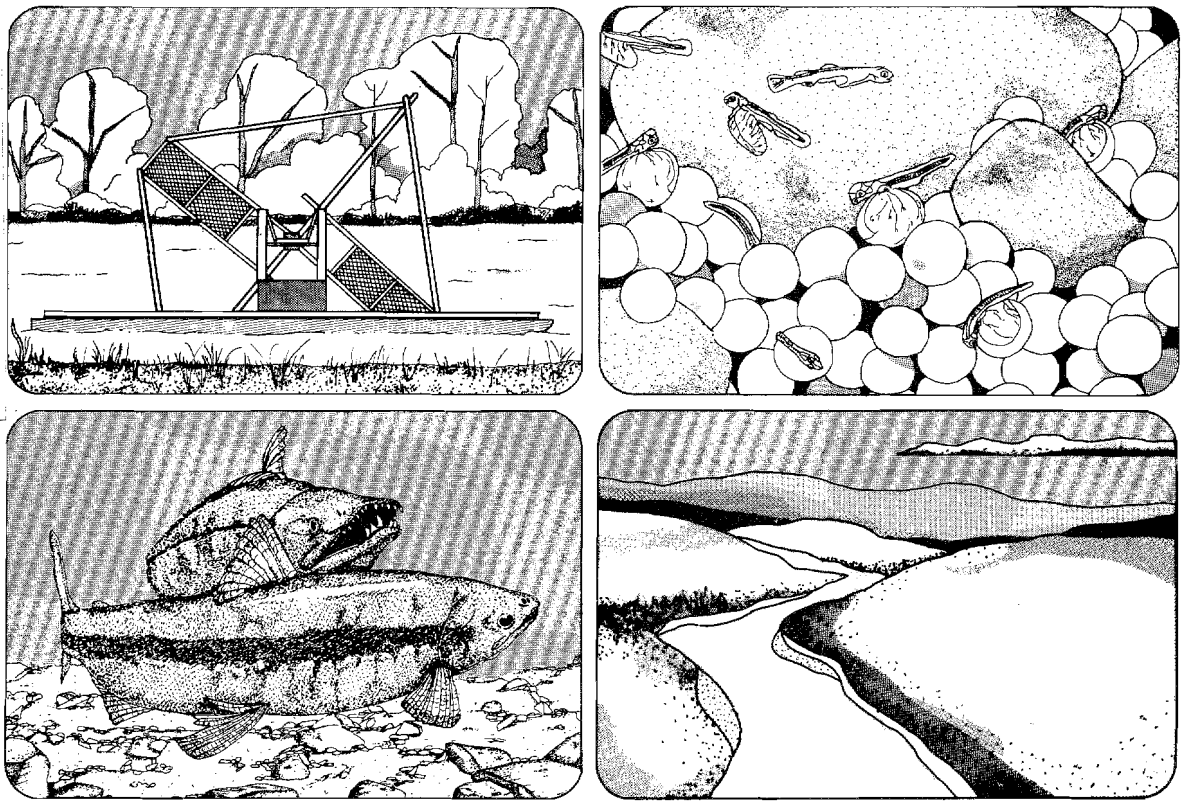

REPORT NO. 3

# AQUATIC HABITAT AND INSTREAM FLOW INVESTIGATIONS (MAY-OCTOBER 1983)

## Chapter 4: Water Quality Investigations



ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES REPORT SERIES

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**REPORT NO. 3**

# AQUATIC HABITAT AND INSTREAM FLOW INVESTIGATIONS (MAY-OCTOBER 1983)

**Chapter 4: Water Quality Investigations**

**Edited by:**

**Christopher C. Estes**
**and**
**Douglas S. Vincent-Lang**

**Prepared for:**

**ALASKA POWER AUTHORITY**
**334 W. FIFTH AVE.**
**ANCHORAGE, ALASKA 99501**

## PREFACE

This report is one of a series of reports prepared for the Alaska Power Authority (APA) by the Alaska Department of Fish and Game (ADF&G) to provide information to be used in evaluating the feasibility of the proposed Susitna Hydroelectric Project. The ADF&G Susitna Hydro Aquatic Studies program was initiated in November 1980. The five year study program was divided into three study sections: Adult Anadromous Fish Studies (AA), Resident and Juvenile Anadromous Studies (RJ), and Aquatic Habitat and Instream Flow Studies (AH). Reports prepared by the ADF&G prior to 1983 on this subject are available from the APA.

The information in this report summarizes the findings of the 1983 open water field season investigations. Beginning with the 1983 reports, all reports were sequentially numbered as part of the Alaska Department of Fish and Game Susitna Hydro Aquatic Studies Report Series.

### TITLES IN THE 1983 SERIES

| Report Number | Title | Publication Date |
|---|---|---|
| 1 | Adult Anadromous Fish Investigations: May - October 1983 | April 1984 |
| 2 | Resident and Juvenile Anadromous Fish Investigations: May - October 1983 | July 1984 |
| 3 | Aquatic Habitat and Instream Flow Investigations: May - October 1983 | 1984 |
| 4 | Access and Transmission Corridor Aquatic Investigations: May - October 1983 | 1984 |

This report, "Aquatic Habitat and Instream Flow Investigations" is divided into two parts. Part I, the "Hydrologic and Water Quality Investigations", is a compilation of the physical and chemical data collected by th ADF&G Su Hydro Aquatic Studies team during 1983. These data are arranged by individual variables and geographic location for ease of access to user agencies. The combined data set represents the available physical habitat of the study area within the Cook Inlet to Oshetna River reach of the Susitna River. Part II, the "Adult Anadromous Fish Habitat Investigations", describes the subset of available habitat compiled in Part 1 that is utilized by adult anadromous fish studied in the middle and lower Susitna River (Cook Inlet to Devil Canyon) study area. The studies primarily emphasize the utilization of side slough and side channel habitats of the middle reach of the Susitna River for spawning (Figure A). It represents the first stage of development for an instream flow relationships analysis report which will be prepared by E.W. Trihey and Associates.

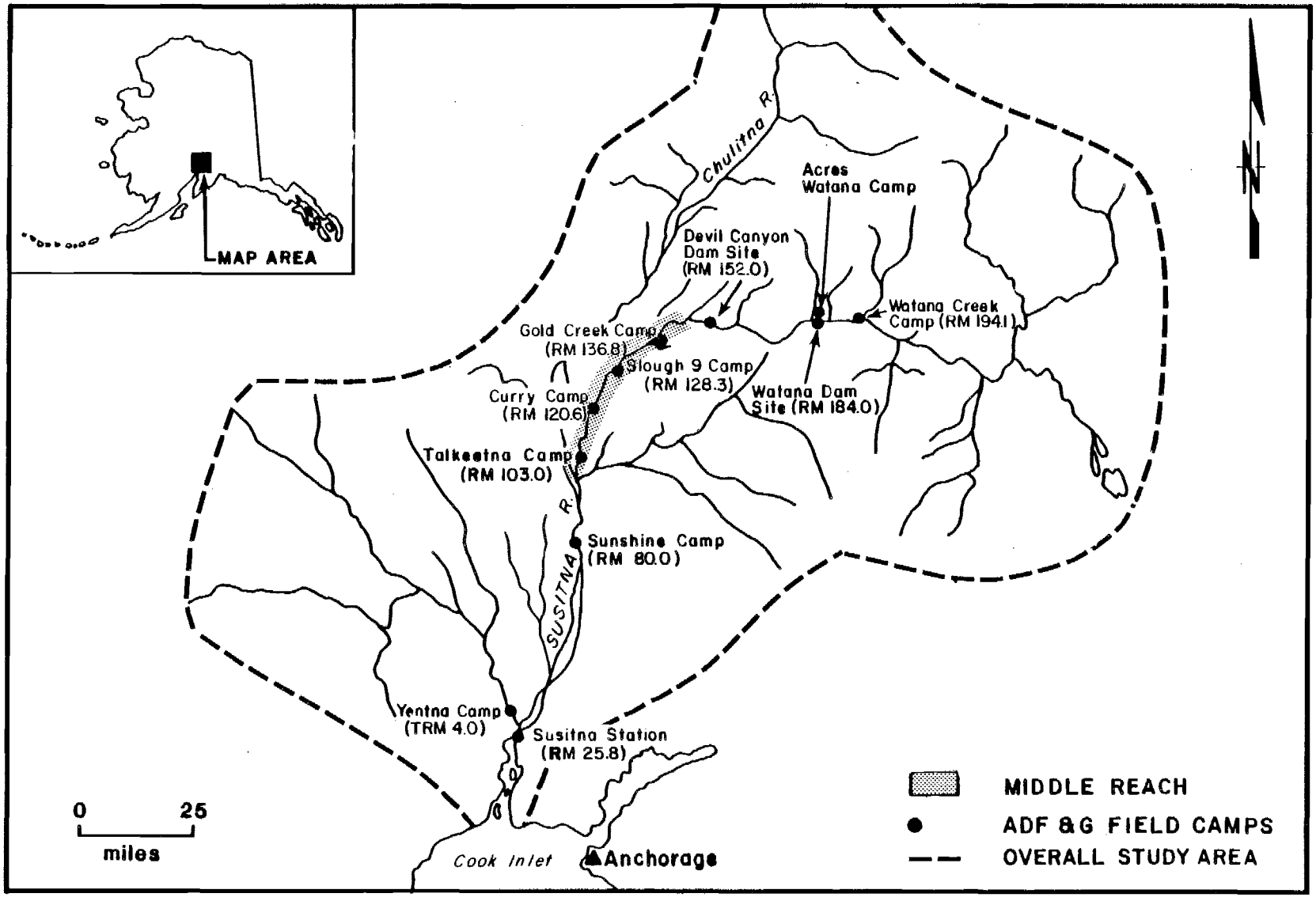


Figure A. Susitna River drainage basin.

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Part One



Part Two



Questions concerning this and prior reports should be directed to:


Alaska Power Authority
334 W. 5th Avenue
Anchorage, Alaska 99501
Telephone (907) 276-0001

# Water Quality Investigations

1984 Report No. 3, Chapter 4

by: Gene Sandone and Tim Quane

Alaska Department of Fish and Game
Susitna Hydro Aquatic Studies
2207 Spenard Road
Anchorage, Alaska 99503

## ABSTRACT

Baseline water quality data have been collected within the Susitna River basin since 1981 in conjunction with the baseline fisheries studies being conducted by the Alaska Department of Fish and Game Susitna Hydroelectric Aquatic Studies Feasibility Team. The primary objective of the data collection program has been to collect baseline water quality data (dissolved oxygen, pH, conductivity, temperature, and turbidity) within the habitats selected for fishery studies that are present in the Susitna River basin and to determine the influences of mainstem discharge conditions on the water quality characteristics of these habitats. Although these investigations have been conducted throughout this large glacially-fed river system, effort has been concentrated in the reach of river extending from Talkeetna (RM 97) to Devil Canyon (RM 150) as impacts from the construction and operation of the proposed hydroelectric development are expected to be greatest in this river reach.

The 1983 investigations (summarized in this report), concentrated on mainstem, side channel, side slough and tributary habitats. Water quality measurements of dissolved oxygen, pH, conductivity and turbidity were obtained in the mainstem Susitna River and the Talkeetna and Chulitna rivers twice a month on an instantaneous basis except for the Talkeetna fishwheel and Gold Creek camp stations, which were monitored daily. Turbidity measurements were obtained from several side channel and side sloughs in the Talkeetna to Devil Canyon reach twice a month.

Results of these investigations indicate that water quality in the mainstem Susitna River is relatively similar among sampling locations but that specific water quality variables at sampling stations change in relation to mainstem discharge. Increased levels of turbidity in the mainstem were found to correlate to mainstem discharge, but are assumed to result from suspended sediment contributed by the Susitna and Maclaren glaciers. Turbidity levels remain low when glacial melt ceases. Turbidity levels in side channels and side sloughs were found to be independent of mainstem discharge prior to breaching of the heads by the mainstem, however subsequent to breaching those sites were found to resemble the turbidity of the mainstem with the controlling factor being the relative flow contribution of the mainstem to that of the site

flow. Tributary water quality was found to be independent of mainstem Susitna River discharge and was determined to influence to varying degrees the water quality conditions of the mainstem depending on the relative size of the tributary.

Information from these studies will be used by other project biologists and engineers to evaluate the impact of hydroelectric development on the Susitna River.

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# 1.0 INTRODUCTION AND OBJECTIVES

## 1.1 Introduction

The Alaska Department of Fish and Game (ADF&G) Susitna Hydroelectric Aquatic Study has collected baseline water quality data throughout the Susitna River basin since 1981. Although measurements of baseline water quality have been obtained throughout the entire river basin, the emphasis of the data collection program has been largely oriented to the reach of the Susitna River extending from Talkeetna to Devil Canyon (middle river). The primary focus of the data collection program to date has been to characterize the baseline water quality conditions present within the mainstem and its peripheral habitats and to determine how these baseline water quality conditions are influenced by mainstem discharge. Results of these investigations are presented in ADF&G 1981, 1982.

## 1.2 Objectives

The overall objective of the FY84 open water field season (May 15 - October 31, 1983) water quality investigations was to continue the monitoring of water quality conditions present in the mainstem, selected side channel, upland and side sloughs, and tributaries of the Susitna River from the Parks Highway Bridge (RM 83.9) to the mouth of Devil Canyon (RM 150.1). The water quality parameters measured included dissolved oxygen (DO), pH, water temperature, conductivity, and turbidity.
The FY 84 open water field season water quality investigations were segregated by habitat into three distinct programs, each with its own specific objectives.

### 1.2.1 Mainstem Habitats

The water quality data collection program conducted in mainstem habitats during the 1983 open water field season was designed to:

1. Characterize the general baseline water quality of the Talkeetna to Devil Canyon reach of the mainstem Susitna River;

2. Determine the effect that mainstem discharge has on selected water quality parameters sampled; and,

3. Support the analyses of fish habitats being conducted in mainstem habitats.

### 1.2.2 Side Channel and Upland and Side Slough Habitats

The water quality data collection program conducted in side channel and side and upland slough habitats during the 1983 open water field season was designed to:

1. Monitor the turbidity levels of selected side channels and sloughs (upland and side) in the Talkeetna to Devil Canyon reach of the Susitna River;

2. Determine the effect that mainstem discharge has on turbidity levels in these peripheral habitats; and,

3. Support the analyses of fish habitats being conducted in these peripheral habitats.

### 1.2.3 Tributary Habitats

The water quality data collection program conducted in tributary habitats during the 1983 open water field season was designed to:

1. Characterize the general water quality influence of the Talkeetna and Chulitna Rivers on the Susitna River.

2. Support the analyses of fish habitats being conducted in tributary habitats.

## 2.0 METHODS

### 2.1 Site Selection

#### 2.1.1 Mainstem Habitats

The mainstem Susitna River water quality monitoring stations were specifically chosen to monitor representative water quality conditions present throughout the 1983 open water field season in the reach of river from Talkeetna to Devil Canyon (Figure 4-1, Table 4-1). Each water quality station was located at a site where continuous water temperature was also collected (see Chapter 3 of this report). Sampling intensity was daily at the two camp locations (Talkeetna fishwheel and Gold Creek Camp), whereas the remaining sites were monitored twice a month (Table 4-1).

#### 2.1.2 Side Channel and Side and Upland Slough Habitats

The side channel and side and upland sloughs selected for water quality monitoring (Table 4-2, Figure 4-1) were chosen based upon their importance as salmon spawning and rearing habitat and their ability to represent side channel and side and upland slough habitats in the Talkeetna to Devil Canyon reach.

Turbidity was monitored twice monthly at each side channel and slough discharge monitoring station.

#### 2.1.3 Tributary Habitats

Tributaries selected for water quality investigations (Table 4-1, Figure 4-1) included the Talkeetna and Chulitna.

The Talkeetna and Chulitna Rivers are major glacial tributaries which join the Susitna River near the town of Talkeetna. Because of their major contribution of flow to the Susitna River general water quality parameters were measured from these two tributaries.

Turbidity data were also collected in Indian River primarily to extend the record of turbidity measurements from this tributary.

The Talkeetna and Chulitna River water quality sites were chosen to coincide with the continuous water temperature stations located in these rivers. The water quality monitoring station for Indian River was the discharge station selected for Indian River.

### 2.2 Field Data Collection

Water quality parameters measured during the 1983 open water field season included dissolved oxygen (DO), pH, water temperature, specific conductance and turbidity. All water quality parameters except turbidity were measured employing a Hydrolab model 4041 portable multiparameter meter using procedures outlined in the FY84 ADF&G Procedures Manual (ADF&G 1984). Turbidity samples were analyzed in the field with a HF

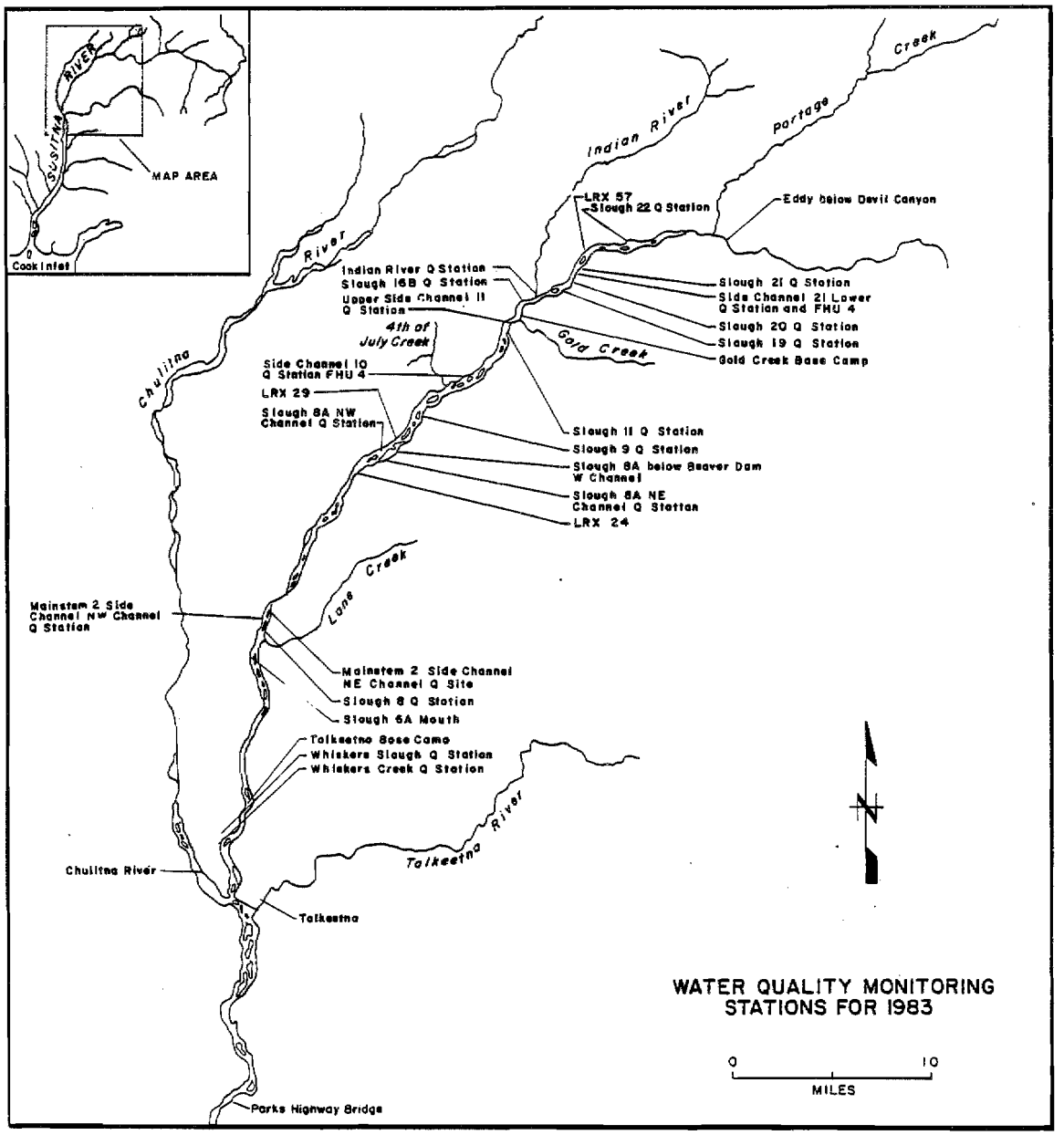


Figure 4-1. Mainstem, side channels, and upland and side slough water quality study sites for 1983.

Table 4-1 Mainstem Susitna River and tributary water quality monitoring stations selected for the 1983 open water field season.

| Location | Habitat | River Mile | TRM[1] | Sample Schedule |
|---|---|---|---|---|
| Parks Highway Bridge | Mainstem | 83.9 | | Twice monthly |
| Talkeetna River | Tributary | 97.2 | 0.5 | Twice monthly |
| Chulitna River | Tributary | 98.6 | 2.0 | Twice monthly |
| Talkeetna Fishwheel | Mainstem | 103.0 | | Daily |
| LRX 24 | Mainstem | 120.7 | | Twice monthly |
| LRX 29 | Mainstem | 126.1 | | Twice monthly |
| MS above Gold Creek | Mainstem | 136.8 | | Daily |
| Indian River | Tributary | 158.6 | 1.0 | Twice monthly |
| LRX 57 | Mainstem | 142.3 | | Twice monthly |
| Eddy below Devil Canyon | Mainstem | 150.1 | | Twice monthly |

[1] TRM = tributary river mile, determined from the mouth of the tributary upstream to the study site.

Table 4-2. Locations of side channel and upland and side slough water quality monitoring stations selected for the 1983 open water field season.

| Site | River Mile |
|---|---|
| **Side channel** | |
| Mainstem II Side Channel | 114.4 |
| Slough 10 Side Channel | 134.2 |
| Upper Side Channel 11 | 136.5 |
| Side Channel 21 | 141.1 |
| **Slough** | |
| Whiskers Creek Slough | 101.4 |
| 6A | 112.3 |
| Slough 8 | 113.7 |
| 8A | 125.5 |
| 9 | 128.9 |
| 11 | 135.7 |
| 16B | 138.0 |
| 20 | 140.2 |
| 21 | 141.0 |

Instrument DRT-15 turbidity meter using procedures outlined in the FY84 ADF&G Procedures Manual (ADF&G 1984).

### 2.3 Analytical Approach

Water quality data collected at mainstem and major tributary sites were tabulated with presentation of the statistical analysis limited to the range and the percentile ranking. Turbidities and temperature obtained at the daily monitored stations in the mainstem were plotted against mainstem discharge and time. Turbidity and discharge were also analyzed for straight line characteristics utilizing a least square regression for these two daily monitoring stations.

Turbidity data collected in side channels and upland and side sloughs, were tabulated with corresponding water surface elevation estimated flow for the study site and mainstem discharge at Gold Creek (USGS 15292000).

## 3.0 RESULTS

### 3.1 Mainstem Habitats

Instantaneous measurements of water quality (dissolved oxygen, pH, water temperature, conductivity, and turbidity) were obtained at seven mainstem Susitna River water quality monitoring stations and two tributaries during the 1983 open water field season. These data are tabulated in Appendix Table 4-A-1. Graphical representations of the range, mean, and median values for each water quality parameter at each station are presented in Figures 4-2 through 4-6. The nature of the sampling procedure (instantaneous measurement) among stations, precludes strict comparisons of the ranges, means, and medians between stations. Thus, these data only provide an overview of the water quality characteristics of the mainstem Susitna River at a specific station.

Percent dissolved oxygen saturation was calculated for each monitoring station using the instantaneous water temperature and dissolved oxygen data bases and utilizing a dissolved oxygen saturation nomograph (Wetzel 1975). These data are tabulated in Appendix Table 4-A-1 and graphically presented in Figure 4-3.

Turbidity measurements collected on a daily basis at the Talkeetna fishwheel station and the Gold Creek camp monitoring stations were plotted against time along with mean daily mainstem Susitna River discharge at Gold Creek (15292000) and mean daily surface water temperatures (Figures 4-7 and 4-8). Turbidity data collected at these mainstem Susitna River monitoring stations were also plotted against mainstem Susitna River discharge at Gold Creek (15292000) (Figures 4-9 and 4-10). A time dependent trend becomes evident when turbidity data is plotted against mainstem Susitna River discharge. The trends are given as four periods of measurements:

1. Early period and late period (5/18/83 to 6/20/83 and 8/15/83 through 10/6/83);

2. Early transitional period (6/21/83 through 6/25/83);

3. Middle period (6/26/83 through 8/6/83);

4. Late transitional period (8/7/83 through 8/14/83).

Large changes in turbidity levels (100 NTUs) for comparable discharges defined the transitional periods. Transitional periods defined the early, late, and middle periods. Transitional period turbidity data were not used in the calibration of the relationships between mainstem turbidity and mean daily mainstem discharge at Gold Creek.

### 3.2 Side Channels and Side and Upland Slough Habitats

Instantaneous water temperature and turbidity measurements were obtained at 5 sites within 5 side channel habitats and at 13 sites within 11 side and upland slough habitats in the Talkeetna to Devil Canyon reach of the Susitna River. These data along with corresponding site specific water

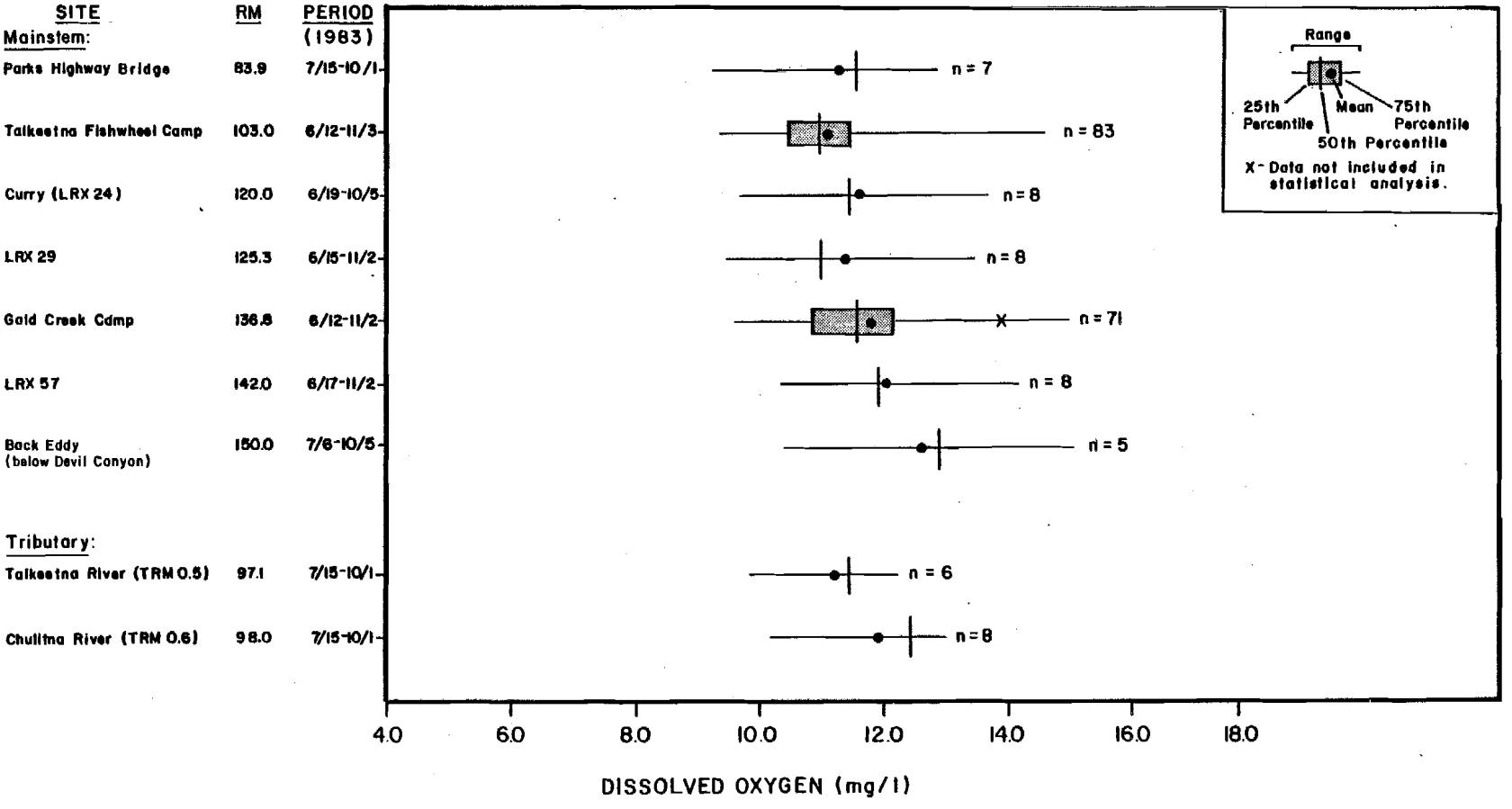


Figure 4-2. Dissolved oxygen data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary water quality study sites.

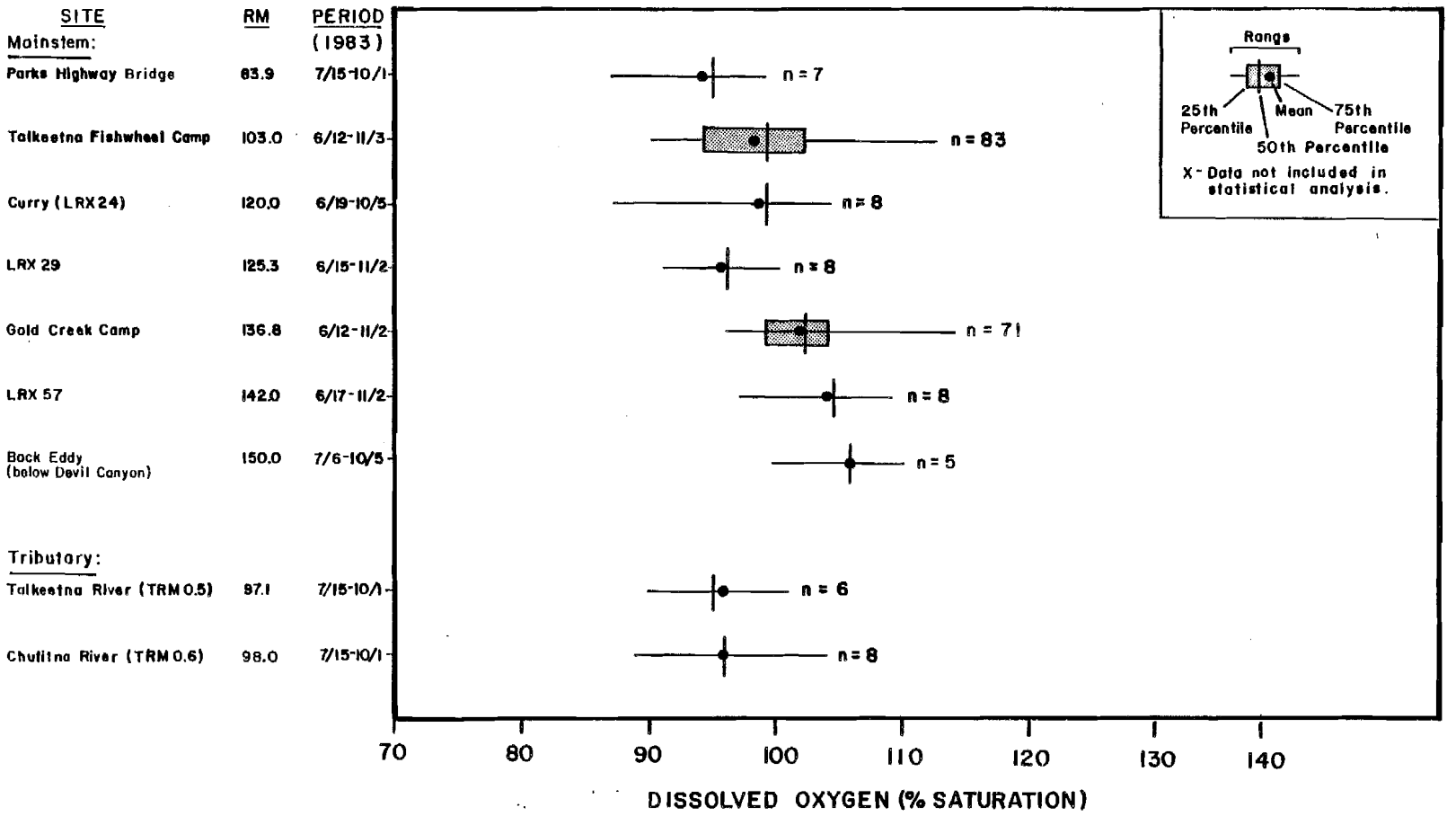


Figure 4-3. Dissolve oxygen percent saturation data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary water quality study sites.

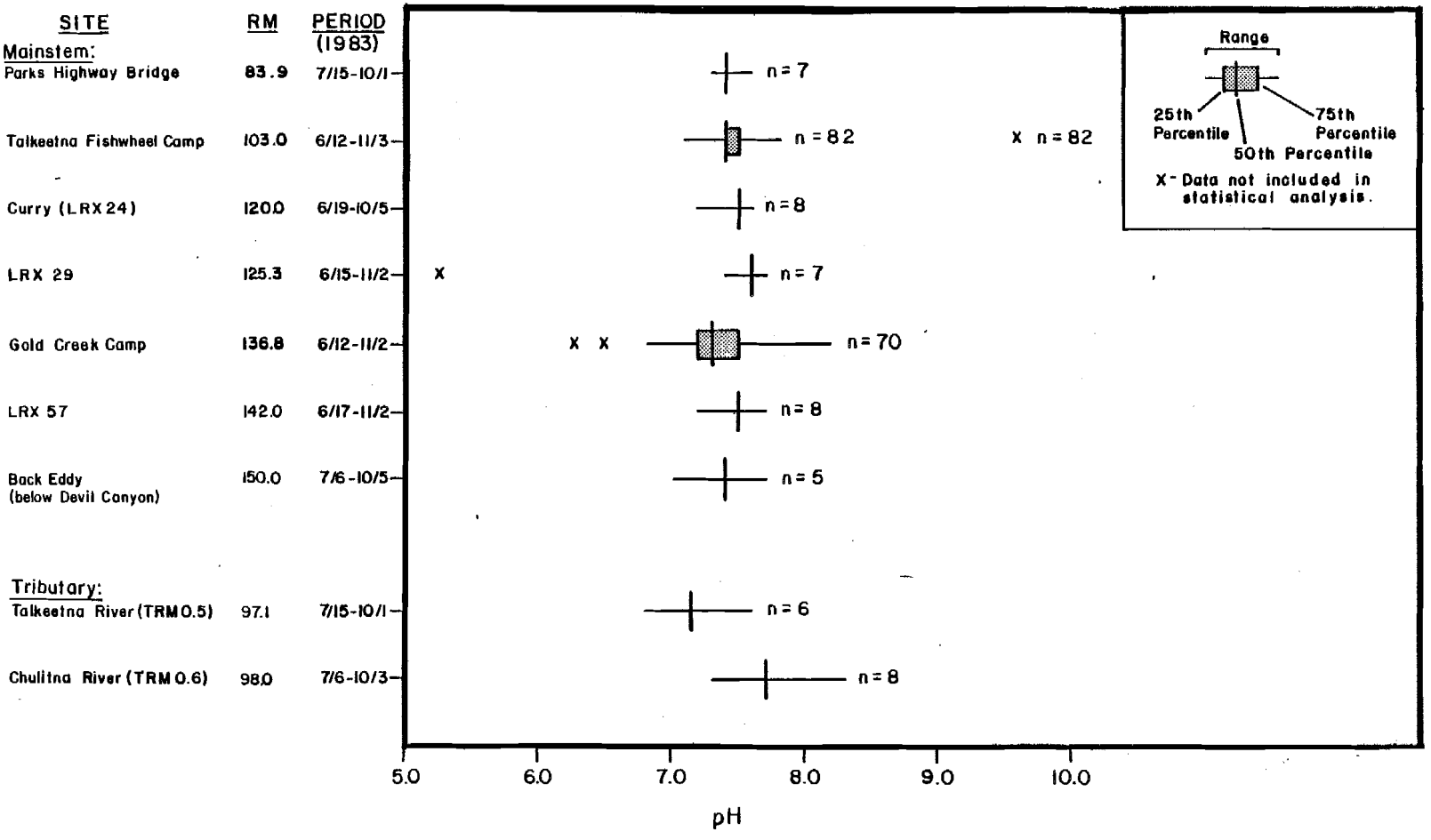


Figure 4-4. pH data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary water quality study sites.

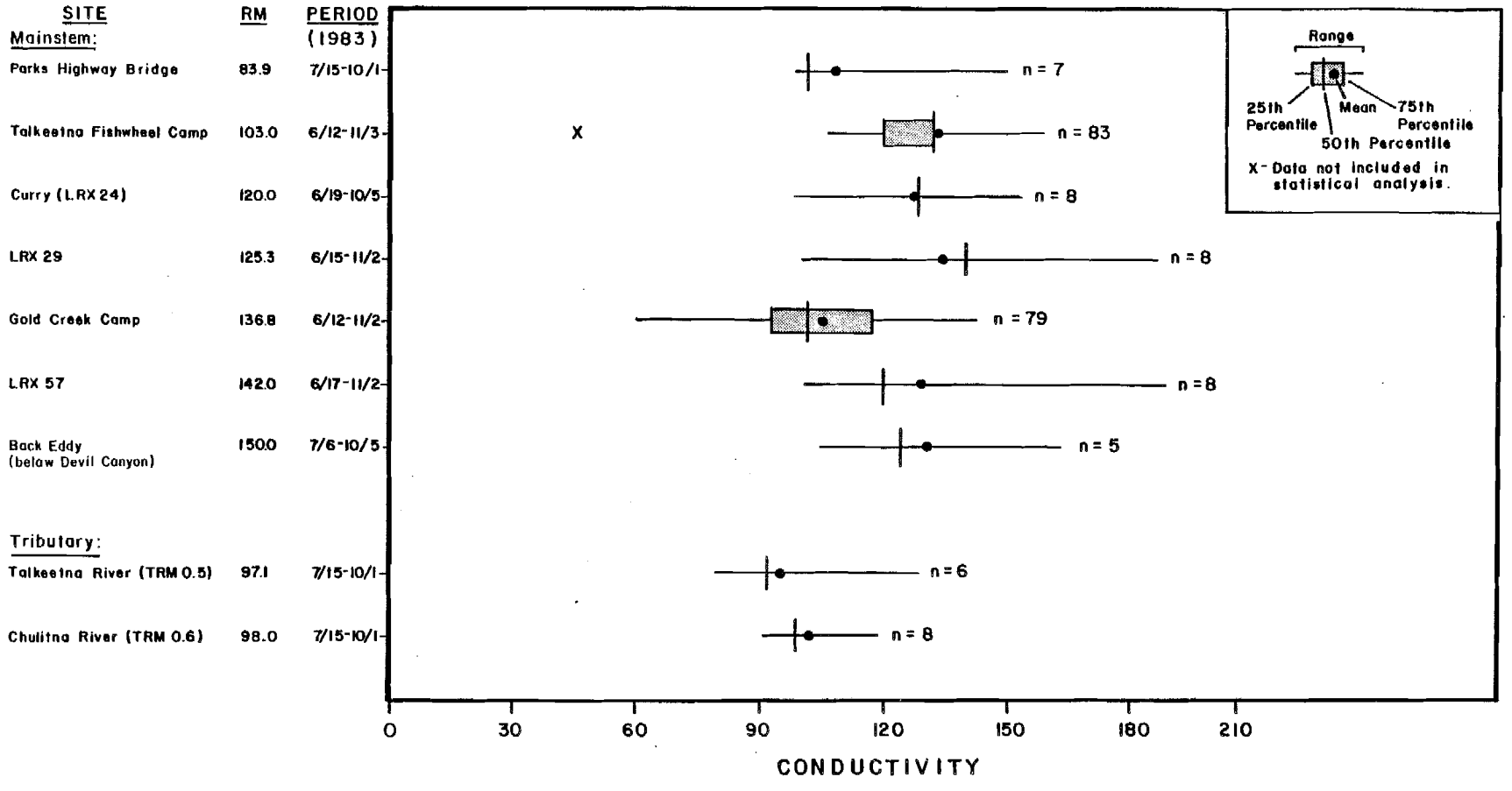


Figure 4-5. Conductivity data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary study sites.

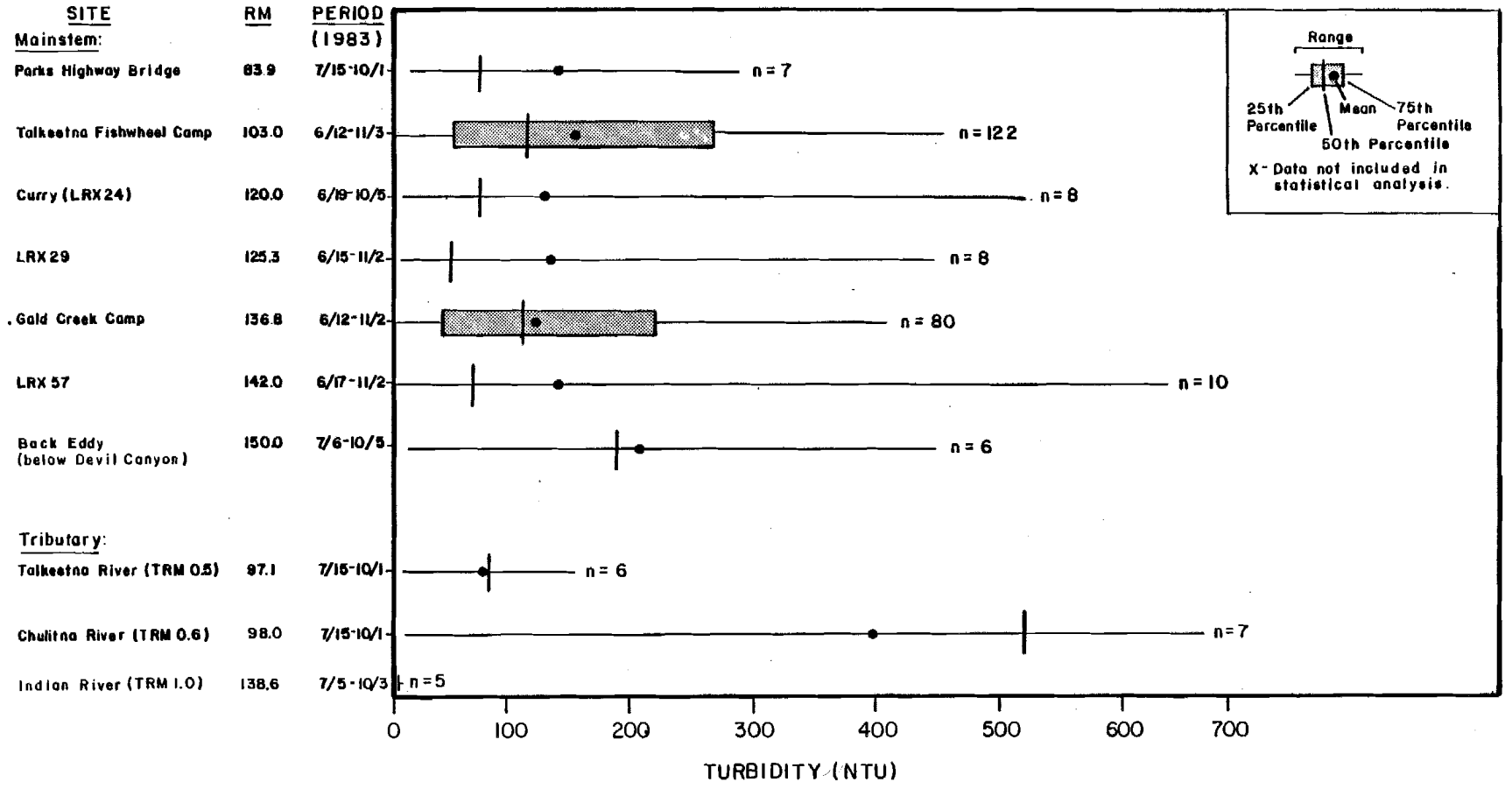


Figure 4-6. Turbidity data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary study sites.

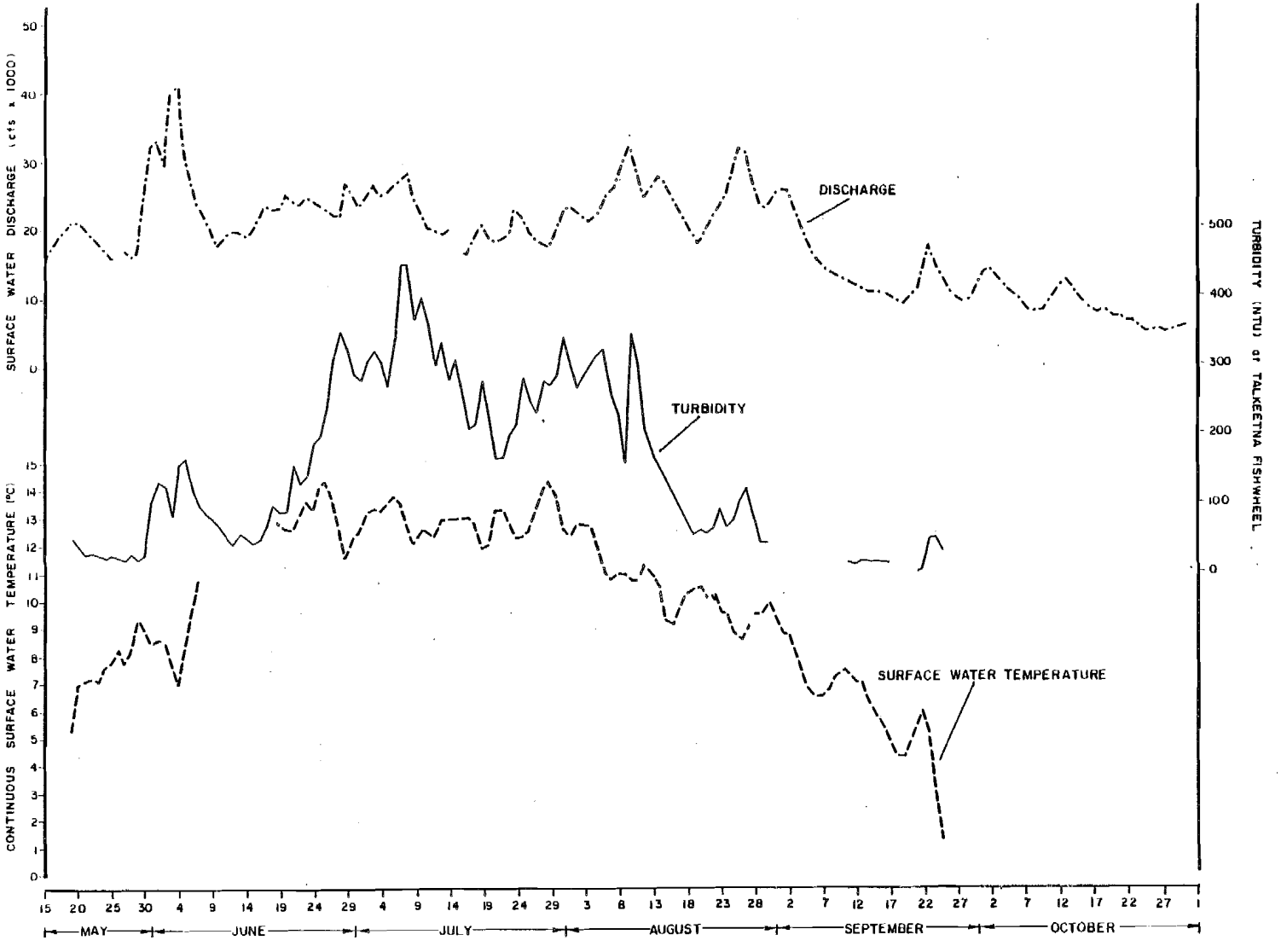


Figure 4-7. Turbidity, water temperature, and Susitna River discharge versus time at the Talkeetna fishwheel camp.

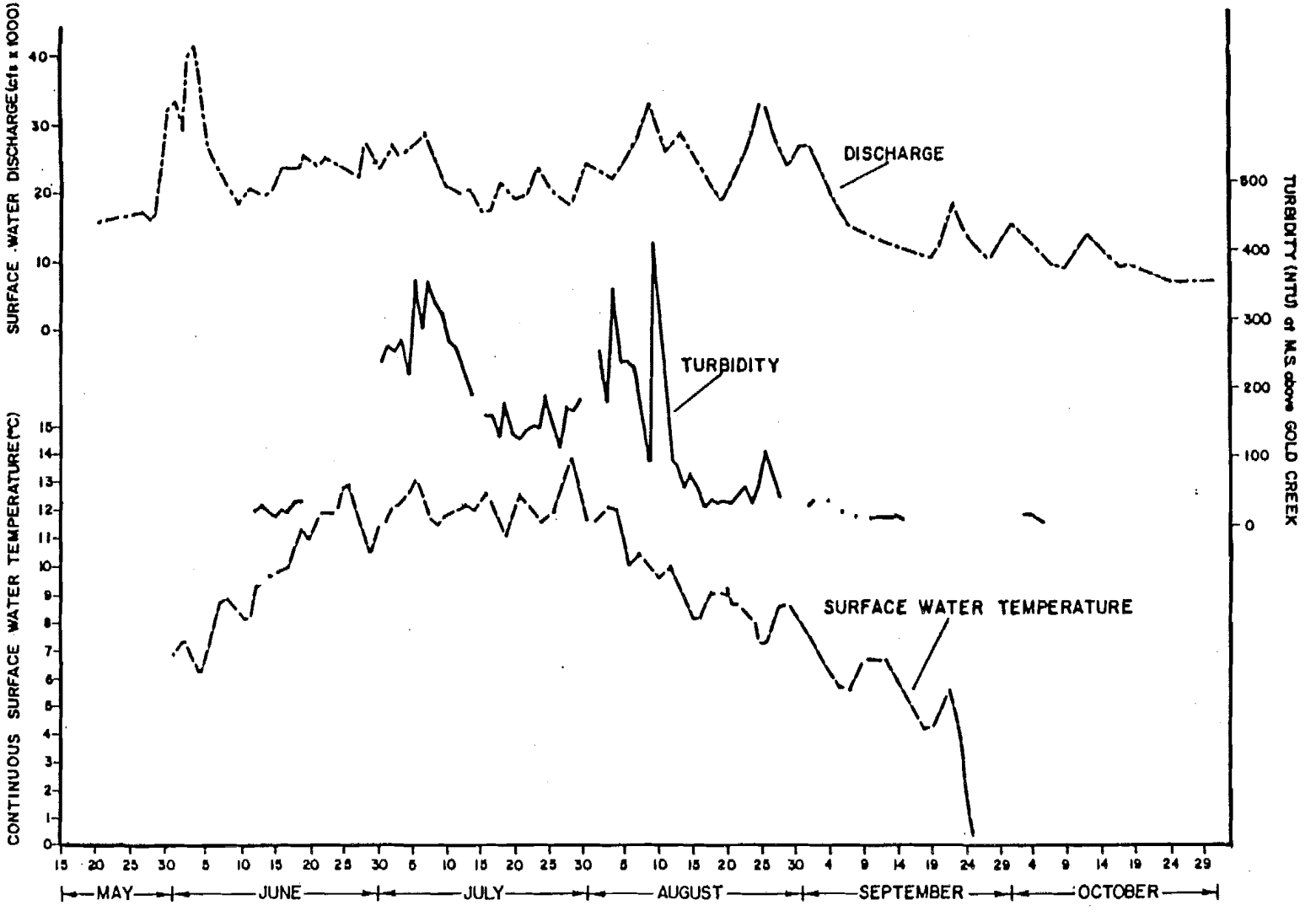


Figure 4-8. Turbidity, water temperature, and Susitna River discharge versus time at the Gold Creek camp.

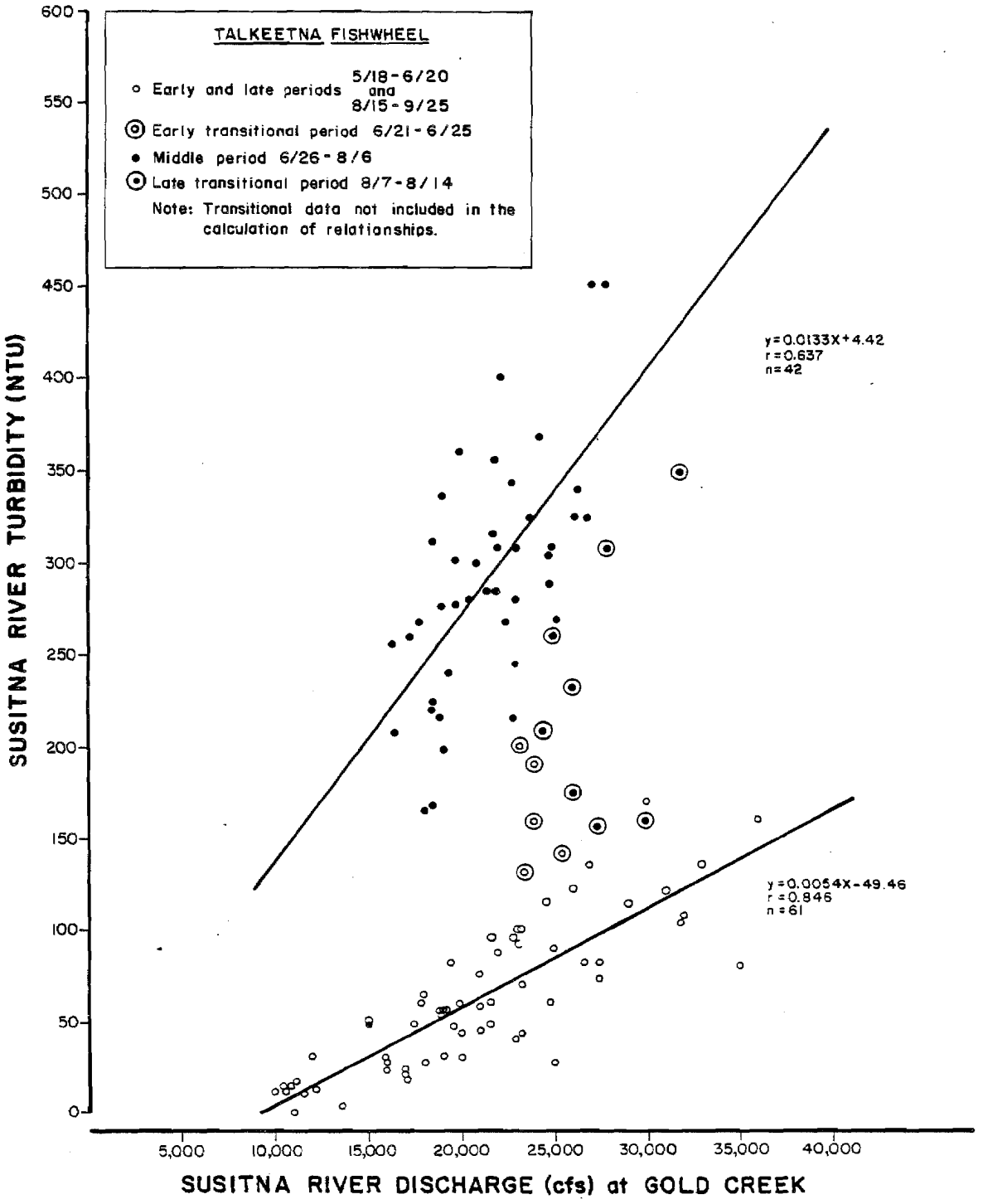


Figure 4-9. Turbidity versus Susitna River discharge at the Talkeetna fishwheel camp.

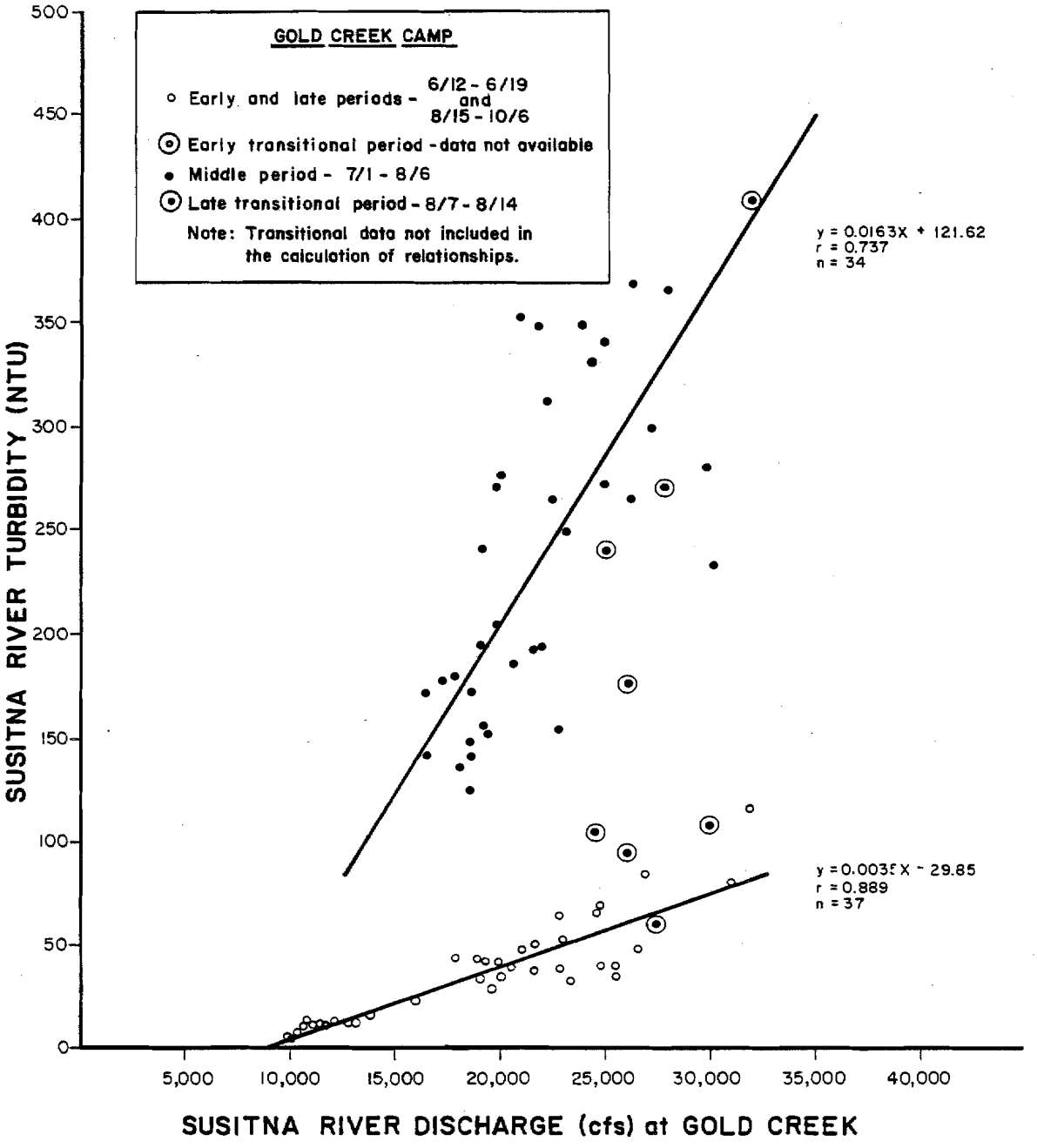


Figure 4-10. Turbidity versus Susitna River discharge at the Gold Creek camp.

surface elevation, estimated flow (see Chapter 1 of this report) and mainstem Susitna River discharge at Gold Creek (15292000) are presented in Appendix Table 4-A-2.

### 3.3 Tributary Habitats

Instantaneous measurements of water quality (dissolved oxygen, pH, water temperature, specific conductance, and turbidity) were obtained twice a month during the 1983 open water field season at the Talkeetna (RM 97.1, TRM 0.5) and Chulitna (RM 98.0, TRM 0.6) River monitoring stations. Percent DO saturation was calculated for each monitoring station using the instantaneous water temperature and dissolved oxygen data bases and a dissolved oxygen saturation nomograph (Wetzel 1975). These data are tabulated in Appendix Table 4-A-1 and graphically presented in Figures 4-2 through 4-6.

Limited water quality measurements, instantaneous water temperatures, and turbidities were obtained at two tributary habitats in the Talkeetna to Devil Canyon reach of the Susitna River (Whiskers Creek and Indian River). These data are presented in Appendix Table 4-A-3.

## 4.0 DISCUSSION

### Mainstem dissolved oxygen

Dissolved oxygen values (mean and medians) determined from mainstem water quality monitoring stations generally tended to decrease from the Back Eddy station (RM 150.1) located immediately below Devil Canyon, downstream to the Parks Highway Bridge station (RM 83.9) which is located below the confluence of the Talkeetna and Chulitna Rivers (Figure 4-2). The exception to this general trend is the station located at LRX 24 (RM 120.0).

In a separate study (ADF&G 1982) the highest levels of total dissolved gas supersaturation of the Susitna River were found to form in the Devil Canyon rapids located a short distance above the Back Eddy water quality monitoring station. This gas supersaturation was also found to decay moving downstream. In addition, the dissolved gas study noted that oxygen levels were found to parallel total dissolved gas saturation moving downstream from the Devil Canyon rapids.

Susitna River dissolved oxygen saturation levels were found to range higher above the confluence of the Talkeetna and Chulitna Rivers than at the Parks Highway Bridge station (Figure 4-2). These two tributaries contribute a substantial flow to the Susitna River and both were found to have lower dissolved oxygen values than observed in the mainstem Susitna River upstream of their confluence. The inflow of these tributaries may result in reducing the dissolved oxygen levels in the mainstem Susitna River, at least as far downstream as the Parks Highway.

Dissolved oxygen and dissolved oxygen saturation values observed at all mainstem Susitna River water quality monitoring stations were well above the minimum requirement to sustain aquatic life.

### Mainstem pH and Conductivity

With the exception of the water quality station located at the Gold Creek camp, both pH and conductivity were found to vary little among the mainstem monitoring stations located within the reach of the Susitna River from the Parks Highway Bridge to Devil Canyon (Figures 4-4 and 4-5). The Gold Creek camp was found to have a greater range of pH and was lower in conductivity compared to the remaining mainstem water quality stations. Indian River, a relatively large, clearwater tributary is located on the same shore as the Gold Creek camp water quality station. This tributary may influence the water quality in the mainstem as far downstream as the two mile distance to the Gold Creek camp station. When the range of pH at the Gold Creek camp station for 1983 (pH 6.3 - pH 8.2) is compared to the pH values measured in 1982 for Indian River[1] (ADF&G 1983), (pH 5.8 - pH 6.9), pH in the mainstem at the

[1] pH was not monitored in Indian River in 1983 by ADF&G.

Gold Creek camp station does not appear to be affected by Indian River. The opposite appears to be true for conductivity. The lower conductivity levels found in the mainstem at the Gold Creek camp may result from the clear water inflow of Indian River diluting the mainstem Susitna River. In 1982 Indian River was found to have a range of conductivity of 32-104 umhos (ADF&G 1982) compared to 61-142 umhos found in 1983 for the Gold Creek camp. Whereas, at LRX 57, which is located 3.2 miles upstream of Indian River, conductivity was found to range from 102-188 umhos in the mainstem for 1983.

Mainstem Turbidity

The periodic positive correlations between Susitna River turbidity and corresponding discharge during 1983 were most likely dependent in part upon the amount of suspended sediment contributed to the mainstem Susitna River by the Susitna and Maclaren glaciers. During the spring and early fall which includes the early and late open water periods characterized by relatively low turbidity, the contribution of suspended material from the glaciers via glacial melt water is small because of the cool air temperatures. Most of the turbidity associated with the spring (post breakup) period probably originate from the resuspension of glacial sediments which settled out from the water column during prior periods of decreasing discharge and receding water levels. Turbidity associated with the fall period may be the result of residual sediments originating from glacial melt and resuspension of glacial sediments during occasional high flow events. Once glacial melt and high flow events cease and residual sediments of glacial origin are settled out of the water column, turbidity levels remain low and continue so through the ice covered months.

The middle turbidity period (Figures 4-8 and 4-9), characterized by relatively high turbidity, most likely correspond to the melting of the glaciers. During this period changes in the suspended sediment load of the mainstem may be related to increases in glacial melt water. The turbidity/discharge relationship of this period is more dynamic and variable than the relationship of the early and late period, because of periodic variations of the volume of glacial melt water and the continuing deposition and resuspension of riverine glacial sediments.

Overall, increases in mainstem turbidity during the middle period may not be strictly correlated to the amount of suspended sediment present, but also depend, in part, on the size distribution of the suspended sediment. Because of their greater surface area to volume ratio of the finer particles, these particles may contribute more per unit weight to mainstem turbidity levels than larger particles.

These smaller particles remain suspended in the water column longer than larger particles. Once the glacial melt stops and the input of additional sediment ceases, the remaining suspended finer particles tend to wash out of the system. The reduced mainstem turbidity/discharge relationship of the early and late period may be partially due to the absence or reduced levels of these very fine particles (Figure 4-6).

Side Channel and Slough Turbidity

Turbidity in sloughs and side channels of the middle Susitna River reach remained very low until a breaching event occurred (Figures 4-11 and 12). Turbidity levels of breached sloughs and side channels elevated rapidly and, from field observations, were found to remain elevated for a period after the breaching event ceased. This residual turbidity decays as a function of the settling rate of the suspended sediment and the ground water and surface runoff flushing rate.

Turbidity of sloughs and side channels during breaching events which initially overtopped the head (see Chapter 1 of this report) were usually lower than mainstem turbidities because of a diluting effect with ground water or surface water runoff. As mainstem discharge increased, the dilution of the mainstem turbid water decreased as more mainstem water entered the head. Slough or side channel turbidity levels may occasionally exceed mainstem turbidities because of the resuspension of previously deposited glacial sediments by the increasing velocities of the mainstem water within the slough.

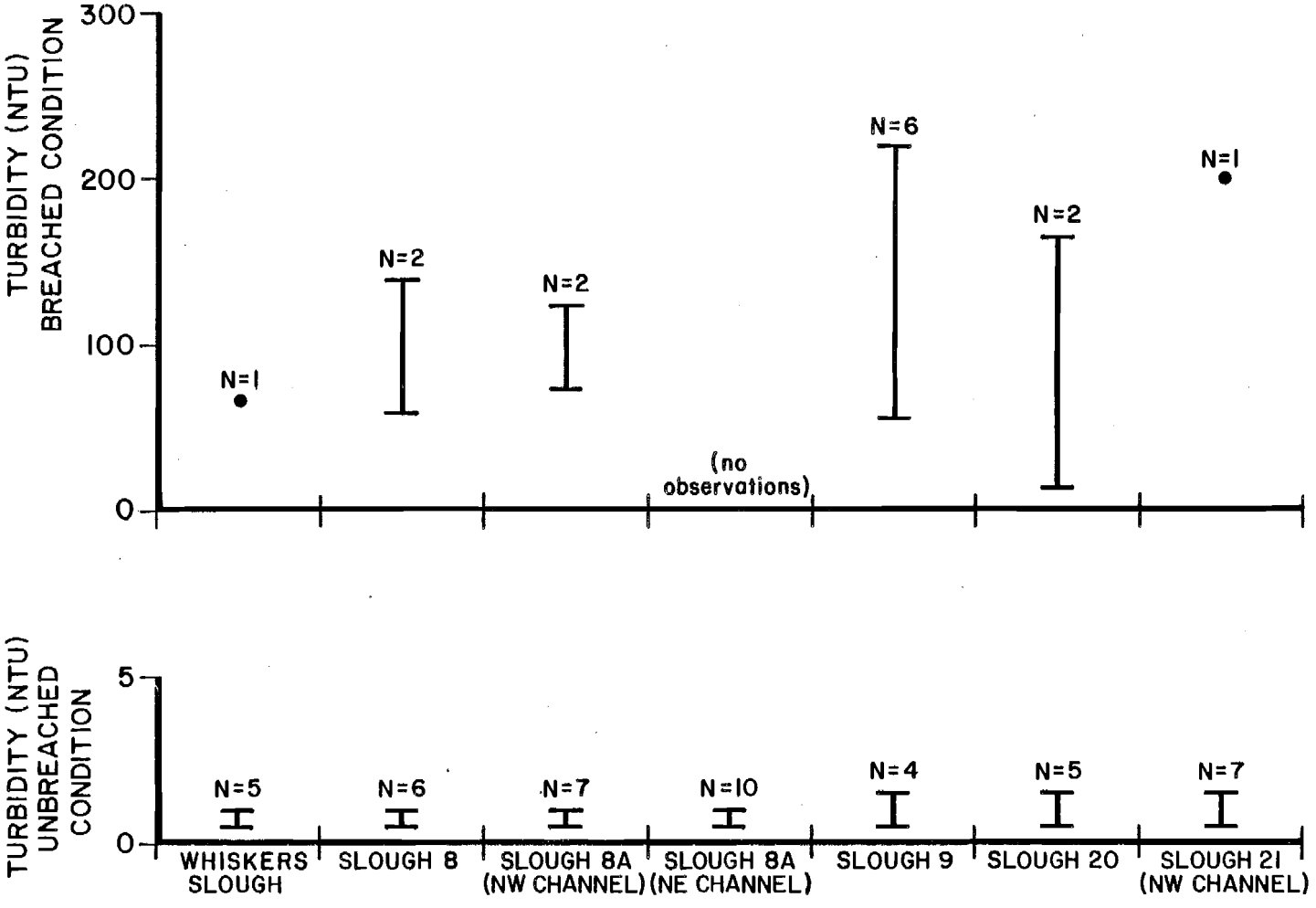


Figure 4-11. Range of turbidity during unbreached and breached hydraulic condition for side slough habitats.

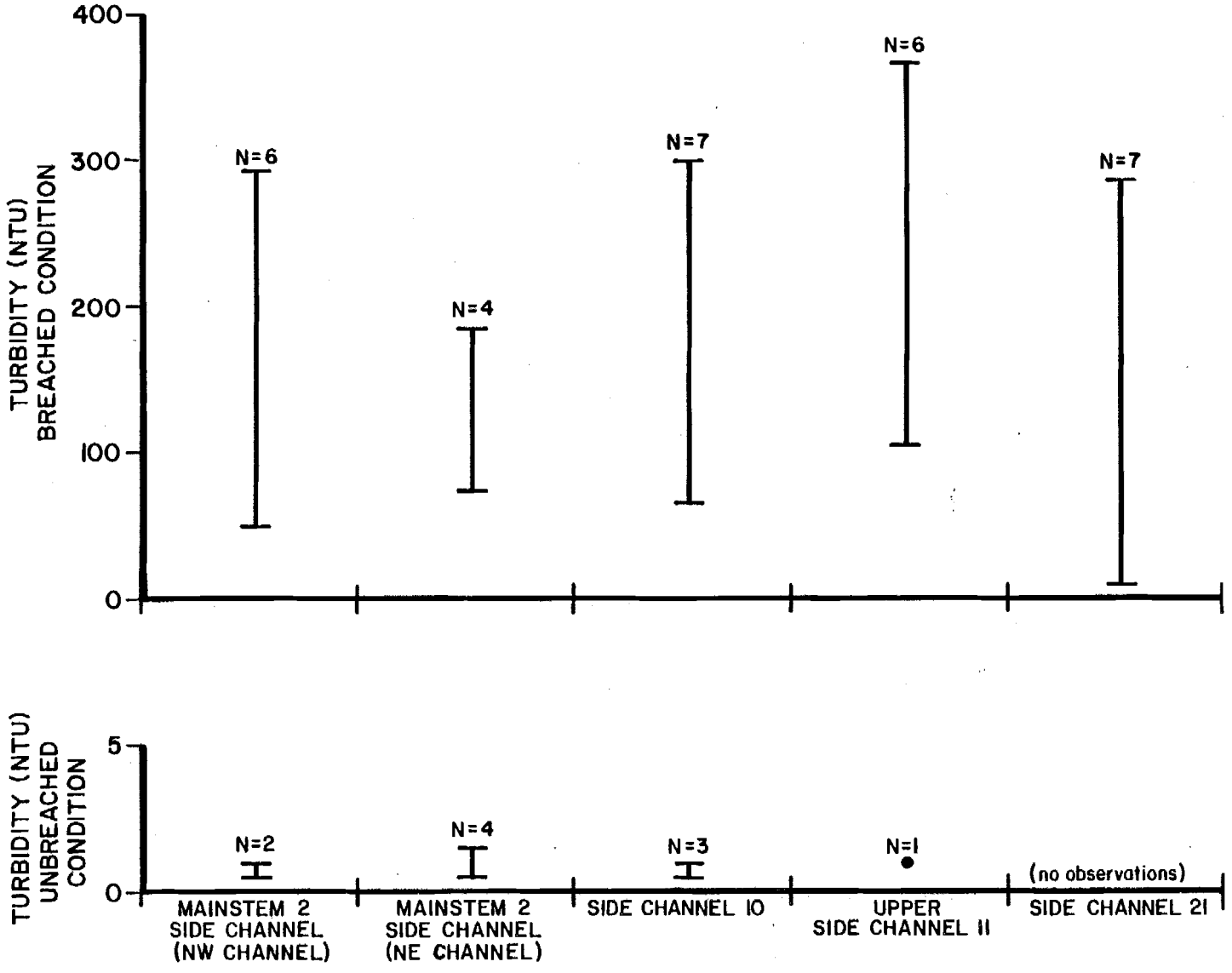


Figure 4-12. Range of turbidity during unbreached and breached hydraulic condition for side channel habitats.

## 5.0 GLOSSARY

Breaching - The overtopping of the head of a side channel or side slough by the mainstem river.

Conductivity - Conductivity is a numerical expression of the ability of an aqueous solution to carry on electric current and is expressed in the reciprocal of ohms as mhos.

Discharge - Discharge, or streamflow, is defined as the volume rate of flow of water passing a specific location for a specific period of time. Dimensions are usually expressed as cubic feet per second (cfs). For the purpose of this report discharge will refer specifically to mainstem habitat and streamflow for side channel, slough and tributary habitats.

Dissolved Oxygen - The concentration of oxygen present in water as measured in mg/l.

Flow - The movement of a stream of water from place to place. See Discharge and Streamflow.

Gaging Station - A location which has been established for monitoring stage, flow and/or discharge.

Head - The upstream or point of origin of a lotic water body.

Initial Breaching Discharge - The mainstem discharge at Gold Creek which represents the initial point when mainstem water begins to enter the upstream head (berm) of a side slough or side channel.

Lower Reach (of the Susitna River) - The segment of the Susitna River between Cook Inlet and the Chulitna River confluence. (See also middle reach and upper reach).

Mainstem Habitat - Consists of those portions of the Susitna River that normally convey water throughout the year. Both single and multiple channel reaches are included in this habitat category. Groundwater and tributary inflow appear to be inconsequential contributors to the overall characteristics of mainstem habitat. Mainstem habitat is typically characterized by high water velocities and well armored streambeds. Substrates generally consist of boulder and cobble size materials with interstitial spaces filled with a grout-like mixture of small gravels and glacial sands. Suspended sediment concentrations and turbidity are high during summer due to the influence of glacial melt-water. Discharges recede in early fall and the mainstem clears appreciably in October. An ice cover forms on the river in late November or December.

Mean Daily Discharge - The computed mean mainstem discharge per 24 hour period for a USGS gaging station.

Middle Reach (of the Susitna River) - The segment of the Susitna River between the Chulitna River confluence and Devil Canyon. (See also lower reach and upper reach).

Monitoring Station - A station set up for the collection of a particular data base.

Mouth - The downstream confluence of a lotic water body with another water body.

Observed Data - Values derived through a visual estimate or evaluation.

Overflow Channel - Those channels which adjoin the mainstem river with side channel and side slough habitats and are located downstream of the head portions of these habitats. Overflow channels periodically breach providing mainstem water into side channel and side slough habitats.

Overtopping - See breaching.

pH - The negative logarithm of the hydronium-ion concentration; $pH = -\log[H_3O+)$

Percent Dissolved Oxygen Saturation - The percent saturation is the measured concentration of dissolved oxygen divided by the saturation value multiplied by 100.

Peripheral Habitats - Aquatic habitats adjacent to the mainstem Susitna River habitat (e.g. side channel, side slough, upland slough, tributary mouth and/or tributary habitats).

Project Datum - The project elevations referenced to mean sea level.

Rating Curve - A curve representing a simple relation between two variables to be used to determine values of the dependent variable as a function of the independent variable. The rating curves developed using project measurements of stage and discharge consist of discharge rating curves and stage rating curves. The discharge rating curves are used to determine streamflow as a function of mainstem discharge and streamflow as a function of water surface elevation. The stage rating curves are used to determine stage referred to as water surface elevation as a function of mainstem discharge.

Side Channel Habitat - Consists of those portions of the Susitna River that normally convey water during the open water season but become appreciably dewatered during periods of low mainstem discharge. Side channel habitat may exist either in well defined overflow channels, or in poorly defined water courses flowing through partially submerged gravel bars and islands along the margins of the mainstem river. Side channel streambed elevations are typically lower than the mean monthly water surface elevations of the mainstem Susitna River observed during June, July, and August. Side channel habitats are characterized by shallower depths, lower velocities and smaller streambed materials than the adjacent habitat of the mainstem river.

Side Slough Habitat - is located in overflow channels between the edge of the floodplain and the mainstem and side channels of the Susitna River. It is usually separated from the mainstem and/or side channels by well vegetated bars. An exposed alluvial berm often separates the head of the slough from mainstem discharge or side channel flows. The controlling streambed/bank elevations at the upstream end of the side sloughs are slightly less than the water surface elevations of the mean monthly discharges of the mainstem Susitna River observed for June, July, and August. At intermediate and low-discharge periods, the side sloughs convey clear water from small tributaries and/or upwelling groundwater. These clear water inflows are essential contributors to the existence of this habitat type. The water surface elevation of the Susitna River generally causes a backwater to extend well up into the slough from its lower end. Even though this substantial backwater exists, the sloughs function hydraulically very much like small stream systems and several hundred feet of the slough channel often conveys water independent of mainstem backwater effects. At high discharges the water surface elevations of the mainstem river is sufficient to overtop the upper end of the slough. Surface water temperatures in the side sloughs during summer months are principally a function of air temperature, solar radiation, and the temperature of the local runoff.

Staff Gage - A non-recording staff, marked in graduations of tenths of feet, used to monitor stage through observation.

Stage - The height of the water surface above an established datum plane. Stage can be converted to true water surface elevation if the observations are converted into project datum.

Streamflow - Same as discharge but refers specifically to side channel, slough and tributary habitats whereas discharge denotes streamflow in mainstem habitats. See Discharge.

Tributary Habitat - Consists of the full complement of hydraulic and morphologic conditions that occur in the tributaries. Their seasonal flow, sediment, and thermal regimes reflect the integration of the hydrology, geology, and climate of the tributary drainage. The physical attributes of tributary habitat are not dependent on mainstem conditions.

Turbid - The condition of water quality at a site when water clarity is decreased by inorganic and/or organic suspended materials.

um - a millionth of a meter.

Upland Slough Habitat - Differs from side slough habitat in that the upstream end of the slough does not interconnect with the surface waters of the mainstem Susitna River or its side channels even at high mainstem discharges. These sloughs are characterized by the presence of beaver dams and an accumulation of silt covering the substrate resulting from the absence of mainstem scouring discharges.

Upper Reach (of the Susitna River) - The segment of the Susitna River between Devil Canyon and the headwaters (See also lower reach and middle reach).

Water Surface Elevation - The elevation of the water at a point of measurement referenced to project datum.

WSEL - Abbreviation for water surface elevation.

## 6.0 CONTRIBUTORS

| | |
|---|---|
| PROJECT LEADER | |
| Aquatic Habitat and Instream Flow Project Leader | Christopher Estes |
| PRIMARY AUTHORS | Gene Sandone<br>Tim Quane |
| REPORT COORDINATORS | Douglas Vincent-Lang<br>Tim Quane |
| EDITORS | Douglas Vincent-Lang<br>Pat Morrow |
| DATA PROCESSING | Allen Bingham<br>Camille Stephens |
| DATA COLLECTION | Pat Morrow<br>Isaac Queral<br>Tommy Withrow<br>Chris Kent<br>Jody Miller |
| DRAFTING | Sally Donovan |
| TYPING | Skeers Word Processing |

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# 9.0 APPENDIX 4-A

Table 4-A-1 Water quality data collected at selected Susitna mainstem and tributary locations for the 1983 open water field season.

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| PARKS HIGHWAY EAST | 830715 | 1730 | 022.3 | 13.3 | 7.3 | 09.3 | 089 | 114 | 288 |
| River Mile 083.9 | 830723 | 1548 | 015.0 | 12.4 | 7.4 | 09.8 | 092 | 111 | 252 |
| | 080810 | 1255 | 015.0 | 10.2 | 7.5 | 11.0 | 098 | 098 | 288 |
| | 830821 | 1330 | 012.5 | 09.0 | 7.4 | 11.7 | 099 | 111 | 78 |
| | 830911 | 1330 | 012.8 | 07.7 | 7.6 | 11.6 | 097 | 137 | 43 |
| | 830927 | 1434 | 002.2 | -0.2 | 7.3 | 12.9 | 087 | 150 | 13 |
| | 831001 | 1215 | 008.6 | 04.1 | 7.4 | 12.5 | 095 | 108 | 16 |
| TALKEETNA RIVER | 830715 | 1630 | 023.5 | 11.7 | 6.8 | 09.0 | 090 | 092 | 120 |
| River Mile 097.1 | 830722 | 1930 | 019.0 | 11.9 | 7.2 | 10.0 | 093 | 092 | 125 |
| TRM 0.5 | 830810 | 1110 | 015.5 | 09.1 | 7.2 | 11.4 | 100 | 081 | 154 |
| | 830822 | 1115 | 011.4 | 08.8 | 7.4 | 11.5 | 101 | 094 | 17 |
| | 830917 | 1255 | 012.2 | 05.2 | 7.6 | 12.2 | 096 | 128 | 3 |
| | 831001 | 1430 | 012.2 | 04.6 | 7.3 | 12.2 | 094 | 085 | 3 |
| CHULITNA RIVER | 830706 | 1430 | | 06.8 | 7.8 | 10.6 | 089 | 092 | |
| River Mile 098.0 | 830715 | 1450 | 020.2 | 07.4 | 7.3 | 11.5 | 095 | 108 | 624 |
| TRM 0.6 | 830722 | 1915 | 018.2 | 10.0 | 7.8 | 10.2 | 091 | 106 | 590 |
| | 830723 | 1318 | | 06.5 | 7.7 | 12.7 | 101 | 092 | 671 |
| | 830810 | 1150 | 015.5 | 05.9 | 8.3 | 12.3 | 100 | 097 | 520 |
| | 830822 | 1030 | 011.4 | 06.1 | 7.6 | 12.9 | 104 | 098 | 264 |
| | 830913 | 1545 | 013.0 | 06.2 | 7.4 | 12.2 | 097 | 118 | 120 |
| | 831003 | 1000 | 004.6 | 01.8 | 7.7 | 13.0 | 094 | 102 | 24 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| TALKEETNA FISHWHEEL | 830518 | 1600 | | 05.0 | | | | | |
| CAMP | 830519 | 1000 | 010.0 | 04.2 | | | | | 58 |
| River Mile 103.0 | 830520 | 1245 | 014.0 | 06.1 | | | | | 46 |
| | 830521 | 1000 | 011.0 | 07.0 | | | | | 31 |
| | 830522 | 1000 | 010.0 | 06.7 | | | | | 32 |
| | 830523 | 0800 | 008.0 | 06.5 | | | | | 28 |
| | 830524 | 0800 | 010.0 | 06.5 | | | | | 24 |
| | 830525 | 0830 | 008.0 | 06.5 | | | | | 29 |
| | 830526 | 0830 | 009.0 | 07.1 | | | | | 24 |
| | 830527 | 0830 | 007.8 | 06.9 | | | | | 22 |
| | 830528 | 0830 | 011.0 | 07.0 | | | | | 30 |
| | 830529 | 0830 | 012.0 | 07.9 | | | | | 21 |
| | 830530 | 0830 | 017.0 | 09.1 | | | | | 27 |
| | 830531 | 0830 | 010.0 | 08.0 | | | | | 108 |
| | 830601 | 0800 | 010.0 | 07.8 | | | | | 136 |
| | 830602 | 0810 | 010.0 | 07.8 | | | | | 114 |
| | 830603 | 0830 | 009.0 | 08.0 | | | | | 81 |
| | 830604 | 0900 | 008.0 | 07.5 | | | | | 160 |
| | 830605 | 0900 | 009.0 | 07.3 | | | | | 170 |
| | 830606 | 0900 | 013.0 | 08.9 | | | | | 122 |
| | 830607 | 0800 | 012.0 | 09.4 | | | | | 100 |
| | 830608 | 0830 | 009.5 | 09.4 | | | | | 88 |
| | 830609 | 0800 | 010.0 | 09.4 | | | | | 82 |
| | 830610 | 0830 | 012.0 | 09.4 | | | | | 65 |
| | 830611 | 0900 | 011.0 | 09.5 | | | | | 54 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| TALKEETNA FISHWHEEL | 830612 | 0900 | 012.4 | 09.4 | 7.4 | 11.1 | 098 | 117 | 44 |
| CAMP | 830613 | 0900 | 011.0 | 09.3 | 7.4 | 11.2 | 099 | 118 | 60 |
| River Mile 103.0 | 830614 | 0915 | 014.8 | 09.9 | 7.4 | 11.0 | 097 | 117 | 55 |
| | 830615 | 0930 | 012.0 | 10.2 | 7.4 | 10.8 | 100 | 118 | 47 |
| | 830616 | 0900 | 014.0 | 10.3 | 7.4 | 10.8 | 100 | 117 | 49 |
| | 830617 | 0920 | 016.4 | 10.1 | 7.5 | 10.8 | 100 | 109 | 71 |
| | 830618 | 0900 | 013.8 | 10.7 | 7.5 | 10.7 | 100 | 114 | 100 |
| | 830619 | 0830 | 011.6 | 11.6 | 7.4 | 10.5 | 099 | 112 | 92 |
| | 830620 | 0900 | 012.0 | 11.7 | 7.4 | 11.1 | 104 | 094 | 90 |
| | 830621 | 0900 | 014.0 | 11.4 | 7.3 | 10.9 | 102 | 108 | 158 |
| | 830622 | 0800 | 013.0 | 12.3 | 7.4 | 11.1 | 104 | 116 | 132 |
| | 830623 | 0820 | 012.0 | 12.7 | 7.4 | 10.9 | 100 | 122 | 142 |
| | 830624 | 0825 | 013.0 | 12.1 | 7.3 | 10.9 | 104 | 120 | 190 |
| | 830625 | 0830 | 015.0 | 12.8 | 7.3 | 10.8 | 103 | 131 | 200 |
| | 830626 | 0800 | 015.0 | 13.5 | 7.4 | 10.5 | 102 | 135 | 245 |
| | 830627 | 0800 | 013.0 | 13.1 | 7.4 | 11.2 | 108 | 142 | 308 |
| | 830628 | 0800 | 014.0 | 12.0 | 7.1 | 10.8 | 100 | 146 | 356 |
| | 830629 | 0900 | 012.0 | 11.1 | 7.6 | 11.3 | 105 | 130 | 324 |
| | 830630 | 0800 | 012.0 | 11.5 | 7.1 | 11.1 | 103 | 137 | 288 |
| | 830701 | 1200 | 013.0 | 12.7 | 7.2 | 11.5 | 110 | 138 | 280 |
| | 830702 | 1000 | 014.0 | 12.6 | 7.2 | 11.1 | 102 | 140 | 308 |
| | 830703 | 1000 | 016.0 | 12.8 | 7.2 | 11.8 | 110 | 132 | 324 |
| | 830704 | 0900 | 017.0 | 13.1 | 7.1 | 11.8 | 112 | 132 | 304 |
| | 830705 | 1000 | 018.0 | 12.9 | 7.2 | 11.4 | 110 | 134 | 268 |
| | 830706 | 1100 | 015.0 | | | | | | 340 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| TALKEETNA FISHWHEEL | 830707 | 0900 | 015.0 | 14.0 | 7.4 | 09.5 | 094 | 120 | 450 |
| CAMP | 830708 | 1200 | 014.0 | 12.6 | 7.3 | 09.6 | 094 | 117 | 450 |
| River Mile 103.0 | 830709 | 1000 | 016.0 | | | | | | 368 |
| | 830710 | 1000 | 014.0 | | | | | | 400 |
| | 830711 | 1000 | 014.0 | | | | | | 360 |
| | 830712 | 1000 | 013.0 | | | | | | 300 |
| | 830713 | 1000 | 014.0 | | | | | | 336 |
| | 830714 | 1000 | 015.0 | 12.5 | 7.7 | 10.3 | 099 | 146 | 278 |
| | 830715 | 1000 | 015.0 | 12.4 | 7.6 | 10.4 | 098 | 143 | 312 |
| | 830716 | 1950 | 016.0 | 12.6 | 7.1 | 09.9 | 094 | 135 | 256 |
| | 830717 | 0900 | 016.0 | 13.1 | 7.5 | 10.8 | 104 | 162 | 208 |
| | 830718 | 0900 | 015.0 | 12.4 | 7.4 | 10.2 | 097 | 154 | 216 |
| | 830719 | 0900 | 015.0 | 10.9 | 7.5 | 10.8 | 098 | 151 | 280 |
| | 830720 | 0900 | 017.0 | 12.7 | 7.3 | 10.7 | 101 | 145 | 224 |
| | 830721 | 0930 | 013.8 | 12.4 | 7.5 | 09.6 | 095 | 140 | 166 |
| | 830722 | 0900 | 011.8 | 12.1 | 7.3 | 09.6 | 090 | 139 | 168 |
| | 830723 | 1030 | 013.8 | 13.2 | 7.4 | 09.4 | 090 | 133 | 198 |
| | 830724 | 1010 | 014.0 | 12.1 | 7.5 | 10.2 | 095 | 160 | 216 |
| | 830725 | 0915 | 013.0 | 11.9 | 7.5 | 09.9 | 093 | 157 | 284 |
| | 830726 | 0910 | 016.0 | 12.5 | 7.5 | 09.9 | 094 | 164 | 240 |
| | 830727 | 0915 | 016.0 | 12.8 | 7.5 | 09.8 | 094 | 173 | 220 |
| | 830728 | 0920 | 016.0 | 13.2 | 7.5 | 09.6 | 093 | 168 | 268 |
| | 830729 | 0925 | 016.0 | 13.7 | 7.5 | 09.7 | 095 | 173 | 260 |
| | 830730 | 0840 | 016.0 | 14.1 | 7.6 | 09.4 | 092 | 180 | 276 |
| | 830731 | 1110 | 017.0 | 12.6 | 7.5 | 09.8 | 094 | 167 | 344 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| TALKEETNA FISHWHEEL | 830801 | 0855 | 015.0 | 11.8 | 7.7 | 09.9 | 093 | 170 | 308 |
| CAMP | 830802 | 0910 | 015.0 | 12.2 | 7.6 | 09.7 | 090 | 168 | 268 |
| River Mile 103.0 | 830803 | 0930 | 017.0 | 12.1 | 7.6 | 10.9 | 104 | 131 | 284 |
| | 830804 | 2010 | 014.0 | 12.7 | 7.6 | 10.5 | 100 | 129 | 300 |
| | 830805 | 0950 | 015.0 | 12.0 | 7.6 | 10.4 | 098 | 129 | 316 |
| | 830806 | 0920 | 013.0 | 10.8 | 7.4 | 11.0 | 100 | 127 | 324 |
| | 830807 | 0920 | 013.0 | 10.5 | 7.4 | 10.9 | 100 | 127 | 260 |
| | 830808 | 0905 | 011.0 | 10.7 | 7.3 | 11.1 | 102 | 124 | 232 |
| | 830809 | 0950 | 016.0 | 10.7 | 7.4 | 11.0 | 100 | 109 | 160 |
| | 830810 | 0920 | 009.0 | 09.9 | 7.6 | 11.1 | 100 | 114 | 348 |
| | 830811 | 0850 | 012.0 | 10.2 | 7.4 | 11.3 | 102 | 117 | 308 |
| | 830812 | 0820 | 012.0 | 10.9 | 7.5 | 10.9 | 100 | 124 | 208 |
| | 830813 | 0745 | 010.0 | 10.2 | 7.4 | 11.0 | 100 | 125 | 176 |
| | 830814 | | | 10.2 | | | | | 156 |
| | 830815 | | | 10.1 | | | | | 136 |
| | 830816 | | | 09.9 | | | | | 116 |
| | 830817 | 1005 | 011.0 | 09.2 | 7.4 | 11.5 | 102 | 130 | 96 |
| | 830818 | 1005 | 013.0 | 09.2 | 7.4 | 11.5 | 102 | 130 | 76 |
| | 830819 | 0910 | 011.0 | 08.9 | 7.4 | 11.0 | 097 | 131 | 56 |
| | 830820 | 0855 | 010.0 | 09.8 | 7.4 | 11.0 | 099 | 137 | 61 |
| | 830821 | 0915 | 010.0 | 09.3 | 7.4 | 11.5 | 102 | 134 | 56 |
| | 830822 | 0910 | 012.0 | 09.4 | 7.3 | 11.4 | 102 | 128 | 62 |
| | 830823 | 0835 | 009.0 | 08.6 | 7.3 | 11.4 | 099 | 135 | 92 |
| | 830824 | 0815 | 008.0 | 08.6 | 7.3 | 11.2 | 098 | 132 | 62 |
| | 830825 | 0835 | 004.0 | 07.6 | 7.3 | 11.7 | 100 | 127 | 74 |
| | 830826 | 0815 | 008.0 | 07.4 | 7.3 | 11.8 | 100 | 120 | 104 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| TALKEETNA FISHWHEEL | 830827 | 0710 | 006.0 | 07.5 | 7.4 | 12.0 | 102 | 114 | 122 |
| CAMP | 830828 | 0925 | 009.6 | 08.8 | 7.4 | 11.8 | 102 | 108 | 88 |
| River Mile 103.0 | 830829 | 1715 | 012.0 | 09.8 | | | | | 44 |
| | 830830 | 1140 | 012.0 | 09.5 | | | | | 42 |
| | 830911 | 0835 | 006.2 | 06.4 | 7.5 | 12.7 | 104 | 148 | 13 |
| | 830912 | 0845 | 007.2 | 06.6 | 7.5 | 12.4 | 102 | 151 | 11 |
| | 830913 | 1030 | 009.0 | 06.8 | | | | | 17 |
| | 830914 | 0845 | 008.0 | 06.5 | | | | | 14 |
| | 830915 | 0935 | 006.7 | 05.6 | 7.6 | 12.4 | 100 | 152 | 14 |
| | 830916 | 0955 | 003.0 | 05.0 | | | | | 13 |
| | 830917 | 0820 | 000.2 | 04.0 | 7.6 | 13.0 | 100 | 156 | 12 |
| | 830921 | 1549 | 013.4 | 06.4 | 7.7 | 12.7 | 105 | 158 | 1 |
| | 830922 | 0858 | 008.8 | 06.1 | 7.6 | 11.8 | 097 | 158 | 4 |
| | 830923 | 0900 | 002.8 | 04.9 | 7.6 | 12.3 | 098 | 152 | 49 |
| | 830924 | 0830 | -02.1 | 02.0 | 7.6 | 13.1 | 096 | 138 | 50 |
| | 830925 | 0915 | 000.0 | 01.0 | | | | | 31 |
| | 830927 | 0944 | -02.0 | -0.4 | 7.3 | 13.3 | 090 | 046 | 16 |
| | 831002 | 0841 | 004.7 | 03.0 | 7.5 | 12.6 | 095 | 131 | 2 |
| | 831003 | 1140 | 004.9 | 02.5 | 7.8 | 13.3 | 098 | 134 | 4 |
| | 831004 | 1010 | 001.8 | 01.3 | 7.5 | 13.6 | 097 | 134 | 4 |
| | 831005 | 0940 | 003.8 | 01.1 | 7.7 | 13.7 | 097 | 137 | 2 |
| | 831103 | 1245 | 002.8 | 00.0 | 9.6 | 14.6 | 100 | 101 | 3 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| CURRY (LRX24) | 830619 | 1300 | | 12.6 | 7.4 | 11.0 | 104 | 099 | 74 |
| River Mile 120.0 | 830706 | 1220 | | 13.1 | 7.5 | 09.7 | 087 | 117 | 512 |
| | 830716 | 1615 | 018.0 | 13.8 | 7.2 | 10.0 | 097 | 132 | 234 |
| | 830807 | 1255 | 012.6 | 10.8 | 7.6 | 11.0 | 100 | 125 | 224 |
| | 830824 | 1230 | 011.8 | 08.8 | 7.6 | 11.9 | 104 | 114 | 60 |
| | 830915 | 1645 | 010.8 | 06.8 | 7.4 | 12.2 | 100 | 154 | 10 |
| | 830924 | 1653 | -01.2 | 01.5 | 7.6 | 13.7 | 098 | 136 | 36 |
| | 831004 | 1230 | | 01.6 | | | | | 16 |
| | 831005 | 1315 | 003.3 | 01.3 | 7.5 | 13.7 | 098 | 141 | 2 |
| LRX29 | 830615 | 1509 | | 12.2 | 7.4 | 10.5 | 091 | 111 | 38 |
| River Mile 125.3 | 830706 | 1200 | 014.0 | 13.2 | 7.5 | 09.9 | 095 | 125 | 448 |
| | 830716 | 1930 | 016.2 | 13.6 | 7.4 | 09.5 | 093 | 140 | 204 |
| | 830805 | 1130 | 013.6 | 12.1 | 7.6 | 10.5 | 100 | 140 | 266 |
| | 830823 | 1000 | 009.6 | 08.8 | 7.6 | 11.4 | 098 | 126 | 72 |
| | 830914 | 1715 | 006.4 | 06.0 | 7.6 | 12.2 | 097 | 157 | 11 |
| | 830924 | 1348 | -00.2 | 01.5 | 7.3 | 13.5 | 097 | 140 | 42 |
| | 831102 | 1600 | 003.6 | 00.1 | 5.3 | 13.4 | 094 | 187 | 2 |
| GOLD CREEK CAMP | 830612 | 0930 | | 08.2 | 6.8 | 12.0 | 105 | 086 | 34 |
| River Mile 136.8 | 830613 | 0907 | | 08.1 | 6.8 | 12.1 | 114 | 084 | 42 |
| | 830614 | 0838 | | 08.6 | 6.9 | 11.9 | 102 | 086 | 34 |
| | 830615 | 0842 | | 08.8 | 6.8 | 11.6 | 108 | 081 | 29 |
| | 830616 | 0855 | | 08.7 | 7.2 | 11.7 | 102 | 078 | 37 |
| | 830617 | 1055 | | 09.3 | 7.3 | 11.2 | 099 | 077 | 33 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| GOLD CREEK CAMP | 830618 | 0900 | | 09.4 | 7.1 | 11.6 | 102 | 083 | 52 |
| River Mile 136.8 | 830619 | 0925 | | 10.0 | 7.2 | 11.4 | 102 | 076 | 50 |
| | 830629 | 1855 | 012.8 | 10.8 | 7.4 | 09.8 | 090 | 094 | |
| | 830630 | 0900 | 013.8 | 10.2 | 7.4 | 10.2 | 093 | 106 | |
| | 830701 | 0920 | 012.2 | 11.0 | 7.4 | 10.1 | 093 | 108 | 248 |
| | 830702 | 0855 | 012.8 | 11.2 | 7.3 | 10.1 | 093 | 106 | 272 |
| | 830703 | 1226 | 023.2 | 11.8 | 7.2 | 10.2 | 095 | 104 | 264 |
| | 830704 | 1107 | 023.0 | 12.2 | 7.2 | 10.1 | 095 | 097 | 280 |
| | 830705 | 0958 | 017.8 | 11.4 | 7.4 | 10.2 | 096 | 105 | 232 |
| | 830706 | 1000 | 013.8 | 12.7 | 7.4 | 09.8 | 093 | 102 | 368 |
| | 830707 | 1100 | 016.5 | 12.5 | 7.3 | 10.2 | 097 | 112 | 298 |
| | 830708 | 0930 | | 11.0 | 7.2 | 10.7 | 098 | 114 | 365 |
| | 830709 | 0930 | | 10.7 | 7.5 | 10.5 | 096 | 123 | 330 |
| | 830710 | 0930 | | 11.0 | 7.4 | 10.9 | 100 | 123 | 312 |
| | 830711 | 0915 | | 11.3 | 7.4 | 11.1 | 103 | 123 | 276 |
| | 830712 | 0930 | | 11.2 | 7.4 | 12.1 | 110 | 132 | 270 |
| | 830713 | 1000 | | 11.5 | 7.4 | 13.9 | 129 | 126 | 240 |
| | 830714 | 1030 | | 11.7 | 7.3 | | | 125 | 204 |
| | 830716 | 1120 | 022.0 | 12.3 | 8.0 | 10.9 | 102 | 098 | 172 |
| | 830717 | 0856 | 016.8 | 12.4 | 7.7 | 10.8 | 102 | 104 | 172 |
| | 830718 | 0912 | 011.8 | 11.0 | 7.6 | 11.3 | 105 | 105 | 142 |
| | 830719 | 0930 | 015.2 | 10.0 | 7.6 | 11.5 | 102 | 107 | 186 |
| | 830720 | 1815 | 018.0 | 13.1 | 7.4 | 10.8 | 104 | 101 | 142 |
| | 830721 | 0950 | 015.6 | 12.2 | 7.5 | 11.2 | 105 | 114 | 136 |
| | 830722 | 1054 | 016.2 | 11.7 | 7.5 | 11.3 | 106 | 107 | 148 |
| | 830723 | 0945 | | 12.1 | 7.6 | 11.0 | 104 | 121 | 156 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| GOLD CREEK CAMP | 830725 | 0945 | | 11.6 | 7.5 | 11.1 | 102 | 111 | 194 |
| River Mile 136.8 | 830726 | 0915 | | 11.6 | 7.5 | 10.9 | 101 | 112 | 152 |
| | 830727 | 0915 | | 12.7 | 7.5 | 10.5 | 102 | 117 | 124 |
| | 830728 | 0800 | | 12.5 | 7.5 | 10.7 | 102 | 117 | 180 |
| | 830729 | 1800 | 009.5 | | | | | | 178 |
| | 830730 | 1215 | 012.0 | | | | | | 194 |
| | 830802 | 1922 | 020.4 | 12.9 | 8.2 | 10.8 | 102 | 105 | 264 |
| | 830803 | 0915 | 017.0 | 11.4 | 7.8 | 11.2 | 104 | 111 | 192 |
| | 830804 | 0826 | 013.8 | 12.1 | 7.8 | 11.0 | 103 | 110 | 352 |
| | 830805 | 0930 | 013.4 | 11.5 | 7.4 | 11.3 | 105 | 094 | 248 |
| | 830806 | 0932 | 012.8 | 09.9 | 7.6 | 11.6 | 104 | 093 | 248 |
| | 830807 | 1145 | 015.0 | 10.5 | 7.2 | 11.4 | 103 | 099 | 240 |
| | 830808 | 1135 | 012.6 | 10.2 | 7.0 | 11.0 | 100 | 083 | 176 |
| | 830809 | 0937 | 011.4 | 09.8 | 7.3 | 11.2 | 098 | 061 | 108 |
| | 830810 | 0750 | 008.5 | 08.4 | 7.6 | 12.3 | 106 | 088 | 408 |
| | 830811 | 0700 | 010.5 | 09.2 | 7.7 | 11.4 | 106 | 094 | 270 |
| | 830812 | | | | | | | | 104 |
| | 830813 | | | | | | | | 94 |
| | 830814 | | | | | | | | 60 |
| | 830815 | 1320 | 009.9 | 07.6 | 7.2 | 08.4 | 073 | 099 | 84 |
| | 830816 | 0900 | 008.0 | 07.0 | 7.1 | 08.4 | 070 | 101 | 66 |
| | 830817 | 0930 | 008.7 | 07.7 | 7.3 | 08.3 | 071 | 107 | 38 |
| | 830818 | 1630 | 016.2 | 09.9 | 7.2 | | | 108 | 48 |
| | 830819 | 1100 | 014.4 | 08.7 | 7.2 | 08.6 | 075 | 114 | 42 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| GOLD CREEK CAMP | 830820 | 1215 | 010.2 | 09.0 | 7.0 | 08.3 | 074 | 119 | 44 |
| River Mile 136.8 | 830821 | 1220 | 010.4 | 08.6 | 7.6 | 11.6 | 102 | 104 | 42 |
| | 830822 | 0909 | 010.6 | 08.6 | 7.2 | 12.2 | 105 | 087 | 50 |
| | 830823 | 0916 | 010.6 | 08.1 | 7.4 | 12.2 | 103 | 082 | 64 |
| | 830824 | 0927 | 007.0 | 07.7 | 6.9 | 12.3 | 105 | 090 | 40 |
| | 830825 | 1629 | 010.6 | 08.0 | 7.3 | 12.5 | 108 | 085 | 68 |
| | 830826 | 0956 | 010.4 | 06.9 | 6.9 | 12.6 | 104 | 092 | 116 |
| | 830827 | 1000 | 010.2 | 07.3 | 6.5 | 13.0 | 108 | 092 | 80 |
| | 830828 | 0947 | 009.7 | 07.9 | 7.0 | 12.9 | 110 | 105 | 48 |
| | 830831 | 1120 | 010.0 | 07.8 | | 11.6 | 100 | 081 | |
| | 830901 | 0905 | 009.1 | 07.4 | | 11.6 | 099 | 095 | 35 |
| | 830902 | 1212 | 011.6 | 07.4 | | 11.6 | 098 | 076 | 40 |
| | 830904 | 1259 | 012.0 | 06.2 | | 12.2 | 100 | 095 | 40 |
| | 830906 | 1733 | 010.8 | 06.5 | | 12.2 | 099 | 107 | 23 |
| | 830908 | 1216 | 010.8 | 06.4 | | 12.0 | 098 | 113 | 17 |
| | 830910 | 1011 | 007.8 | 06.4 | 7.3 | 12.7 | 108 | 111 | 13 |
| | 830911 | 0917 | 006.8 | 06.5 | 7.3 | 12.2 | 100 | 118 | 14 |
| | 830912 | 0918 | 007.7 | 06.4 | 7.1 | 12.6 | 103 | 120 | 13 |
| | 830913 | 1147 | 008.2 | 06.6 | 7.2 | 12.6 | 102 | 121 | 12 |
| | 830914 | 0854 | 006.6 | 05.6 | 7.2 | 12.8 | 104 | 124 | 14 |
| | 830915 | 1045 | 008.4 | 05.7 | 7.2 | 12.7 | 102 | 122 | 11 |
| | 830916 | 1100 | 008.6 | 05.0 | 7.3 | 13.1 | 102 | 115 | |
| | 831003 | 1400 | 003.0 | 02.5 | 7.7 | 13.3 | 100 | 141 | 12 |
| | 831004 | 1645 | | 02.3 | 7.5 | 14.3 | 106 | 142 | 12 |
| | 831005 | 1948 | | 00.5 | 7.1 | 14.3 | 101 | 134 | 7 |

Table 4-A-1 Continued

| Location | Date | Time | Temperature Air (C°) | Temperature Water (C°) | pH | Dissolved Oxygen (mg/1) | Dissolved Oxygen Percent Saturation | Conductivity (umho/cm) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| GOLD CREEK CAMP | 831006 | 1000 | | 01.0 | 7.5 | 13.9 | 100 | 132 | 12 |
| River Mile 136.8 | 831102 | 1330 | 005.2 | 00.1 | 6.3 | 15.0 | 105 | 125 | 1 |
| LRX57 | 830617 | 1148 | | 10.4 | 7.5 | 11.8 | 107 | 102 | 69 |
| River Mile 142.0 | 830630 | | 11.2 | | | | | | 200 |
| | 830706 | 0928 | | 13.0 | 7.5 | 10.4 | 100 | 123 | 448 |
| | 830721 | 1417 | 012.6 | 13.3 | 7.2 | 10.8 | 104 | 111 | 168 |
| | 830804 | 0856 | 013.8 | 12.2 | 7.7 | 11.5 | 109 | 118 | 288 |
| | 830822 | 1033 | 011.8 | 08.5 | 7.5 | 12.1 | 105 | 113 | 72 |
| | 830912 | 1906 | 008.4 | 06.8 | 7.3 | 12.6 | 104 | 150 | 20 |
| | 831102 | 1050 | 002.8 | 00.2 | 7.6 | 13.7 | 097 | 188 | 2 |
| | 831003 | 1000 | 001.0 | 02.1 | 7.6 | 14.2 | 105 | 137 | 12 |
| BACK EDDY | 830704 | | | | | | | | 392 |
| River Mile 150.1 | 830706 | 0915 | 014.4 | 13.4 | 7.5 | 10.4 | 100 | 124 | 448 |
| | 830805 | 1155 | 013.2 | 11.0 | 7.7 | 11.5 | 106 | 113 | 320 |
| | 830828 | 1041 | 009.7 | 07.9 | 7.0 | 12.9 | 110 | 105 | 58 |
| | 830915 | 1600 | 008.8 | 05.7 | 7.2 | 13.5 | 109 | 153 | 10 |
| | 831005 | 1100 | | 00.1 | 7.4 | 15.1 | 105 | 163 | 13 |

Appendix Table 4-A-2. Comparisons of periodic water quality (temperature and turbidity), water surface elevations (WSEL) and streamflow collected at selected non-mainstem locations upstream of Talkeetna with mean daily mainstem discharge at Gold Creek (15292000)[1]

| Location | Date | Time | Temperature (°C) Water | Air | Turbidity NTU | WSEL (ft.) | Estimated[2] flow (cfs) | Susitna River Discharge (cfs) |
|---|---|---|---|---|---|---|---|---|
| Whiskers Slough Q site | 830911 | 0945 | 7.1 | 9.0 | 2 | 365.70 | 0.5 | 12200 |
| gage no. 101.2S3 | 831001 | 1520 | 4.8 | 9.3 | 1 | 365.82 | 0.2 | 13200 |
| RM 101.4 | 830716 | 1130 | 10.8 | 18.8 | 2 | 365.70 | 0.5 | 16400 |
| | 830722 | 1840 | 16.4 | 21.6 | 2 | 365.72 | 0.4 | 18600 |
| | 830822 | 1255 | 7.4 | 14.6 | 2 | 365.75 | 0.3 | 21600 |
| | 830618 | 1225 | 14.6 | NA | 68 | 365.95 | 10.2 | 22900 |
| Slough 6A Mouth | 831004 | 1110 | 2.1 | 3.5 | 2 | 455.92 | 3/ | 11400 |
| gage no. 112.3W1 | 830912 | 1145 | 7.2 | 12.2 | 3 | 455.80 | 3/ | 11600 |
| RM 112.3 | 830716 | 1400 | 12.2 | 20.2 | 29 | 456.52 | 3/ | 16400 |
| | 830722 | 1720 | 16.0 | 19.2 | 80 | 456.86 | 3/ | 18600 |
| | 830822 | 1655 | 10.0 | 14.2 | 4 | 457.22 | 3/ | 21600 |
| | 830805 | 1510 | 12.8 | 14.2 | 140 | 457.20 | 3/ | 21700 |
| | 830826 | 1530 | 10.0 | 16.4 | 16 | 458.13 | 3/ | 31700 |
| Slough 8 Q site | 831004 | 1230 | 4.2 | 5.8 | 1 | 468.01 | 2.0 | 11400 |
| gage no. 113.6S2 | 830912 | 1600 | 7.4 | 12.7 | 1 | 467.94 | 1.9 | 11600 |
| RM 113.7 | 830716 | 1430 | 9.2 | 19.2 | 1 | 467.98 | 1.9 | 16400 |
| | 830722 | 1730 | 10.2 | 22.2 | 1 | 468.15 | 2.2 | 18600 |
| | 830805 | 1450 | 8.2 | 14.4 | 1 | 468.70 | 3.4 | 21700 |
| | 830825 | 1710 | 7.4 | 12.4 | 2 | 470.58 | 12.5 | 27400 |
| | 830809 | 1815 | 11.8 | 15.8 | 140 | 470.36 | 10.9 | 29900 |
| | 830826 | 1610 | 8.9 | 18.6 | 60 | 470.58 | 12.5 | 31700 |

1 USGS provisional data, 1983

2 Flow estimated using stage/flow rating curve determined for the study site (refer to Chapter 1 of this report).

3 Stage/flow rating curve not developed for this site.

Appendix Table 4-A-2 (Continued)

| Location | Date | Time | Temperature (°C) Water | Temperature (°C) Air | Turbidity NTU | WSEL (ft.) | Estimated[1] flow (cfs) | Susitna River Discharge (cfs) |
|---|---|---|---|---|---|---|---|---|
| Mainstem 2 Side Channel | 830917 | 1025 | 3.0 | 3.9 | 1 | 478.84 | 33.7 | 10000 |
| NW Channel Q site | 831004 | 1340 | 3.9 | 8.2 | 2 | 479.10 | 48.6 | 11400 |
| gage no. 114.4S5 | 830722 | 1405 | 13.8 | 20.4 | 220 | 480.64 | 350 | 18600 |
| RM 115.4 | 830611 | 1830 | 9.9 | 15.6 | 53 | 480.66 | 359 | 19000 |
| | 830805 | 1315 | 12.3 | 14.1 | 294 | 481.31 | 758 | 21700 |
| | 830806 | 1730 | 11.1 | 18.8 | 280 | 481.60 | 1044 | 23800 |
| | 830808 | 1440 | 11.3 | 13.4 | 192 | 481.89 | 1426 | 26000 |
| | 830825 | 1300 | 8.4 | 13.4 | 84 | 481.97 | 1553 | 27400 |
| Mainstem 2 Side Channel | 830917 | 1040 | 3.9 | 5.2 | 1 | 480.41 | 3.4 | 10000 |
| NE Channel Q site | 831004 | 1450 | 3.2 | 8.1 | 1 | 480.38 | 3.1 | 11400 |
| gage no. 114.4S8 | 830721 | 2000 | 15.0 | 16.2 | 2 | 480.44 | 3.6 | 18100 |
| RM 115.5 | 830805 | 1335 | 14.0 | 13.8 | 3 | 480.46 | 3.7 | 21700 |
| | 830806 | 1900 | 14.8 | 14.4 | 156 | 480.57 | 4.8 | 23800 |
| | 830808 | 1530 | 11.4 | 14.2 | 168 | 481.28 | 21 | 26000 |
| | 830825 | 1605 | 9.3 | 12.4 | 76 | 481.31 | 22 | 27400 |
| | 830826 | 1925 | 8.2 | 12.6 | 184 | 482.88 | 432 | 31700 |
| Slough 8A | 830915 | 1515 | 9.4 | 10.2 | 2 | 566.01 | 0.6 | 10600 |
| NW Channel Q site | 831003 | 1350 | 6.2 | 7.8 | 2 | 566.10 | 1.0 | 13000 |
| gage no. 125.3S3 | 830924 | 1246 | 2.4 | 0.2 | 1 | 566.08 | 0.8 | 15200 |
| RM 125.3 | 830716 | 1800 | 14.0 | 18.0 | 1 | 566.11 | 1.0 | 16400 |
| | 830721 | 1150 | 13.4 | 18.5 | 1 | 566.00 | 0.5 | 18100 |
| | 830804 | 1130 | 9.4 | 13.2 | 1 | 566.03 | 0.6 | 20900 |
| | 830823 | 1340 | 9.0 | 11.4 | 1 | 566.05 | 0.7 | 22700 |
| | 830809 | 1245 | 11.7 | 15.9 | 126 | 566.44 | 7.3 | 29900 |
| | 830827 | 1320 | 9.3 | 19.0 | 75 | 566.80 | 8.1 | 31000 |

[1] Flow estimated using stage/flow rating curve determined for the study site (refer to Chapter 1 of this report).

Appendix Table 4-A-2 (Continued)

| Location | Date | Time | Temperature (°C) Water | Air | Turbidity NTU | WSEL (ft.) | Estimated[1] flow (cfs) | Susitna River Discharge (cfs) |
|---|---|---|---|---|---|---|---|---|
| Slough 8A | 830915 | 1505 | 9.8 | 10.6 | 1 | 567.22 | 2/ | 10600 |
| NE Channel Q site | 830924 | 1315 | 0.6 | 1.0 | 1 | 567.29 | 2/ | 15200 |
| gage no. 125.3S1 | 830716 | 1820 | 15.4 | 18.0 | 1 | 566.20 | 2/ | 16400 |
| RM 125.8 | 830721 | 1250 | 15.6 | 18.7 | 1 | 566.33 | 2/ | 18100 |
| | 830615 | 1615 | NA | NA | 1 | 566.09 | 2/ | 19600 |
| | 830804 | 1220 | 11.2 | 13.8 | 1 | 566.60 | 2/ | 20900 |
| | 830823 | 1210 | 9.2 | 18.4 | 2 | 566.97 | 2/ | 22700 |
| | 830630 | 1404 | NA | NA | 1 | 566.08 | 2/ | 24700 |
| | 830809 | 1130 | 11.6 | 16.2 | 1 | 566.91 | 2/ | 29900 |
| | 830827 | 1125 | 9.6 | 15.2 | 1 | 567.07 | 2/ | 31000 |
| Slough 8A | 831003 | 1310 | 6.2 | 3.0 | 2 | 563.68 | 8.6 | 13000 |
| B/L Beaver Dam | 830924 | 1224 | 1.4 | 0.2 | 1 | 563.60 | 6.3 | 15200 |
| W. Channel | 830721 | 1430 | 6.2 | 17.2 | 1 | 563.51 | 4.4 | 18100 |
| gage no. 125.3S4 | 830804 | 1320 | NA | 13.2 | 1 | 563.57 | 5.6 | 20900 |
| RM 125.7 | 830823 | 1400 | 10.2 | 14.0 | 1 | 563.66 | 8.0 | 22700 |
| | 830827 | 1427 | 11.0 | 18.8 | 78 | 564.14 | 46.6 | 31000 |
| Slough 9 Q site | 830914 | 0955 | 5.8 | 9.9 | 1 | 593.27 | 6.9 | 10700 |
| gage no. 128.3S1 | 831003 | 1515 | 4.2 | 6.6 | 1 | 593.50 | 14.3 | 13000 |
| RM 128.9 | 830924 | 1550 | 2.6 | 1.0 | 2 | 593.33 | 8.5 | 15200 |
| | 830716 | 2200 | 11.0 | 14.6 | 3 | 593.27 | 7.0 | 16400 |
| | 830721 | 1745 | 16.0 | 15.4 | 54 | 593.36 | 9.3 | 18100 |
| | 830805 | 0900 | NA | NA | 126 | --[3/] | 3/ | 18200 |
| | 830618 | 1450 | NA | NA | 64 | --[3/] | 3/ | 22900 |
| | 830630 | 1030 | 12.1 | NA | 200 | 594.00 | 58.9 | 24700 |
| | 830824 | 1135 | 9.0 | 8.6 | 64 | 594.05 | 67.2 | 24700 |
| | 830809 | 1540 | 11.9 | 17.2 | 224 | 595.11 | 788 | 29900 |

1 Flow estimated using stage/flow rating curve determined for the study site (refer to Chapter 1 of this report.
2 Stage/flow rating curve not developed for this site.
3 Data not available.

Appendix Table 4-A-2 (Continued)

| Location | Date | Time | Temperature (°C) Water | Temperature (°C) Air | Turbidity NTU | WSEL (ft.) | Estimated[1] flow (cfs) | Susitna River Discharge (cfs) |
|---|---|---|---|---|---|---|---|---|
| Side Channel 10 | 830911 | 1115 | 8.4 | 12.6 | 1 | 654.27 | 3.0 | 12200 |
| Q site FHU 4 | 831003 | 1225 | 6.4 | 7.0 | 2 | 654.30 | 3.2 | 13000 |
| gage no. 133.8S3 | 830717 | 1100 | 8.2 | 17.2 | 2 | 654.30 | 3.2 | 16500 |
| RM 134.2 | 830803 | 1703 | 13.6 | NA | 304 | 655.18 | 118 | 21600 |
| | 830823 | 1330 | 8.8 | 12.6 | 64 | 655.54 | 157 | 22700 |
| | 830618 | 1600 | NA | NA | 89 | - -[2] | - -[2] | 22900 |
| | 830808 | 1310 | 10.2 | NA | 184 | 656.27 | 264 | 26000 |
| | 830629 | 1610 | 10.3 | NA | 200 | 656.09 | 234 | 26800 |
| | 830826 | 1713 | 7.8 | 12.3 | 152 | 657.97 | 730 | 31700 |
| | 830810 | 1233 | 9.5 | NA | 440 | 658.26 | 849 | 31900 |
| Slough 11 Q site | 830915 | 1751 | 6.7 | 8.8 | 2 | 670.67 | 1.5 | 10600 |
| gage no. 135.3S6 | 831004 | 1340 | 2.0 | 4.8 | 2 | 670.67 | 1.5 | 11400 |
| RM 135.7 | 830721 | 1110 | 8.8 | 17.8 | 1 | 670.72 | 2.5 | 18100 |
| | 830718 | 1040 | 7.8 | 17.2 | 12 | 670.72 | 2.5 | 18900 |
| | 830823 | 1524 | 6.8 | 12.7 | 1 | 670.73 | 2.8 | 22700 |
| | 830618 | 1530 | NA | NA | 3 | - -[2] | - -[2] | 22900 |
| | 830806 | 1155 | 7.8 | 13.8 | 1 | 670.73 | 2.8 | 23800 |
| | 830629 | 950 | 8.0 | NA | 1 | 670.76 | 3.8 | 26800 |
| Upper Side Channel 11 | 830911 | 1745 | 7.9 | 14.1 | 2 | 680.63 | 5.7 | 12200 |
| Q site | 830720 | 0940 | 11.6 | 16.2 | 104 | 681.34 | 49 | 18600 |
| gage no. 136.2S1 | 830806 | 1345 | 10.5 | NA | 248 | 681.95 | 247 | 23800 |
| RM 136.5 | 830808 | 1450 | 10.4 | 12.4 | 184 | 682.24 | 513 | 26000 |
| | 830629 | 1255 | 10.9 | -- | 200 | 682.13 | 390 | 26800 |
| | 830826 | 1835 | 7.8 | 12.4 | 152 | 682.93 | 2615 | 31700 |
| | 830810 | 1438 | 10.5 | -- | 368 | 682.87 | 2283 | 31900 |

[1] Flow estimated using stage/flow rating curve determined for the study site (refer to Chapter 1 of this report.

[2] Data not available.

Appendix Table 4-A-2 (Continued)

| Location | Date | Time | Temperature (°C) Water | Air | Turbidity NTU | WSEL (ft.) | Estimated[1] flow (cfs) | Susitna River Discharge (cfs) |
|---|---|---|---|---|---|---|---|---|
| Slough 16B Q site gage no. 138.0S5 RM 138.0 | 830703 | NA | 11.2 | NA | 96 | -- [2] | -- [2] | 26200 |
| Slough 19 Q site gage no. 140.0S4 RM 139.9 | 830914 | 1110 | 4.6 | 7.8 | 2 | 720.04 | [3] | 10700 |
| | 831003 | 1120 | 3.2 | 1.4 | 1 | -- [2] | [3] | 13000 |
| | 830721 | 1833 | 8.1 | 16.6 | 1 | 720.29 | [3] | 18100 |
| | 830804 | 1532 | 6.1 | 13.8 | 1 | 720.80 | [3] | 20900 |
| | 830616 | 1555 | 8.4 | NA | 1 | NA | [3] | 21600 |
| | 830823 | 1806 | NA | 11.0 | 2 | 720.97 | [3] | 22700 |
| | 830629 | 1635 | 6.0 | NA | 3 | 721.39 | [3] | 26800 |
| | 830809 | 1632 | 10.8 | 17.8 | 1 | 722.25 | [3] | 29900 |
| Slough 20 Q site gage no. 140.1S5 RM 140.2 | 830913 | 1915 | 6.2 | 8.4 | 2 | 726.75 | 5.4 | 11100 |
| | 831003 | 1100 | 1.8 | 3.8 | 1 | 727.00 | 11.0 | 13000 |
| | 830721 | 1804 | 11.8 | 16.6 | 3 | 726.64 | 4.0 | 18100 |
| | 830804 | 1511 | 9.4 | 13.8 | 2 | 726.69 | 4.5 | 20900 |
| | 830701 | 1212 | 8.0 | NA | 2 | 726.77 | 5.7 | 23100 |
| | 830824 | 1258 | 7.6 | 17.0 | 14 | 726.93 | 9.0 | 24700 |
| | 830809 | 1606 | 10.6 | 17.8 | 168 | 727.65 | 62.0 | 29900 |

1 Flow estimated using stage/flow rating curve determined for the study site (refer to Chapter 1 of this report.

2 Data not available.

3 Stage/flow rating curve not developed for this site.

Appendix Table 4-A-2 (Continued)

| Location | Date | Time | Temperature (°C) Water | Air | Turbidity NTU | WSEL (ft.) | Estimated[1] flow (cfs) | Susitna River Discharge (cfs) |
|---|---|---|---|---|---|---|---|---|
| Side Channel 21 Lower Q site and FHU 4 gage no. 140.6S4 RM 141.1 | 830912 | 1524 | 9.2 | 14.4 | 12 | 736.11 | 39.2 | 12200 |
| | 830721 | 1735 | 13.2 | 16.6 | 176 | 737.02 | 314 | 18100 |
| | 830804 | 1339 | 12.6 | 13.8 | 288 | 737.20[2] | 459[2] | 20900 |
| | 830616 | 1330 | 11.7 | NA | 41 | - -[2] | - -[2] | 21600 |
| | 830822 | 1707 | 9.0 | 16.4 | 30 | 737.29 | 553 | 21600 |
| | 830630 | 1430 | 12.6 | NA | 200 | 737.36 | 639 | 24700 |
| | 830809 | 1150 | 10.2 | 17.8 | 232 | 737.73 | 1333 | 29900 |
| Slough 21 Q site gage no. 142.0S6 RM 142.0 | 830913 | 1634 | 6.0 | 9.8 | 2 | 745.02 | 3.9 | 11100 |
| | 831003 | 1030 | 2.8 | 0.2 | 1 | 745.02 | 3.9 | 13000 |
| | 830721 | 1525 | 11.2 | 16.6 | 3 | 744.99 | 3.9 | 18100 |
| | 830804 | 1113 | 5.4 | 13.8 | 2 | 745.00[2] | 3.9[2] | 20900 |
| | 830616 | 1245 | 8.4 | NA | 1 | - -[2] | - -[2] | 21600 |
| | 830822 | 1352 | 6.0 | 14.4 | 3 | 745.07 | 3.9 | 21600 |
| | 830630 | 1115 | 8.1 | NA | 1 | 745.03 | 3.9 | 24700 |
| | 830809 | 1510 | 10.8 | 17.8 | 204 | 746.03 | 32.2 | 29900 |
| Slough 22 Q site gage no. 144.3S6 RM 144.6 | 830702 | 1632 | 12.8 | NA | 288 | 784.04 | 13.5 | 24900 |

1 Flow estimated using stage/flow rating curve determined for the study site (refer to Chapter 1 of this report.

2 Data not available.

Appendix Table 4-A-3. Incidental water quality data (temperature and turbidity) compared to tributary stream flow water surface for Indian River and Whiskers Creek for the 1983 open water field season.

| Location | Date | Time | Temperature (°C) Water | Air | Turbidity NTU | Tributary[2]/ Streamflow (cfs) |
|---|---|---|---|---|---|---|
| Indian River Q site gage no. 138.6T2 RM 138.6 | 830913 | 0946 | 6.2 | 8.0 | 1 | 244 |
| | 831003 | 1615 | 3.4 | 4.8 | 1 | 1049 |
| | 830721 | 1255 | 12.6 | 18.2 | 7 | 84 |
| | 830705 | 1140 | 9.9 | NA | 2 | 384 |
| | 830827 | 1326 | 8.8 | 18.3 | 1 | 433 |
| Whiskers Creek Q site gage no. 101.2T2 RM 101.4 | 830618 | 1225 | 13.4 | - -[2/] | 1 | 12 |

1 Streamflow estimated from observed water surface elevation utilizing the stage/flow rating curve developed for the study site (refer to Chapter 1 of this report).

2 Data not available