bonanza Creek	052-3	3-95	52	293.8	NA	89	1123+60	2HR550+59	1	1,3,5,11,17,20,21,29,30,31, 34,47,38,55,76,77,118
Grizzly Creek	052-2	3-94.03	52	293.7	NA	89		2HR545	1	11,118,122
Unnamed Bonanza Creek Channel	052-1	3-94.02	52	293.7	NA	89	1128+60	2HR547	2	11,20,21,30,76,118,122
Oxbow Lake System	051-5	3-94.01	51	293.2	NA	89	1148+00	2HR561+64	3	11,20,30,48,76,118,122
North Fork Bonanza Creek	051-4	3-94	51	292.2	NA	89	1208+32	2HR606+69	1	1,3,5,11,17,20,21,29,30,31, 34,38,45,67,76,118,121,123
South Fork Little Nasty Creek	051-3	3-93	51	290.0	NA	90	1327+15	2HR759+84	4	5,11,20,21,29,30,48,67,76, 118,121
Little Nasty Creek	051-2	3-92	51	289.7	NA	90	1340+25	2HR767+82	1	1,5,11,20,21,24,30,48,61,64, 76,118,123
North Fork Little Nasty Creek	051-1	3-91.02	51	289.6	NA	90	1344+10	2HR767	3	11,118,122
Catch 22 Springs	FH-050-2	3-91.01	50	285.3	NA	91			1	122
Prospect Creek	050-3	3-91	50	285.3	NA	91	1590+00	2HR1099+52	1	1,3,5,11,17,20,21,29,30,31, 34,37,38,43,55,70,74,76,77, 118
Unnamed Creek	050-2	3-90.05	50	284.6	NA	91			4	
Unnamed Creek	050-1	3-90.04	50	282.1	NA	91			4	
Douglas Creek	049-2	3-89	49	278.4	NA	92	330+00	2HR1470+34	1	1,3,5,11,17,20,21,29,30,34, 48,62,74,76,118,121
Unnamed Creek	049-1	3-87.03	49	276.6	NA	92			4	
Jim River	048-2	3-87	48	275.2	NA	92	453+50	2HR1579+80	1	1,3,5,11,13,17,20,21,30,34, 38,48,62,76,118,123
Inlet to Grayling Lake	048-1	3-86.05	48	270.4	NA	93	758+70	2HR1893+22	4	
1-Acre Lake	047-6	3-86.04	47	269.8	NA	93	798+30	2HR1926+00	4	122
Grayling Lake Creek	047-5	3-86.02	47	269.3	NA	93	849+00	2HR1949+14	4	11,20,21,30,48,70,76,118
Elwood Creek	047-4	3-86.01	47	267.6	NA	94	884+20	2HR2017	4	
East Fork Abba-Dabba Creek	047-3	3-86.005	47	267.0	NA	94		2HR2069+59	4	
Abba-Dabba Creek	047-2	3-86	47	266.5	NA	94	963+28	2HR2098+18	1	1,5,11,20,21,29,30,48,61, 64,74,75,76,77,122
South Fork Koyukuk River	047-1	3-85	47	264.4	NA	94-95	1073+00	2HR2206+88	4	
South Fork Koyukuk River	046-4	3-85	46	264.3	NA	94-95	1073+00	2HR2206+88	1	1,3,5,11,13,17,20,21,29,30, 48,76,118
Crossroads Creek #1	046-3	3-82.03	46	259.5	NA	95	222+50	3HR129+23	3	11,20,21,29,30,76,118,122

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Crossroads Creek #2	046-2	3-82.02	46	259.4	NA	95	288+75	3HR129+58	4	11,20,21,29,30,76,118
Chapman Creek	046-1	3-81	46	258.3	NA	96	295+17	3HR205+23	1	1,5,11,20,21,29,30,48,76,118
South Fork Windy Arm Creek	045-7	3-80	45	257.3	NA	96	343+75	3HR255+64	1	1,11,20,21,29,30,48,76,118,121
North Fork Windy Arm Creek	045-6	3-79	45	256.0	NA	96	417+25	3HR326+94	1	1,5,11,20,21,29,30,48,64,74, 76,118
Unnamed Creek	045-5	3-78.01	45	255.1	NA	96	458+70	3HR369+59	4	11,20,21,30,76,118,121
Trent's Trickle	045-4	3-78	45	254.0	NA	96	518+39	3HR413+47	1	5,11,20,21,29,30,48,61,62,70, 76,118,122
Jackson's Slough East Channel #1	045-3	3-77.02	45	253.3	NA	97	555+85	3HR452+15	1	5,11,30,34,48,61,62,64,76,118, 123
Jackson's Slough Cross Channel	045-2	3-77.01	45	253.0	NA	97	570+70	3HR464+00	1	5,11,29,30,34,48,61,62,66,74, 76,118,123
Jackson's Slough East Channel #2	045-1	3-77	45	252.8	NA	97	593+00	3HR483+00	1	5,11,30,34,48,61,62,64,76,118, 123
Cathedral Mountain Creek	044-6	3-75	44	251.8	NA	97	626+40	3HR528+26	2	11,122
Rosie Creek	044-5	3-74	44	250.5	NA	97	666+00	3HR599+00	1	3,5,11,17,20,21,29,30,31,48, 74,76,77,118
First Creek	044-4	3-72.06	44	248.1	NA	97		3HR727+14	4	11,20,21,30,76,118
Tributary to East Fork Spring Slough	044-3	3-72.04	44	247.0	NA	97-98	835+50	3HR776+84	4	5,11,30,76,118
Tributary to Spring Slough #1	044-2	3-72.03	44	246.8	NA	98		3HR783+98	1	5,11,30,76,118
Tributary to Spring Slough #2	044-1	3-72.02	44	246.7	NA	98		3HR790+14	1	5,11,30,76,118
Tributary to Spring Slough #3	043-9	3-72.01	43	246.5	NA	98		3HR797+60	1	5,11,30,48,76,118
Slate Creek	043-8	3-72	43	245.0	NA	98	976+83	3HR876+86	1	1,3,4,11,17,20,21,29,30,31, 34,38,76,118,122,123
Calf Creek	043-7	3-71	43	244.3	NA	98	1004+75	3HR910+70	4	5,11,29,30,31,48,76,118
South Fork Clara Creek Overflow	043-6	3-70.01	43	244.0	NA	98	1015+80	3HR925+49	4	5,11,29,30,31,48,76,118
Clara Creek Overflow	043-5	3-70	43	243.9	NA	98	1019+50	3HR933+34	4	5,11,29,30,31,48,64,76,118
Clara Creek	043-4	3-69	43	243.8	NA	98	1036+20	3HR941+85	4	5,11,17,29,30,31,34,48,76,118
South Fork Mary Angel Creek	043-3	3-65	43	241.5	NA	98-99	4+30	3HR1052+04	4	5,11,29,30,31,48,64,76,118
Mary Angel Creek	043-2	3-63.04	43	241.4	NA	99	8+40	3HR1055+57	1	5,11,30,34,48,61,64,70,74,76, 118,123
South Fork Sharon Creek	043-1	3-63.03	43	240.8	NA	99	38+70	3HR1076+29	4	5,11,30,76,118
Marion Creek	042-6	3-63	42	240.3	NA	99	59+85	3HR1114+14	1	1,3,5,11,20,21,29,30,31,34,38, 48,74,76,118,122

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
North Marion Creek Overflow #1	042-5	3-63.04	42	240.2	NA	99	68+80	3HR115	2	11,30,76,118,122
North Marion Creek Overflow #2	042-4	3-62.03	42	240.1	NA	99	70+75	3HR1120+33	4	11,30,76,118
North Marion Creek Overflow #3	042-3	3-62.02	42	240.0	NA	99	87+00	3HR1122+90	4	11,30,76,118
Pence's Pond Creek	042-2	3-62.01	42	239.9	NA	99	85+50	3HR1143+81	4	5,11,20,21,30,31,48,76,118
Dry Gulch	042-1	3-62	42	236.3	NA	99	265+00	3HR1335+38	4	
South Fork Confusion Creek	041-7	3-61.03	41	234.1	NA	100	369+00	3HR1439+92	3	5,11,20,30,31,48,76,77,118
Confusion Creek	041-6	3-61.02	41	233.9	NA	100	391+70	3HR1443	4	5,11,20,30,31,48,76,118
Middle Fork Confusion Creek	041-5	3-61.015	41	233.8	NA			3HR1443+50	4	
Minnie Creek	041-4	3-61	41	232.3	NA	100	454+46	3HR1519+34	4	1,3,5,11,17,20,21,29,30,34,38,48,76,118,123
Middle Fork Koyukuk River	041-3	2-60.19	41	231.2	NA	100	495+50	3HR1588+80	1	1,3,5,11,13,17,20,21,30,76,118,123
Union Gulch Creek	041-2	2-60.17	41	230.3	NA	100	536+00	3HR1600	1	5,11,20,21,30,48,76,118
Confederate Gulch Creek	041-1	2-60.16	41	229.8	NA	100	590+75	3HR1655+00	4	11,30,76,118
Middle Fork Koyukuk River	040-8	2-60.13	40	228.8	NA	101	651+50	3HR1726+35	4	1,5,11,13,20,21,29,30,38,48,76,118
One-O-One Creek	040-7	2-60.122	40	228.6	NA	101	663+45	3HR1734+29	4	
Coon Gulch Creek	040-6	2-60.121	40	228.1	NA			3HR1758	4	
Richardson's Slough	040-5	2-60.12	40	226.1	NA	101	778+30	3HR1861+03	1	5,11,30,48,76,118
Over Creek #4	040-4	2-60.07	40	225.7	NA	101	805+39	3HR1896+30	4	1,11,30,48,76,118
Nugget Creek	040-3	2-60	40	224.2	NA	101	886+60	3HR1969+70	4	5,11,20,21,30,34,48,76,118,121
Wolf Pup Creek	040-2	2-59	40	223.7	NA	102	906+50	3HR1990+56	4	5,11,20,30,34,48,76,118,121
Sheep Creek	040-1	2-53	40	223.2	NA	102	933+00	3HR2018+85	4	5,11,20,21,29,30,34,48,76,118
Cushing Creek	039-4	2-52.01	39	222.9	NA	102	948+60	3HR2033+06	4	5,11,20,30,48,76,118,122
Gold Creek	039-3	2-52	39	222.4	NA	102	976+00	3HR2059+11	4	3,5,11,17,20,21,29,30,31,34,64,76,118,121
Linda Creek	039-2	2-51	39	221.9	NA	102	1001+18	3HR2087+21	4	5,11,17,20,21,29,30,31,34,48,76,118,121
Valve Site Creek	039-1	2-49.07	39	219.7	NA	102	1121+05	3HR2203+04	3	11,20,30,76,118
Sukakpak Creek	038-8	2-49.03	38	216.5	NA	103	1305+00	3HR2373+80	1	5,11,20,21,30,31,61,62,76,118,123

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Access Road Creek	038-7	2-49.026	38	216.2	NA	103		3HR2387+57	4	
West Fork Sukakpak Creek	038-6	2-49.025	38	216.0	NA	102		3HR2395	4	
Middle Fork Koyukuk River	038-5	2-49	38	214.3-214.6	NA	103	1361+45	3HR2440+47	1	1,3,5,13,17,20,21,29,30,31,38,48,74,76,118,123
Millie's Meander	038-4	2-48.03	38	214.0	NA	103	1418+76	3HR2489+68	4	11,30,31,48,64,70,76,118,121
Eva's Alv	038-3	2-48.01	38	212.4	NA	103	1507+08	3HR2583+84	1	11,20,30,48,76,118,121
Dietrich River (Lower)	038-2	2-48	38	211.9-212.1	NA	104	1526+55	3HR2604+66	1	1,3,5,11,17,20,21,29,30,31,37,38,48,61,62,76,77,118
1415 Lake Outlet	038-1	2-46.01	38	211.5	NA	104	1556+18	3HR2631+80	4	11,30,76,118,121
Brockman Creek	037-5	2-46	37	210.6	NA	104	1581+87	3HR2662+07	1	11,20,21,29,30,48,64,76,118
South Branch Airport Creek	037-4	2-45.03	37	209.4	NA	104	1637+70	3HR2728+26	4	11,20,30,76,118,123
Airport Creek	037-3	2-45.01	37	208.5	NA	104	1681+92	3HR2775+58	4	11,20,30,48,76,118
Disaster Creek	037-2	2-45	37	207.8	NA	104	1719+41	3HR2809+90	4	3,5,11,20,30,48,64,76,118
Unnamed Creek	037-1	2-43.07	37	207.5	NA	104	1736+51	3HR2826+88	4	11,30,76,118
Snowden Creek	036-4	2-43	36	205.0	NA	105	1870+20	3HR2959+42	1	3,5,11,17,20,21,29,30,34,48,64,76,118,122
Snowden Pond Inlet	036-3	2-41.04	36	204.4	NA	105		3HR2988+41	4	
Number Lake Creek	036-2	2-41.03	36	203.7	NA	105	1941+95	4HR3026+13	4	1,5,11,20,30,48,76,118,121
Ugh Creek	036-1	2-41	36	202.3	NA	105	2011+00	4HR3103+51	4	11,20,30,48,76,118
Steep Creek	035-4	2-39	35	198.3	NA	106	2235+00	4HR3309+86	3	11,29,30,76,118,121,122
Buff Creek	035-3	2-38	35	196.8	NA	106	52+10	4HR3375+85	3	11,29,30,76,118,121,122
Burger's Bayou	035-2	2-36.02	35	196.3	NA	106	72+50	4HR3414+01	1	1,5,11,20,30,48,76,77,118,122
Tracy's Trickle	035-1	2-36	35	193.9	NA	107	212+40	4HR3543+02	4	11,30,76,118,122
Unnamed Creek	034-8	2-34.07	34	192.9	NA	107			4	
Beaver Dam Brook #1	034-7	2-34.05	34	192.4	NA	107	295+10	4HR255+58	1	11,30,76,118,122
Beaver Dam Brook #2	034-6	2-34.04	34	192.0	NA	107	321+32	4HR280+97	1	11,30,76,118,122
Beaver Dam Brook #3	034-5	2-34.03	34	191.8	NA	107	329+88	4HR290+66	1	11,30,76,118,122
Beaver Dam Brook #4	034-4	2-34.02	34	191.8	NA	107	334+05	4HR293+50	1	11,30,76,118,122
Nutirwik Creek	034-3	2-34	34	190.8	NA	107	375+54	4HR343+00	1	3,5,11,17,20,21,30,38,48,64,67,76,118,122
Homewood Spring	034-2	2-32.05	34	188.4	NA	107	496+00	4HR470+00	1	30,41,76,118,122
Unnamed Creek	034-1	2-33	34	187.8	NA	108	525+75	4HR496+86	4	
Overwintering Creek	033-6	2-32.02	33	186.8	NA	108		4HR553+73	1	11,30,40,41,64,76,118
Nina Creek	033-5	2-31.01	33	186.0	NA	108		4HR592+16	4	

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Oskar's Eddy	033-4	2-31	33	185.1	NA	108	662+80	4HR632+98	4	5,11,30,87,118
Unnamed Creek	033-3	2-30.02	33	184.9	NA	108	675+00	4HR649+00	3	11,20,30,76,118
Wetfoot Creek	033-2	2-29.04	33	184.0	NA	108		4HR690	1	11,118,121,122
Dietrich River Floodplain	033-1	2-29.03	33	182.1-183.3	NA	109			1	1,3,5,11,20,30,31,62,76,118,121,126
Dietrich River Floodplain	032-3	2-29.02	32	181.8-182.1	NA	109			1	1,3,5,11,20,30,62,118,122,126
Unnamed Creek	032-2	2-28.02	32	177.4	NA	109			4	
Unnamed Creek	032-1	2-28.01	32	177.0	NA	109			4	
West Fork of North Fork Chandalar River	031-3	2-28	31	175.4	NA	109	55+00-78+72		4	1,3,5,11,20,21,30,42,64,76,77,118
East Creek	031-2	2-27.04	31	171.8	NA	110		5HR1427	4	1,3,5,11,30,31,48,67,76,118
North Atigun Pass Creek	031-1	2-27.03	31	171.7	NA	110		5HR1449+51	4	
Unnamed Creek	030-2	2-27.02	30	168.6	NA				4	
Unnamed Creek	030-1	2-27.01	30	165.5	NA				4	
Who Creek	029-8	2-26	29	163.8	NA	111	673+00	5HR520+00	4	11,30,76,118
Mickey's 6:30 Creek	029-7	2-25.03	29	163.6	NA	111-112	678+30	5HR541+88	4	11,30,76,118
Whybother Creek	029-6	2-25.02	29	163.5	NA	112		5HR550+80	4	11,30,76,118
Unnamed Creek	029-5	2-25.01	29	163.2	NA	112	681+00	5HR552+37	4	11,30,76,118
Trevor Creek	029-4	2-25	29	160.6	NA	112	837+00	5HR709+72	4	11,30,48,64,70,76,118,123
Tyler Creek	029-3	2-24.008	29	160.5	NA	112	881+00	5HR717+90	4	11,30,48,78,118,121
Unnamed Creek	029-2	2-24.007	29	159.6	NA	112			4	
Bicycle Creek	029-1	2-24.006	29	159.5	NA	112			4	
Waterhole Creek	028-2	2-24.005	28	158.8	NA	112	724+83	5HR801+90	4	
Roche Moutonee	028-1	2-24	28	154.1	NA	113	1170+91	5HR1053+28	1	3,11,30,48,57,62,64,76,118
Leentha Creek	027-4	2-23.015	27	152.9	NA	113-114		5HR1122+00	4	11,121
Holden Creek	027-3	2-23.01	27	151.8	NA	114	30+44	5HR1176+47	1	11,30,48,62,64,76,118,121,123
Tad Creek	027-2	2-22.04	27	151.7	NA	114	44+00	5HR1169	4	11,118,121
Atigun River	027-1	2-22	27	148.4	NA	114	20+94	5HR1364+44	1	1,3,5,11,30,31,48,76,77,118
Jill Creek	025-9	2-21.11	25	141.6	NA	115	380+60	6HR229+00	4	11,30,48,64,76,118,121,122
Jill Creek Tributary	025-8	1-21.10	25	141.5	NA	115	395+24	6HR234+75	4	11,30,48,76,118
Ed Creek	025-7	1-21.09	25	140.9	NA	115	421+74	6HR436+25	4	11,20,30,48,76,118,121,122,123
Mack Creek	025-6	1-21.08	25	140.6	NA	115	438+29	6HR452+00	1	11,30,48,76,118,122,123

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Terry Creek	025-5	1-21.07	25	139.9	NA	115	466+12	6HR490+00	4	11,30,48,64,76,118
Moss Creek	025-4	1-21.06	25	139.4	NA	115	494+00	6HR500+41	4	11,30,48,76,118
Hallock Creek	025-3	1-21.05	25	139.3	NA	115	504+27	6HR512+00	4	11,30,48,76,118
Clawsod Creek	025-2	1-21.045	25	137.6	NA	115	586+37	6HR607+00	4	
Yan Creek	025-1	1-21.04	25	137.0	NA	115	629+06	6HR641+00	4	11,30,48,76,118,122
Kuparuk River	024-1	1-21	24	132.6	NA	117	842+00	6HR936+50	1	1,3,5,11,29,30,36,48,64,67, 76,118
East Fork Kuparuk River	023-3	1-20.01	23	130.6	NA	117	921+55	6HR911+80	4	5,11,30,48,64,76,118,121
Toolik River	023-2	1-20	23	130.0	NA	117	968+30	6HR948+50	4	3,5,11,29,30,48,64,76,118, 121,122
East Fork Toolik River	023-1	1-19.01	23	129.6	NA	117	973+30	6HR970+25	4	11,30,48,76,118,121,122
Mary Lamb Creek	022-2	1-19.005	22	125.0	NA	117	1037+00	6HR1011+00	4	
Oksrukuyik Creek	022-1	1-19	22	124.0	NA	118	1325+64	6HR1285+32	4	1,3,5,11,29,30,48,50,57,64, 76,118
Lower Oksrukuyik Creek	020-1	1-18+18.01	20	110.3	NA	120	895+76	6HR2109+00	1	1,11,30,48,57,64,70,76,77, 118,123,124
Rudy Creek	019-6	1-17	19	108.6	NA	120	947+99	6HR2153	1	3,11,29,30,48,76,118,121,122
Bassett Creek	019-5	1-16.03	19	107.0	NA	121	1029+20	6HR2228+14	4	11,30,48,76,118
Dennis Creek	019-4	1-16.02	19	106.9	NA	121	1033+60	6HR2234+80	1	11,30,48,76,118,121,122
Climb Creek	019-3	1-16.01	19	106.3	NA	121	1060+34	6HR2262+60	4	11,30,38,64,76,118,121
Poison Pipe Creek	019-2	1-16	19	106.1	NA	121	1077+10	6HR2318+92	1	11,29,30,48,76,118
Polygon Creek	019-1	1-15	19	105.1	NA	121	1125+00	6HR2351+97	1	11,30,48,64,76,118,122
Gustafson Gulch	018-4	1-14	18	102.3	NA	122	1280+00	6HR2517+85	1	11,30,48,63,76,118,121,122
Arthur Creek	018-3	1-13	18	101.9	NA	122	1297+50	6HR2536+20	1	11,20,30,48,63,64,71,118,122
Sagavanirktok River Side Channel	018-2	1-12.05	18	99.7	NA	122	1424+79	6HR2657+20	4	11,30,48,64,76,118,121
Sagavanirktok River Side Channel	018-1	1-12.04	18	99.1	NA	122	1445+85	6HR2684+43	4	11,30,48,76,118,121
Stump Creek	017-3	1-12.02	17	97.4	NA	122	1499+00	6HR2770+86	1	11,30,48,57,63,76,118
Tributary to Lori Creek	017-2	1-12.015	17	94.7	NA	123			4	
Lori Creek	017-1	1-12.01	17	93.6	NA	123	1719+50	6HR2974+15	4	11,30,48,63,70,76,118,121
Charlotte Creek	016-3	1-12	16	91.5	NA	123	20+12	6HR3083+19	1	11,29,30,64,76,118,122
Happy Valley Camp Creek	016-2	1-11	16	87.6	NA	124		6HR3259+77	1	3,5,11,29,30,48,63,64,76, 118,122
Milke Creek	016-1	1-10	16	87.1	NA	124		6HR3281+77	1	3,11,29,30,48,63,64,76,118
Woody Creek	015-3	1-9.5	15	86.4	NA	124	256+83	6HR3332	4	30
Stout Creek	015-2	1-9	15	83.6	NA	124	441+00	6HR3471+69	1	11,30,48,64,70,76,118,122

Provisional List of Waterbodies (continued)

Waterbody	NPRX	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Station	Haul Road Station	Fall Criteria	References
Spoiled Mary Creek	015-1	1-8	15	82.4	NA	125	493+95	6HR3535+62	4	11,29,30,48,76,118,122
Mark Creek	014-1	1-7	14	76.5	NA	126	791+40	6HR3849+11	1	3,11,42,43,76,118
Toolik River Tributary	013-1	1-5.49	13	69.6	NA	126W		6HR4198+97	4	11,30,42,43,76,118
Sand Creek	012-2	1-5.485	12	67.8	NA	126W			4	
Unnamed Creek	012-1	1-5.48	12	64.3	NA	126W		6HR4481+00	3	11,30,42,43,76,118,122
Lake 802	010-1	1-5.295	10	54.4	NA	129		7HR802	4	
East Fork Sylvia Creek	007-5	1-5.055	7	39.3	NA	132	1286+60	7HR1608+94	2	11,118,122
Sylvia Creek	007-4	1-5.05	7	39.0	NA	132	1315+25	7HR1624+77	4	11,30,48,76,118
Tributary to Short Creek	007-3	1-5.045	7	38.6	NA	132	4829+00	7HR1645+56	4	
Short Creek	007-2	1-5.02	7	38.4	NA	132	4822+81	7HR1655+59	4	11,30,48,76,118
Telma Creek	007-1	1-5.01	7	35.8	NA	132	4951+44		1	11,30,48,76,118,122
Pescado Creek	005-2	1-4.07	5	27.4	NA	134		7HR2232+10	1	122
Unnamed Lake	005-1	1-4.06	5	26.7	NA	135		7HR2482+36	4	11,30,76,118
Low-Life Creek	004-2	1-3.05	4	23.0	NA	135	806	7HR2412+36	1	122
Unnamed Lake	004-1	1-3.04	4	17.5	NA				4	
Unnamed Lake	003-1	1-3.03	3	12.5	NA	137			4	
Little Putuligayuk River	002-1	1-3	2	9.4	NA	137	1478+52		3	3,11,30,48,57,76,118,121,122
Putuligayuk River	001-1	1-1	1	3.2	NA	138			1	27,30,40,48,56,76,118,121

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