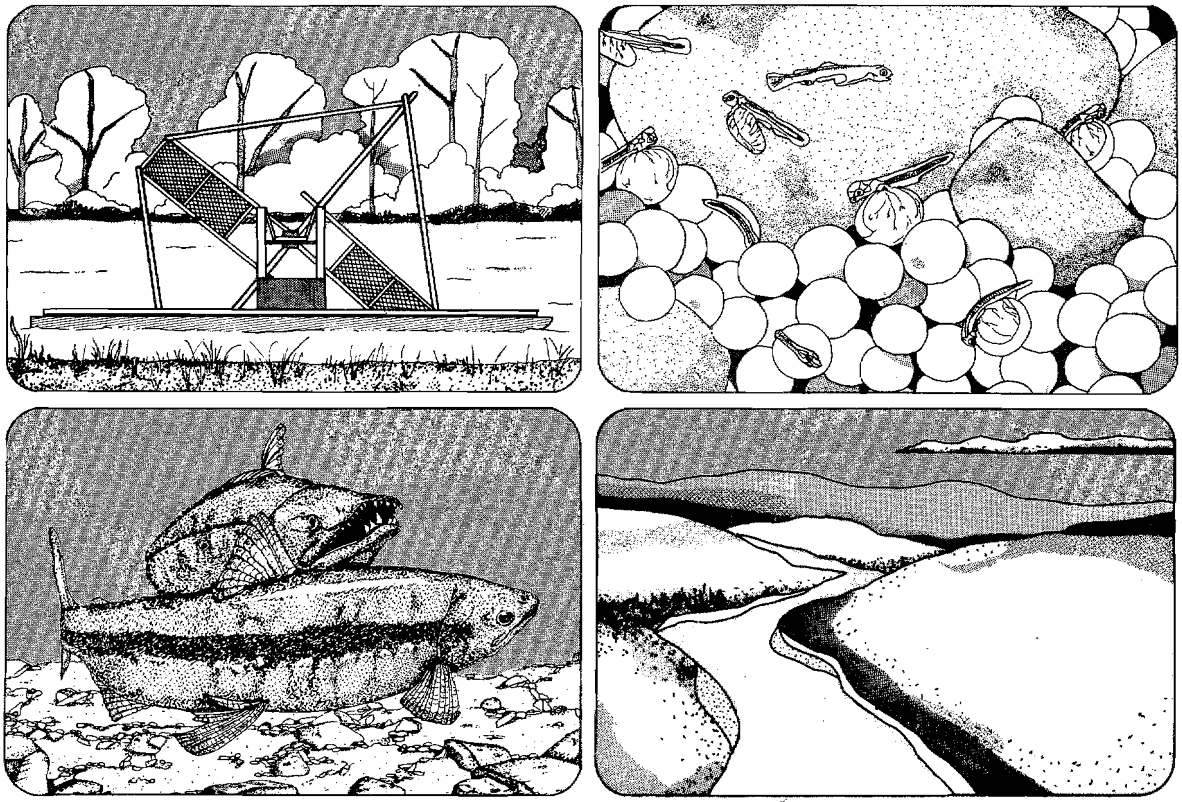


1984
ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES
REPORT NO. 1
2207 Spenard Road
Anchorage, Alaska 99503

ALASKA DEPARTMENT OF FISH AND GAME

SUSITNA HYDRO AQUATIC STUDIES REPORT SERIES

Document No. 1450
Susitna File No. 4.3.1.6

ADULT ANADROMOUS FISH INVESTIGATIONS: MAY - OCTOBER 1983

by

Bruce M. Barrett
Frederick M. Thompson
Susan N. Wick

1984
ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES
REPORT NO. 1
2207 Spenard Road
Anchorage, Alaska 99503

for

Alaska Power Authority
334 W. 5th Avenue, Second Floor
Anchorage, Alaska 99501

NOTICE

ANY QUESTIONS OR COMMENTS CONCERNING THIS REPORT SHOULD BE DIRECTED TO THE ALASKA POWER AUTHORITY SUSITNA PROJECT OFFICE

PREFACE

The Susitna River produces anadromous fish runs of chinook, sockeye, pink, chum and coho salmon important to local fisheries. Commercial fisherman in Upper Cook Inlet annually harvest about 13 thousand chinook, 2.0 million sockeye, and 1.5 million pink (even years), 165 thousand pink (odd years), 805 thousand chum and 340 thousand coho salmon.[1] About 10% of the chinook, 10-30% of the sockeye, 80-90% of the pink, 80-90% of the chum and 50% of the coho salmon commercial catch are Susitna River stocks. These estimates of Susitna River stock contribution are not definitive. They are based on fragmentary data and the judgement of the authors. The Susitna River also supports a salmon sport fishery. In 1982 sportfishermen expended about 131,500 man days of effort harvesting: 10,700 chinook, 4,400 sockeye, 17,500 pink, 6,900 chum and 20,900 coho salmon from the system.[2]

Although 30 years of fishery research work has been conducted on the Susitna River, salmon escapements into the entire system have not been completely quantified because of high turbidity, numerous and wide flow channels, and funding and gear limitations. For 1981 and 1982 the partial or minimum escapements of sockeye, pink, chum and coho salmon into the system were:

---

[1] Paul H. Ruesch, Memorandum to Ken Parker, 1983.

[2] Michael Mills, Statewide Harvest Survey: 1982 Data; (ADF&G, 1983), pp 57-58.

	1981 [3]	1982 [3]
Sockeye	272,900	265,300
Pink	85,600	890,500
Chum	282,700	458,200
Coho	36,800	79,800

These escapement numbers are minimum values as they do not include escapements in the lower Susitna River reach downstream of river mile (RM) 80 excluding the Yentna River (RM 28). This unmonitored reach supports major salmon spawning populations, particularly pink and coho salmon stocks.

The Alaska Power Authority (APA) has proposed the construction of two hydroelectric facilities on the upper Susitna River. The Federal Energy Regulatory Commission (FERC), the licensing authority, requires that APA provide an analysis of the environmental issues of the project. To this end APA has contracted the Alaska Department of Fish and Game (ADF&G) to assess the Susitna River fishery resources. This report addresses the adult anadromous fish investigations contracted to ADF&G for the open water period in the Susitna River from May to October 1983. It is one of several reports prepared by ADF&G for APA since 1981. It is the first to be included in the <u>Alaska Department of Fish and Game Susitna Hydro Aquatic Studies Report Series</u>.

---

[3] Alaska Department of Fish and Game, Adult Anadromous Fish Studies, 1982.

All questions concerning this report should be directed to:

Alaska Power Authority
334 West 5th Avenue, Second Floor
Anchorage, Alaska 99501
Telephone (907) 277-7641

Titles In This Series

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

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

LIST OF FIGURES (Continued)

LIST OF FIGURES (Continued)

LIST OF FIGURES (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF PLATES

LIST OF APPENDIX FIGURES

LIST OF APPENDIX FIGURES (Continued)

LIST OF APPENDIX FIGURES (Continued)

LIST OF APPENDIX FIGURES (Continued)

LIST OF APPENDIX TABLES

LIST OF APPENDIX TABLES (Continued)

LIST OF APPENDIX TABLES (Continued)

ACKNOWLEDGEMENTS

Project funding was provided by the State of Alaska, Alaska Power Authority.

The authors sincerely appreciate the technical assistance provided by the following Department of Fish and Game (ADF&G) employees:

Fisheries Biologists	Fisheries Technicians
Beers, Dean	Badgley, Albert
Bigler, Jeffrey	Blaney, Alden
Gustin, Richard	Crowe, Thomas
Kerkvliet, Carol	Fusco, Robert
Richards, Craig	Harris, Patricia
Sharp, Dan	Jones, Craig
Volk, Don	Patrick, James
	Stratton, Barry
	Wilkey, Robert

Additional credit is due Carol Kerkvliet (ADF&G) for her assistance on the eulachon, sockeye and chum salmon sections.

The authors thank Gene and Rose Jenne (Three Rivers Union, Talkeetna), the Alaska Railroad and Robert Bacon (Snafu Freight Inc.) for field support services.

Appreciation is also extended to Thomas Trent, Larry Bartlett, Robert Dieryck and Kyle Watson and other ADF&G staff for administrative support services.

Special thanks is given to Allen Bingham and staff (ADF&G) for data processing services, Mary Gressett (ADF&G) for typing this report and Sally Donovan (ADF&G) for drafting services.

We also extend thanks to the following individuals and agencies for reviewing earlier drafts of the manuscript:

Arctic Environmental Information and Data Center
Larry Bartlett (ADF&G, Su Hydro)
Allen Bingham (ADF&G, Su Hydro)
Drew Crawford (ADF&G, Su Hydro)
Harza-Ebasco Susitna Joint Venture
Bruce King (ADF&G, Soldotna)
Larry Molten (Woodward Clyde Consultants)
Dana Schmidt (ADF&G, Su Hydro)
Ken Tarbox (ADF&G, Soldotna)

1.0 OBJECTIVES

In 1983 a third year of study was initiated of the adult anadromous fish populations in the Susitna River basin. The main emphasis in 1983 was the salmon populations particularly emphasizing the Talkeetna (RM 98.6) to upper Devil Canyon (RM 161.0) reach (Figure 2-2-1). The principle study objectives were:

1. Determine the escapements, timing and migrational characteristics of the sockeye, pink, chum and coho salmon populations in the Yentna River (RM 28) and Susitna River main channel at RM 80, 103 and 120. Additionally, determine the same for chinook salmon in the Susitna River main channel at RM 80, 103 and 120.

2. Define where salmon spawn between Talkeetna (RM 98.6) and upper Devil Canyon (RM 161.0) with emphasis on streams and sloughs.

3. Determine the seasonal distribution, relative abundance and spawning areas of eulachon in the Susitna River.

Anadromous fish species addressed in this report are:

Eulachon	*Thaleichthys pacificus*
Pacific Salmon	*Oncorhynchus sp*
Chinook Salmon	*O. tshawytscha*
Sockeye Salmon	*O. nerka*
Pink Salmon	*O. gorbuscha*
Chum Salmon	*O. keta*
Coho Salmon	*O. kisutch*
Bering cisco	*Coregonus laurettae*

2.0 METHODS

2.1 Eulachon

2.1.1 Intertidal

From May 10 to June 8, 1983, a standard sinking gill net measuring 25 feet (ft.) long, 5 ft. deep with 1.5-inch (in.) stretch mesh was fished intermittently at two locations in the Susitna River intertidal, Sites II and III (Figure 2-2-1), according to the following schedule:

1. May 10 through May 16 - Once every high tide beginning on the second high tide on May 10.

2. May 17 through May 23 - Once every fourth high tide.

3. May 24 through June 8 - Once every fifth high tide minimum.

At each fishing location the net was released perpendicular to the river channel with a 20-ft. riverboat powered by a 75-horsepower (hp) jet outboard. The net was secured at each end by a 20-pound (lb.) navy anchor and marked at each surface end with a single 18-in. diameter buoy (Plate 2-2-1).

Set net sites II and III were fished 30 minutes each during each selected high tide. Netting was terminated at any time in a 30-minute set when visual observation indicated 200 or more eulachon in the net. Fishing began at Site II, 15 minutes following high tide and at Site III, 45 minutes preceding high tide. Fishing time at each location was recorded to the nearest minute. The

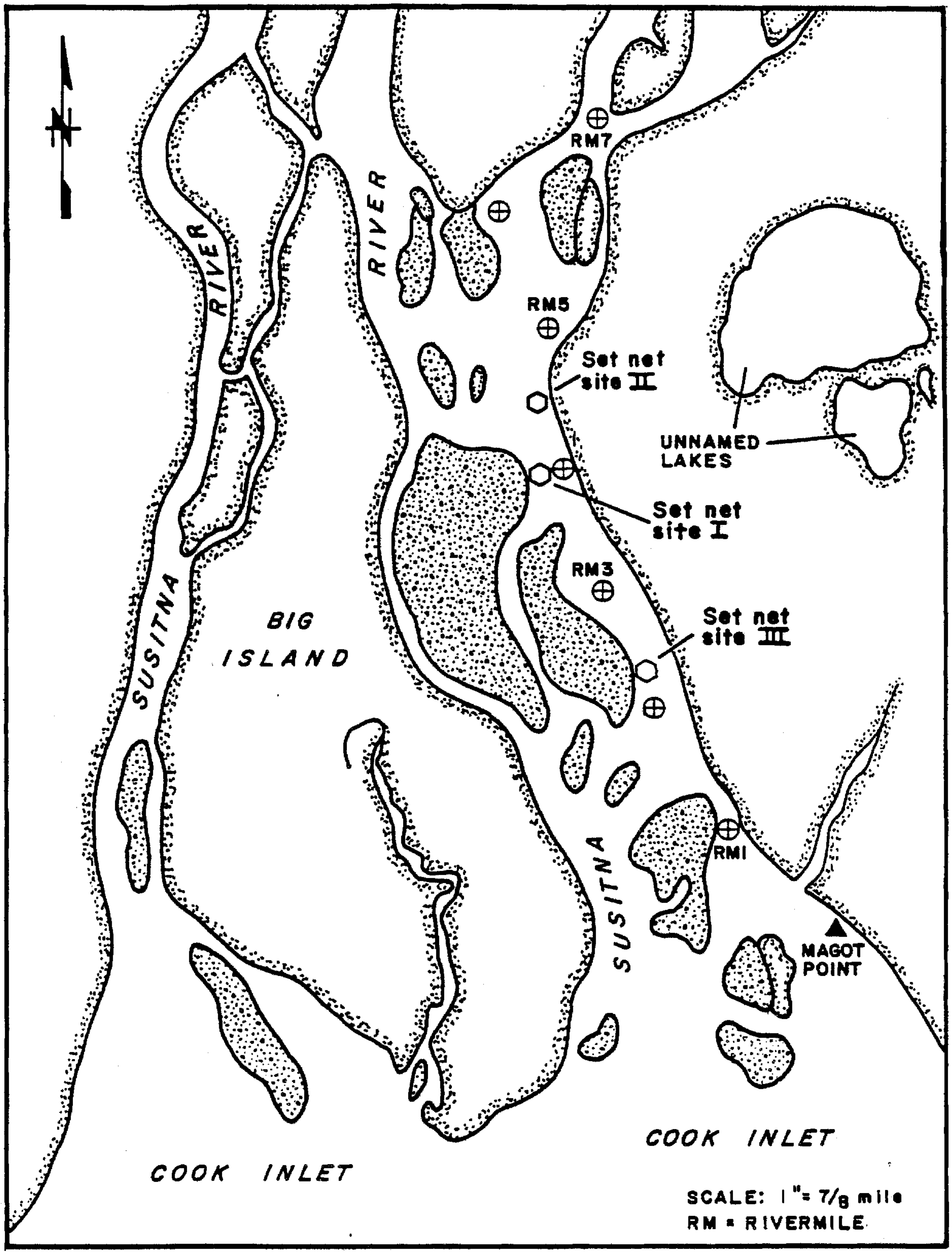


Figure 2-2-1. Susitna River intertidal with set net sites defined, 1983.

time of high tide for the Susitna River intertidal was determined by subtracting 36 minutes from the 1983 high tide table for the Anchorage District (U.S. Coast Guard, pers. com. 1982).

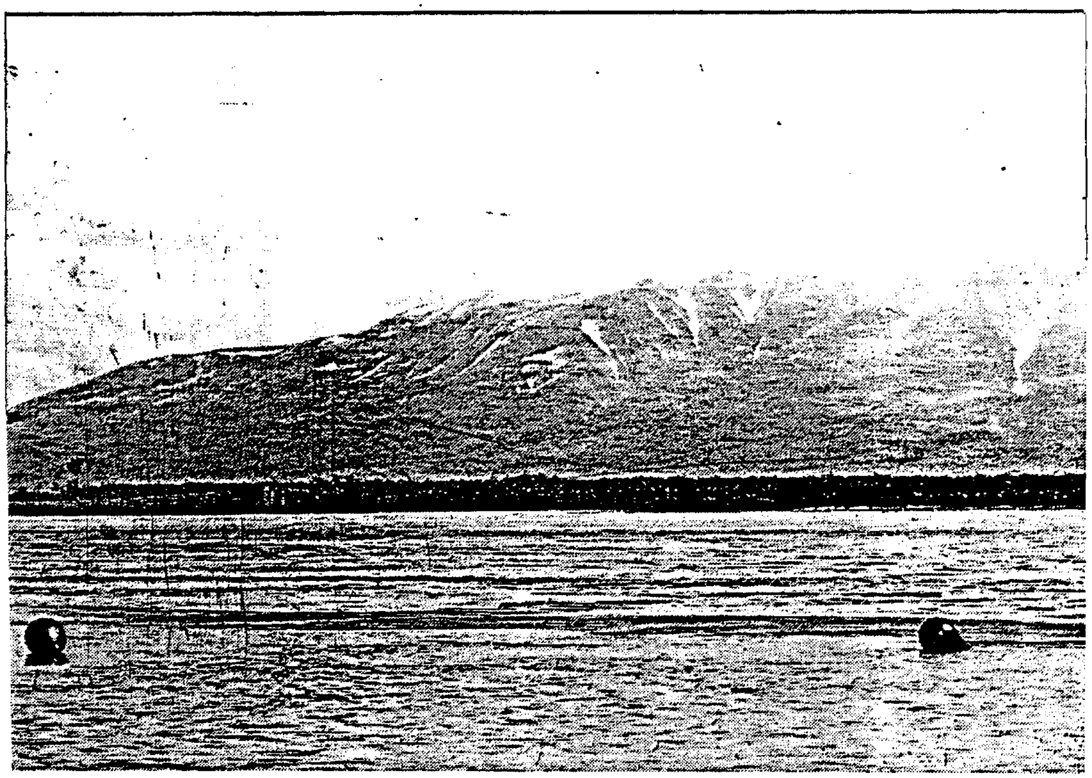


Plate 2-2-1. Sinking gill net set in the Susitna River intertidal, 1983.

The eulachon caught at each set net location were separated into two categories: inmigrants and outmigrants. The pre-spawning and spawning condition fish were classified as inmigrants and post-spawning condition fish as outmigrants. The reason pre-spawning and spawning condition eulachon were placed into a single category was because net caught fish were often damaged to where it was not possible to accurately separate these development stages (Plate 2-2-2). Net caught post-spawning eulachon were easy to distinguish from pre- and spawning condition eulachon and were classified as outmigrants. All spawning condition classifications were determined by morphological examination and when necessary by exerting slight hand pressure to the abdominal region of each fish.

Plate 2-2-2. Removing eulachon from a set net set in the Susitna River intertidal, 1983.

A sample of 100 eulachon were collected with a standard dip net for sex, and spawning condition data at Site II either prior to, or after net duties. The minimum amount of time expended to obtain the 100 fish sample was 0.5 hours (hrs.) and the maximum, 1.0 hrs. The eulachon caught were sorted and recorded by spawning condition and sex. Age, length and weight samples were taken from the first 10 pre-spawning eulachon per sex caught.

The criteria used to classify the male spawning development stages were somewhat subjective due to free expulsion of milt among male fish in the pre- and spawning conditions. The criteria followed were:

Pre-spawners - bright coloration and thick milt.

Spawners - dark coloration and watery milt.

Post-spawners - essentially void of milt.

Female spawning condition classifications were determined by the following criteria:

Pre-spawners - eggs are not expelled freely.

Spawners - eggs are expelled freely.

Post-spawners - essentially void of eggs.

Age samples were collected by taking the two otoliths from each eulachon sampled. Each otolith set was stored in a water-dampened paper towel in an individually labeled vial until aged with a standard microfiche reader. Eulachon lengths were taken from the tip of the mouth to the fork of the tail to the nearest millimeter (mm). The weights were registered to the nearest decigram (0.1 g) with an Ohaus, Triple Beam balance. Sex was determined by morphological examination and when necessary by exerting slight hand pressure to the abdominal region of each fish.

2.1.2 Main Channel

The main channel reach between RM 4.5 and 60 was sampled daily for eulachon presence and spawning areas from May 15 to June 6, 1983 using a combination of an electroshocking equipped boat and hand-held dip nets (Plate 2-2-3). The electroshocking unit was a Model VVP-3E Coffelt electroshocker powered by a 3500 watt Homelite generator. Input into the electroshocker was 230 volts of alternating current (AC) and the output, direct current (DC). The output was setup with the anode (+) electrode wired to a hand supported dip net and the cathode (-) electrode grounded to the boat hull. Activation of the circuit ranged from five to 10 seconds followed by a 20 to 40 second pause to avoid herding fish. The most effective output for electroshocking eulachon was 1.0 to 2.0 amperes (amps).

A eulachon spawning area was considered a site where a single sample by dip net or electroshocker produced a catch with a ratio of 23 free-swimming (male and female) eulachon : 2 female eulachon with one of the two females being in spawning condition. The basis for implementing this procedure can be found in the Phase II, ADF&G/Su Hydro Adult Anadromous report, 1982 (ADF&G, 1982).

A sample of 10 pre-spawning eulachon, males and females, were collected by dip net for age, length and weight data once every three days from May 15 to June 6, 1983.

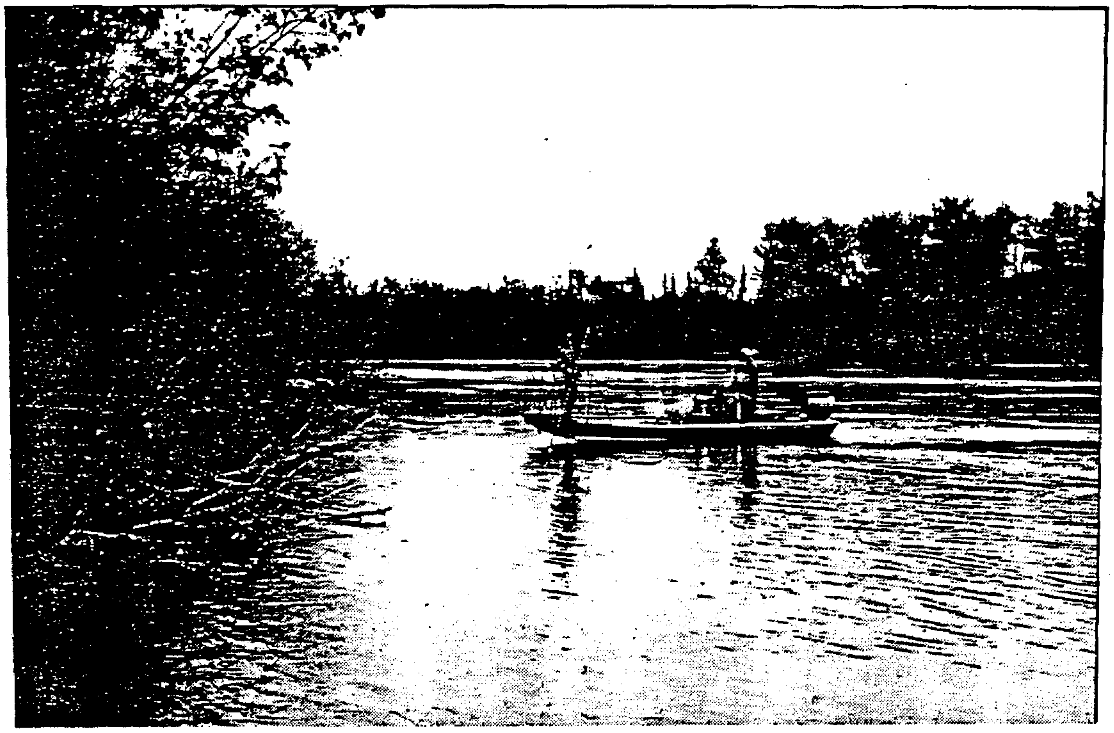


Plate 2-2-3. Electroshocking eulachon in the lower Susitna River in 1983.

2.2 Adult Salmon

2.2.1 Main Channel Escapement Monitoring

Four escapement monitoring stations were operated in 1983 on the Susitna and Yentna rivers at locations indicated in Figure 2-2-2 according to the schedule in Table 2-2-1. A map of each station is in Appendix 2-A.

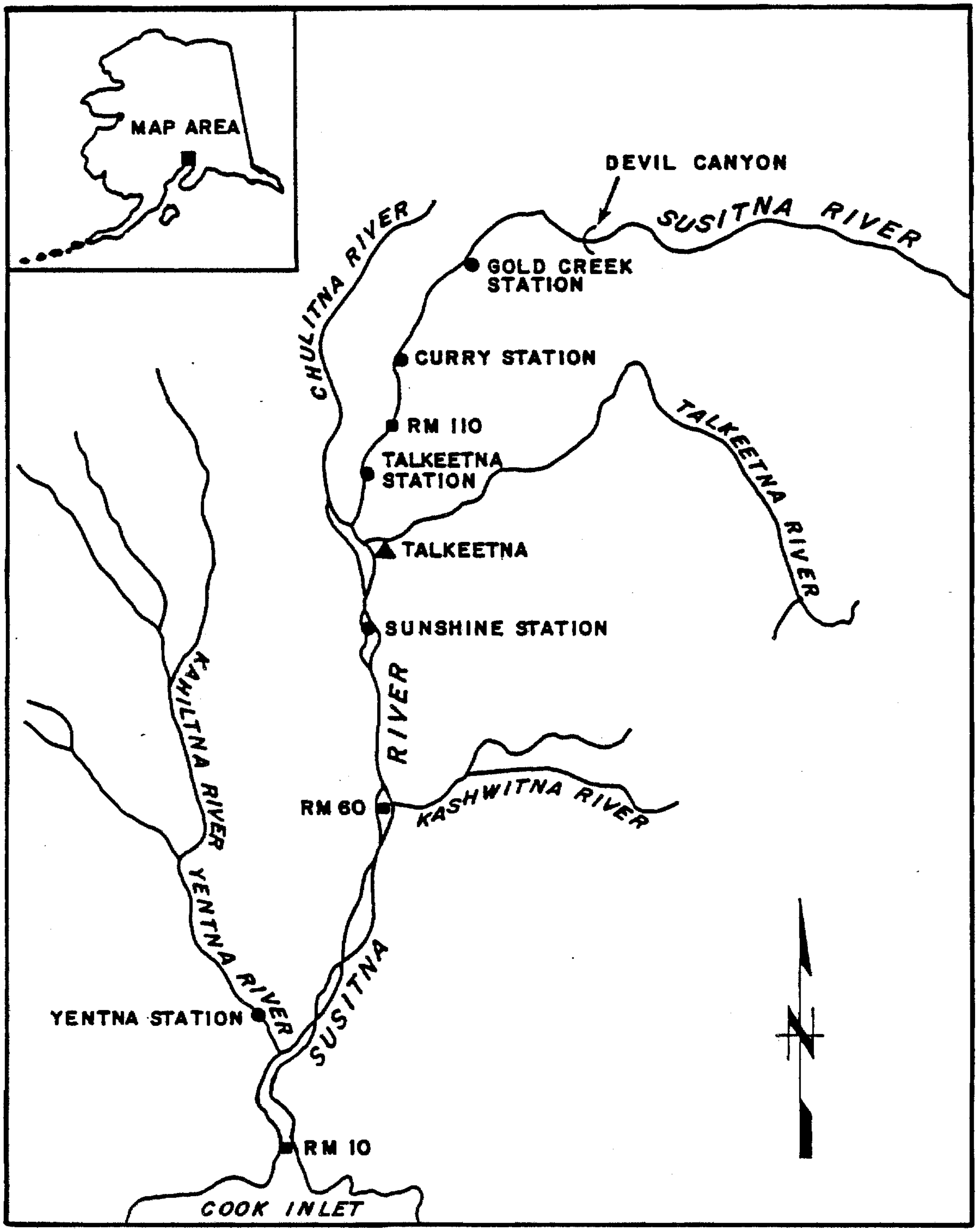


Figure 2-2-2. Susitna River basin map showing field stations and major glacial streams, 1983.

Table 2-2-1. Operation schedules at main channel Susitna and Yentna River escapement monitoring stations, 1983.

Sampling Site	Location		Period	
	River	River Mile	Begin	End
Yentna Station	Yentna	04	6/30	9/5
Sunshine Station	Susitna	80	6/3	9/11
Talkeetna Station	Susitna	103	6/7	9/12
Curry Station	Susitna	120	6/9	9/14

Two basic gear types were used to monitor Susitna and Yentna rivers salmon escapements. On the Yentna River (RM 28) at Yentna Station (TRM 04) two 1980 Model Bendix side scan sonar (SSS) counters were deployed in combination with two fishwheels. On the Susitna River four fishwheels were operated both at Sunshine (RM 80) and Talkeetna (RM 103) stations. At Curry Station (RM 120) two fishwheels were used to intercept salmon.

2.2.1.1 Sonar Operations

The two SSS counters, one off each bank, at Yentna Station (TRM 04) on the Yentna River (RM 28) were operated consistent with the 1980 Side Scan Sonar Counter Installation and Operation Manual by Bendix Corporation. Counter accuracy was checked four or more times daily by hand tallying fish registered echos on a Model 323, Sony Oscilloscope. Counter adjustments were made when the percent agreement between hand tallied oscilloscope counts and SSS counts for a 30 or more minute period was less than 90 or more than 110 percent.

Each SSS unit is capable of counting from 1 to 59 feet with the counting range divided into twelve equal sectors, the width of each a function of the distance being counted. Sonar counts were printed out for each sector every hour. The data form used to tabulate this information was divided into two sections, each consisting of six sectors, or 144 hourly blocks (ADF&G, 1983). Adjustment for debris counts followed these steps:

1. Total all counts for 144 hourly blocks (sectors 1-6).

2. Subtract debris counts from total counts leaving total good counts.

3. Multiply total good counts by 144 (number of hourly blocks) and;

4. divide by the total number of good blocks.

5. Repeat the above procedure for sectors 7-12 and then,

6. add the two adjusted totals from sectors 1-6 and 7-12 for the total adjusted sonar count for a 24 hour period.

The total adjusted sonar counts are apportioned to species based on the percent fishwheel catch, by species, for the corresponding 24 hours. This procedure provided the estimated daily escapements as reported in Appendix Table 2-C-3.

Sector distribution of salmon (i.e., spatial distribution of salmon through the sonar counting range) is based on the array of total single sector counts for a 24 hour period. Unlike the above procedure, debris adjustments were made for individual hourly blocks. This was accomplished by summing the hourly blocks before and after the debris block and using the average as the probable count for that hour. These values were not considered total sonar counts and were used only for identifying salmon distribution across the substrate.

2.2.1.2 Fishwheel Operations

The fishwheels used at Yentna (TRM 04), Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations in 1983 were of a 1981 design by ADF&G/Su Hydro Adult Anadromous staff (Plate 2-2-4). Construction specifications, maintenance and deployment procedures are outlined in the Phase I, ADF&G/Su Hydro Adult Anadromous report and Phase II, ADF&G/Su Hydro Adult Anadromous report (ADF&G, 1981 and 1982). The fishwheels were operated at Sunshine, Talkeetna and Curry stations 24 hours per day through the sampling season (Table 2-2-1). Occasionally the fishwheels were shut-down for maintenance, debris and at Sunshine Station, excessive catches. At Yentna Station the fishwheels were run a minimum of twelve hours per day during site operation.

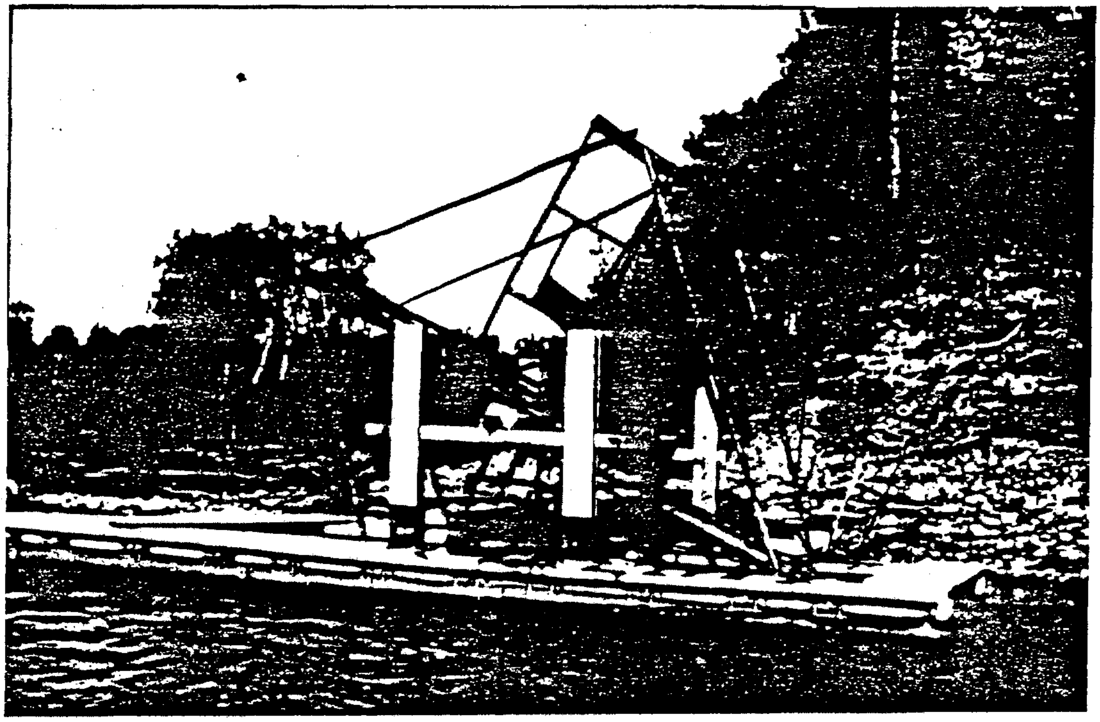


Plate 2-2-4. One of 12 fishwheels operated on the Yentna and Susitna rivers in 1983.

2.2.1.3 Tagging Operations

In 1983, all chinook ($\geq$ 351 mm length), sockeye, pink, chum and coho salmon caught in fishwheels at Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations were marked with color coded Petersen disc or Floy FT-4 spaghetti tags and released (Plates 2-2-5 and 2-2-6). Petersen disc tags were used to mark the chinook salmon caught at these stations. Additionally they were used to mark sockeye, pink, chum and coho salmon at Curry Station. At Sunshine and Talkeetna stations Floy FT-4 spaghetti tags were used for marking sockeye, pink, chum and coho salmon (Table 2-2-2). A percentage of

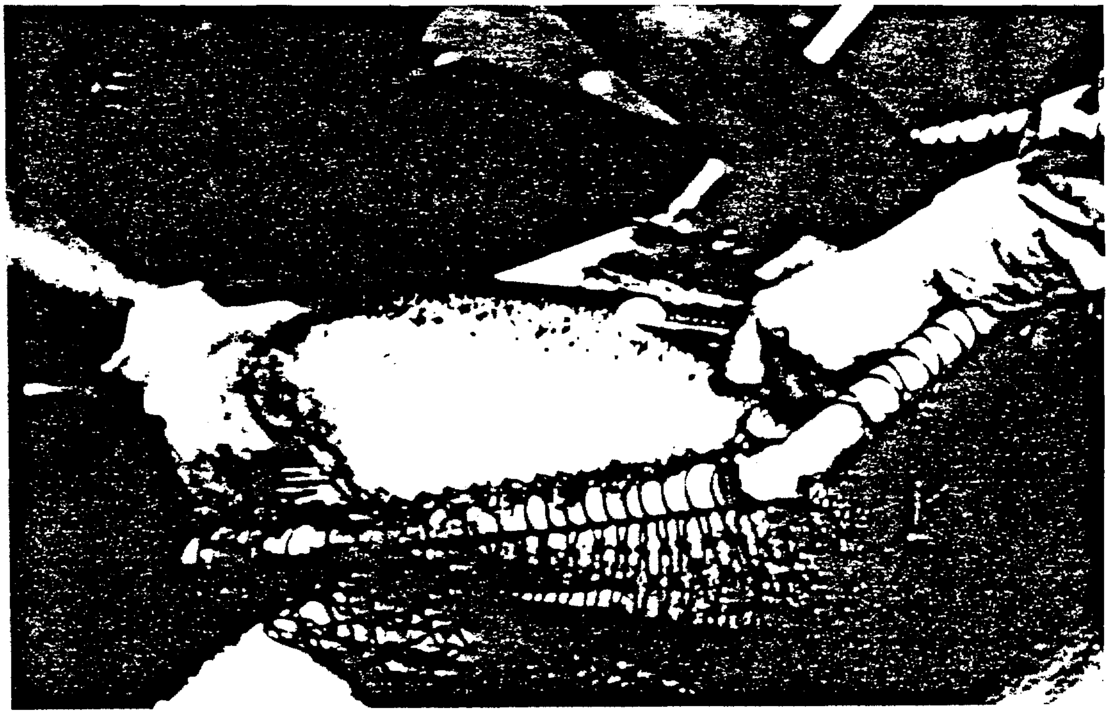


Plate 2-2-5. Chinook salmon being marked in 1983 with a Petersen disc tag.

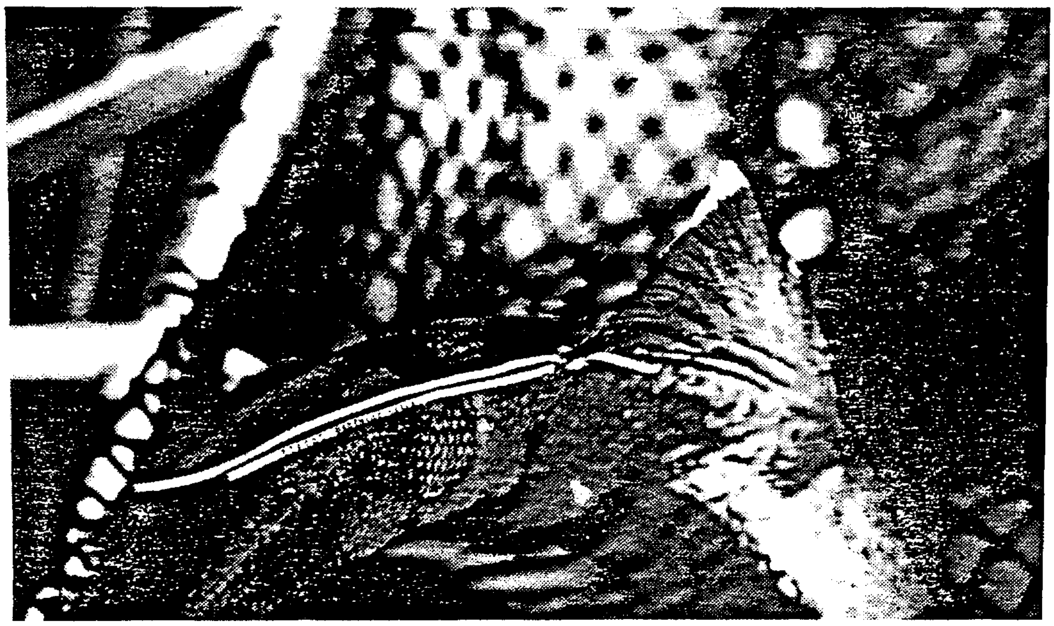


Plate 2-2-6. Chum salmon tagged in 1983 with a Floy FT-4 spaghetti tag.

the spaghetti and disc tags were numbered to provide data on travel time of species between stations. All recaptures made at upstream sampling locations were released following species identification and recording of tag type, color and number.

Table 2-2-2. Tag type and color code used in 1983 at Sunshine, Talkeetna and Curry stations.

Sampling Site	River Mile	Tag	
		Type	Color
Sunshine Station	80	FT-4/Spaghetti Petersen Disc	pink white and red
Talkeetna Station	103	FT-4/Spaghetti Petersen Disc	blue green
Curry Station	120	Petersen Disc	orange

The methodology followed for applying the Petersen disc and Floy FT-4 spaghetti tags is covered in the Phase I, ADF&G/Su Hydro Adult Anadromous report, 1981 (ADF&G, 1981).

2.2.1.4 Age, Length and Sex Composition Sampling

Sixty chinook, 30 sockeye, 20 chum and 20 coho salmon were sampled daily for age, length and sex from respective station fishwheel catches in 1983 at Yentna (TRM 04), Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations. Thirty pink salmon were also sampled daily for length and sex data at each site.

Age samples were not obtained from pink salmon due to their generally accepted age of two years. Age sampling of the other salmon species was accomplished by taking a 'preferred scale' from each fish sampled. The location of this scale is two rows dorsal to the lateral line on a diagonal between the posterior insertion of the dorsal fin and the anterior insertion of the anal fin. All length measurements were taken from the middle of the eye to the fork of tail to the nearest 10 mm on chinook salmon, and five mm on the other salmon species. Sexes were determined by standard morphological examination. The time for composite age, length and sex sampling was about 25 seconds per fish. Each fish was released immediately following sampling.

2.2.1.5 Fecundity Sampling

In 1983, Susitna River sockeye, pink and chum salmon fecundities were estimated from samples collected at Sunshine Station (RM 80). A total of 25 sockeye, 22 pink and 27 chum salmon were obtained between July 28 and 31 for use in the analysis. Samples were collected throughout the length ranges of sockeye, pink and chum salmon available during this time period

Prior to egg removal all salmon were measured to the nearest mm (FL) and weighed to the nearest gram (g). In addition, three scales were removed from the 'preferred area' on sockeye and chum salmon and mounted onto gum cards for later age determination.

Eggs from each fish sampled were bagged, placed in coolers and transported to Talkeetna for freezing. The eggs were processed by boiling each sample for approximately five minutes. Once the eggs had separated the water was drained off, and the eggs were enumerated by a volumetric estimation method.

Pink and chum salmon fecundities were determined by filling a 50 milliliter (ml) graduated cylinder to the 50 ml level with eggs and counting each egg in the graduated cylinder. This process was repeated three times for each female. The mean number of eggs from the three sampling trials was multiplied by the number of times the 50 ml graduated cylinder was filled to the 50 ml level for each sample. Residual eggs for each sample (those left that did not fill a 50 ml volume) were individually counted and added to the total estimate obtained by the volumetric method. This is mathematically represented by the following formula:

$$Te = A\,(Y) + r$$

where: Te = Total numbers of eggs in sample

A = Mean number of eggs in the three 50 ml volumetric sampling trials.

Y = Number of times the 50 ml graduated cylinder was filled for each sample.

r = Residual number of eggs from sample, individually counted.

Sockeye salmon egg diameters were smaller than pink and chum salmon and approximately one half of the total number of eggs filled a 50 ml volume. Therefore, only one 50 ml sampling trial was performed. In all other respects the counting procedures used were identical to those of pink and chum salmon.

2.2.2 Spawning Ground and Tag Recovery Surveys

2.2.2.1 Sloughs and Streams

In 1983, all known and suspected chinook salmon spawning areas in the Susitna River drainage upstream of the Chulitna River confluence (RM 98.6) were surveyed twice between July 15 and August 9. The surveys were conducted by helicopter and where possible on foot. Each of the spawning areas were surveyed in their entirety except Chase Creek (RM 106.9) which was surveyed for the first mile.

Additional escapement surveys, non-specific to chinook salmon, were made almost weekly between July 25 and October 11 of all probable salmon spawning streams and sloughs between RM 98.6 and 161.0 in 1983. The sloughs were surveyed on foot in total. Streams were surveyed to standard index markers on foot. The exceptions were Indian River (RM 138.6) and Portage Creek (RM 148.9) which were also surveyed by helicopter to the upper spawning limits, and Cheechako (RM 152.4), Chinook (RM 157.0) and Devil (RM 161.0) creeks located above Devil Canyon that were surveyed by helicopter to the upper limits of spawning.

Tag recovery surveys were also made in 1983. Between RM 80 and 98.6 selected spawning areas were surveyed for live tagged and untagged fish (Table 2-2-3). Above RM 98.6 tag recovery surveys were conducted concurrent with the regular scheduled slough and stream escapement surveys.

All spawning ground surveys including the tag recoveries surveys were performed by trained observers outfitted with polaroid sunglasses and hand-held tally counters.

Table 2-2-3. Location and schedule of tag recovery surveys of 1983 selected spawning areas between RM 84 and 98.6.

Spawning Area	Location 1/	Period	Frequency
Answer Creek	84.1	9/15-28	Once
Question Creek	84.1	9/15-25	Once
Birch Creek	88.4	8/10-25	Once
(lower)		9/15-28	Once
Fish Creek	97.1	8/10-25	Twice
Clear Creek	97.1	7/20-8/7	Once
Prairie Creek	97.1	7/20-8/7	Once
Byers Creek	98.6	8/10-15	Once
Troublesome Creek	98.6	9/5-15	Once
Chulitna River	98.6	7/25-8/7	Once
Bunco Creek	98.6	7/25-8/7	Once

1/ Location designated by river mile for the confluence of the spawning area or the junction of its receiving waters with the Susitna River main channel.

2.2.2.1.1 Chinook Salmon Index Surveys

In 1983, index surveys of the chinook salmon escapement were conducted in pre-selected spawning areas in the Susitna River drainage (ADF&G, 1981). The index surveys conducted above RM 98.6 were performed as defined in Section 2.2.1.5. The surveys in index areas downstream of RM 98.6 were conducted between July 13 and August 3 by ADF&G, Region II, Sport Fish Division staff with some assistance from ADF&G, Su Hydro personnel.

The chinook salmon index surveys in 1983 were performed by helicopter, foot and inflatable raft depending on accessibility. All observers conducting index surveys wore polaroid sunglasses and used hand-held counters.

2.2.2.1.2 Observation Life Surveys

At Curry Station (RM 120) between July 6 and September 9, 1983, 130 sockeye and 667 chum salmon were caught by fishwheels that were marked and released with large numbered Petersen disc tags (Section 2.2.1.3). An additional 18 sockeye and 13 chum salmon were similarly marked and released off the mouths of Moose Slough (RM 123.5) and Slough 11 (RM 135.3) on August 11 and 14, 1983 respectively. These fish were captured using a standard beach seine (60 ft. long, 6 ft. deep, and 1.5 in. stretch mesh).

In 1983, five sloughs upstream of RM 120 were intensely surveyed for marked sockeye and chum salmon released from Curry Station (RM 120) and off the mouths of Moose Slough (RM 123.5) and Slough 11 (RM 123.5). The study sloughs were: Moose (RM 123.5), A' (RM 124.6), 8A (RM 125.1), 9 (RM 128.3) and 11 (RM 135.3). The surveys were performed between August 11 and October 12 at a minimum of four day intervals. Ongoing with this work, enumeration surveys of live and dead salmon by species were conducted between July 26 and October 8 in these and other known salmon sloughs between RM 98.6 and 161.0 at seven day intervals (Section 2.2.2).

Individually tagged sockeye and chum salmon were surveyed in the five study sloughs by foot and occasionally from a powered riverboat. The observers used polarized sunglasses and polarized 7X35 Bushnell binoculars to improve observation. A record was kept of each tagged fish sighting. Information recorded included the date of observation, fish tag number, species, sex, behavior and location within the habitat. There were two categories of fish behavior recorded for each live tagged fish: milling or spawning. Milling activity was assessed by a judgemental observation of there being no 'significant' caudal fin erosion, and spawning activity by the fish bearing 'significant' caudal fin erosion or observed spawning. Within sloughs fish sightings were recorded by habitat zone. These zones were standardized reaches between major riffles areas as depicted in Appendix Figures 2-G-2 thru 2-G-5. Due to an absence of major riffle divisions in Slough A' (RM 124.6), no record was made of individual fish locations in this slough.

2.2.2.1.3 Egg Retention Sampling

In 1983, female sockeye and chum salmon carcasses were checked for egg retention in several slough and main channel spawning habitats between RM 98.6 and 161.0. There was no pre-defined minimum or maximum number of female sockeye or chum salmon sampled in this study. Sampling intensity was based on the availability of fish, that is when an escapement survey crew encountered a dead female sockeye or chum salmon the abdomen of the fish was incisioned and the eggs counted.

2.3 Bering Cisco

In 1983, the Bering cisco escapement into the Susitna River was not specifically sampled. However, a record was kept of the date and location of each catch made in association with other scheduled sampling operations.

2.4 Data Analysis and Evaluation

2.4.1 Eulachon

The Student's t test (Dixon and Massey, 1969) and the Mann-Whitney median test (Daniel, 1978) were used to test a null hypothesis that lengths of first and second run eulachon were not significantly different.

2.4.2 Salmon Tag and Recapture Escapement Estimates

Adult salmon escapements to Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations were calculated using tag/recapture population estimation techniques. Chinook salmon less than 351 mm in length were not tagged and the method used to estimate their escapement is discussed later in this section.

The Petersen tag/recapture model was used to estimate escapements to the three tagging locations. Cousens et al. (1980) cite several recent studies in which the Petersen model is used to estimate salmon escapements. The method is not new and is considered a useful management tool.

Escapement estimates were derived using the following modified Petersen model (Ricker, 1975):

$$\hat{N} = (m+1) \bullet (c+1)/(r+1)$$

where:

m = Number of fish successfully marked = (number originally tagged)$\bullet$ (tag retention (R) factor)

c = Total number of fish examined for marks (tags) during sampling census

r = Total number of marked (tagged) fish observed during sampling census

$\hat{N}$ = Population estimate

The Petersen model incorporates six basic assumptions (Began, 1979; Seber and Felton, 1981). These assumptions are:

1. Sampling is random with respect to the population.
2. There was no mortality associated with the tagging process.
3. Marked and unmarked individuals experience no differential mortality.
4. Once marked, the individual mixes randomly back into the population.
5. Recovery of the marked individual is not influenced by the presence of the mark.
6. The population is closed.

The Petersen model is typically associated with closed systems (i.e., no immigration or emigration), not open systems characterized by spawning migrations of salmon. We have not adhered to this format. The need for a closed system with the Petersen model is readily apparent, any additions or substrations to the population will dilute or concentrate the population of marked individuals thereby affecting the outcome of the final population estimate. However, if you continually mark individuals entering the population ultimately, if the proportion of fish being marked remains constant and behave in the same manner as marked fish, there will be no change in the estimate, although it is an open system. This would require that the probability of initial capture did not change throughout the season. The alternative is to stratify the catch effort into several time intervals which would, if the intervals were of relatively short duration, account for a change in the probability of capture with respect to time. This is how Schaefer (1951) approached the problem in estimating sockeye salmon populations in the Harrison River, Canada. He found that the unequal probability of capture in the first sample was not a factor when repetitive tag recovery surveys were conducted throughout the entire spawning period. The results of the simple model (Petersen) were then comparable to the results of the model which stratified catch sampling effort with respect to time.

Tag/recapture population estimates are based on discrete frequency distributions such as the hypergeometric, Poisson or binomial distributions. Large sample sizes allow normal approximation of these distributions and for r values of 50 or more the confidence intervals were calculated from the following formula (Dixon and Massey, 1969):

$$r/c + 1.96\sqrt{\frac{r/c\ (1-r/c)}{c}} < r/c < r/c - 1.96\sqrt{\frac{r/c\ (1-r/c)}{c}}$$

$$\text{and;}\quad r/c_{\text{upper}}\ (1/m) < 1/\hat{N} < r/c_{\text{lower}}\ (1/m)$$

The Poisson distribution was considered appropriate when r values were less than 50, and the confidence limits were taken from Appendix II of Ricker (1975).

Tag losses for all adult salmon species except chinook salmon were estimated for each station from data collected during repetitive surveys of spawning areas. Data used for these determinations were restricted to those surveys, primarily in sloughs, in which visibility conditions allowed positive identification of shed tags, tag scarred fish (where applicable) and live tagged fish (Appendix Table 2-G-2). Tag retention by tag type and tagging location was calculated in the following manner:

$$R = \frac{T}{S + T}$$

where:

T = Number of live tagged fish observed by tag type and tagging station.

S = Number of shed tags by tag type and tagging station or when applicable, number of tagged scarred fish.

R = Tag retention factor

For example, if 1,000 salmon were observed with tags and 10 shed tags found the tag retention factor would be:

$$R = \frac{1{,}000}{10 + 1{,}000}$$

$$= .99$$

The total number of marks available is adjusted by this factor before calculating population estimates. Since it is not possible to identify the species from which the tags were shed the assumption was made that tag loss, by tag type, was the same for all species at each station.

Chinook salmon tag losses were calculated in essentially the same manner with the exception that tag loss information from fishwheel recaptures of tag scarred fish were included in the analysis. Survey and fishwheel tag retention factors were calculated, weighted by sample size and reported as the overall tag retention factor for chinook salmon (Appendix Table 2-G-1).

The formula used to estimate the number of chinook salmon 350 mm and less in length (FL) migrating to Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations was:

$$J = \frac{\hat{N}b}{e}$$

where:

$\hat{N}$ = Population estimate for fish larger than 350 mm in length (FL).

b = number of fish intercepted at tagging location equal to or less than 350 mm in length (FL)

e = number of fish intercepted at tagging location larger than 350 mm in length (FL).

J = Population estimate of fish with length (FL) 350 mm and less.

2.4.3 Calculation of Main Channel Escapement Timing

Escapement timing by species was determined for each main channel station through interpretation of fishwheel catch rate data. The migration was defined to have 'started', 'reached a midpoint' and 'ended' on the date when 5.0, 50.0 and 95.0 percents, respectively, of the cumulative daily mean hourly fishwheel catch was attained at each station.

Timing for each species is also provided graphically as the fishwheel catch per unit effort as a function of time. The fishwheel catch per unit effort curves were smoothed using the von Hann linear filter method (BMDP, 1981).

2.4.4 Age Determination

Adult salmon are aged by standard scale analysis techniques using a portable microfiche reader (Clutter and Whitesel, 1956). Age classes are described using Gilbert-Rich notation. Ages are presented as X_{i+1} where X is the total age of the fish and the subscript i+1, the number of freshwater annuli plus one. The addition of one to the freshwater age accounts for the year spent in freshwater prior to the formation of the first annulus. For example, age 5_2 fish are those fish which return to spawn in their fifth year of life having migrated or smolted from freshwater to the marine environment in their second year of life after having spent one winter (plus one winter in which development from egg to fry occurred and no annulus was formed) rearing in freshwater.

Total age for adult salmon, as reported in this text, represents only the age at which the fish returned to spawn regardless of their freshwater life histories.

Eulachon ages were determined from otoliths and are not reported in Gilbert-Rich notation but instead aged as to the total number of annuli observed. For example, eulachon reported to be age 3 would actually be in its fourth year of life.

2.4.5 Slough Escapement

Individual slough escapements of sockeye and chum salmon were calculated using 1983 observation life data and slough survey counts. Slough survey counts were plotted by date and areas beneath the curves were expressed in terms of fish-days. Areas were determined using a Numonic DigiTablet digitizer. The total number of fish-days per slough was divided by the mean observation life to estimate total slough escapement. For 1983 data, individual observation life values were used in calculating total escapement for study sloughs; all other 1983, 1982 and 1981 total slough escapements were calculated using the 1983 composite mean observation life values. There were two exceptions to this method: 1) when peak slough survey counts were less than 15 fish and 2) when spawning fish were counted on only one survey.

Total slough escapements in these cases were calculated by adjusting the peak live and dead survey count. The adjustment was made as follows:

$$x = \frac{A}{B}(T)$$

where: x = estimated slough escapement

A = estimated total escapement of sloughs with peak surveys greater than 50 fish

B = peak live and dead survey counts in sloughs where counts totaled greater than 50 fish

T = slough surveys where peak live and dead counts were less than 15 fish or when fish were counted on one survey only

Slough escapement estimates for pink salmon were made by adjusting peak live and dead survey counts. Peak surveys for a species with short spawning duration, as exhibited by pink salmon, may account for 80 to 90 percent of the spawning population (Cousens et al., 1982). Less than ideal survey conditions made it appropriate to use the lower value for adjustment and all peak surveys were increased by a factor of 1.2 to estimate total slough escapement.

3.0 RESULTS AND DISCUSSION

3.1 Eulachon

3.1.1 Intertidal

In 1983, eulachon entered the intertidal reach of the Susitna River in two distinct migrations. The first migration began on or about May 10, peaked on May 14 and ended on May 17, as determined by set and dip net catches (Tables 2-3-1 and 2-3-2). The second eulachon migration began on May 19, peaked on May 23 and ended on June 6.

Set and dip net catches in the intertidal indicate that the first migration of eulachon in 1983 was considerably smaller in numbers of fish than the second migration (Tables 2-3-1 and 2-3-2). For example, the highest set net CPUE of inmigrant (pre-spawning and spawning condition) eulachon in the first migration was 3.7 fish per set net minute fished on May 13. In the second migration, there were three days where catch rates were higher with CPUE's of 11.3, 13.0 and 3.8 on May 21, 23 and 26, respectively (Plate 2-3-1). The highest dip net catches of inmigrants (pre-spawners) in the first migration were 2.2 and 1.7 eulachon per dip on May 13 and 14, respectively. During the second migration the highest catches were 41.7 and 49.0 fish per dip on May 21 and 23, respectively.

In 1983, there were two periods when outmigrant or post-spawning condition eulachon were intercepted in the intertidal reach: between May 16 and 19 (first migration fish) and between May 26 and June 8 (second migration fish) (Tables 2-3-1 and 2-3-2). The largest catches were recorded from May 26 to 31 at an average of 2.0 per minute in the set nets and 4.2 per dip in the dip nets.

Table 2-3-1. Eulachon set net catches in the Susitna River intertidal, 1983.

	Tide 1/		Location		Fishing Time			Eulachon Catch 5/			
					Net		Total	In-	Out-	Total	CPUE
Date	Ht.	Time 2/	Site # 3/	RM 4/	In	Out	Min.	Migrants	Migrants		6/
5/10/83	27.8	1722	III	2.3	1647	1710	23	2	0	2	0.2
5/10/83	27.8	1722	II	4.5	1737	1807	30	7	0	7	
5/11/83	29.8	0532	III	2.3	0512	0530	18	4	0	4	0.5
5/11/83	29.8	0532	II	4.5	0547	0617	30	21	0	21	
5/11/83	28.8	1802	III	2.3	1720	1750	30	8	0	8	0.5
5/11/83	28.8	1802	II	4.5	1817	1847	30	19	0	19	
5/12/83	30.7	0604	III	2.3	0619	0649	30	7	0	7	0.7
5/12/83	30.7	0604	II	4.5	0720	0750	30	32	0	32	
5/12/83	29.5	1844	III	2.3	1759	1829	30	11	0	11	1.2
5/12/83	29.5	1844	II	4.5	1859	1929	30	58	0	58	
5/13/83	31.4	0636	III	2.3	0551	0621	30	86	0	86	2.5
5/13/83	31.4	0636	II	4.5	0651	0721	30	61	0	61	
5/13/83	29.7	1926	III	2.3	1845	1915	30	66	0	66	3.7
5/13/83	29.7	1926	II	4.5	1941	2011	30	157	0	157	
5/14/83	31.7	0711	III	2.3	0631	0701	30	28	0	28	3.3
5/14/83	31.7	0711	II	4.5	0726	0756	30	171	0	171	
5/14/83	29.6	2009	III	2.3	1924	1954	30	96	0	96	2.8
5/14/83	29.6	2009	II	4.5	2024	2054	30	69	0	69	
5/15/83	31.5	0749	III	2.3	0704	0734	30	27	0	27	1.6
5/15/83	31.5	0749	II	4.5	0804	0834	30	70	0	70	
5/15/83	29.2	2055	III	2.3	2010	2041	31	10	0	10	1.4
5/15/83	29.2	2055	II	4.5	2110	2140	30	75	0	75	

Table 2-3-1. Continued.

	Tide 1/		Location		Fishing Time			Eulachon Catch 5/			
					Net		Total	In-	Out-	Total	CPUE
Date	Ht.	Time 2/	Site # 3/	RM 4/	In	Out	Min.	Migrants	Migrants		6/
5/16/83	30.7	0832	III	2.3	0750	0820	30	1	0	1	1.3
5/16/83	30.7	0832	II	4.5	0847	0917	30	78	1	79	
5/17/83	29.5	0922	III	2.3	0837	0907	30	4	1	5	0.8
5/17/83	29.5	0922	II	4.5	0937	1007	30	44	8	52	
5/19/83	26.6	1129	III	2.3	1044	1114	30	10	0	10	0.7
5/19/83	26.6	1129	II	4.5	1144	1214	30	29	2	31	
5/21/83	26.5	1420	III	2.3	1335	1405	30	260	0	260	11.3
5/21/83	26.5	1420	II	4.5	1435	1445	10	190	0	190	
5/23/83	28.5	1634	III	2.3	1549	1604	15	140	0	140	13.0
5/23/83	28.5	1634	II	4.5	1649	1702	13	225	0	225	
5/26/83	30.4	0604	III	2.3	0521	0551	30	113	54	167	3.8
5/26/83	30.4	0604	II	4.5	0619	0649	30	115	56	171	
5/28/83	29.0	2008	III	2.3	1923	1953	30	94	87	181	2.6
5/28/83	29.0	2008	II	4.5	2023	2053	30	61	78	139	
5/31/83	26.6	0844	III	2.3	0759	0829	30	7	7	14	2.4
5/31/83	26.6	0844	II	4.5	0859	0929	30	135	70	205	
6/03/83	22.5	1121	III	2.3	1036	1106	30	0	0	0	1.3
6/03/83	22.5	1121	II	4.5	1136	1206	30	77	38	115	

Table 2-3-1. Continued.

	Tide 1/		Location		Fishing Time			Eulachon Catch 5/			
					Net		Total	In-	Out-	Total	CPUE
Date	Ht.	Time 2/	Site # 3/	RM 4/	In	Out	Min.	Migrants	Migrants		6/
6/05/83	22.6	1356	III	2.3	1311	1341	30	0	1	1	0.3
6/05/83	22.6	1356	II	4.5	1411	1441	30	15	6	21	
6/06/83	23.8	1509	III	2.3	1424	1454	30	0	0	0	0.1
6/06/83	23.8	1509	II	4.5	1524	1554	30	6	53	59	
6/07/83	25.3	1608	III	2.3	1523	1553	30	0	1	1	0.0
6/07/83	25.3	1608	II	4.5	1623	1653	30	0	15	15	
6/08/83	26.7	1658	III	2.3	1613	1643	30	0	0	0	0.0
6/08/83	26.7	1658	II	4.5	1713	1743	30	0	0	0	

1/ High Tide In Feet

2/ Military Time

3/ Site III: (T14N R7W Section 17 AAC)
Site II: (T14N R7W Section 5 AAC)

4/ River Mile

5/ Eulachon catch divided into inmigrants and outmigrants wherein inmigrants include both pre-spawners and spawners, and outmigrants represent post-spawners

6/ CPUE = Mean Number of Inmigrants/Net Minute

Table 2-3-2. Dip net catches of eulachon in the Susitna River intertidal at river mile 4.5 with corresponding water temperatures, May 10 - June 8, 1983.

	Eulachon Catch							CPUE 2/			
	Males			Females							
Date	Pre-	Spawning	Post-	Pre-	Spawning	Post-	Fishing Effort 1/	Pre-	Spawning	Post-	Water Temperature (°C)
5/10	0	0	0	2	0	0	80	0.0	0.0	0.0	4.8
5/11	3	0	0	1	0	0	70	0.1	0.0	0.0	3.5
5/11	7	0	0	2	0	0	50	0.2	0.0	0.0	4.5
5/12	39	6	0	12	0	0	64	0.8	0.1	0.0	5.2
5/12	19	2	0	5	0	0	35	0.7	0.1	0.0	5.4
5/13	56	4	0	22	1	0	43	1.8	0.1	0.0	5.5
5/14	39	14	0	45	2	0	49	1.7	0.3	0.0	6.0
5/15	2	1	0	0	0	0	64	0.0	0.0	0.0	5.8
5/15	11	0	0	3	0	0	186	0.1	0.0	0.0	6.8
5/16	10	3	0	4	0	0	100	0.1	0.0	0.0	6.0
5/17	10	1	4	5	1	0	230	0.1	0.0	0.0	5.8
5/19	12	24	10	22	0	0	125	0.3	0.2	0.1	7.6
5/21	34	9	0	86	0	0	134	1.0	0.1	0.0	9.2
5/23	37	13	0	61	0	0	2	49.0	6.5	0.0	8.3
5/26	58	203	96	10	13	16	78	0.9	2.8	1.4	9.0
5/28	5	156	203	0	1	13	30	0.2	5.2	7.2	9.2
5/31	0	173	130	0	9	3	55	0.0	3.3	2.4	10.0
6/3	0	17	18	1	0	1	100	0.0	0.2	0.2	--
6/5	0	1	0	0	0	1	80	0.0	0.0	0.0	8.2
6/6	0	0	6	0	0	50	75	0.0	0.0	0.8	12.2
6/7	0	0	2	0	0	28	100	0.0	0.0	0.3	12.8
6/8	0	0	0	0	0	4	75	0.0	0.0	0.1	13.4

1/ Number of dip net sub-samples.

2/ Catch per unit effort for pre-, spawning and post-spawning eulachon.

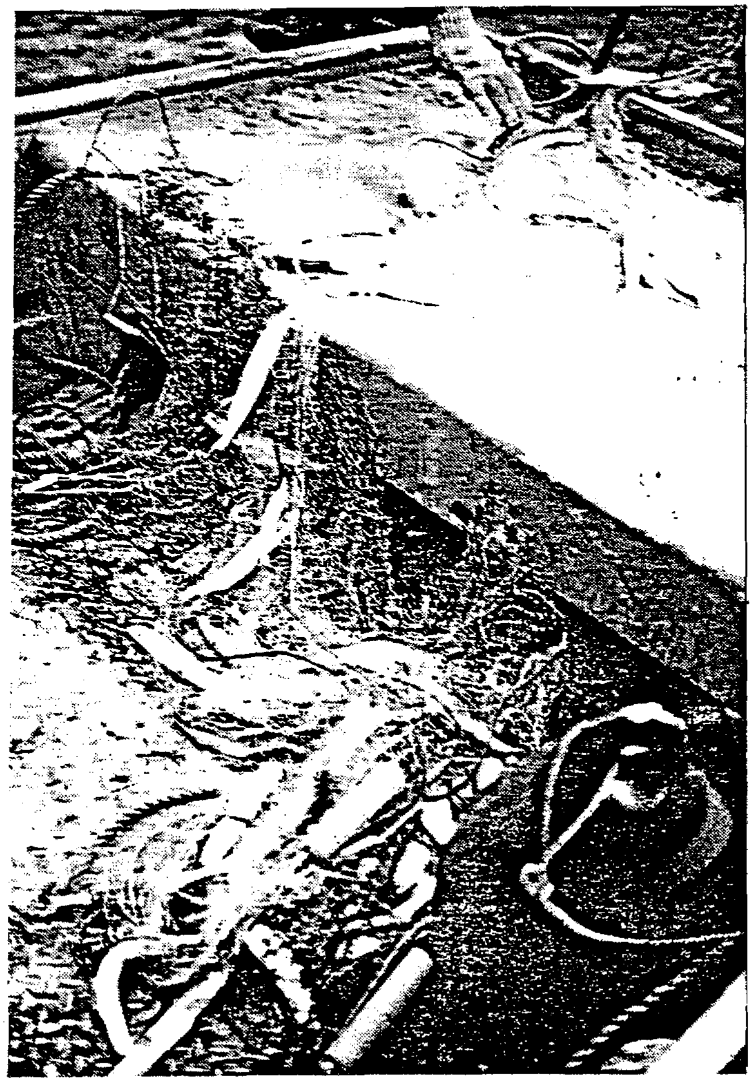


Plate 2-3-1. Eulachon set net catch at RM 4.5 on May 23, 1983.

Pre-spawning males in 1983 were more numerous than females in the first migration (May 10-17) and pre-spawning females were more numerous than males in the second migration (May 19 - June 8) based on dip net catch data not weighted by CPUE. The respective male to female ratios were 1.8:1 and 0.8:1 (Table 2-3-3). Comparatively, among spawning condition eulachon the male to female ratios were 6.2:1 in the first migration and 25.9:1 in the second migration. The increase of males to females in spawning condition indicate that individual male eulachon ripen earlier and spawn over a longer period than their female counterparts. A probable advantage of male eulachon having a longer spawning life than female eulachon would be that the eggs released by a female would have a higher chance of being fertilized by available males due to the longer time individual males are in spawning condition compared to females.

Table 2-3-3. Summarization of sex composition samples (not weighted by CPUE) from eulachon dip net catches at RM 4.5 in 1983.

Development Stage	First Migration 1/ Sample Size			Second Migration 2/ Sample Size		
	Males	Females	M:F Ratio	Males	Females	M:F Ratio
Pre-Spawners	203	110	1.8:1	151	180	0.8:1
Spawners	31	5	6.2:1	596	23	25.9:1
Post-Spawners	4	0	-	465	116	4.0:1

1/ First migration samples collected from 5/10-17 for pre-spawners, 5/10-22 for spawners and 5/10-23 for post-spawners.

2/ Second migration samples collected from 5/18-6/6 for pre-spawners, 5/23-6/6 for spawners and 5/24-6/6 for post-spawners.

Age composition samples collected in 1983 from pre-spawning condition eulachon (weighted by set net CPUE data) indicate the first migration was comprised of two, three and four year old fish (Table 2-3-4 and Figure 2-3-1). Most of the first migration fish were three year olds, which accounted for 92.6 percent of the males and 97.2 per cent of the females sampled. In the second migration the three year olds again were the most

Table 2-3-4. Length and weight of pre-spawning condition first and second migration eulachon segregated by age and sex from dip net samples collected in 1983 in the Susitna River intertidal.

			Length (mm)					Weight (g)				
Age	Sex	Migration	Sample Size	Range Limits	Mean	95% Conf. Interval	Median	Sample Size	Range Limits	Mean	95% Conf. Interval	Median
2	M	1st	2	191-216	203	---	202	2	50.6-68.8	59.1	---	58.6
3	M	1st	50	186-229	212	210-215	213	50	45.1-86.0	69.1	66.9-71.2	69.3
4	M	1st	2	200-222	211	---	211	2	59.4-78.7	69.1	---	69.1
2	F	1st	1	195-195	195	---	195	1	54.3-54.3	54.3	---	54.3
3	F	1st	35	180-222	203	199-206	204	35	45.1-74.8	60.2	57.4-63.1	60.3
2	M	2nd	1	182-182	182	---	182	1	44.2-44.2	44.2	---	44.2
3	M	2nd	36	187-228	207	204-210	207	36	44.3-82.8	67.4	64.7-69.4	67.6
4	M	2nd	2	219-231	220	---	219	2	89.4-93.5	89.6	---	89.5
2	F	2nd	2	174-193	191	---	192	2	43.4-48.0	47.3	---	47.6
3	F	2nd	35	186-218	201	198-203	199	35	48.8-71.3	59.7	57.5-62.0	59.6
4	F	2nd	1	203-203	203	---	203	1	60.6-60.6	60.6	---	60.6
All 1/	All	All	202	179-231	205	204-206	204	202	43.4-93.5	64.2	63.0-65.4	63.6

1/ Composite of all aged and non-aged eulachon.

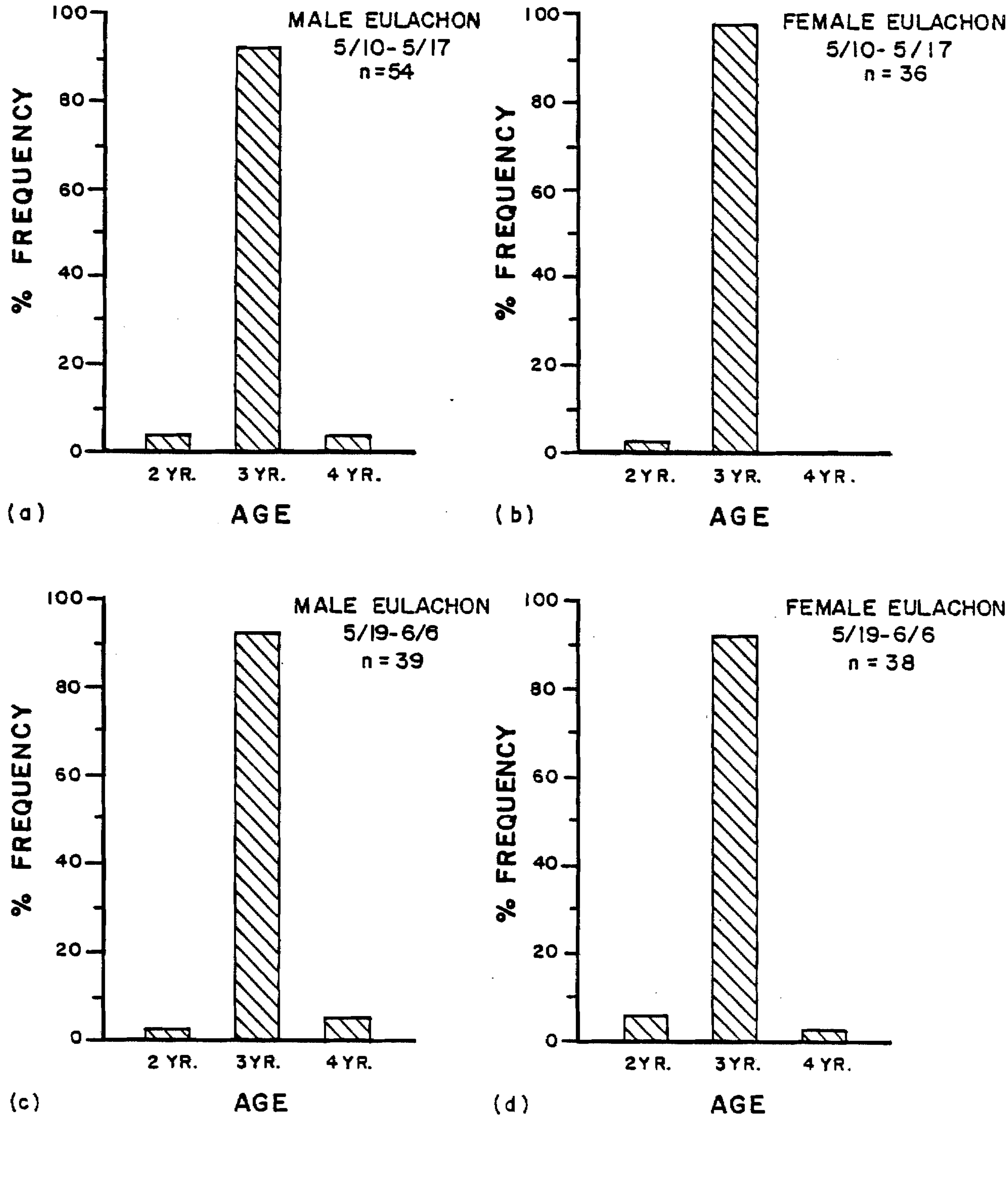


Figure 2-3-1. Age composition by sex of first (a-b) and second (c-d) migrant pre-spawning condition eulachon collected from the Susitna River intertidal in 1983.

numerous, representing 92.3 percent of the males and 92.1 percent of the females sampled.

Length (TL) and weights of 1983 dip netted pre-spawning condition eulachon are presented in Table 2-3-4. The results, weighted by CPUE dip net data of inmigrants, indicate three year old fish averaged 212 mm for males and 203 mm for females in the first migration, and 207 mm and 201 mm, respectively, in the second migration. The average weights of three year old males and females were 69.1 g and 60.2 g respectively in the first migration and 67.1 g and 59.7 g in the second migration. The same size difference was evident among the two and four year old fish of the first migration, that is, they were generally larger in length and weight than corresponding age fish in the second migration. Student's t and Mann-Whitney tests showed no significant differences in lengths among the first and second migration female eulachon ($p > .90$). For the age three eulachon, both tests established males were significantly larger in the first migration than the second migration ($p > .99$).

A comparison of 1983 Cook Inlet tidal heights, Susitna River water temperatures and eulachon inmigrant catches is provided in Figure 2-3-2. Set net catches of first migration inmigrants occurred in the Susitna River at high tides ranging from 27.8 to 31.7 feet and water temperatures between 3.5 and 7.5°C. The peak catch was made on May 13 at a high tide of 29.7 feet and water temperature at 6.6°C. Comparatively, the second migration catches of inmigrants occurred at high tides ranging from 22.1 to 30.5 feet with water temperatures ranging from 6.0 to 10.5°C (Figure 2-3-2). Set net catches peaked on May 23 at a high tide of 28.5 feet and water temperature of 8.3°C (Figure 2-3-2).

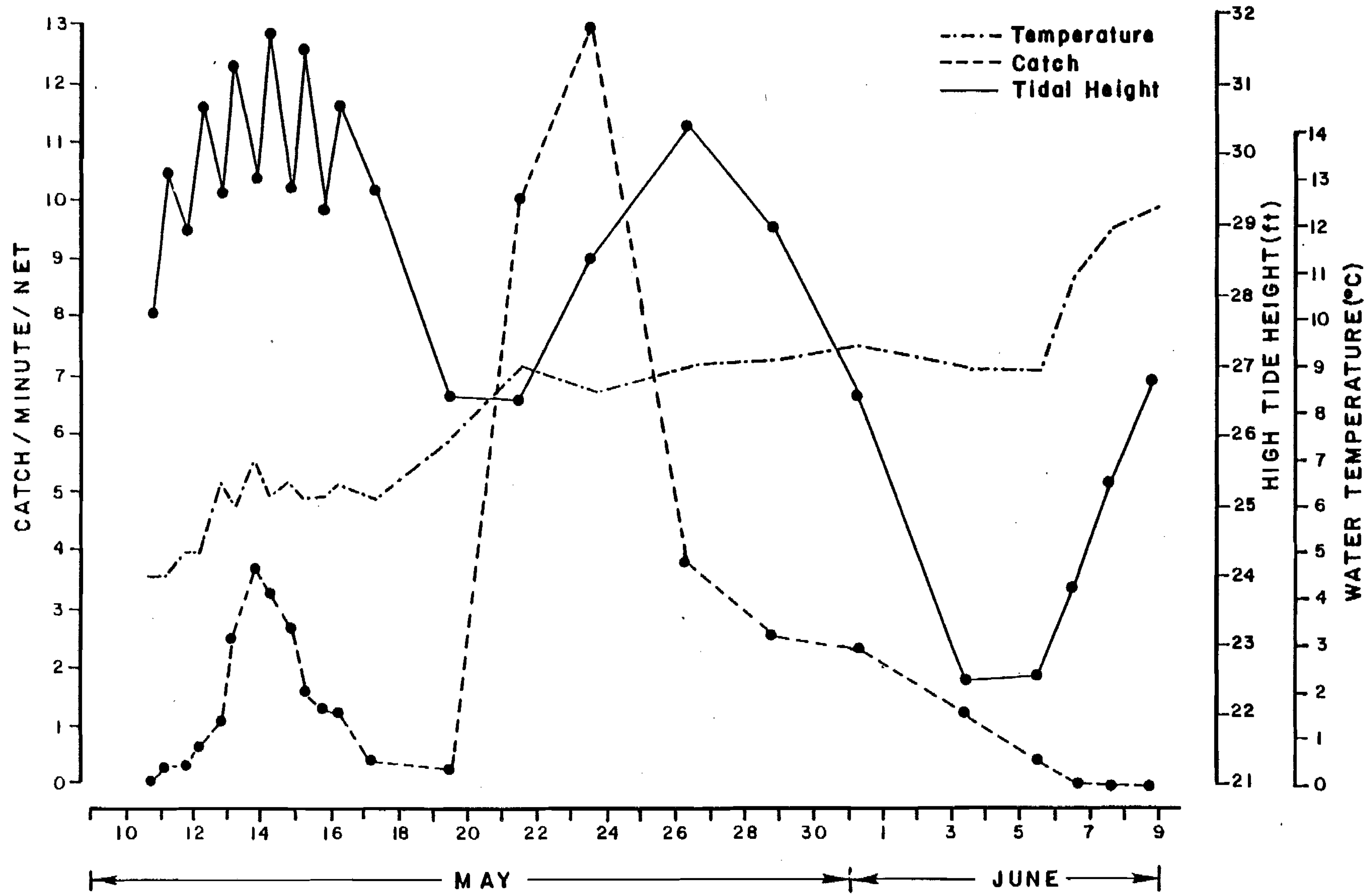


Figure 2-3-2. Eulachon set net catches at RM 4.5 with associated water temperatures and high tide heights in 1983.

Eulachon set net catches in the Susitna River intertidal do not appear to be correlated to daily changes in Susitna River water temperatures or Cook Inlet high tide heights (Figure 2-3-2). The eulachon migration into the Susitna River may, however, be influenced by water temperature. Synder (1970) reported most eulachon enter the Columbia River (Washington) when river temperatures average around 7°C, and if temperatures change much above or below normal eulachon schools act erratically, i.e., they are delayed, migrate farther upstream or do not enter spawning tributaries. Smith and Saalfeld (1955) stated that Columbia River eulachon showed preference for a narrow water temperature range of 2° to 10°C. In the Stikine River the 1979 and 1980 migration occured at water temperatures of 2° to 8°C (Franzel and Nelson, 1981). The 1983 eulachon migration into the Susitna River intertidal occured when the river temperature was between 3.5° and 10.5°C.

For the Columbia River (Washington), Smith and Saalfeld (1955) found that eulachon migration and availability were correlated with water temperature around 7 to 8°C. In the Susitna River intertidal reach in 1983, about 50 percent of the set net catches of first migration inmigrant eulachon were made between May 13 and 14 when water temperature ranged between 6.0 and 7.5°C. During the second migration, about 50 percent of the catches were made from May 21 to 23 at water temperatures between 8.0 and 9.0°C. It is concluded that the major movement of eulachon into the Susitna River follows ice-out at water temperatures between 6.0 and 9.0°C.

3.1.2 Main Channel

The results of sampling the Susitna River main channel (RM 4.5 - 60.0) in 1983 for eulachon presence, spawning habitat and sex composition are presented in Table 2-3-5.

Table 2-3-5. Eulachon spawning areas in the Susitna River main channel in 1983.

	Spawning Location		Water 2/			Substrate	Eulachon Catch 3/						General
							Male			Female			Habitat
Date	RM 1/	Geographic Code	Temp.	Depth	Velocity	Type	Pre-	Sp.	Post-	Pre-	Sp.	Post-	Notes
5/15	12.5	S15N07W11ACD	-	130	1.0	100% silty sand	10	4	2	7	1	1	cutbank
5/15	13.8	S15N07W02ADA	6.4	140	1.5	100% silty sand	24	48	18	18	5	4	
5/17	23.0	S17N07W33BBB	5.8	170	2.0	75% gravel 25% sand	4	11	2	7	1	0	
5/20	9.8	S15N07W10DDB	7.4	100	1.5	100% silty sand	22	10	2	10	2	0	
5/20	12.5	S15N07W11ACD	7.4	130	1.0	100% silty sand	18	33	1	10	6	0	cutbank
5/20	18.2	S16N07W22AAD	-	100	1.0	90% sand 10% gravel	14	13	8	3	3	0	
5/21	15.0	S16N07W35BCD	8.1	130	1.5	60% sand 40% gravel	54	64	0	22	7	0	
5/21	25.5	S17N07W22ACA	-	120	2.0	100% silty sand	17	13	3	5	2	0	cutbank
5/22	25.5	S17N07W22ACA	7.8	120	2.0	100% silty sand	16	14	0	17	2	0	cutbank
5/22	27.1	S17N07W23BAD	7.8	130	1.5	100% silty sand	38	3	1	18	2	0	cutbank
5/22	27.3	S17N07W13DCD	7.6	110	1.0	100% silty sand	11	21	2	5	3	0	cutbank
5/22	27.7	S17N07W13DCA	7.6	150	-	100% silty sand	21	47	0	30	2	0	back eddy; cutbank
5/23	9.0	S15N07W15ADA	8.0	110	1.0	100% silty sand	6	15	0	26	5	0	
5/23	9.7	S15N07W10CDA	7.6	100	0.5	100% sand and gravel mix	10	14	0	38	5	0	cutbank
5/23	21.4	S16N07W09CCD	8.4	160	1.0	100% silty sand	26	14	0	25	2	0	beach
5/23	22.1	S16N07W09ACB	8.6	-	-	-	16	10	0	34	1	3	
5/23	23.0	S17N07W33BBB	7.8	170	2.0	75% gravel 25% sand	28	21	0	43	5	0	
5/24	12.5	S15N07W11ACD	6.6	-	-	100% silty sand	3	11	1	50	10	1	cutback
5/24	13.1	S15N07W12BBB	6.6	80	2.0	100% silty sand	2	15	0	69	15	0	cutbank
5/24	13.3	S15N07W01DDC	6.6	110	1.5	100% silty sand	1	4	0	35	8	0	cutbank
5/24	13.4	S15N07W02CCC	7.6	120	1.5	100% silty sand	4	20	0	20	4	0	
5/24	13.8	S15N07W02ADA	6.7	-	-	100% sand	5	12	0	38	9	1	
5/24	13.8	S15N07W02ACA	7.8	130	1.0	100% silt	5	8	0	8	1	3	gradual slope
5/24	14.7	S16N07W35CDA	8.0	40	3.0	100% sand and gravel mix	6	15	0	19	8	0	gradual slope
5/24	14.9	S16N07W35BCD	6.8	-	-	100% silty sand	2	19	0	45	21	0	
5/24	15.0	S16N07W35ADB	7.6	-	-	100% sand and gravel mix	7	30	0	26	8	0	
5/24	15.5	S16N07W35BAD	7.0	120	2.0	100% silty sand	4	16	0	19	14	0	cutbank

Table 2-3-5. Continued.

Date	Spawning Location RM [1/]	Spawning Location Geographic Code	Water [2/] Temp.	Water Depth	Water Velocity	Substrate Type	Eulachon Catch [3/] Male Pre-	Male Sp.	Male Post-	Female Pre-	Female Sp.	Female Post-	General Habitat Notes
5/24	15.5	S16N07W35ABD	7.8	130	3.0	100% silty sand	2	12	0	32	29	1	cutbank
5/24	15.7	S16N07W35BAA	6.8	100	-	100% silty sand	4	18	0	50	9	0	back eddy
5/24	16.2	S16N07W26CDB	8.0	-	-	100% silty sand	4	14	0	58	5	0	beach
5/24	16.5	S16N07W26BCD	7.0	130	1.0	100% silty sand	3	3	0	60	10	0	
5/24	17.1	S16N07W26BBC	7.4	130	-	100% silty sand	1	8	0	39	8	0	
5/24	17.2	S16N07W26BBB	7.2	100	1.5	100% silty sand	1	46	0	3	6	0	
5/24	17.7	S16N07W23DAB	8.2	150	2.0	100% silty sand	24	54	0	50	9	0	
5/24	18.2	S16N07W22AAD	7.2	100	1.0	90% sand 10% gravel	6	94	0	4	28	2	
5/24	18.7	S16N07W22ABA	7.4	130	1.0	75% gravel 25% sand	0	25	5	0	3	1	
5/24	19.3	S16N07W22BBA	6.8	140	-	100% silty sand	2	39	1	1	3	4	back eddy
5/24	19.8	S16N07W16ADD	7.1	100	3.0	100% silty sand	0	32	0	7	10	2	cutbank
5/24	19.8	S16N07W09CDD	8.4	80	1.5	100% silty sand	0	47	3	9	7	8	
5/24	21.3	S16N07W08ACC	9.6	80	2.0	100% silty sand	0	42	7	4	7	12	
5/24	22.5	S16N07W05ABD	7.4	120	4.0	100% silt	0	25	0	0	12	0	cutbank
5/24	23.7	S17N07W33BAB	8.0	100	-	100% sand	0	40	2	12	7	2	back eddy; cutback
5/24	24.8	S17N07W28ACB	8.6	90	1.5	50% sand 50% gravel	0	54	0	20	18	0	
5/25	6.1	S16N07W09DCB	8.0	-	-	100% silty sand	2	11	16	0	2	5	
5/25	9.0	S15N07W15BCD	7.6	120	1.0	-	3	22	0	1	3	0	
5/25	9.8	S15N07W10DDB	7.6	-	-	100% silt and gravel mix	1	18	2	2	7	1	
5/25	11.7	S15N17W11CCB	8.0	90	2.0	100% silt and gravel mix	1	35	2	1	7	0	cutback
5/25	14.3	S15N07W02ABA	7.4	150	2.5	100% silty sand	0	24	3	2	4	1	cutback
5/25	17.1	S15N07W16CBD	8.1	-	-	100% silty sand	0	27	0	0	42	0	cutback
5/25	19.0	S16N07W22BBB	7.4	140	3.0	100% silty sand	0	12	1	3	11	2	gradual slope
5/25	22.0	S16N07W04BDA	7.8	80	2.0	100% sand	0	8	1	5	18	0	gradual slope
5/25	24.3	S17N07W33ABB	9.4	90	1.5	100% silty sand	1	19	2	5	22	2	gradual slope
5/25	27.8	S17N07W13BCA	8.4	70	1.5	100% silty sand	0	18	0	2	12	0	
5/25	29.6	S17N06W07CCC	8.5	70	1.5	100% silty sand	0	24	0	4	6	0	gradual slope
5/25	32.0	S17N06W04ABA	8.2	100	2.0	100% silty sand	1	23	0	15	9	0	

Table 2-3-5. Continued.

Date	Spawning Location RM 1/	Spawning Location Geographic Code	Water 2/ Temp.	Water 2/ Depth	Water 2/ Velocity	Substrate Type	Eulachon Catch 3/ Male Pre-	Male Sp.	Male Post-	Female Pre-	Female Sp.	Female Post-	General Habitat Notes
5/25	34.0	S18N06W28DCD	10.2	80	-	98% silty sand 2% organic	0	23	0	7	12	0	back eddy
5/25	36.0	S18N06W22BBB	9.2	70	1.5	100% silt and gravel mix	1	22	0	14	13	0	
5/25	38.2	S18N06W11BDB	9.4	70	1.5	50% sand 50% gravel	5	24	0	10	4	0	
5/25	41.6	S19N06W25DDB	11.4	80	3.5	100% silty sand	3	25	0	2	8	1	
5/25	44.0	S19N05W20CBD	10.8	70	3.5	50% sand 50% gravel	0	20	0	4	5	0	
5/25	44.9	S19N05W17CCC	10.2	80	2.0	50% sand 50% gravel	3	12	0	1	9	1	
5/25	47.0	S19N05W04CCA	9.8	60	1.5	50% sand 50% gravel	3	8	0	10	5	0	
5/25	49.2	S20N06W28AAA	10.0	40	2.0	50% sand 50% gravel	9	40	0	0	5	0	
5/26	4.5	S14N07W05AAC	9.0	-	-	100% silty sand	58	203	96	10	13	16	gradual slope
5/26	12.0	S15N07W11BAB	10.2	80	1.5	100% silty sand	0	29	2	2	4	0	gradual slope
5/26	25.5	S17N07W22CCA	-	-	-	100% sand and gravel mix	12	65	95	22	34	50	
5/27	41.5	S19N06W24BCA	9.8	90	3.5	100% silty sand	1	64	14	0	7	2	
5/27	41.7	S19N06W25DDC	8.6	110	1.5	100% sand and gravel mix	0	121	5	1	19	1	cutbank
5/27	50.5	S20N05W22DDA	9.2	90	0.5	100% silty sand	0	37	5	0	4	50	
5/28	26.2	S17N07W23DAB	-	-	-	-	0	13	0	0	34	0	
5/29	27.5	S17N07W24BBA	10.0	-	-	100% silty sand	0	30	5	0	3	0	
5/30	25.5	S17N07W22ACA	-	-	-	100% silty sand	0	81	6	0	43	1	cutbank
5/31	4.5	S14N07W05AAC	10.0	-	-	100% silty sand	0	173	130	0	9	13	gradual slope
5/31	6.4	S16N07W09DCB	-	-	-	100% silty sand	0	41	0	0	31	0	
5/31	12.5	S15N07W11ACD	8.2	-	-	100% silty sand	0	43	27	0	4	2	cutbank

1/ RM = River Mile

2/ Temperature recorded to nearest 0.1°C, depth to nearest 10cm and surface velocity to nearest 0.5 ft/sec.

3/ Eulachon catch: Pre- = pre-spawners; Sp. = spawners; Post- = post-spawners

The first migration of eulachon, which passed through the intertidal reach between May 10 and 17, 1983, initiated spawning in the Susitna River main channel on or about May 15 and concluded spawning about May 22 (Table 2-3-5). The second migration, which was intercepted in the intertidal reach from May 19 to June 6, began spawning in the Susitna River main channel on or about May 23. Spawning was essentially over among second migration fish by June 5.

In 1983 the upper spawning limit of first migration eulachon in the Susitna River main channel was approximately RM 28.5 and among fish of the second migration, RM 50.5 (Table 2-3-5). The largest concentrations of eulachon in both migrations were found downstream of RM 28.0 (Yentna River confluence). Both migrations entered the Yentna River (RM 28), but the extent of utilization was not determined.

A total of 61 separate eulachon spawning areas were identified in the Susitna River main channel in 1983. Ten of the spawning areas supported first migration spawning and 57 of the sites supported spawning by second migration fish. At least six of the ten areas identified as first migration spawning areas were also used for spawning by second migration fish. About 70 percent of all the first and second migration spawning areas located were between RM 12 and 27.

In 1983, the first migration eulachon spawning areas were located in moderate surface velocity areas near cutbanks where the riverbed composition was mainly loose sands and gravels. The surface velocity at these sites ranged from 1.0 to 2.0 ft/sec and averaged 1.5 ft/sec. Depths averaged 130 cm and ranged from 100 to 170 cm. Water temperatures ranged from 5.8 to 8.1°C and averaged 7.3°C.

The spawning areas for the second migration of eulachon in 1983 were similar to those identified for the first migration. However, overall the second migration spawners generally spawned in higher velocity areas and showed less preference toward areas offshore of cutbanks. Surface velocities at the second migration eulachon spawning areas ranged from 0.5 to 3.5 ft/sec and averaged 2.0 ft/sec. Depths ranged from 40 to 170 cm and averaged 100 cm. The water temperatures ranged from 6.6 to 11.4°C and averaged 8.3°C.

The minor variation in spawning habitat utilization among first migration eulachon and second migration eulachon in 1983 was probably due in part to the marked difference in abundance between the two migrations. The second migration was at least seven times larger than the first migration as determined from intertidal set net catches. Space was probably less of a limiting factor for first migration eulachon than for second migration fish. Since the majority of all spawning sites used by first migration spawners were utilized by second migration spawners, crowding most likely forced second migration fish to utilize less preferred spawning habitats or die prior to spawning (Plate 2-3-2).

In addition to the suspected utilization of less preferred spawning habitat by second migration eulachon in 1983, observations made at one location indicate that second migration eulachon into the Susitna River experienced crowding to levels that induced mortality. On May 24, 1983, one day following the peak catch of second migration fish in the intertidal reach, hundreds of thousands (visual estimate) of eulachon were migrating along the banks of the Susitna River between RM 12.5 and 24.3. At the same time,

Plate 2-3-2. Dead and dying pre-spawning eulachon, mainly females, at RM 17 on May 24, 1983.

eulachon were spawning between RM 17.2 and 18.2. The spawning fish were noticeably thin, had dull coloration, and fin erosion typical of spawning condition fish. By contrast, nearly all of the second migration eulachon around and below RM 17.1 were in pre-spawning condition with bright coloration and no recognized fin erosion. These fish were crowded near shore to the extent that the fish near the surface were half out of the water and rolling over on their sides (Plate 2-3-3). The adjacent banks to this location (RM 17.1) were littered with dead, unspawned eulachon in depths up to four feet (Plate 2-3-4). The majority (80%) of these were female

Plate 2-3-3. Thousands of stressed, pre-spawning condition eulachon dying at RM 17, May 24, 1983.

Plate 2-3-4. Dead unspawned eulachon in the Susitna River at RM 17.1, 1983.

carcasses. Comparatively, where spawning was occurring between RM 17.2 and 18.2, approximately 80 percent of the fish were live, spawning males.

To understand what may have caused this mortality at RM 17.1 it is necessary to define the general migration movement of eulachon in the Susitna River. Eulachon enter the intertidal reach in schools. Once through the intertidal, the eulachon schools migrate upstream along the near shore zone where there is direct flow. When eulachon encounter inshore areas that are placid, they move offshore with the current. The preference of eulachon schools to follow near shore currents is apparently strong. On several occasions the crew, when sampling, moored their 20 ft. boat semi-perpendicular to the shore. Moored in this manner the boat acted as a partial migrational block. The eulachon that first reached the boat were literally pushed by fish from below, to the extent many were forced up on the shore to die. A possible scenario that may have resulted in the mass mortality at RM 17.1 is that an advancing eulachon school(s) of pre-spawners (inmigrants) approached threshold density or an aggregation of eulachon which were not moving upstream but were spawning. This encounter may have provided a stimulus that caused the inmigrating fish at the head of the school to stop or slow their upstream migration. The inmigrating fish from below, having not received this stimulus, continued moving upstream which lead to crowding to where individual fish were literally pushed on shore or to the surface where from oxygen deficiency and stress associated with trying to regain entry to the water, they died. Once the process started, a chain reaction followed until the schooling behavior was lost by reduction to recruitment from below.

In 1983 the male to female eulachon ratios differed between spawning development stages (Table 2-3-6). Unweighted catch samples collected in the main channel of first migration fish showed average male to female ratios for pre-spawners at 1.2:1, spawners at 18.9:1 and post-spawners at 15.6:1. In the second migration, pre-spawner ratios averaged 0.6:1, spawners 4.7:1 and post-spawners 3.4:1. The changes in sex ratios are due to differences in length of spawning time between sexes, that is individual males ripen earlier and remain in the river longer than individual females.

Table 2-3-6. Summarization of eulachon sex composition samples collected in 1983 by dip netting and electroshocking between Susitna River mile 4.5 and 60.0.

Development Stage	First Migration 1/			Second Migration 2/		
	Sample Size		M:F	Sample Size		M:F
	Males	Females	Ratio	Males	Females	Ratio
Pre-Spawners	316	253	1.2:1	1341	2084	0.6:1
Spawners	1320	70	18.9:1	3730	788	4.7:1
Post-Spawners	249	16	15.6:1	1388	403	3.4:1

1/ First migration samples collected from 5/10-17 for pre-spawners, 5/10-22 for spawners and 5/10-23 for post-spawners.

2/ Second migration samples collected from 5/18-6/6 for pre-spawners, 5/23-6/6 for spawners and 5/24-6/6 for post-spawners.

Variations in second migration eulachon sex ratios between spawning development stages are further illustrated through Figure 2-3-3. The sex composition of 1,956 second migration fish between RM 12.1 and 25.1 on May 24, 1983 indicates that overall, male eulachon were less abundant than females by a ratio of 0.8:1. Above and below RM 17.1 where the previously referenced mortality was noted, more females were in pre-spawning condition than males, more males were in spawning condition than females and lastly, more females were in post-spawning condition than male eulachon. While the overall male to female ratio between RM 12.1 and 25.1 was 0.8:1, the subsample ratios above RM 17.1 averaged 2.3:1 and below RM 17.1 averaged 0.4:1. Differential male and female migration rates, spawning time, sexual development and mortality are probable causes for the observed differences in sex ratios.

In 1983, a total of 267 first and second migration eulachon were aged from samples taken between RM 4.5 and 60. This information is summarized in Table 2-3-7 along with corresponding length, weight and sex data. The data in Table 2-3-7 were not weighted by CPUE due to variations in sampling intensity and collection sites. Three year old eulachon comprised the majority of both migrations and two and four year old eulachon were present in both migrations. Three year old fish accounted for 90.4 percent of the males and 95.5 percent of the females sampled in the first migration, and 83.3 percent of the males and 91.4 percent of the females in the second migration samples. As indicated in Table 2-3-7, there were no notable differences in the unweighted length and weight data between the samples of first and second migration fish.

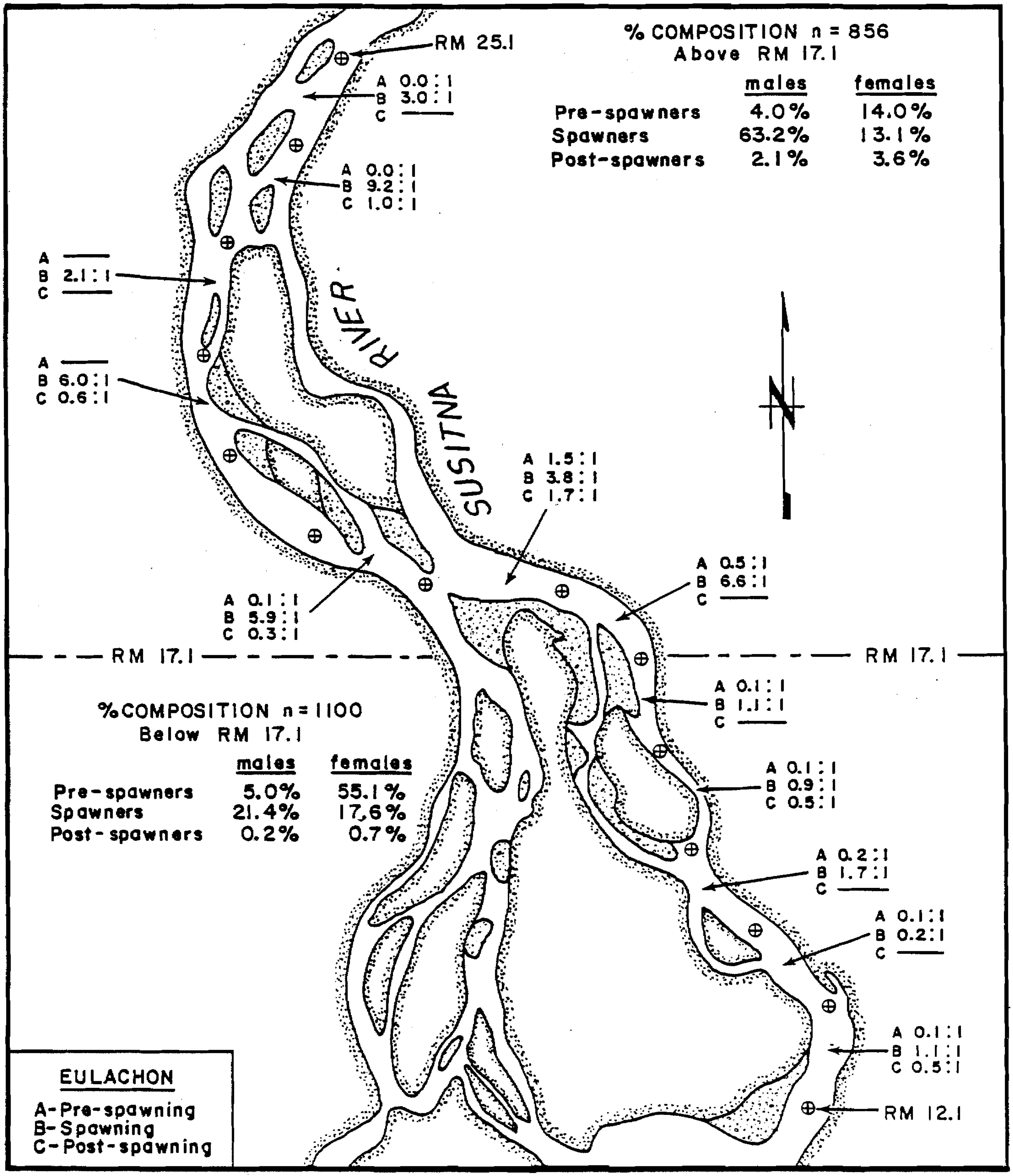


Figure 2-3-3. Male to female sex ratios of eulachon sampled between RM 12.1 and 25.1 on May 24, 1983.

Table 2-3-7. Length and weight of pre-spawning condition eulachon segregated by age and sex from samples collected in 1983 in the Susitna River intertidal and main channel.

			Length (mm)					Weight (g)				
Age	Sex	Migration	n	Range	x	95% C.I. [1]	Median	n	Range	x	95% C.I. [1]	Median
2	M	1st	4	191-216	199	---	195	4	50.6-68.8	57.1	---	54.5
3	M	1st	57	178-229	210	208-212	210	57	39.4-86.0	67.1	64.7-69.6	67.1
4	M	1st	2	200-222	211	---	211	2	59.4-78.7	69.1	---	69.1
2	F	1st	2	188-195	192	---	192	2	53.0-54.3	53.7	---	53.7
3	F	1st	43	180-222	202	199-205	202	43	42.3-76.6	59.7	57.1-62.2	59.2
4	F	1st	0	---	-	---	-	0	-	-	---	-
2	M	2nd	4	182-208	198	---	201	4	44.2-65.1	55.7	---	56.8
3	M	2nd	65	187-228	209	207-211	210	65	44.3-84.3	68.1	66.1-70.1	68.5
4	M	2nd	9	213-231	221	---	219	9	66.9-93.5	79.8	---	79.3
2	F	2nd	4	179-193	185	---	183	4	40.4-48.0	43.8	---	43.4
3	F	2nd	74	176-221	203	201-205	203	74	45.3-77.3	60.7	59.1-62.3	60.1
4	F	2nd	3	199-212	205	---	203	3	60.2-71.1	64.0	---	60.6
All [2]	All	All	308	176-231	206	205-207	206	308	39.4-93.5	64.2	63.2-65.3	64.4

1/ Confidence Interval

2/ Composite of all aged and non-aged eulachon

No empirical estimate of the total 1983 escapement of first and second migration eulachon is available for the Susitna River. General observations of eulachon densities, particularity associated with the second migration, indicate that the Susitna River in 1983 supported an escapement ranging in the millions of fish.

In 1983, only a minor amount of sport fishing effort occurred in the Susitna River for eulachon. In the thirty days of sampling operations, two parties of fishermen were observed dip netting eulachon on the Susitna River main channel. Overall, the total sport fish catch of eulachon below RM 28 in 1983 was probably in the range of 500 to 2,000 fish.

3.2 Adult Salmon

The estimated escapements of Pacific salmon into the Susitna River basin for 1983 with exception of chinook salmon are reported in Table 2-3-8. These

Table 2-3-8. Minimum Susitna River salmon escapements of sockeye, pink, chum and coho salmon in 1983.

Year	Escapement Estimates 1/				
	Sockeye 2/	Pink	Chum	Coho	Total
1983	175,900	101,200	276,600	24,100	577,800

1/ Defined as the summation of the Yentna River escapement obtained by side scan sonar at Yentna Station and the Susitna River escapement obtained by tag/recapture population estimates at Sunshine Station. These estimates do not include escapements to Susitna River tributaries below RM 80 excluding the Yentna River (RM 28).

2/ Sockeye salmon escapement estimates do not include first run sockeye salmon.

estimates should be considered conservative as they do not account for salmon escapements to systems downstream of RM 80 except into the Yentna River (RM 28). Minimum salmon escapements for the Susitna River reach above RM 80 are quantified in sections 3.2.1.1 and 3.2.1.2.1 of this report.

Specific results of the 1983 salmon escapement work follow by order of species and river reach. The order of presentation of salmon species are: chinook, sockeye, pink, chum and coho salmon. The river reach divisions are: (1) from the intertidal (RM 0.0) to Talkeetna (RM 98.6); and (2) from Talkeetna to Upper Devil Canyon (RM 161.0).

3.2.1 Chinook Salmon

3.2.1.1 Intertidal to Talkeetna

3.2.1.1.1 Main Channel Escapement Monitoring

In 1983, chinook salmon entering the Yentna River (RM 28) were monitored by SSS counters and fishwheels at Yentna Station (TRM 04) beginning June 30 (Appendix 2-C and 2-D). Most of the chinook salmon escapement was already past Yentna Station by this date (ADF&G, 1982). Therefore, total escapement was not quantified.

At Sunshine Station (RM 80), on the Susitna River, chinook salmon were monitored in total. The 1983 escapement was an estimated 90,100 fish (Tables 2-3-9 and 2-3-10). This estimate includes: (1) 45,200 fish larger than 350 mm in length and 1,700 fish smaller than this (3.6% $\leq$350 mm) which migrated along the east side of the river; and (2) 41,000 fish larger than 350 mm in length and 2,200 fish smaller than this (5.1% $\leq$350 mm) which migrated along the west side of the Susitna River at RM 80 (Tables 2-3-9 and 2-3-10).

Table 2-3-9. Escapement of chinook salmon 350 mm or less in length in 1983 at Sunshine, Talkeetna and Curry stations.

Chinook Salmon Escapement ≤ 350 mm				
Sunshine Station			Talkeetna	Curry
East Bank	West Bank	Total	Station	Station
1,664	2,209	3,873	2,692	477

Two sub-estimates of the (1983) chinook salmon escapement to Sunshine Station (RM 80) were computed because of differences in tagged to untagged ratios. The surveys performed on the east side of the Susitna River between RM 80 and 98.6 and the upper Susitna River drainage above RM 98.6 revealed an overall ratio of tagged to untagged chinook salmon spawners of 1:15.3. Tag recovery surveys on the west side of the Susitna River of west side entering tributaries between RM 80 and 98.6, provided tagged to untagged ratios averaging 1:136.3. These ratios indicate: (1) the chinook salmon escapement to RM 80 was segregated with the Chulitna River stocks (RM 98.5) mainly migrating along the west side of the river at RM 80, and the east side tributaries and Susitna River stocks above RM 98.6 mainly migrating along the east river bank at RM 80; and (2) the chinook salmon escapement to RM 80 was not sampled equally on the east and west sides of the river even though fishing effort was identical with two fishwheels operated on each side. Based on this, it was decided that east and west bank migrating fish should be treated independently as two separate populations in estimating the total chinook salmon escapement to RM 80. In accomplishing this the tagged chinook salmon release data generated on the east side of the Susitna River at RM 80 was combined with tag recovery survey data collected from east side spawning areas to compute an east side escapement estimate. The west side escapement was computed in the same manner using west side tag release and tag recovery data.

Table 2-3-10. Petersen population estimates with associated 95% confidence intervals for 1983 chinook salmon escapements to Sunshine, Talkeetna and Curry stations.

Parameter 1/	Population Estimate Location 2/				
	Sunshine Station			Talkeetna Station	Curry Station
	East Bank	West Bank	Total 3/		
m	2,777	308	3,085	650	792
c	3,770	5,178	8,948	1,290	275
r	231	38	269	71	23
$\hat{N}$	45,154	41,034	86,188	11,673	9,120
95% C.I.	40,149-	30,081-	70,230-	9,533-	6,148-
	51,585	57,565	109,150	15,051	14,212

1/ m = Number of fish marked (adjusted).
c = Total number of fish examined for marks during sampling census.
r = Total number of marked fish observed during sampling census.
$\hat{N}$ = Population estimate.
C.I. = Confidence interval around $\hat{N}$.

2/ Chinook salmon escapements do not include fish 350 mm and less in length (FL).

3/ All totals are a summation of east and west bank values and do not represent calculated population estimates.

Fishwheel catches at Yentna Station (TRM 04) indicate that the 1983 migration of chinook salmon into the Yentna River (RM 28) began before June 30 and ended in the first week of August (Appendix Table 2-D-3 and Figure 2-3-4). Additionally, there was no strong migrational preference for chinook salmon movement along either bank at this site after June 30. The north bank Yentna Station fishwheel intercepted 57.5 percent and the south bank fishwheel captured 42.5 percent of the station catch (Appendix Tables 2-D-1 and 2-D-2).

The overall timing of the 1983 chinook salmon migration at Sunshine Station (RM 80) can be determined from the total catch of 3,832 fish in the four fishwheels operated at this location between June 3 and September 11 (Table 2-3-11 and Figure 2-3-4). The migration essentially covered a 31 day period which began on June 9, reached a midpoint on June 18 and ended on July 9. The peak migration occurred on June 14. The average fishwheel catch on this date was about 3.7 chinook salmon per hour. A plot of the daily east and west bank fishwheel catches at Sunshine Station indicate that the majority of the escapement traveled along the east side of the river with 90.3 percent of the total station catch being caught in the east bank fishwheels (Appendix 2-D). The results from tag recovery surveys performed upstream of RM 80 on the east and west sides of the river indicated the difference in interception ratios between the east and west bank fishwheels was primarily related to fishwheel efficiency: the east bank fishwheels caught in the range of six percent of the escapement on the east side of the river and the west bank fishwheels intercepted about one percent of the west bank escapement.

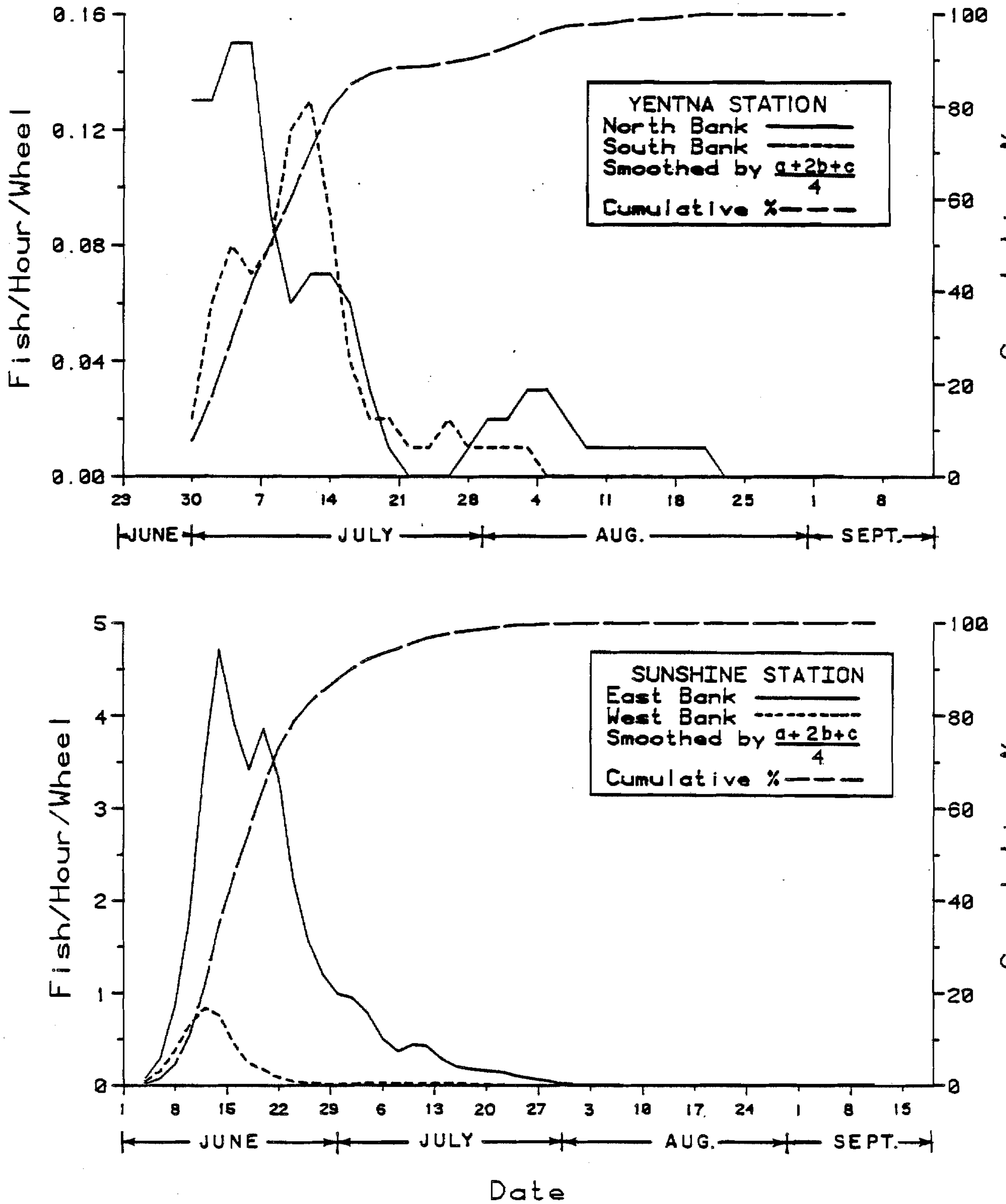


Figure 2-3-4. Mean hourly and cumulative percent fishwheel catch of chinook salmon by two day periods at Yentna and Sunshine stations in 1983.

Table 2-3-11. Summary of 1983 fishwheel catches by species and sampling locations.

Sampling Location	River Mile	Catch				
		Chinook	Sockeye	Pink	Chum	Coho
Yentna Station	04	87	4,648	4,489	775	574
Sunshine Station	80	3,832	8,147	3,085	17,600	2,254
Talkeetna Station	103	1,030	536	2,213	2,467	422
Curry Station	120	1,064	201	589	861	93

The results of sampling chinook salmon for age at Yentna River (RM 28) and Sunshine Station (RM 80) are summarized in Table 2-3-12 and Figure 2-3-5. An insufficient number of samples were collected at Yentna Station (TRM 04) to define other than that the escapement included fish ranging from three to seven years old. At Sunshine Station 1,307 legible scales indicate the escapement was about 85 percent five and six year old fish (Figure 2-3-5). The balance of the escapement sample was comprised of fish seven, four and three years old in order of abundance. Nearly all the adults sampled from Sunshine Station were fish that had gone to sea (smolted) in their second year of life (Table 2-3-13).

Length composition data collected from fishwheel caught chinook salmon at Yentna (TRM 04) and Sunshine (RM 80) stations in 1983 is summarized in Table 2-3-12. A near linear correlation exists between the age and length of

Table 2-3-12. Analysis of chinook salmon lengths, in millimeters, by age class from escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Collection Site	Age Class	n		Range Limits		Mean		95% Conf. Interval 3/		Median	
		M 1/	F 2/	M	F	M	F	M	F	M	F
Yentna Station	3_2	5	-	286-367	-	323	-	-	-	325	-
	4_2	1	1	442	524	442	524	-	-	442	524
	5_2	-	2	-	542-785	-	664	-	-	-	664
	6_2	2	2	825-845	750-872	835	811	-	-	835	811
	7_2	1	1	940	945	940	945	-	-	940	945
	ALL 4/	58	25	286-940	436-985	530	741	470-591	680-802	399	779
		83		286-985		594		544-644		590	
Sunshine Station	3_2	19	-	325-410	-	373	-	363-382	-	370	-
	4_2	41	10	360-720	445-690	522	548	495-548	494-604	515	555
	5_1	1	-	635	-	635	-	-	-	635	-
	5_2	338	170	420-1015	455-1100	631	670	620-642	649-692	610	630
	6_2	238	352	550-1200	505-1250	879	873	861-896	862-883	900	890
	7_2	46	92	710-1250	715-1040	993	927	963-1022	915-940	1000	923
	ALL 4/	936	810	325-1250	430-1250	714	815	702-726	805-826	655	870
		1746		325-1250		761		752-769		790	
Talkeetna Station	3_1	9	-	300-400	-	343	-	-	-	340	-
	3_2	140	-	290-430	-	346	-	342-349	-	350	-
	4_1	1	-	430	-	430	-	-	-	430	-
	4_2	56	5	330-680	460-530	492	494	464-520	-	515	490
	5_1	5	2	530-720	590-730	616	660	-	-	620	660
	5_2	178	41	460-860	500-840	616	623	605-628	597-650	610	600
	6_2	60	126	680-1100	630-1000	854	840	828-879	828-853	840	840
	7_2	9	32	870-1040	830-1050	956	927	-	904-949	960	915
	ALL 4/	634	268	290-1100	460-1050	555	795	541-570	779-811	560	820
		902		290-1100		626		613-640		620	

Table 2-3-12. Continued.

Collection Site	Age Class	n		Range Limits		Mean		95% Conf. Interval [3/]		Median	
		M [1/]	F [2/]	M	F	M	F	M	F	M	F
Curry Station	3_1	2	-	280-345	-	313	-	-	-	313	-
	3_2	65	-	300-400	-	346	-	340-352	-	345	-
	4_2	27	1	360-680	510	499	510	463-529	-	500	510
	5_2	158	16	460-810	600-790	627	675	617-637	643-707	630	670
	6_2	129	180	530-1100	700-970	845	841	829-861	834-849	840	840
	7_2	31	103	840-1140	800-1070	1001	924	977-1025	916-932	1000	930
	ALL [4/]	535	372	280-1140	510-1070	665	855	645-683	847-864	650	860
		907		280-1140		743		731-756		800	

1/ Males
2/ Females
3/ Confidence Interval of the Mean.
4/ Composite of all aged and non-aged samples.

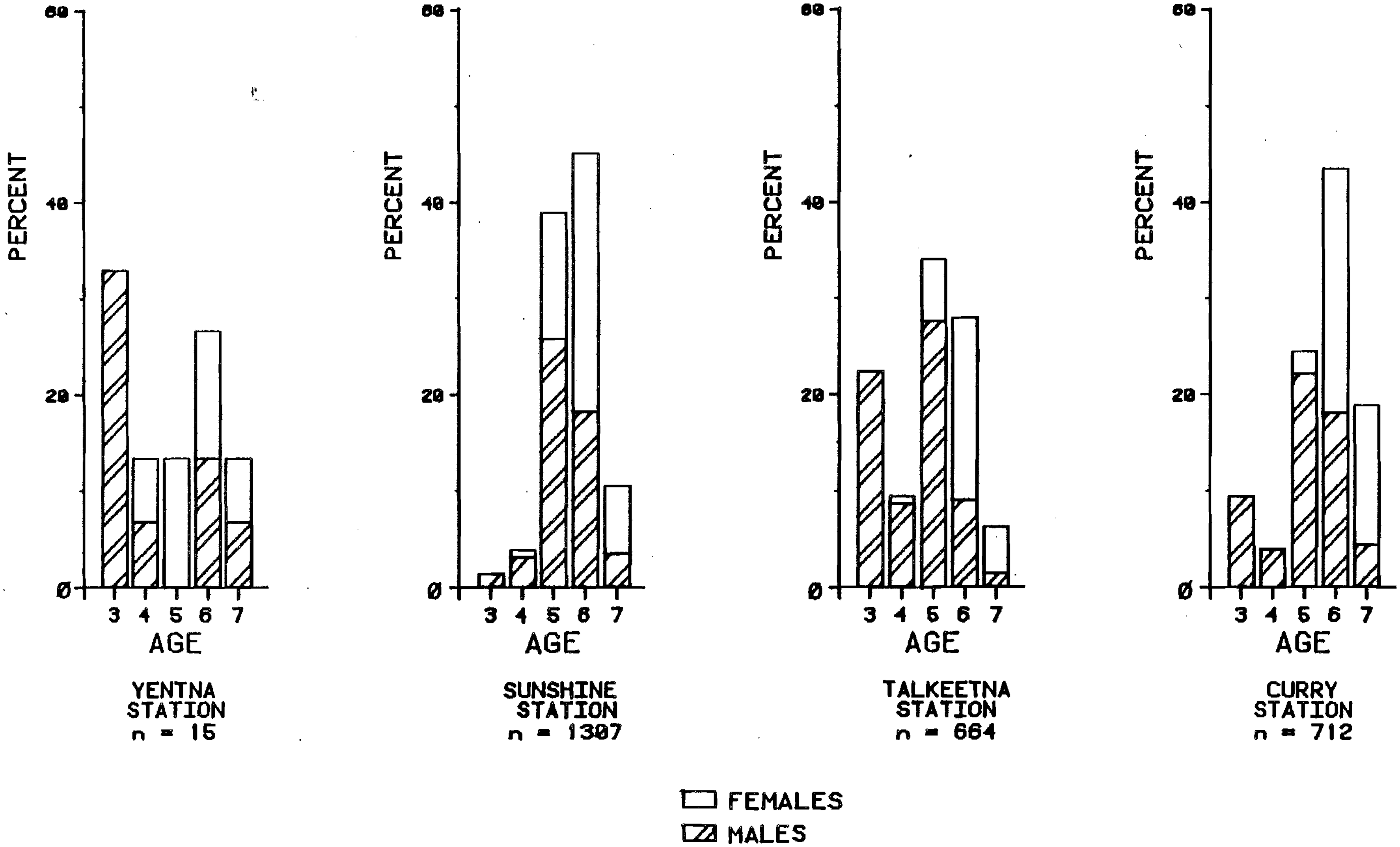


Figure 2-3-5. Age composition of fishwheel intercepted chinook salmon at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Table 2-3-13. Analysis of chinook salmon age data by percent from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	n	Age Class 1/							
		3_1	3_2	4_1	4_2	5_1	5_2	6_2	7_2
Yentna Station	15	-	33.3	-	13.3	-	13.3	26.7	13.3
Sunshine Station	1307	-	1.5	-	3.9	0.1	38.9	45.0	10.6
Talkeetna Station	664	1.4	21.1	0.2	9.2	1.1	32.9	27.9	6.2
Curry Station	712	0.3	9.1	-	3.9	-	24.4	43.5	18.8

1/ Gilbert-Rich Notation

the chinook salmon sampled at Sunshine Station as illustrated in Figure 2-3-6. Sex composition sampling at this station established that males were more numerous than females among the three and four year old fish, and females were more numerous than males among fish five, six and seven years old (Table 2-3-14).

3.2.1.2 Talkeetna To Upper Devil Canyon

3.2.1.2.1 Main Channel Escapement Monitoring

The 1983 escapement of chinook salmon at Talkeetna Station (RM 103) was an estimated 14,400 fish. Represented in this estimate are 11,700 chinook salmon larger than 350 mm in length and 2,700 fish smaller than this length (18.6% 350 mm) (Tables 2-3-9 and 2-3-10).

The 1983 chinook salmon escapement at Curry Station (RM 80) was an estimated 9,600 fish or about 4,800 fish less than the estimate for Talkeetna Station (RM 103) (Tables 2-3-9 and 2-3-10). About 9,100 of the 9,600 chinook salmon

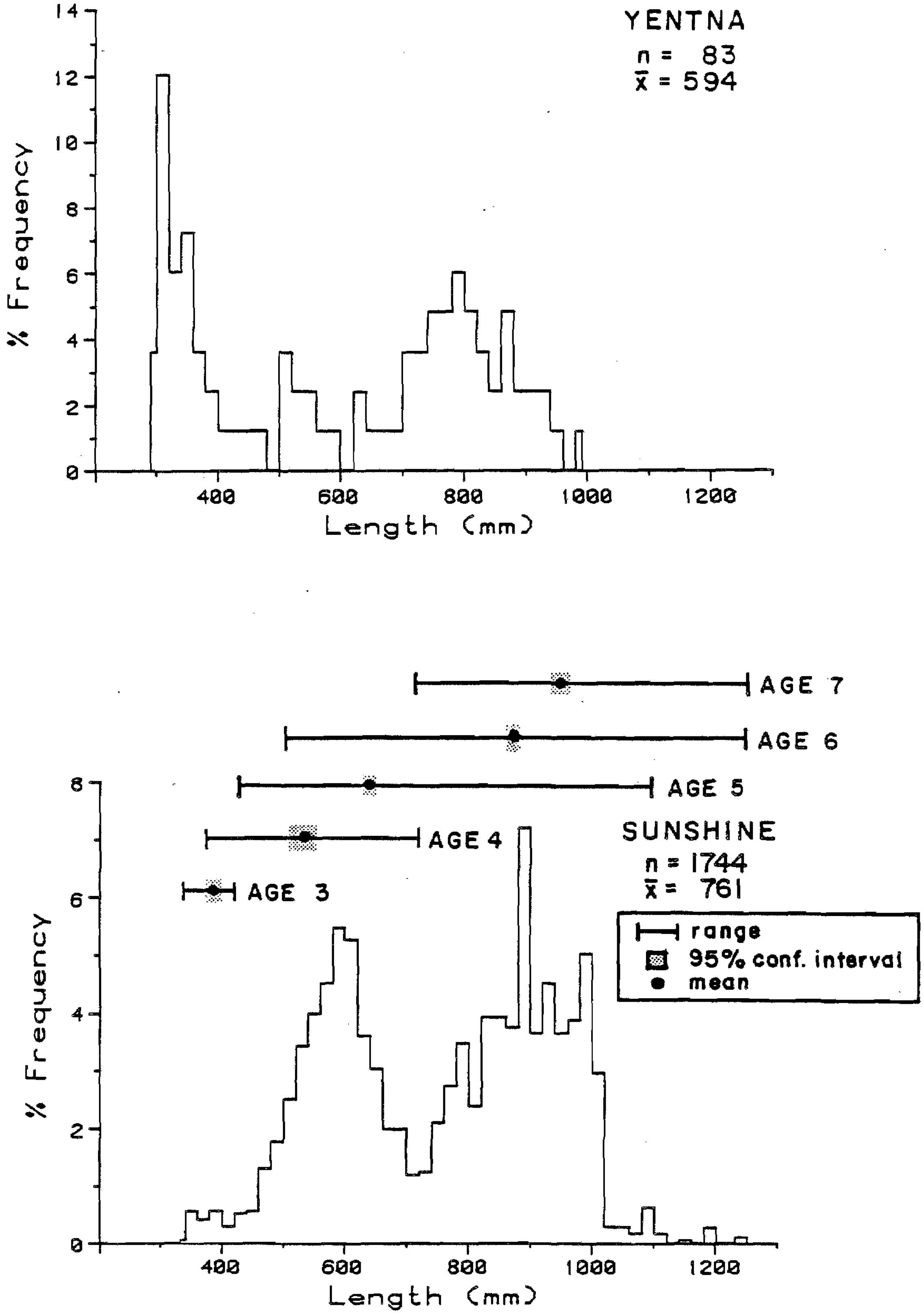


Figure 2-3-6. Length frequency distribution of chinook salmon at Yentna Station in 1983 and length and age distribution of chinook salmon at Sunshine Station in 1983.

Table 2-3-14. Sex ratios of male and female chinook salmon by age from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	Age	Sample Size	Number		Sex Ratio (M:F)
			Males	Females	
Yentna Station	3	5	5	0	-
	4	2	1	1	1.0.1
	5	2	0	2	-
	6	4	2	2	1.0:1
	7	2	1	1	1.0:1
	All 1/	83	58	25	2.3:1
Sunshine Station	3	19	19	0	-
	4	51	41	10	4.1:1
	5	509	339	170	2.0:1
	6	590	238	352	0.7:1
	7	138	46	92	0.5:1
	All 1/	1746	936	810	1.2:1
Talkeetna Station	3	149	149	0	-
	4	62	57	5	11.4:1
	5	226	183	43	4.3:1
	6	186	60	126	0.5:1
	7	41	9	32	0.3:1
	All 1/	902	634	268	2.4:1
Curry Station	3	67	67	0	-
	4	28	27	1	27.0:1
	5	174	158	16	9.9:1
	6	309	129	180	0.7:1
	7	134	31	103	0.3:1
	All 1/	907	535	372	1.4:1

1/ Includes all aged and non-aged samples.

escapement estimate to Curry Station were fish larger than 350 mm in length. The balance of the estimate were fish smaller than this length (5.2% $\leq$ 350 mm).

About 19 percent of the estimated chinook salmon escapement to Talkeetna Station (RM 103) were jacks ($\leq$ 350 mm). At Curry Station (RM 120) the escapement was about five percent jacks (Tables 2-3-9 and 2-3-10). The relatively high percentage of jacks at Talkeetna Station as compared to Curry Station may be due to: (1) general selectivity of fishwheels toward smaller fish and (2) less milling activity in the lower Susitna River reach by adult chinook salmon (> 350 mm) than by jack salmon. The fishwheels operated at Talkeetna and Curry stations likely caught an artificially high percentage of the jack chinook salmon population due to the near shore placement of the fishwheels. It is reported that adult chinook salmon tend to migrate further offshore, favoring higher water velocities, than jack chinook salmon (Meehan, 1961). The Curry Station fishwheels were probably less selective toward jacks than the Talkeetna Station fishwheels due to differences in inshore velocities. At Curry Station water velocities were generally higher near shore than at Talkeetna Station. Because of higher near shore velocities at Curry Station adult chinook salmon were likely more abundant in the inshore area here than at Talkeetna Station and this is evident in the fishwheel catches (Table 2-3-11). At Talkeetna Station the four fishwheels caught 1,030 chinook salmon. Upstream at Curry Station, the two fishwheels surpassed this with a catch of 1,064 chinook salmon. Whether differential milling activity occurred between adult and jack chinook salmon in the area of Talkeetna Station is unknown. We know that tagged adult chinook salmon generally mill less the farther they ascend the Susitna River main channel as will be later addressed in this report, but we have no information to determine this for jacks as they were not tagged at either station in 1983.

In 1984 we intend to independently mark the jacks and adults caught at Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations and monitor the recoveries upstream. This information will permit an evaluation of the milling activity by jacks and adults and also fishwheel selectivity.

Migration timings of the 1983 chinook salmon escapements to Talkeetna (RM 103) and Curry (RM 120) stations have been determined by interpretation of fishwheel catches (Figure 2-3-7). At Talkeetna Station, the migration began on June 18, reached a midpoint on June 28 and ended on July 21. The migration peaked on June 22 at an average catch rate of 0.8 fish per fishwheel hour. Seventeen miles up river at Curry Station, the chinook migration began on June 18, reached a midpoint on June 25 and ended on July 13. The highest daily catch rate at this site occurred on June 23 with 1.9 fish per fishwheel hour being recorded (Appendix 2-D).

In 1983, the majority of the chinook escapement migrated along the east bank of the Susitna River at both Talkeetna (RM 103) and Curry (RM 120) stations. About 55 percent of the total 1,030 chinook salmon fishwheel catch at Talkeetna Station and 55 percent of the total 1,064 fishwheel catch at Curry Station were made by east bank fishwheels at these locations (Appendix Tables 2-D-9 and 2-D-12). Inseason catch rates held relatively constant between the east and west bank fishwheels at both locations as indicated in Figure 2-3-7.

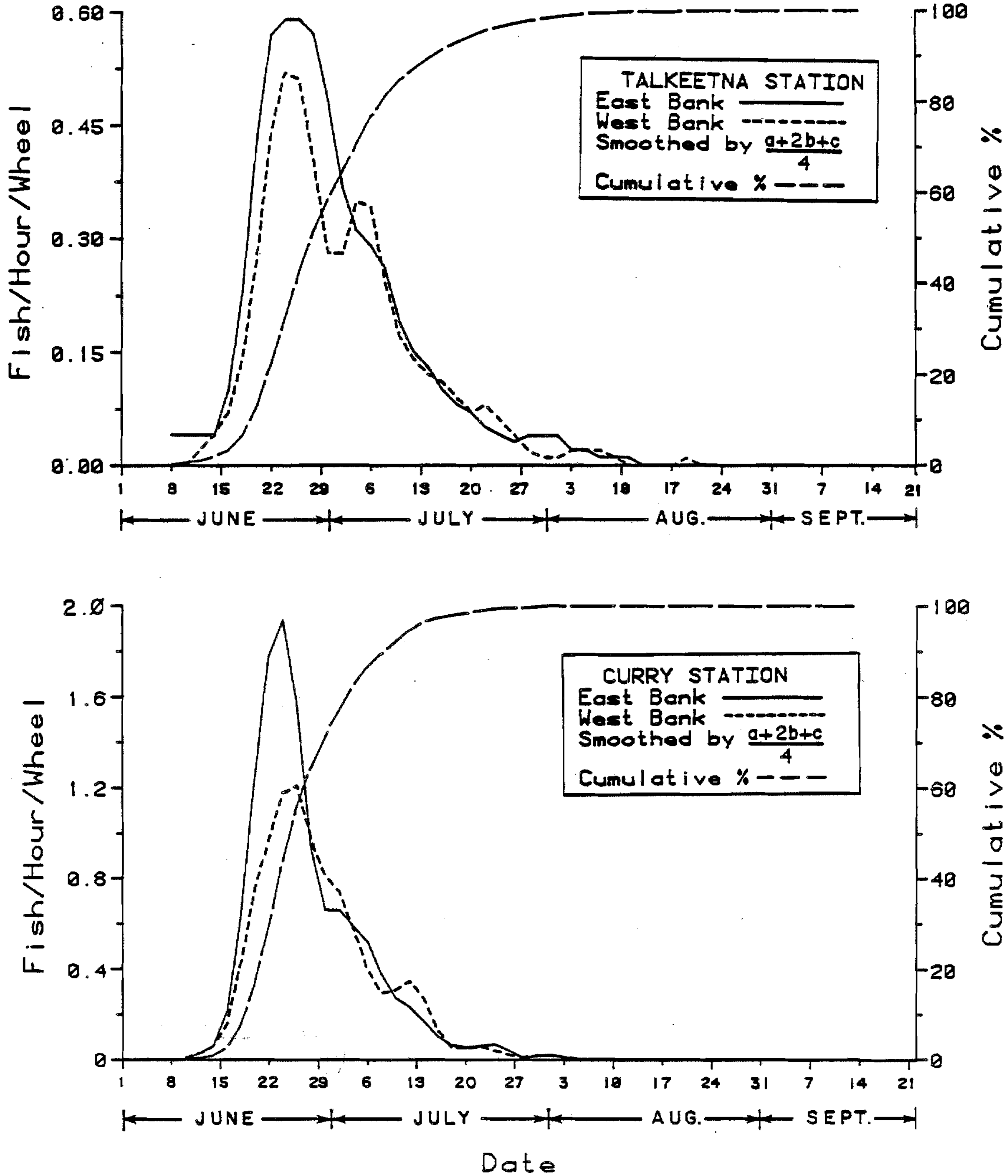


Figure 2-3-7. Mean hourly and cumulative percent fishwheel catch of chinook salmon by two day periods at Talkeetna and Curry stations in 1983.

A comparison of the migration rates of fish tagged and released at Sunshine Station (RM 80) and later recaptured at Talkeetna (RM 103) and Curry (RM 120) stations indicates that adult chinook salmon traveled at a faster speed or spent less time milling in 1983 the further they traveled upstream (Figure 2-3-8). Chinook salmon released at Sunshine Station averaged a 1.8 miles per hour (mph) travel speed to Talkeetna Station (23 miles) and an overall speed of 3.0 mph to Curry Station (40 miles).

The results of age samples collected in 1983 from 664 and 712 chinook salmon caught in fishwheels at Talkeetna (RM 103) and Curry (RM 120) stations are summarized in Table 2-3-13. Approximately 62 percent of the escapement sampled from Talkeetna Station were five and six year old fish. The balance of the sample was comprised of fish three, four and seven years old in respective order. About 97 percent of the escapement sample from Talkeetna Station were fish that had gone to sea (smolted) in their second year of life. The remainder of the sample had gone to sea in their first year of life. At Curry Station five and six year old fish represented 68 percent of the escapement sample with the remaining 32 percent represented by fish seven, three and four years old in order of contribution. Nearly all (97.7%) of the escapement sampled for age from Curry Station were fish that had gone to sea in their second year of life.

Length composition data of chinook salmon sampled at Talkeetna (RM 103) and Curry (RM 120) stations in 1983 are presented in Table 2-3-12 and Figure 2-3-9.

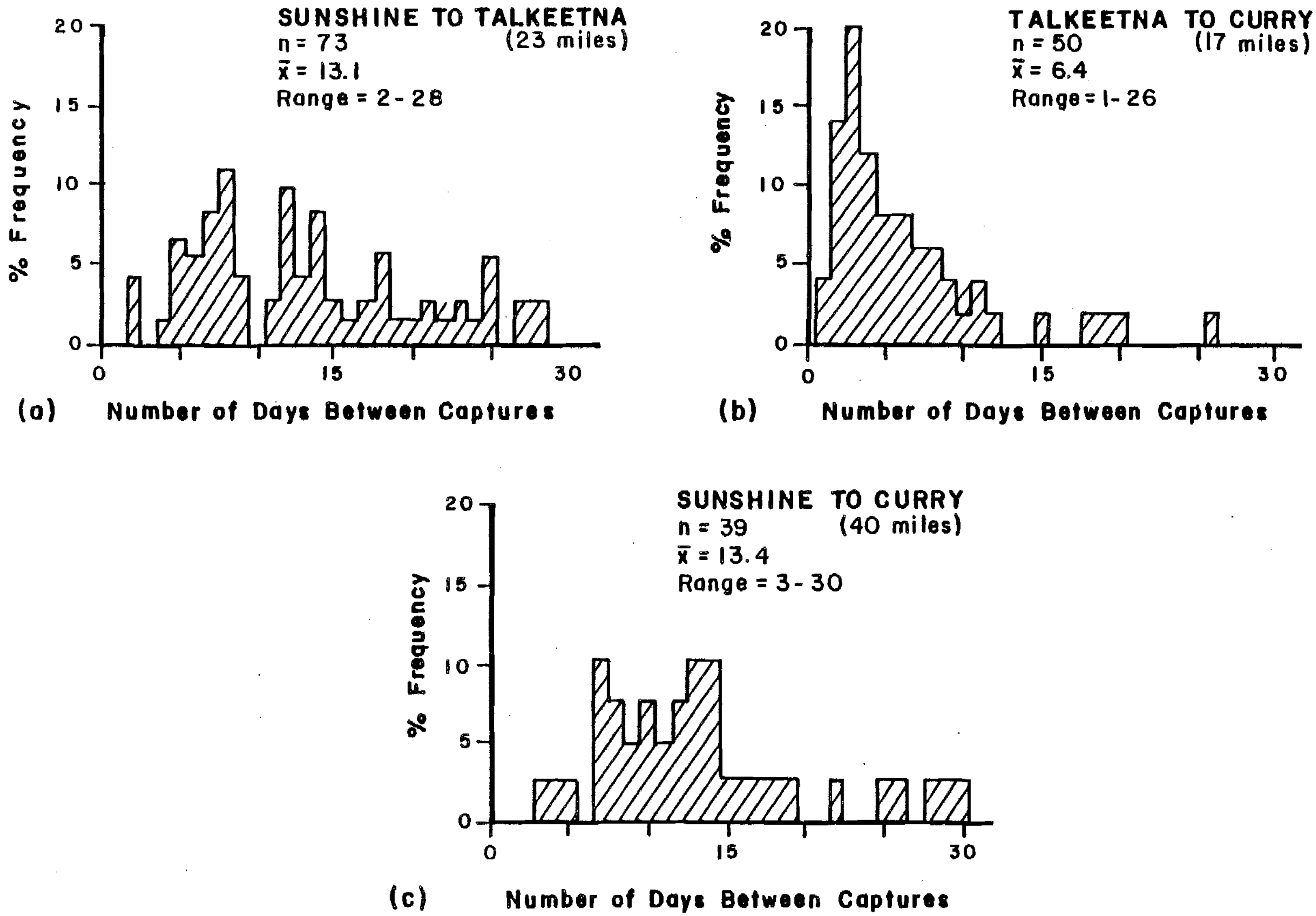


Figure 2-3-8. Migrational rates of chinook salmon between (a) Sunshine and Talkeetna stations, (b) Talkeetna and Curry stations and (c) Sunshine and Curry stations, 1983.

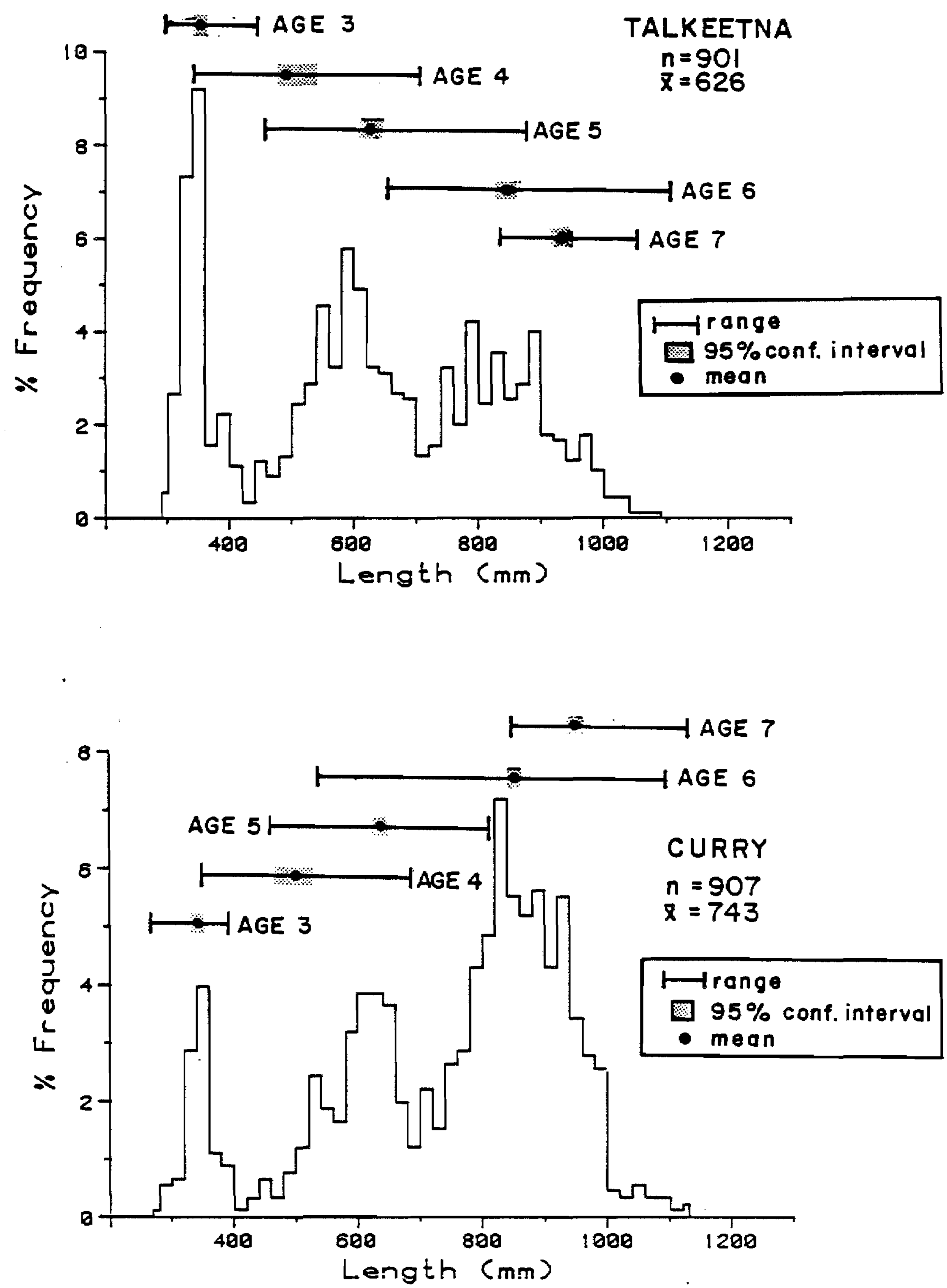


Figure 2-3-9. Length frequency distribution of chinook salmon sampled for age at Talkeetna and Curry stations in 1983.

Sex composition data collected at Talkeetna (RM 103) and Curry (RM 120) stations in 1983 are presented in Table 2-3-14. Overall male to female ratios were 2.1:1 and 1.4:1 respectively for samples collected at Talkeetna and Curry stations. At both stations there were more females among the six and seven year old fish than males. Among the three, four and five year old fish males were more numerous than females.

3.2.1.2.2 Spawning Ground Surveys

3.2.1.2.2.1 Main Channel

In 1983, there was no specific sampling for chinook salmon spawning in the Susitna River main channel. General observations in 1983 by the crews assigned to main channel stations at RM 80, 103 and 120 and at Gold Creek (RM 136.7) provided no evidence that chinook salmon spawned in the Susitna River main channel.

3.2.1.2.2.2 Sloughs and Streams

A total of 35 sloughs between RM 98.6 and 161.0 were routinely surveyed for salmon escapements between July 25 and October 11, 1983. Twenty streams were likewise surveyed in this reach between July 15 and October 8, 1983.

The results of the sloughs surveyed above RM 98.6 indicate chinook salmon did not use these habitats in 1983 for spawning or milling. A single chinook salmon carcass was found in Slough 15 (RM 137.2) on July 25, 1983. Considering the close proximity of Slough 15 to Indian River (RM 138.6) it is likely this carcass was washed out from Indian River.

In 1983 chinook salmon were found in 11 streams above RM 98.6 (Table 2-3-15). A total of 4,432 chinook salmon were enumerated in the peak survey counts of these streams. The majority (97.8%) of these counts were recorded at Indian River (RM 138.6) and Portage Creek (RM 148.9). The remaining nine streams accounted for 2.2 percent of the total peak count (Table 2-3-15).

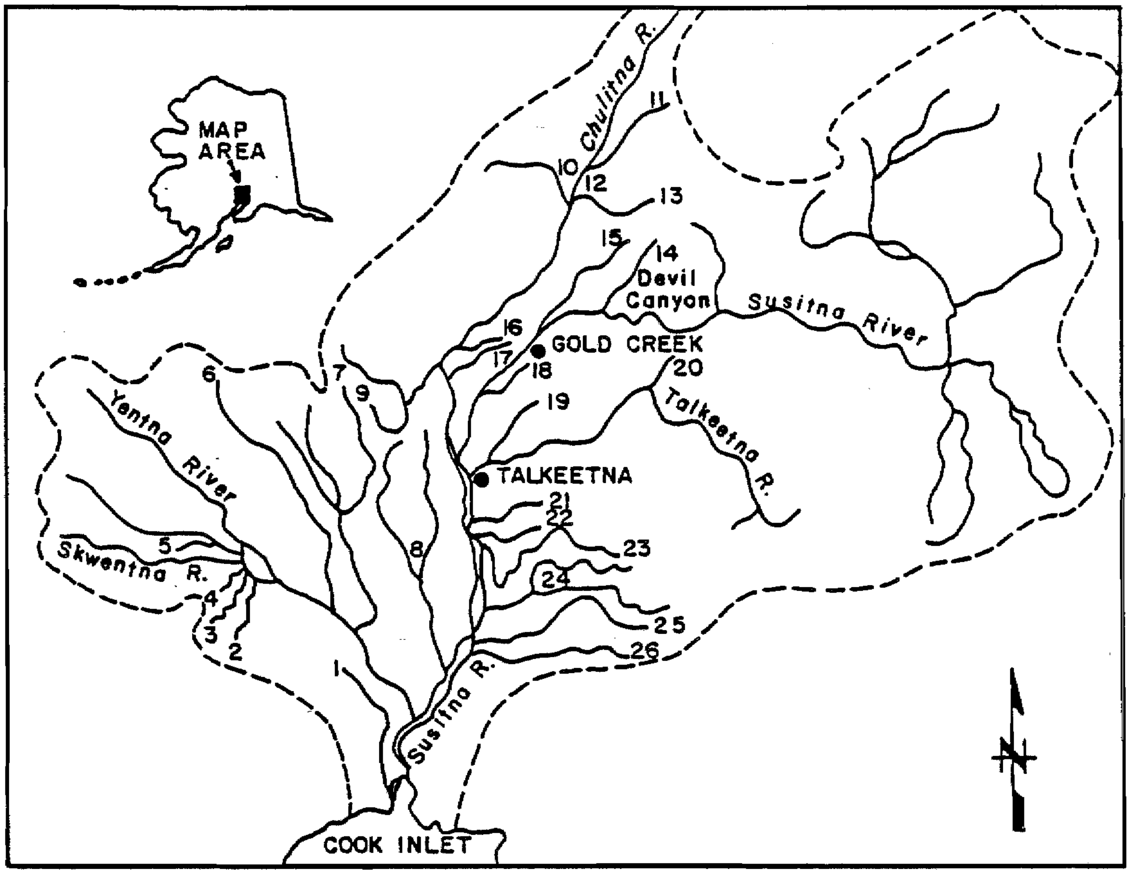
Table 2-3-15. Chinook salmon peak 1983 escapement counts for streams above RM 98.6 in order of contribution.

Stream	River Mile	Date	Number Counted			Percent Contribution
			Live	Dead	Total	
Portage Creek	148.9	7/25	3,123	17	3,140	70.8
Indian River	138.6	7/25	1,172	21	1,193	26.9
Cheechako Creek	152.5	8/1	25	0	25	0.6
Gold Creek	136.7	7/24	19	4	23	0.5
Chase Creek	106.9	8/11	8	7	15	0.3
Lane Creek	113.6	8/2	10	2	12	0.3
Chinook Creek	156.8	8/1	8	0	8	0.2
Whiskers Creek	101.4	8/4	3	0	3	0.1
4th of July Creek	131.0	8/2	4	2	6	0.1
Jack Long Creek	144.5	8/1	3	3	6	0.1
Devil Creek	161.0	8/1-2	1	0	1	<0.1
		TOTAL	4,376	56	4,432	100.0

A peak survey count of chinook salmon probably represents less than about 52 percent of the total escapement (Neilsen and Geen, 1981). The total peak survey count in 1983 of 4,432 fish to 11 streams above RM 98.6 therefore probably represents an escapement in the range of 8,500 fish. Inasmuch as there has been no record of chinook salmon spawning in the main channel of the Susitna River above RM 98.6 and there was a complete survey of all suspected and known salmon spawning tributaries above RM 98.6 in 1983, it is reasonable to assume that the 14,500 (1983) escapement estimate for Talkeetna Station (RM 103) represents a combination of both milling fish that reached RM 103 but spawned below RM 103 and fish which migrated past RM 103 to upstream spawning areas. Salmon ascending a river beyond their final spawning designation has been reported in several Susitna River studies. Barrett (1974) reported that a portion of the adult salmon escapement that reached RM 103 in 1974 spawned in downstream spawning areas. Radio telemetry observations of four chinook salmon released at RM 103 in 1981 revealed that three of the four fish spawned above RM 103 and the remaining fish spawned below this location (ADF&G, 1981). In 1982, five of seven radio tagged chinook salmon released at RM 103 spawned in tributaries below RM 103, including the Talkeetna River (RM 97.1) (ADF&G, 1982). In 1983, chinook salmon tag recovery surveys conducted in tributaries of the Talkeetna and Chulitna rivers (RM 98.5) further substantiate that a portion of the 1983 escapement to RM 103 descended to downstream spawning areas (Appendix Table 2-G-4).

3.2.1.3 Escapement Index Surveys

In 1983, escapement surveys were conducted at 19 of 26 designated chinook salmon spawning index streams in the Susitna River drainage (Figure 2-3-10 and Table 2-3-16). The results indicate that escapements in 11 of the 19 index streams in 1983 were higher than the previous seven year average and



1. ALEXANDER CREEK
2. TALACHULITNA R.
3. QUARTZ CREEK
4. CANYON CREEK
5. RED CREEK
6. LAKE CREEK
7. PETERS CREEK
8. DESHKA RIVER
9. BUNCO CREEK
10. CHULITNA MIDDLE FORK
11. CHULITNA EAST FORK
12. CHULITNA RIVER
13. HONOLULU CREEK
14. PORTAGE CREEK
15. INDIAN RIVER
16. BYERS CREEK
17. TROUBLESOME CREEK
18. LANE CREEK
19. CLEAR CREEK
20. PRAIRIE CREEK
21. MONTANA CREEK
22. GOOSE CREEK
23. SHEEP CREEK
24. KASHWITNA RIVER NORTH FORK
25. LITTLE WILLOW CREEK
26. WILLOW CREEK

Figure 2-3-10. Susitna River basin with chinook salmon index streams defined, 1983.

Table 2-3-16. 1983 escapement surveys of chinook salmon index streams in the Susitna River drainage.

Stream Surveyed	Survey			No. of Chinook Salmon Counted		
	Date	Method	Conditions	Live	Dead	Total
Alexander Creek (Mouth to Lake)	7/19	Hel.	Good	3,755	0	3,755
Wolverine Creek (Alexander Cr. drainage)	7/19	Hel.	Good	491	0	491
Sucker Creek (Alexander Cr. drainage)	7/19	Hel.	Good	597	0	597
Bunco Creek	8/2	Foot	Good	277	2	523
Canyon Creek	7/13	S.Cub	Excellent	575	0	575
Cheechako Creek (Devil Canyon)	7/24 8/1	Hel. Hel.	Excellent Excellent	16 25	0 0	16 25
Chinook Creek (Devil Canyon)	7/24 8/1	Hel. Hel.	Excellent Excellent	4 8	0 0	4 8
Chulitna River (Middle Fork)	7/19 8/3	Raft Raft	Excellent Excellent	3,842 883	4 75	3,846 958
Clear Creek	8/1	Hel.	Good	758	48	806
Deshka River	7/26	Hel.	Excellent	19,237	0	19,237
Devil Creek	8/2	Hel.	Excellent	1	0	1
Goose Creek	7/18	Hel.	Fair	472	5	477
Indian River	7/25 8/2	Hel. Hel.	Excellent Excellent	1,172 417	21 76	1,193 493
Kashwitna River (North Fork)	7/18	Hel.	Good	297	0	297
Lake Creek	7/26	Hel.	Excellent	7,025	50	7,075
Camp Creek (Lake Cr. drainage)	7/29	Hel.	Excellent	1,050	0	1,050
Sunflower Creek (Lake Cr. drainage)	7/29	Hel.	Excellent	2,250	0	2,250
Lane Creek	8/2	Hel.	Excellent	10	2	12

Table 2-3-16. Continued.

Stream Surveyed	Survey			No. of Chinook Salmon Counted		
	Date	Method	Conditions	Live	Dead	Total
Little Willow Creek	7/19	Hel.	Good	1,039	3	1,042
Montana Creek	7/14	Foot	Excellent	1,638	3	1,641
Peters Creek	7/14	Hel.	Excellent	2,272	0	2,272
Portage Creek	7/25 8/1	Hel. Hel.	Excellent Excellent	3,123 2,172	17 384	3,140 2,556
Prairie Creek	7/20	Foot & Cessna	Excellent	871	0	3,200
Sheep Creek	8/18	Hel.	Fair	942	3	945
Talachulitna River	7/29	Hel.	Excellent	9,714	300	10,014
Willow Creek						
Parks Hwy to Mouth	7/18	Hel.	Good	83	0	83
Canyon to Highway	7/19	Raft	Excellent	690	4	694

nine of these supported escapements higher than any year between 1976 and 1982 (Table 2-3-17). Overall, the 1983 chinook salmon escapement in the Susitna River drainage index streams was about six percent higher than the escapement average for the previous seven years (1976-1982).

Chinook salmon escapements to index streams in 1983 averaged about 50 percent more fish than in 1982 (Table 2-3-17). For the west side of the Susitna River below RM 97 the 1983 escapement was about 60 percent more than the 1982 escapement. The east side Susitna River index streams below RM 97 were not surveyed during the peak of spawning in 1982 and therefore no comparison can be made with the 1983 escapement data. The Talkeetna River drainage (RM 97.1) index streams in 1983 supported about 15 percent less escapement than in 1982. For the Chulitna River drainage (RM 98.5) the escapements were about 430 percent higher in 1983 than in 1982. In the Susitna River reach above RM 98.6 approximately 80 percent higher escapements were realized in 1983 than in the previous year.

Table 2-3-17. Chinook salmon peak survey escapement counts of Susitna River basin streams from 1976 to 1983.

	Year							
Stream	1976	1977	1978	1979	1980	1981	1982	1983
Alexander Creek	5,412	9,246	5,854	6,215	a/	a/	2,546	3,755
Deshka River	21,693	39,642	24,639	27,385	a/	a/	16,000 e/	19,237
Willow Creek	1,660	1,065	1,661	1,086	a/	1,357	592 d/	777
Little Willow Creek	833	598	436	324 c/	a/	459	316 d/	1,042
Kashwitna River (North Fork)	203	336	362	457	a/	557	156 d/	297
Sheep Creek	455	630	1,209	778	a/	1,013	527 d/	945
Goose Creek	160	133	283	b/	a/	262	140 d/	477
Montana Creek	1,445	1,443	881	1,094 c/	a/	814	887 d/	1,641
Lane Creek	b/	b/	b/	b/	b/	40	47	12
Indian River	537	393	114	285	a/	422	1,053	1,193
Portage Creek	702	374	140	190	a/	659	1,253	3,140
Prairie Creek	6,513	5,790	5,154	a/	a/	1,900	3,844	3,200 e/
Clear Creek	1,237	769	997	864 c/	a/	a/	982	806
Chulitna River (East Fork)	112	168	59	a/	a/	a/	119 d/	b/
Chulitna River (MF)	1,870	1,782	900	a/	a/	a/	644 d/	3,846
Chulitna River	124	229	62	a/	a/	a/	100 d/	b/
Honolulu Creek	24	36	13	37	a/	a/	27 d/	b/
Byers Creek	53	69	a/	28	a/	a/	7 d/	b/
Troublesome Creek	92	95	a/	a/	a/	a/	36 d/	b/
Bunco Creek	112	136	a/	58	a/	a/	198	523
Peters Creek	2,280	4,102	1,335	a/	a/	a/	a/	2,272
Lake Creek	3,735	7,391	8,931	4,196	a/	a/	3,577	7,075
Talachulitna River	1,319	1,856	1,375	1,648	a/	2,129	3,101	10,014
Canyon Creek	44	135	b/	b/	b/	84	b/	575
Quartz Creek	b/	8	b/	b/	b/	8	b/	b/
Red Creek	b/	1,511	385	b/	b/	749	b/	b/

a/ No total count due to high turbid water
b/ Not counted
c/ Poor counting conditions
d/ Counts conducted after peak spawning
e/ Estimated peak spawning count

3.2.2 Sockeye Salmon

3.2.2.1 Intertidal to Talkeetna

3.2.2.1.1 Main Channel Escapement Monitoring

3.2.2.1.1.1 First Run

The first run sockeye salmon escapement into the Yentna River (RM 28) was not monitored at Yentna Station (TRM 04) in 1983. This station was operational in late June 1983 which is after first run sockeye passed through the lower Yentna River.

Sunshine Station (RM 80) on the Susitna River main channel was operated early enough in the 1983 season to record the first run sockeye salmon escapement. An estimated 3,300 first run sockeye salmon migrated past this location in 1983. The 95 percent confidence interval associated with this estimate is 3,000 to 3,700 fish (Table 2-3-18). Based on fishwheel catches the migration began at Sunshine Station on June 6, reached a midpoint on June 10 and ended on June 19. The peak of migration occurred on June 14 with 3.7 fish caught per fishwheel hour (Appendix Table 2-D-6).

Table 2-3-18. Petersen population estimate for 1983 first run sockeye salmon escapement to Sunshine Station.

Location	River Mile	Tagged (m)	Examined for Tags (c)	Recaptures (r)	Population Estimate 1/ ($\hat{N}$)	95% Confidence Interval
Sunshine Station	80	415	2,296	286	3,332	3,006-3,737

1/ Migration period of first run sockeye salmon extended from June 5 through June 28, 1983.

In 1983, the escapement of first run sockeye salmon passed essentially along the east side of the Sunshine River at Sunshine Station (RM 80). The two east bank station fishwheels caught 399 first run fish and the two west bank fishwheels caught only one first run sockeye salmon (Appendix Table 2-D-6).

Age composition data was collected from 290 first run fish at Sunshine Station (RM 80) in 1983 (Table 2-3-19). The escapement was comprised mainly of four (26.9%) and five (71.4%) year old fish which had gone to sea after one winter in freshwater (Table 2-3-19).

Table 2-3-19. Analysis of sockeye salmon age data by percent from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	n	Age Class 1/									
		3_1	3_2	4_1	4_2	4_3	5_1	5_2	5_3	6_2	6_3
Yentna Station	1024	0.4	4.7	0.4	66.8	0.9	0.5	22.6	1.8	0.2	1.7
Sunshine Station											
First Run	290	-	-	-	26.9	-	-	71.4	0.7	1.0	-
Second Run	994	0.1	-	0.1	63.4	0.5	0.1	33.7	1.7	-	0.4
Talkeetna Station	344	0.3	4.1	-	50.9	4.9	-	38.1	1.7	-	-
Curry Station	118	0.8	5.9	-	69.6	2.5	0.8	18.7	1.7	-	-

1/ Gilbert-Rich Notation

Length data was collected from 334 first run sockeye salmon at Sunshine Station (RM 80). The results are presented in Table 2-3-20. The five and

Table 2-3-20. Analysis of sockeye salmon lengths, in millimeters, by age class from escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Collection Site	Age Class	n M 1/	n F 2/	Range Limits M	Range Limits F	Mean M	Mean F	95% Conf. Interval 3/ M	95% Conf. Interval 3/ F	Median M	Median F
Yentna Station	3_1	4	-	380-436	-	403	-	-	-	399	-
	3_2	47	1	291-465	403	329	403	-	-	324	403
	4_1	3	1	448-502	570	469	570	-	-	456	570
	4_2	377	308	342-622	422-566	473	484	469-478	481-486	464	483
	4_3	8	1	324-388	571	358	571	-	-	361	571
	5_1	2	3	584-587	535-554	586	543	-	-	586	539
	5_2	134	98	442-645	439-615	577	548	571-582	541-555	583	552
	5_3	13	5	426-551	492-522	490	507	-	-	499	510
	6_2	-	2	-	540-587	-	564	-	-	-	564
	6_3	10	7	520-600	498-568	564	544	-	-	569	546
	ALL 4/	722	493	291-652	403-615	488	502	483-494	499-506	481	495
		1215		291-652		494		490-498		489	
Sunshine Station First Run	4_2	39	39	355-565	370-640	477	499	460-495	478-520	480	505
	5_2	119	88	355-690	400-615	527	521	516-538	512-529	540	520
	5_3	-	2	-	430-480	-	455	-	-	-	455
	6_2	2	1	505-590	505	548	505	-	-	548	505
	ALL 4/	186	148	355-690	370-650	515	514	506-524	506-522	525	515
		334		355-690		515		508-521		520	
Sunshine Station Second Run	3_1	1	-	400	-	400	-	-	-	400	-
	4_1	-	1	-	460	-	460	-	-	-	460
	4_2	309	321	325-665	390-580	476	482	470-481	478-486	470	480
	4_3	3	2	360-405	370-550	382	460	-	-	380	460
	5_1	-	1	-	565	-	565	-	-	-	565
	5_2	165	170	400-655	420-640	573	541	567-579	536-547	580	540

Table 2-3-20. Continued.

Collection Site	Age Class	n		Range Limits		Mean		95% Conf. Interval [3/]		Median	
		M [1/]	F [2/]	M	F	M	F	M	F	M	F
Sunshine	5_3	8	9	400-580	430-520	506	483	-	-	515	485
Station	6_3	-	4	-	485-560	-	530	-	-	-	538
Second Run	ALL [4/]	554	584	325-695	370-640	510	502	504-515	499-506	510	500
(Continued)		1138		325-695		506		503-509		505	
Talkeetna	3_1	1	-	420	-	420	-	-	-	420	-
Station	3_2	13	1	320-435	365	343	365	-	-	340	365
	4_2	101	74	330-625	375-600	472	496	462-482	487-505	465	500
	4_3	17	-	320-460	-	355	-	-	-	350	-
	5_2	73	58	480-670	480-690	590	561	583-597	550-571	595	560
	5_3	4	2	440-570	515-550	521	533	-	-	538	533
	ALL [4/]	267	171	320-690	365-690	498	526	487-509	518-534	500	525
		438		320-690		509		502-516		515	
Curry	3_1	1	-	400	-	400	-	-	-	400	-
Station	3_2	7	-	300-405	-	337	-	-	-	320	-
	4_2	51	31	420-640	435-545	467	502	-	-	450	505
	4_3	3	-	320-365	-	347	-	-	-	355	-
	5_1	1	-	485	-	485	-	-	-	485	-
	5_2	7	15	520-605	480-580	569	551	-	-	580	560
	5_3	1	1	570	380	570	380	-	-	570	380
	ALL [4/]	82	50	300-640	380-580	459	515	443-475	504-526	450	515
		132		300-640		481		469-492		488	

1/ Males
2/ Female
3/ Confidence Interval of the Mean.
4/ Composite of all aged and non-aged samples.

six year old males sampled at this station averaged a larger length than the females. The four year old females averaged a larger length than the four year old males. The overall average length of all male and female first run sockeye salmon sampled at Sunshine Station was 515 mm.

Figure 2-3-11 shows a percent comparison of the male and female first run sockeye salmon sampled for age at Sunshine Station (RM 80) in 1983. There were about an equal number of male and female four year old fish and about 25 percent more males than females among the five year old fish. The overall male to female ratio of all aged and non-aged first run sockeye salmon sampled averaged 1.3:1 (Table 2-3-21).

3.2.2.1.1.2 Second Run

The 1983 escapement of second run sockeye salmon in the Yentna River (RM 28) at Yentna Station (TRM 04) was determined by SSS counters and in the Susitna River at Sunshine Station (RM 80) by the Petersen tag/recapture method (Table 2-3-8). The 1983 escapement into the Yentna River was an estimated 104,400 fish (Table 2-3-22). For the Susitna River at Sunshine Station the escapement was an estimated 71,500 fish (Table 2-3-23).

The migrational timing of the 1983 second run sockeye salmon escapements to Yentna (TRM 04) and Sunshine (RM 80) stations can be calculated from station fishwheel catches (Figure 2-3-12). The Yentna River (RM 28) migration began on July 14, reached a midpoint on July 22 and ended on August 15. In the Susitna River at Sunshine Station the escapement migration began on July 17, reached a midpoint on July 23 and ended on August 14.

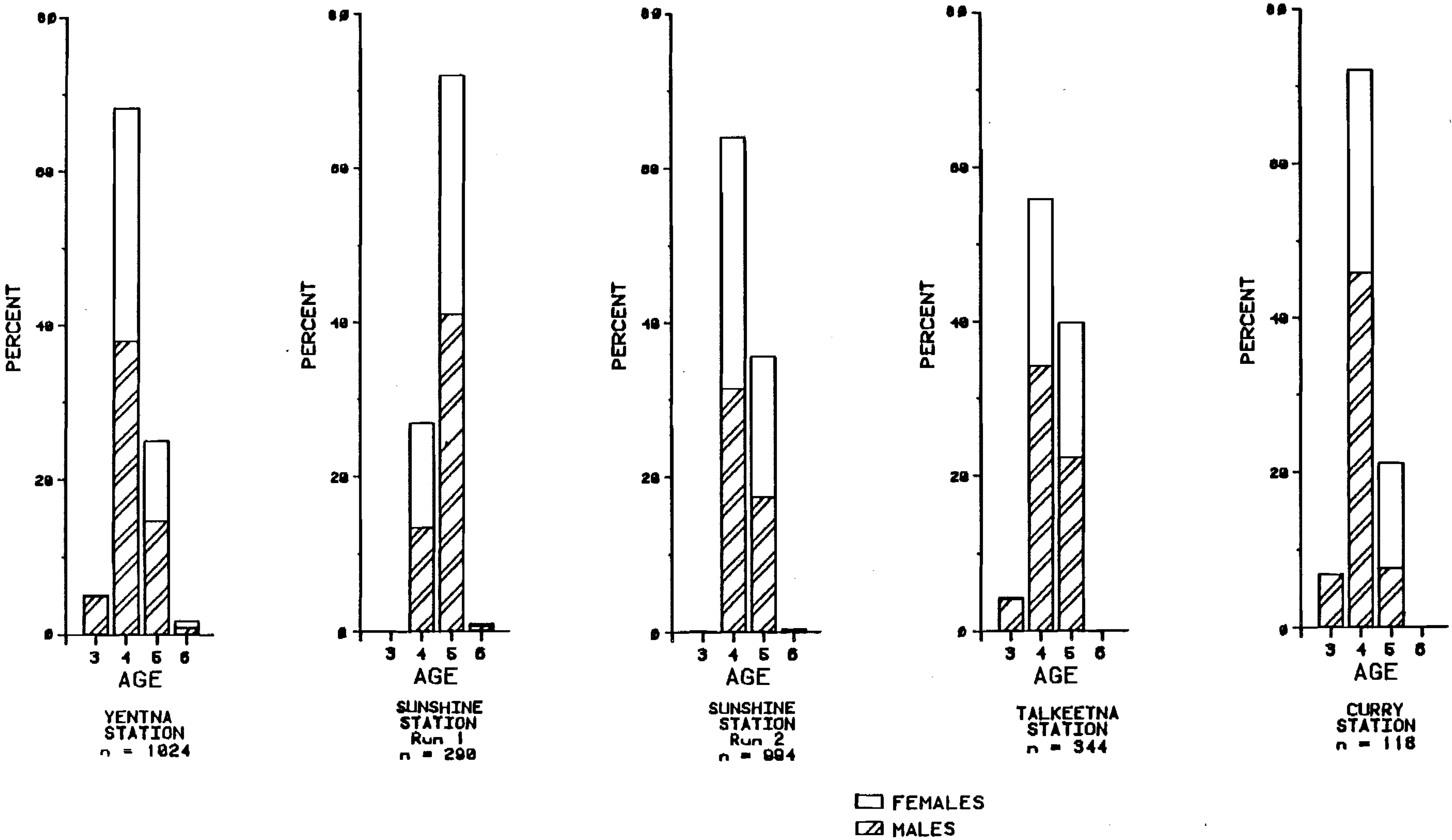


Figure 2-3-11. Age composition of fishwheel intercepted sockeye salmon at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Table 2-3-21. Sex ratios of male and female sockeye salmon by age from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	Age	Sample Size	Number		Sex Ratio (M:F)
			Males	Females	
Yentna Station	3	52	51	1	51.0:1
	4	698	388	310	1.3:1
	5	255	149	106	1.4:1
	6	19	10	9	1.1:1
	All 1/	1215	722	493	1.5:1
Sunshine Station					
First Run	4	78	39	39	1.0:1
	5	209	119	90	1.3:1
	6	3	2	1	2.0:1
	All 1/	334	186	148	1.3:1
Second Run	3	1	1	0	-
	4	636	312	324	1.0:1
	5	353	173	180	1.0:1
	6	4	0	4	-
	All 1/	1138	554	584	0.9:1
Talkeetna Station	3	15	14	1	14.0:1
	4	192	118	74	1.6:1
	5	137	77	60	1.3:1
	All 1/	438	267	171	1.6:1
Curry Station	3	8	8	0	-
	4	85	54	31	1.7:1
	5	25	9	16	0.6:1
	All 1/	132	82	50	1.6:1

1/ Includes all aged and non-aged samples.

Table 2-3-22. Apportioned 1983 sonar counts of chinook, sockeye, pink, chum and coho salmon at Yentna Station.

Sampling Location	Operational Period	Apportioned Sonar Counts				
		Chinook	Sockeye	Pink	Chum	Coho
Yentna Station	6/30 to 9/5	613	104,414	60,661	10,802	8,867

Table 2-3-23. Petersen population estimates with associated 95% confidence intervals for 1983 sockeye salmon escapements to Sunshine, Talkeetna and Curry stations.

Parameter 1/	Population Estimate Location		
	Sunshine Station 2/	Talkeetna Station	Curry Station
m	7,677	421	130
c	2,570	1,675	1,474
r	275	166	102
$\hat{N}$	71,522	4,235	1,876
95% C.I.	64,349-80,495	3,702-4,947	1,581-2,305

1/ m = Number of fish marked (adjusted).
c = Total number of fish examined for marks during sampling census.
r = Total number of marked fish observed during sampling census.
$\hat{N}$ = Population estimate.
C.I. = Confidence interval around $\hat{N}$.

2/ Sockeye salmon escapement estimate for Sunshine Station does not include the population estimate for first run sockeye.

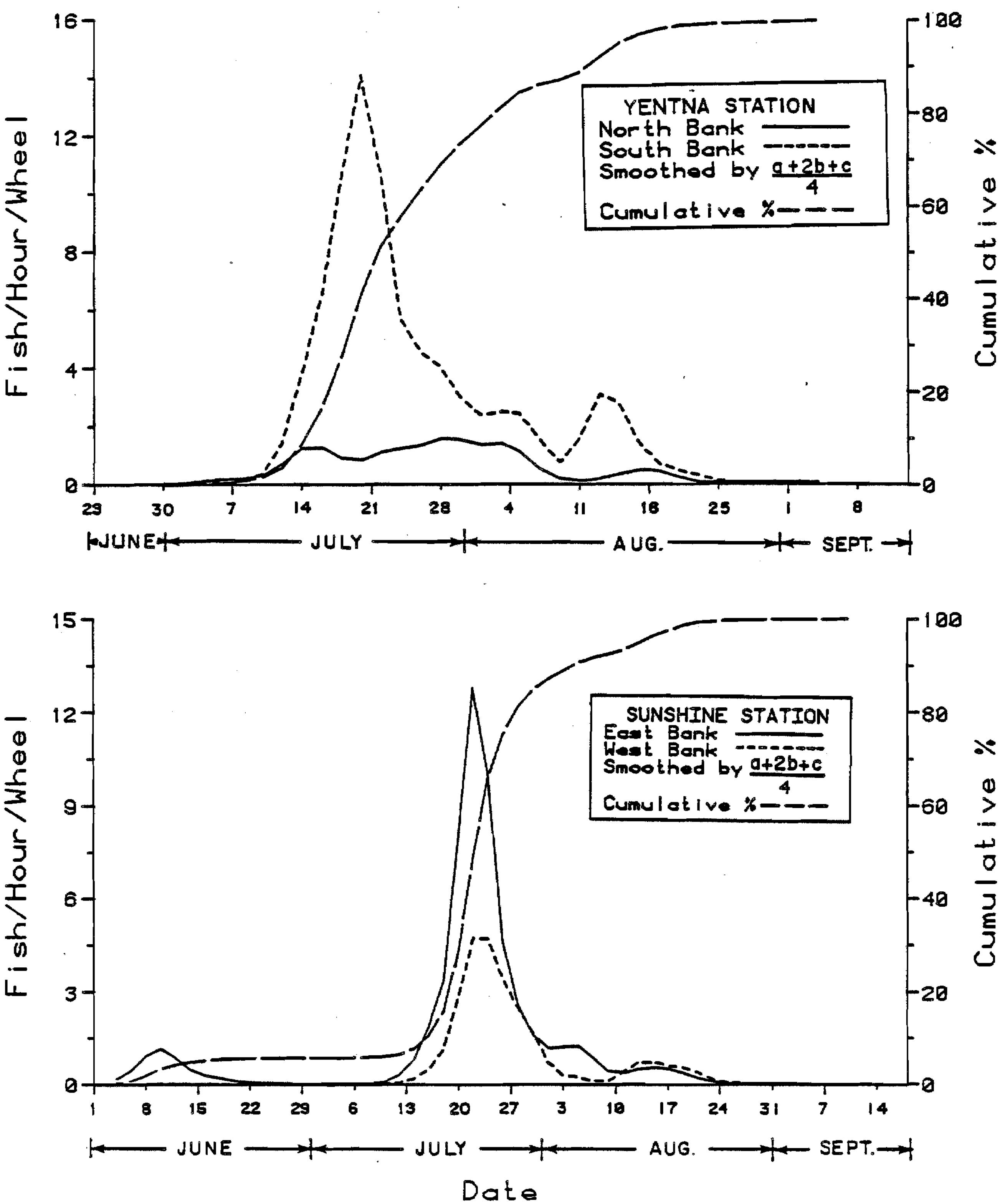


Figure 2-3-12. Mean hourly and cumulative percent fishwheel catch of sockeye salmon by two day periods at Yentna and Sunshine stations in 1983.

Based on fishwheel catches, second run sockeye salmon in 1983 had a migrational preference for the south bank of the Yentna River (RM 28) at Yentna Station (TRM 04) and the east bank of the Susitna River at Sunshine Station (RM 80) assuming mixed stocks and no differential fishwheel selectivity. At Yentna Station the south bank fishwheel caught about 80 percent of the total station catch of 4,648 second run sockeye salmon (Appendix Table 2-D-2). The remaining percentage (20%) was landed in the north bank fishwheel (Appendix Table 2-D-1). At Sunshine Station, the two east bank fishwheels caught approximately 67 percent of the total 7,707 station catch and the two west bank fishwheels caught the remaining 33 percent (Appendix Table 2-D-4).

Age composition data of second run sockeye salmon sampled in 1983 at Yentna (TRM 04) and Sunshine (RM 80) stations are provided in Table 2-3-19. The escapement into the Yentna River (RM 28) in 1983 was primarily four (66.8%) and five (22.6%) year old fish that had traveled to sea (smolted) in their second year of life. Also represented in the Yentna River escapement sample were three (5.1%) and six (1.9%) year old fish, and four (1.3%) and five (2.3%) year old fish that had migrated to sea in their first or third years of life. Age samples collected at Sunshine Station indicate the majority of the escapement was comprised of four (63.4%) and five (33.7%) year old fish that had left freshwater in their second year of life. Three and six year old fish represented less than one percent of the escapement sample from Sunshine Station.

Length data from second migration sockeye salmon sampled at Yentna (TRM 04) and Sunshine (RM 80) stations in 1983 have been summarized in Table 2-3-20. Sockeye salmon in the Yentna River (RM 28) averaged about 12 mm smaller than the fish sampled in the Susitna River at Sunshine Station. The average length measured at Yentna Station was 494 mm and at Sunshine Station 506 mm.

Sex composition data from escapement sampling of second migration sockeye salmon at Yentna (TRM 04) and Sunshine (RM 80) stations are presented in Table 2-3-21. The overall male to female ratio of the Yentna River (RM 28) escapement sample calculates at 1.5:1 and for the Susitna River at Sunshine Station 0.9:1.

3.2.2.1.1.3 Fecundity

In 1983, 25 sockeye salmon fecundities were determined from samples obtained at Sunshine Station (RM 80). These samples were collected from July 28 to 30. The mean number of eggs per female sockeye salmon for this sample was 3,543 eggs and ranged from 2,954 to 4,792 eggs (Table 2-3-24).

Table 2-3-24. Number of eggs, length, weight and associated statistics for sockeye salmon sampled for fecundity at Sunshine Station in 1983.

Variables	Statistic				
	Sample Size	Mean	Standard Deviation	Standard Error of the Mean	Range
Number of Eggs	25	3,543	531	106	2,954 - 4,792
Length (mm)	25	513	37	7	465 - 575
Weight (g)	25	1,979	495	99	1,325 - 2,775

The relationship between length and the number of eggs per female sockeye salmon for the sample was determined using regression and correlation analysis with the results of these analyses presented in Figure 2-3-13. The correlation between the two variables had a correlation coefficient (r) value of 0.73. Replacing length with weight as the independent variable increased the correlation (r=0.78) as portrayed in Figure 2-3-13.

North American sockeye salmon fecundities vary from under 2,200 to more than 4,300 eggs per female. The average fecundity is about 3,700 eggs per individual (Hart, 1973). The predicted mean fecundity for Susitna River sockeye salmon, as determined from a mean length of 502 mm for 584 sockeye salmon measured at Sunshine Station, is 3,350 eggs per female.

Susitna River sockeye salmon fecundities can also be predicted by utilizing the following multiple regression equation:

$$y_c = 597.93 + 1.83\ (x_1) + 1.01\ (x_2)$$

where: Y_c = predicted number of eggs

x_1 = length measurement

x_2 = weight measurement

and: coefficient of determination (r^2) = .61

correlation coefficient (r) = .78

Any further analysis of this data for the purposes of predicting egg deposition should provide for sockeye salmon egg retention. This information is provided in report section 2.4. It should also be noted, for further analysis, that it is assumed there are essentially no differences in fecundities between Susitna River sockeye salmon stocks.

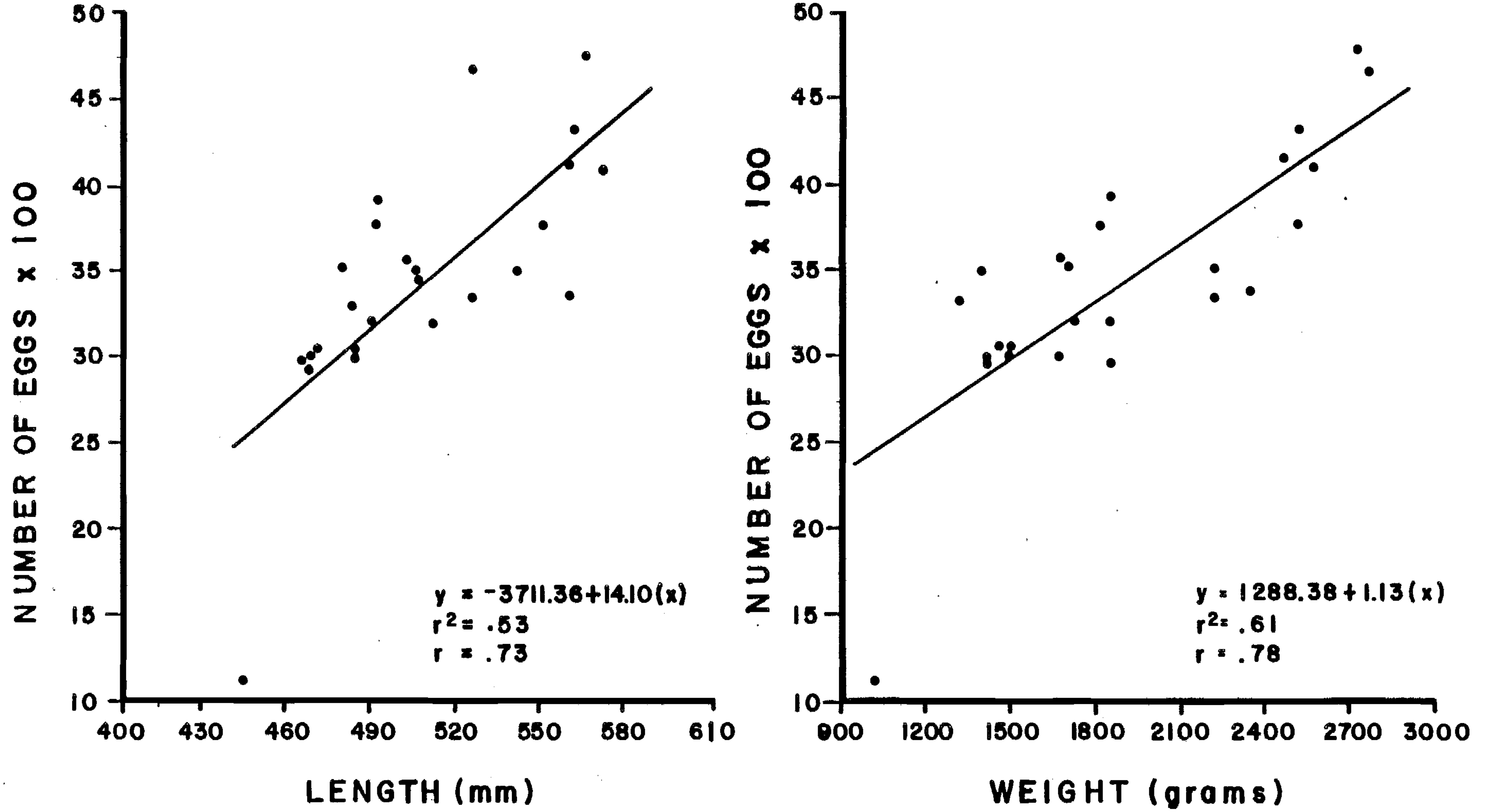


Figure 2-3-13. Number of eggs for sockeye salmon sampled at Sunshine Station in 1983 as a function of length and weight.

Analyses are also provided for sockeye salmon fecundities segregated by age. This information is presented in Appendix 2-F but because of the small sample sizes should be considered as informative and not analytical.

3.2.2.1.2 Spawning Ground Surveys

3.2.2.1.2.1 Sloughs and Streams

3.2.2.1.2.1.1 First Run

In 1983, Papa Bear Lake and its inlet stream were primarily surveyed for tag recovery data to quantify the first run sockeye salmon escapement to Sunshine Station (RM 80). Papa Bear Lake and its inlet stream are located in the Talkeetna River watershed (RM 97.1) as shown in Figure 2-3-14. The tag recovery results are provided in Table 2-3-25.

Table 2-3-25. Escapement survey counts of tagged and untagged first run sockeye salmon tagged at Sunshine Station in 1983.

Area Surveyed	River Mile 1/	Date	Survey Conditions	Sunshine Tags: Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Papa Bear Lake	97.1	6/29	Good	134	676	810	6.1
Papa Bear Lake Inlet Stream	97.1	6/29	Excellent	0	1	1	0.0
Papa Bear Lake	97.1	6/30	Excellent	22	149	171	7.8
Papa Bear Lake	97.1	7/19	Poor 2/				
Papa Bear Lake Inlet Stream	97.1	7/19	Good	128	1175	1303	10.2

1/ Confluence of stream or receiving system with Susitna River mainstem.

2/ Fish not surveyed for tag recovery data. Approximately 50-100 sockeye salmon were milling at the lake inlet.

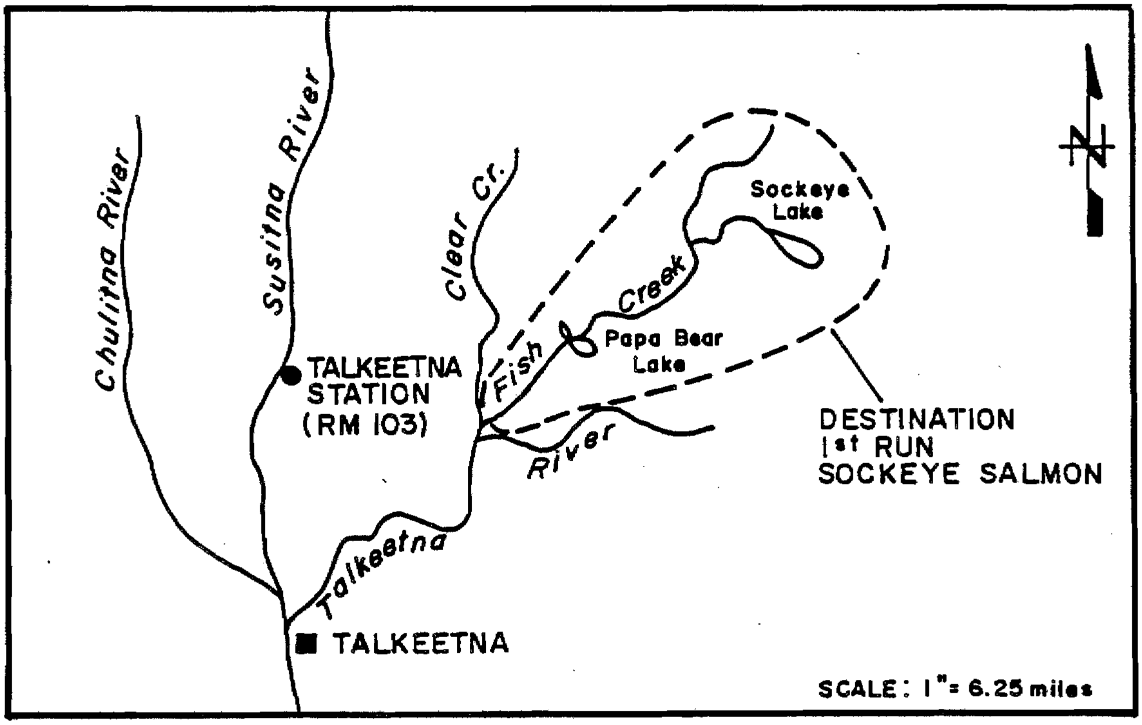


Figure 2-3-14. Destination of first run sockeye salmon tagged at Sunshine Station on the Susitna River in 1983.

The inlet stream of Papa Bear Lake in the Talkeetna River watershed was the only area where the first run sockeye salmon, that passed Sunshine Station (RM 80) between June 6 and 19, spawned in 1983. Tag recovery collections and ground and aerial escapement surveys of other Susitna River tributaries, in association with work reported in Section 3.2, support this. Based on escapement surveys conducted at Papa Bear Lake and its inlet stream, first run sockeye salmon reached peak spawning between the second and fourth weeks of July 1983 (Table 2-3-25). On the June 29 and 30 surveys of this area, nearly all the fish observed were holding off the mouth of the Papa Bear inlet stream with the exception of one fish which had ascended the inlet stream. On July 19, a relatively low number of fish (50-100) were holding off the mouth of Papa Bear Lake inlet stream and approximately 1,300 fish had ascended the creek and were actively spawning.

3.2.2.1.2.1.2 Second Run

In 1983, second run sockeye salmon escapement surveys were conducted in five tributaries which enter the Susitna River reach between RM 80 and 97.8. These surveys were performed exclusively for tag recovery data to calculate an escapement estimate to Sunshine Station (RM 80). The results have been tabulated in Appendix Table 2-G-5. The tagged to untagged ratios recorded for samples greater than 10 fish ranged from 1:2.3 to 1:18.3. Generally the highest ratios were recorded in the Chulitna River drainage (RM 97.8) and the lowest in the Talkeetna River drainage (RM 97.1).

3.2.2.2 Talkeetna to Upper Devil Canyon

3.2.2.2.1 Main Channel Escapement Monitoring

3.2.2.2.1.1 First Run

The four fishwheels operated in 1983 in the Susitna River at Talkeetna Station (RM 103) caught 11 first run sockeye salmon between June 12 and 24 (Appendix Table 2-D-9). Four of the 11 fish were caught between June 21 and 22. Two of the 11 fish caught were recaptures from Sunshine Station (RM 80). The first recapture at RM 103 was made on June 13 of a fish that had been released on June 9 at RM 80. The second recapture occurred on June 16 of a fish tagged four days earlier at Sunshine Station.

No estimate was made of the 1983 escapement of first run sockeye salmon to Talkeetna Station (RM 103) due to the lack of recaptures at Curry Station (RM 120) and the absence of first run fish spawning areas above RM 103. The first run sockeye salmon that migrated to Talkeetna Station in 1983 were probably milling fish which spawned below RM 103 in the Talkeetna River drainage (Section 3.2.2.1.2.1.1).

The two fishwheels at Curry Station (RM 120) on the Susitna River ran continuously between June 9 and July 5, 1983 without catching any sockeye salmon (Appendix Table 2-D-12). It is concluded that the first run sockeye salmon escapement, which passed Sunshine Station (RM 80) between June 6 and 19, did not migrate to or above RM 120 in 1983.

3.2.2.2.1.2 Second Run

The 1983 escapement of second run sockeye salmon to Talkeetna Station (RM 103) is estimated at 4,200 fish and to Curry Station (RM 120), 1,900 fish (Table 2-3-23). The 95 percent confidence intervals associated with these estimates are provided in Table 2-3-23.

The migrational timing of the 1983 escapements to Talkeetna (RM 103) and Curry (RM 120) stations can be determined from fishwheel catches (Section 2.4.3). At Talkeetna Station the second run migration of sockeye salmon began on July 15, reached a midpoint on August 1 and ended on

August 18. The peak migration occurred on August 3 with 41 fish being caught in the four fishwheels. Upstream at Curry Station, the migration began on July 17, reached a midpoint on August 5 and ended on August 25 (Figure 2-3-15). The peak catches were made on August 2, 12 and 13. Ten fish were landed on each of these days in the two station fishwheels.

In 1983, there was not strong preference by second run sockeye salmon to passage along either the east or west banks of the Susitna River at Talkeetna Station (RM 103) based on fishwheel catches (Appendix 2-D). The east bank fishwheels caught about 47 percent of the station catch and the west bank fishwheels caught 53 percent. At Curry Station (RM 120) sockeye salmon were more abundant along the east bank than the west bank. About 80 percent of the station catch was made by the east bank fishwheel.

In 1983, 101 second run sockeye salmon were caught at Talkeetna (RM 103) and Curry (RM 120) stations that had been tagged at Sunshine Station (RM 80). Another 17 recaptures were made at Curry Station from releases at Talkeetna Station. The migration rates of these fish are graphed in Figure 2-3-16. In comparing the average travel times between Sunshine, Talkeetna and Curry stations it appears that migration speed increased and/or milling behavior decreased the further distance these fish traveled upstream. The average net speed traveled between Sunshine and Talkeetna stations was 2.4 mpd, between Talkeetna and Curry stations 3.0 mpd, and between Sunshine and Curry stations 3.8 mpd (Figure 2-3-16).

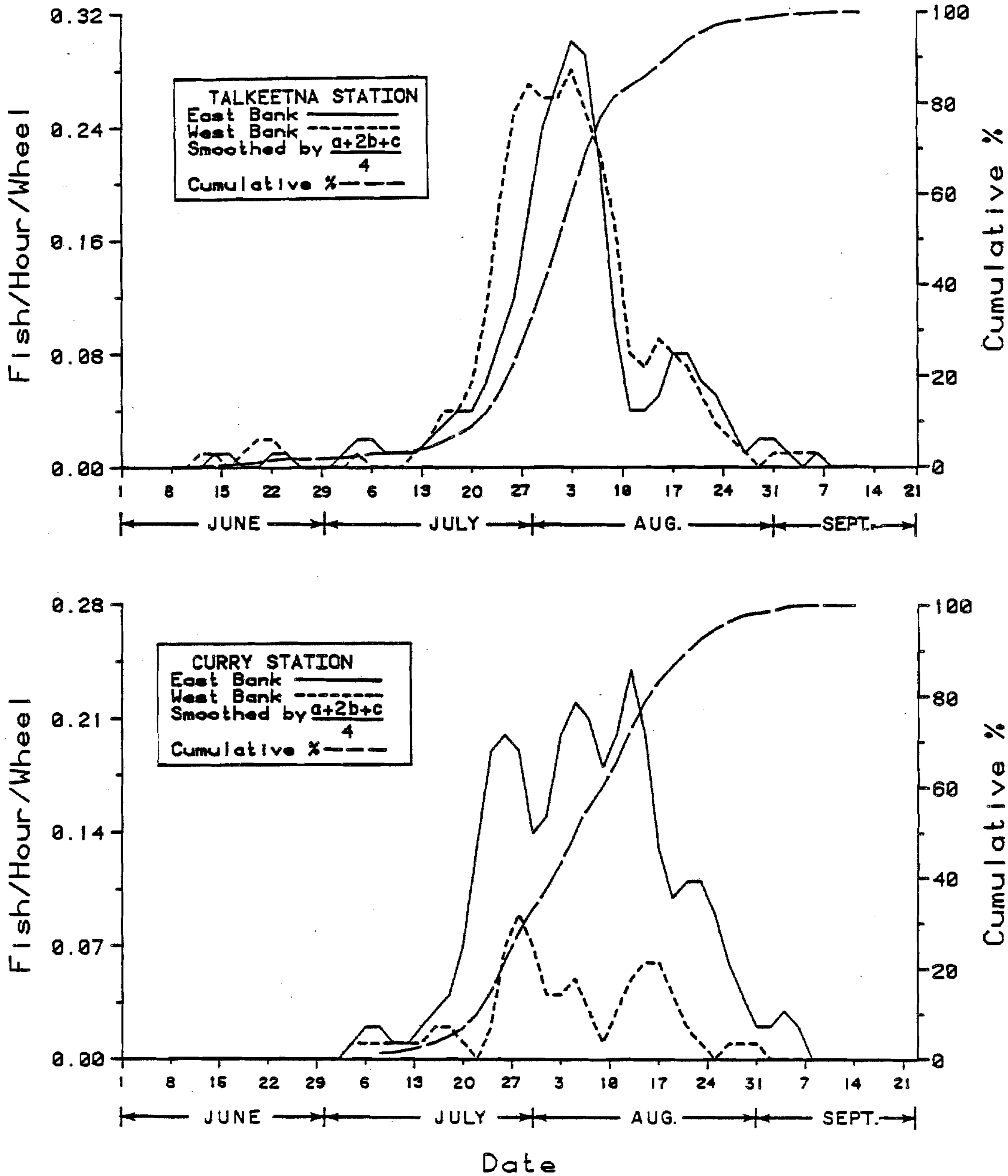


Figure 2-3-15. Mean hourly and cumulative percent fishwheel catch of sockeye salmon by two day periods at Talkeetna and Curry stations in 1983.

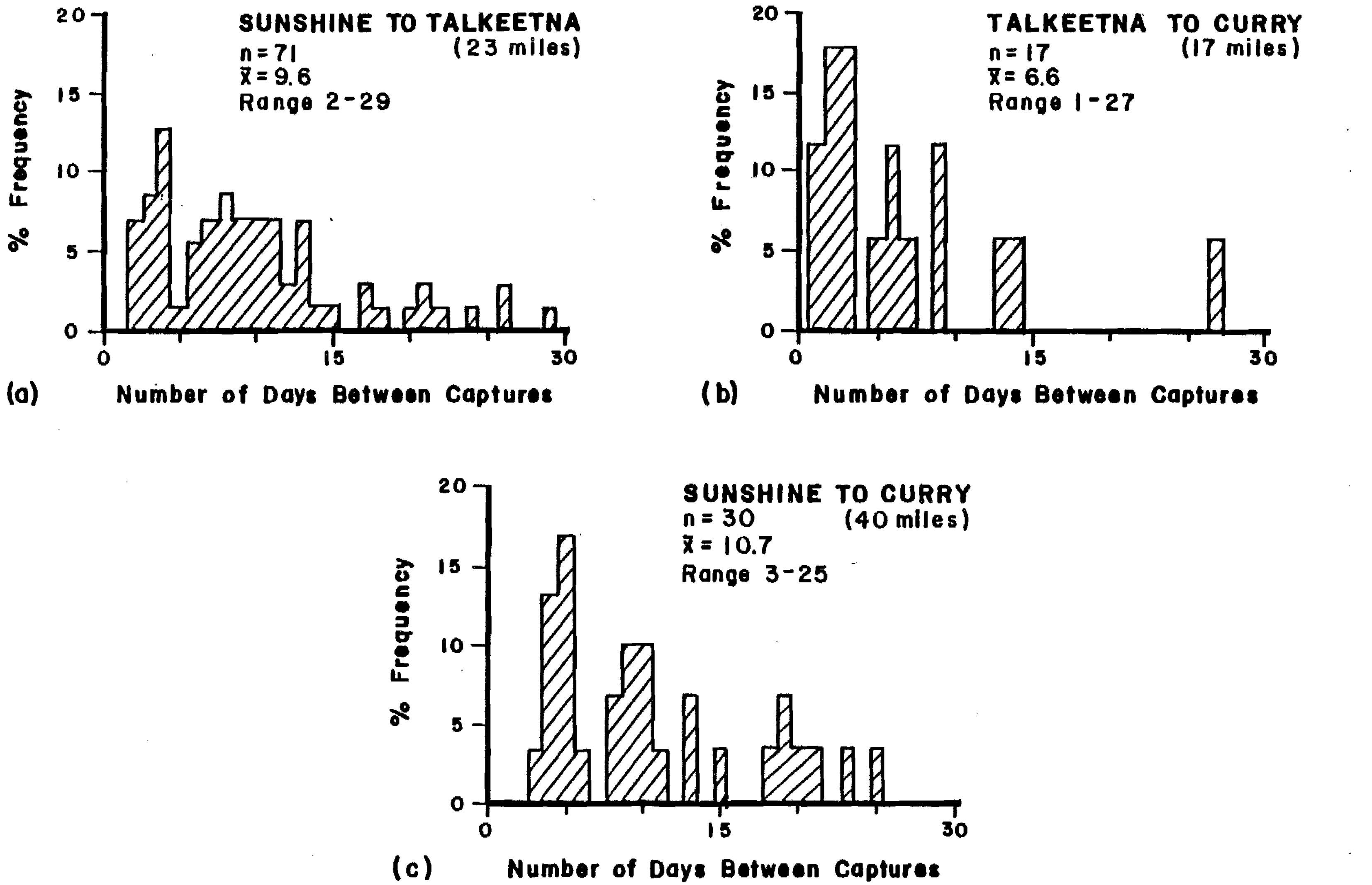


Figure 2-3-16. Migrational rates of sockeye salmon between (a) Sunshine and Talkeetna stations, (b) Talkeetna and Curry stations and (c) Sunshine and Curry stations, 1983.

Age composition data of second run sockeye salmon sampled at Talkeetna (RM 103) and Curry (RM 120) stations in 1983 are presented in Table 2-3-19. The majority of the escapements to both locations were four and five year old fish which had traveled to sea after spending one winter in freshwater. Three year old fish accounted for less than seven percent of the sample from each station.

Length measurements collected from second run sockeye salmon at Talkeetna (RM 103) and Curry (RM 120) stations are summarized in Table 2-3-20. In 1983, the second run fish averaged about 28 mm larger in length at Talkeetna Station than at Curry Station. The average length measured at Talkeetna Station was 509 mm and at Curry Station 481 mm.

Results of sampling second migration sockeye salmon for sex at Talkeetna (RM 103) and Curry (RM 120) stations are provided in Figure 2-3-11 and Table 2-3-21. A higher number of males than females in nearly every age class were sampled at both stations. The overall male to female sex ratio at Talkeetna Station was 1.6:1 and at Curry Station 1.6:1.

3.2.2.2.2 Spawning Ground Surveys

3.2.2.2.2.1 Main Channel

In 1983, there was no inclusive sampling of the Susitna River main channel for sockeye salmon spawning. Project crews assigned to escapement monitoring sites at Talkeetna (RM 103) and Curry (RM 120) stations did not observe any main channel spawning by this species in 1983. The stream and slough survey crew based at Gold Creek (RM 136.7) located a single spawning site that extended along the west bank of the Susitna River main channel between RM 138.6 and 138.9 (Appendix Table 2-G-1). This site was located on September 15, and on that date it supported about 11 spawning sockeye salmon. A map depicting the location can be found in Appendix 2-G.

3.2.2.2.2.2 Streams

A total of 20 streams were surveyed in 1983 for sockeye salmon between RM 98.6 and 161.0. The results are presented in Appendix Table 2-G-3. A single sockeye salmon was observed in Indian River (RM 138.6) on August 19. This was the only sockeye salmon observed in a Susitna River stream above RM 98.6 in 1983. It can be concluded that sockeye salmon spawning did not occur in any stream above RM 98.6 in 1983.

3.2.2.2.2.3 Sloughs

3.2.2.2.2.3.1 Observation Life

A total of 77 sockeye salmon were monitored to define the average number of days a single fish could be visually seen in sloughs Moose (RM 123.5), 8A (RM 125.1) and 11 (RM 135.3). The results, presented in Table 2-3-26, indicate differences existed between the observation life of male and female sockeye wherein generally, the individual male sockeye salmon spent less time in a slough than the individual female. The combined average observation life of both male and female sockeye salmon was 8.1 days at Moose Slough, 13.0 days at Slough 8A and 14.5 days at Slough 11. The differences between these numbers can be partially explained by differences in visibility in these sloughs (Figure 2-3-17). The lowest average observation life was recorded in Moose Slough, the slough which had the highest frequency of restricted visibilities. Comparatively, in Slough 11 where the average observation life was the highest, visibility was the least restricted. The problem of restricted visibility however does not limit the usefulness of the data for computing total sockeye salmon escapement to sloughs. The observation life surveys were conducted during the same time that regular escapement counts were conducted with both crews encountering similar visibility conditions. For example, several times the Susitna River breached the head of Moose Slough and restricted visibility. When this occurred the crew making individual fish observations were often unable to locate fish previously identified. At least some of the previously identified fish were probably present but not visible and therefore were considered absent. The crew conducting escapement counts encountered the same conditions and registered corresponding results with the counts reflecting less fish than were probably present.

The average observation life of a sockeye salmon using sloughs in 1983 was 11.8 days, determined by averaging the observation life means from results recorded at sloughs Moose (RM 23.5), 8A (RM 125.1) and 11 (RM 135.3) (Table 2-3-26). This estimate will subsequently be applied with the regular escapement count data to calculate the escapement to sloughs other than Moose, 8A and 11 between RM 98.6 and 161.0 where respective peak survey counts exceeded 15 fish. Escapements to sloughs Moose, 8A and 11 will be determined in Section 3.2.2.2.2.3.2 by using the respective slough observation life estimate in conjunction with the respective slough escapement count data. The mathematical method for calculating total escapement by respective sloughs can be found in Section 2.4.

Table 2-3-26. Summary of mean number of days individual sockeye salmon were observed in 1983 in sloughs Moose, 8A and 11.

Slough with RM 1/	Males			Females			Combined		
	n	Range (days)	Mean (days)	n	Range (days)	Mean (days)	n	Range (days)	Mean (days)
Moose RM 123.5	3	2.0-12.0	9.1	4	8.0-10.5	6.7	7	2.0-12.0	8.1
8A RM 125.1	13	2.0-38.0	10.2	3	18.0-35.0	25.0	16	2.0-38.0	13.0
11 RM 135.3	35	0.5-37.0	13.0	20	2.0-40.0	17.2	55	0.5-40.0	14.5
							Mean average =		11.8

1/ RM = River Mile

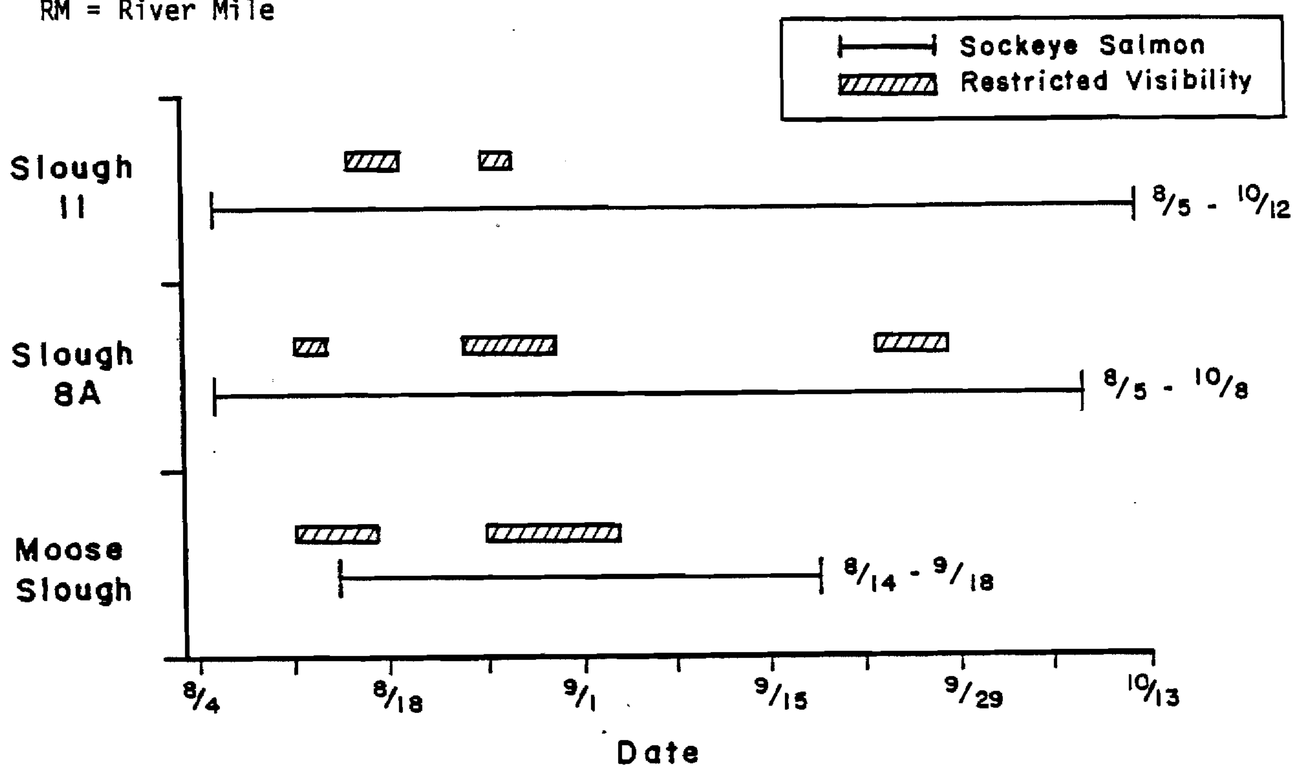


Figure 2-3-17. Periodicities of restricted visibility conditions and sockeye salmon life observations in 1983 at sloughs Moose, 8A and 11.

In 1983 between 57.1 and 76.4 percent of the sockeye salmon monitored for observation life in sloughs Moose (RM 123.5), 8A (RM 125.1) and 11 (RM 135.3) initiated or completed spawning in the slough of first recorded entry (Table 2-3-27). The remainder (23.6-42.9%) did not spawn. These fish either departed the slough or died from bear predation or stranding. At least one of the seven sockeye salmon monitored in Moose Slough spawned elsewhere, as a fish observed in Moose Slough in mid August was later found in mid September at Slough 11 where it was observed to have spawned. Of 55 sockeye salmon monitored in Slough 11 one fish experienced pre-spawning mortality by being stranded in a riffle. At sloughs Moose and 8A there were no recorded mortalities associated with stranding.

Table 2-3-27. Percentages of sockeye salmon monitored for observation life in 1983 that spawned, by habitat zone, in sloughs Moose, 8A and 11.

Slough with RM 1/	n 2/	Percent Spawning	Spawning Location 3/ by Habitat Zone							Percent Non-spawning 4/
			1	2	3	4	5	6	7	
Moose RM 123.5	7	57.1	50.0	50.0	0.0	-	-	-	-	42.9
8A RM 125.1	16	75.0	8.3	0.0	91.7	-	-	-	-	25.0
11 RM 135.3	55	76.4	7.1	7.1	0.0	45.3	0.0	28.6	11.9	23.6

1/ RM = River Mile

2/ Total sample for all sloughs equals 78 fish; actually 77 individual fish were monitored with one individual occupying both Moose Slough and Slough 11.

3/ Habitat zones defined in Appendix Figures 2-G-2 thru 2-G-5.

4/ Includes milling fish and also bear killed and other non-spawning mortalities.

In the process of monitoring sockeye salmon for observation life a record was kept of where these fish spawned in sloughs Moose (RM 123.5), 8A (RM 125.1) and 11 (RM 135.3) in 1983 (Table 2-3-27). At Slough 11 where 42 spawning fish were monitored, approximately 86 percent of them spawned in the middle to upper reach of the slough above habitat zone 3 (Appendix Figure 2-G-5). In Slough 8A, the predominate spawning area was zone 3 (Appendix Figure 2-G-3). At Moose Slough, half of the sockeye salmon monitored spawned in zone 1 and the balance used zone 2 (Appendix Figure 2-G-2).

3.2.2.2.2.3.2 <u>Escapement</u>

A total of 35 sloughs between RM 98.6 and 161.0 were surveyed in 1983 for sockeye salmon. The results are in Appendix Table 2-G-2.

The following 11 sloughs were found to contain sockeye salmon in 1983:

1. Slough 3B (RM 101.4)
2. Moose Slough (RM 123.5)
3. Slough 8A (RM 125.1)
4. Slough B (RM 126.3)
5. Slough 9 (RM 128.3)
6. Slough 9A (RM 133.8)
7. Slough 10 (RM 133.8)
8. Slough 11 (RM 135.3)
9. Slough 17 (RM 138.9)
10. Slough 19 (RM 139.7)
11. Slough 21 (RM 141.1)

The sockeye salmon observed in these sloughs were considered second run escapement as determined from fishwheel catches and tag releases at Talkeetna (RM 103) and Curry (RM 120) stations (Section 3.2.2.2.1).

Sockeye salmon spawned in all but three of the sloughs listed above. Sloughs 9, 9A and 10 were not considered spawning areas. Relatively few fish were found in these sloughs and those observed were not paired-up or engaged in spawning (Appendix Table 2-G-2).

The total peak count of sockeye salmon to sloughs above RM 98.6 in 1983 was 555 fish (Table 2-3-28). This total peak count of 555 does not represent total escapement or even a consistent portion of the total escapement, due to variability in spawning timing and duration. A peak count is at best an escapement index (Cousens et al., 1982). A more reliable estimate of escapement to sloughs can be obtained by developing, for each slough, a spawner abundance curve expressed in number of live fish days and then calculating escapement from the curve on the basis of the mean observation life data provided in report Section 3.2.4.2.2.3.1. These calculations were made for sloughs Moose, 8A, 11 and 21 where the peak survey counts exceeded 15 fish (Table 2-3-29). The escapements to sloughs 3B, B, 17 and 19 were computed by multiplying the respective peak survey count by 1.9. This value represents the summation of the value of the estimated slough escapement divided by the summation of the total peak survey count for those sloughs with a peak survey count of more than 49 fish.

In 1983 the total sockeye escapement to sloughs above RM 98.6 was an estimated 1,060 fish (Table 2-3-29). About 93 percent of the escapement occurred in sloughs 11, 21 and 8A in order of contribution.

Table 2-3-29. Total 1983 sockeye salmon slough escapements between RM 98.6 and 161.0.

Slough	River Mile	Total Fish Days [1]	Peak Live-Dead Survey Count	Mean Observation Life in Days	Slough Escapement	% of Total Slough Escapement	% of Curry Station Escapement [3]
3B	101.4		5		10 [2]	0.9	0.5
Moose	123.5	249.5	22	8.1	31	2.9	1.6
8A	125.1	1,687.8	66	13.0	130	12.3	6.8
B	126.3		5		10 [2]	0.9	0.5
11	135.3	8,182.0	248	14.5	564	53.2	29.7
17	138.9		6		11 [2]	1.1	0.6
19	139.7		5		10 [2]	0.9	0.5
21	141.1	3,470.4	197	11.8	294	27.8	15.5
TOTAL		13,589.7	554	-	1,060	100.0	55.7

1/ Number of fish days were calculated for sloughs that had peak survey counts > 15 fish. Refer to Section 2.4 for detailed data analysis procedures.

2/ Total slough escapement into sloughs having peak live-dead survey counts of ≤ 15 fish were computed by multiplying the peak live-dead survey count by 1.9. This value represents the summation of the estimated slough escapement divided by the summation of the peak live-dead survey counts for all sloughs with peak survey counts ≥ 50 fish.

3/ 1983 Curry Station sockeye salmon escapement was approximately 1,900 fish.

Table 2-3-28. Sockeye salmon peak survey counts of sloughs above RM 98.6, 1983.

Slough	River Mile	Date	Number Counted		
			Live	Dead	Total
3B	101.4	9/19	5	0	5
Moose	123.5	9/9	21	1	22
8A	125.1	9/11	63	3	66
B	126.3	9/18	2	0	2
9	128.3	9/7	2	0	2
9A	133.8	9/11	1	0	1
10	133.8	10/1	1	0	1
11	135.3	9/11	237	11	248
17	138.9	9/22	6	0	6
19	139.7	9/9	4	1	5
21	141.1	9/9	180	17	197
		TOTAL	522	33	555

The estimated (1,060 fish) escapement of sockeye salmon to sloughs above RM 98.6 in 1983 is about 44 percent less than the same year estimated escapement (1,900) to the Susitna River at Curry Station (RM 120). The approximate 800 fish difference represents a combination of several factors: (1) an unquantified number of milling fish reached RM 120 which spawned below RM 98.6 (Appendix Table 2-G-5); (2) a percentage of the sockeye escapement spawned in the Susitna River main channel above RM 98.6; (3) the 1,900 fish population estimate for Curry Station has a 95 percent confidence interval of 1,582 to 2,311 fish; and (4) the observation life and peak survey count data have some undefined levels of error. While all of these factors contributed to the 800 fish difference between the estimated total slough escapement and Curry Station escapement estimate, the two factors likely to have the greatest influence are the percentage of fish which migrated to RM 120 and then spawned below RM 98.6, and the 700 fish confidence level spread on the Curry Station escapement estimate.

Assuming the two 1983 escapement estimates of second migration sockeye salmon to Curry Station (RM 120) and sloughs above RM 98.6 are accurate, and that less than 100 sockeye salmon spawned in the Susitna River main channel above RM 98.6 in 1983, the best estimate of milling activity at Curry Station is that approximately 39 percent of the 1,900 fish escapement that reached this station in 1983 spawned below RM 98.6. By the same analysis about 72 percent of the estimated 4,200 fish that reached Talkeetna Station in 1983 were probably milling fish that spawned below RM 98.6.

3.2.2.2.2.3.3 Egg Retention

In 1983, a total of 56 female sockeye salmon carcasses were sampled for egg retention at four sloughs between RM 98.6 and 161.0. There was an average retention of approximately 250 eggs per female from combined samples at sloughs Moose (RM 123.5), 8A (RM 125.1), 11 (RM 135.3) and 21 (RM 141.1) (Table 2-3-30). Nearly all the females sampled in these sloughs had completely spawned. About 80 percent of the females retained less than 25 eggs each (Figure 2-3-18). Seven percent of the sample were from fish that had retained more than 1,000 eggs each.

Table 2-3-30. Egg retention of sockeye salmon at selected sloughs between RM 98.6 and 161.0, 1983.

Slough with RM	Sample Size	Egg Retention		
		Mean	Median	Range
Moose Slough RM 123.5	1	7.0	-	-
Slough 8A RM 125.1	2	0.0	-	0
Slough 11 RM 135.3	33	384.7	1.5	0-3542
Slough 21 RM 141.1	20	62.7	2.0	0-858
Composite of all sloughs sampled	56	249.2	2.0	0-3542

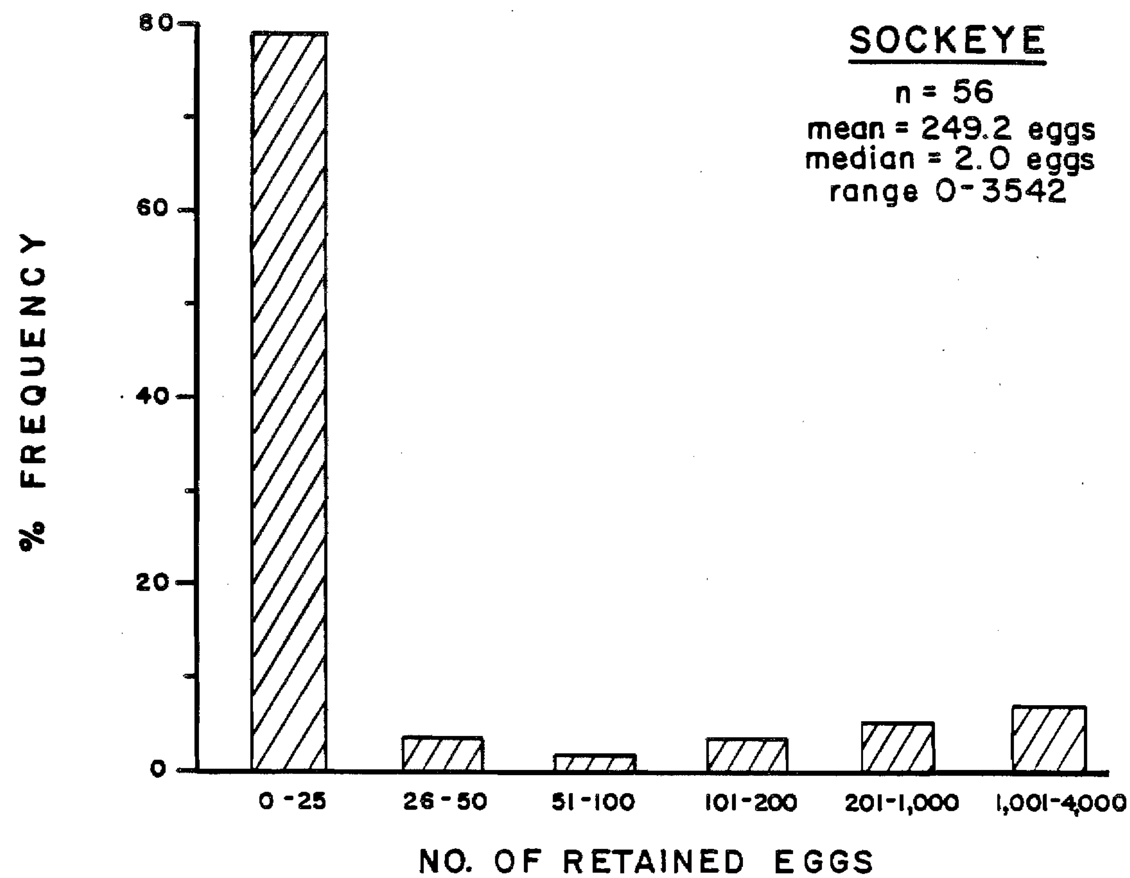


Figure 2-3-18. Percent frequency of number of eggs retained by female sockeye salmon sampled in sloughs above RM 98.6 in 1983.

3.2.3 Pink Salmon

3.2.3.1 Intertidal to Talkeetna

3.2.3.1.1 Main Channel Escapement Monitoring

Escapement estimates for Susitna River pink salmon were obtained for Yentna (TRM 04) and Sunshine (RM 80) stations in 1983 (Table 2-3-22 and 2-3-31). The 1983 pink salmon escapement to the Yentna River (RM 28) based on sonar counts at Yentna Station was about 60,700 fish (Table 2-3-22). Daily and cumulative SSS counts for Yentna Station are presented in Appendix 2-C.

Table 2-3-31. Petersen population estimates with associated 95% confidence intervals for 1983 pink salmon migration to Sunshine, Talkeetna and Curry stations.

Parameter 1/	Population Estimate Location		
	Sunshine Station	Talkeetna Station	Curry Station
m	2,942	1,987	446
c	6,816	3,548	2,851
r	494	743	232
$\hat{N}$	40,530	9,483	5,471
95% C.I.	37,361- 44,287	8,914- 10,130	4,872- 6,239

1/ m = Number of fish marked (adjusted).
c = Total number of fish examined for marks during sampling census.
r = Total number of marked fish observed during sampling census.
$\hat{N}$ = Population estimate.
C.I. = Confidence interval around $\hat{N}$.

For the Susitna River at Sunshine Station (RM 80) the escapement was about 40,500 fish as determined by the Petersen method (Table 2-3-31). The 95% confidence interval for this estimate is 37,400 to 44,300 fish.

The two fishwheels at Yentna Station (TRM 04) captured 4,489 pink salmon in 1983 (Table 2-3-11 and Appendix Table 2-D-3). Daily fishwheel catches indicate the migration began, reached a midpoint and ended on July 14, 26 and August 15, respectively (Figure 2-3-19). The migration peak occurred on July 24 with 298 pink salmon caught in the two fishwheels for an average catch of 6.2 fish per hour. Pink salmon showed little migrational preference for either the north or south bank. The north bank fishwheel intercepted 59.4 percent of the pink salmon and the south bank fishwheel captured the remaining 41.6 percent (Appendix 2-D).

At Sunshine Station (RM 80), fishwheels intercepted 3,085 pink salmon in 1983 (Table 2-3-11 and Appendix Table 2-D-6). Based on these catches, the migration began on July 20, reached a midpoint on July 30 and terminated on August 15 (Figure 2-3-19). The peak fishwheel catch occurred on July 25. Of the 3,085 fish intercepted at Sunshine Station, 91.6 percent were captured by the east bank fishwheels.

Length (FL) data associated with 1,126 Yentna Station (TRM 04) pink salmon samples and 987 fish from Sunshine Station (RM 80) are summarized in Table 2-3-32 and Appendix 2-E. The average overall lengths at Yentna and Sunshine stations were 426 and 429 mm respectively. Females at Yentna Station were 11 mm smaller in length than males while Sunshine Station females averaged 12 mm less than males. Of the 1,126 pink salmon sampled at

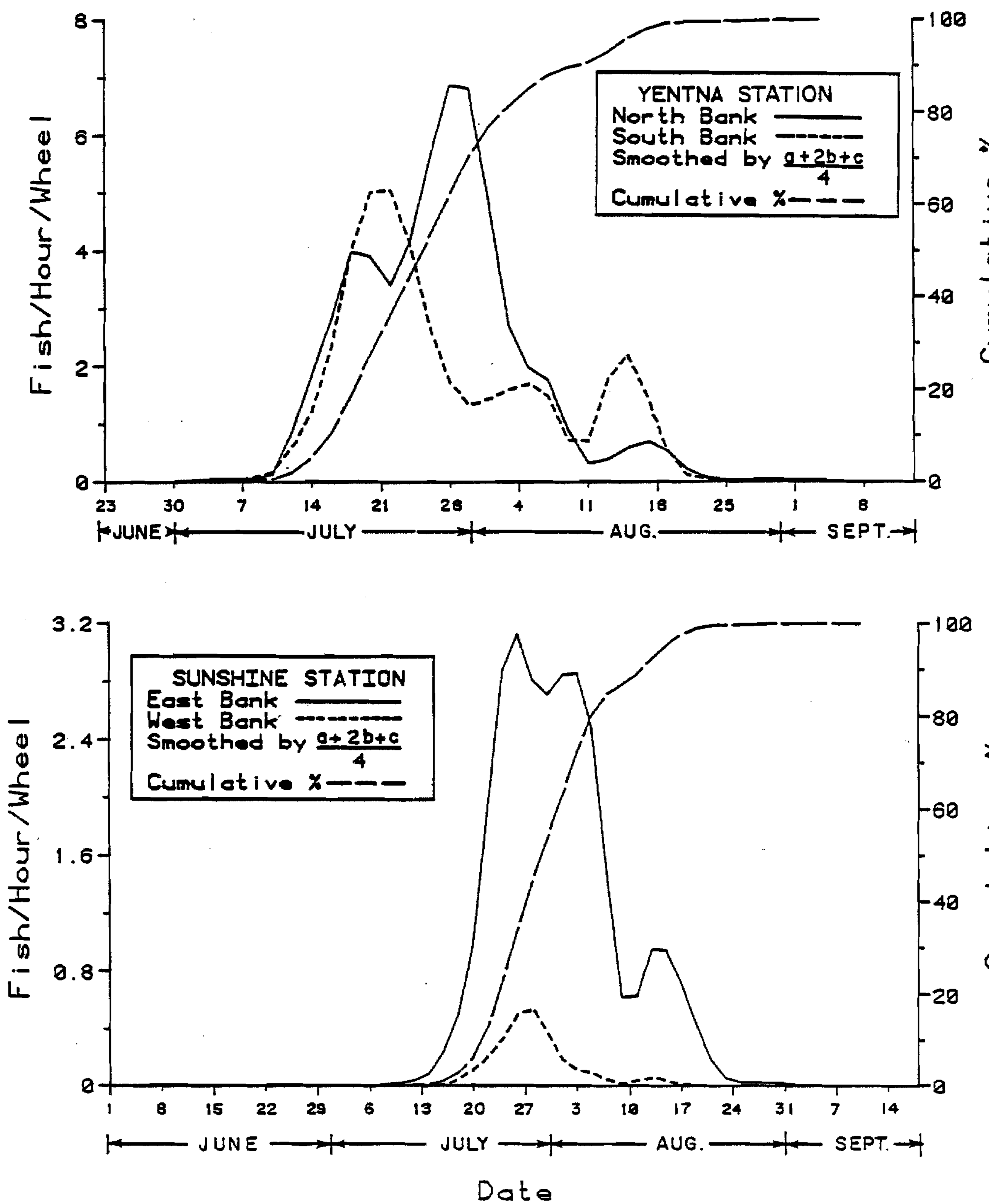


Figure 2-3-19. Mean hourly and cumulative percent fishwheel catch of pink salmon by two day periods at Yentna and Sunshine stations in 1983.

Table 2-3-32. Analysis of pink salmon lengths, in millimeters, from escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Collection Site	n			Sex Ratio	Range Limits			Mean			95% Conf. Interval [3]			Median		
	M [1]	F [2]	Total	(M:F)	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Yentna Station	535	591	1126	0.9:1	335-531	312-485	312-531	432	421	426	430-434	419-423	425-428	431	421	425
Sunshine Station	503	484	987	1.0:1	350-590	345-570	345-590	435	423	429	432-438	421-425	427-431	430	420	425
Talkeetna Station	309	365	674	0.8:1	310-605	330-580	310-605	428	426	427	425-431	423-429	425-429	425	425	425
Curry Station	199	192	391	1.0:1	365-645	370-490	365-645	425	425	425	421-428	422-429	422-428	420	425	420

1/ Males

2/ Females

3/ Confidence Interval of the Mean.

Yentna Station 535 were males for a male to female sex ratio of 0.9:1, and 503 of the 987 fish sampled at Sunshine Station were males for a sex ratio of 1.0:1 (Table 2-3-32).

3.2.3.1.2 Fecundity

In 1983 Susitna River pink salmon fecundities were determined for 22 samples collected at Sunshine Station (RM 80). These samples were obtained between July 29 and 31. Fecundities of the sample averaged 1,475 eggs per female and ranged from 1,125 to 1,975 eggs (Table 2-3-33).

Table 2-3-33. Number of eggs, length, weight and associated statistics for pink salmon sampled for fecundity at Sunshine Station in 1983.

Variables	Statistic				
	Sample Size	Mean	Standard Deviation	Standard Error of the Mean	Range
Number of Eggs	22	1,469	273	58	1,124 - 1,982
Length (mm)	22	433	25	5	388 - 474
Weight (g)	22	1,044	270	58	500 - 1,500

The predicted mean fecundity for Susitna River pink salmon stocks in 1983, based on a mean length of 423 mm for 484 pink salmon measured at Sunshine Station, is 1,350 eggs per female.

Susitna River pink salmon fecundities appear to be similar to other Alaskan and Canadian stocks. McPhail and Lindsey (1970) report large females may contain up to 2,000 eggs. Morrow (1980) lists the fecundity range between 800 and 2,000 eggs with larger females generally containing more eggs.

For the pink salmon sampled, length and weight were excellent indicators of the number of eggs per female as illustrated by correlation coefficients (r) of 0.97 and 0.87 respectively in the two regression analyses shown in Figure 2-3-20. The greatest predictive precision came from a multiple regression in which length and weight were both used as independent variables. The equation of the regression line had the form of:

$$Y_c = 3288.81 + 11.15\ (x_1) + (0.06)\ (x_2)$$

where: Y_c = predicted numbers of eggs

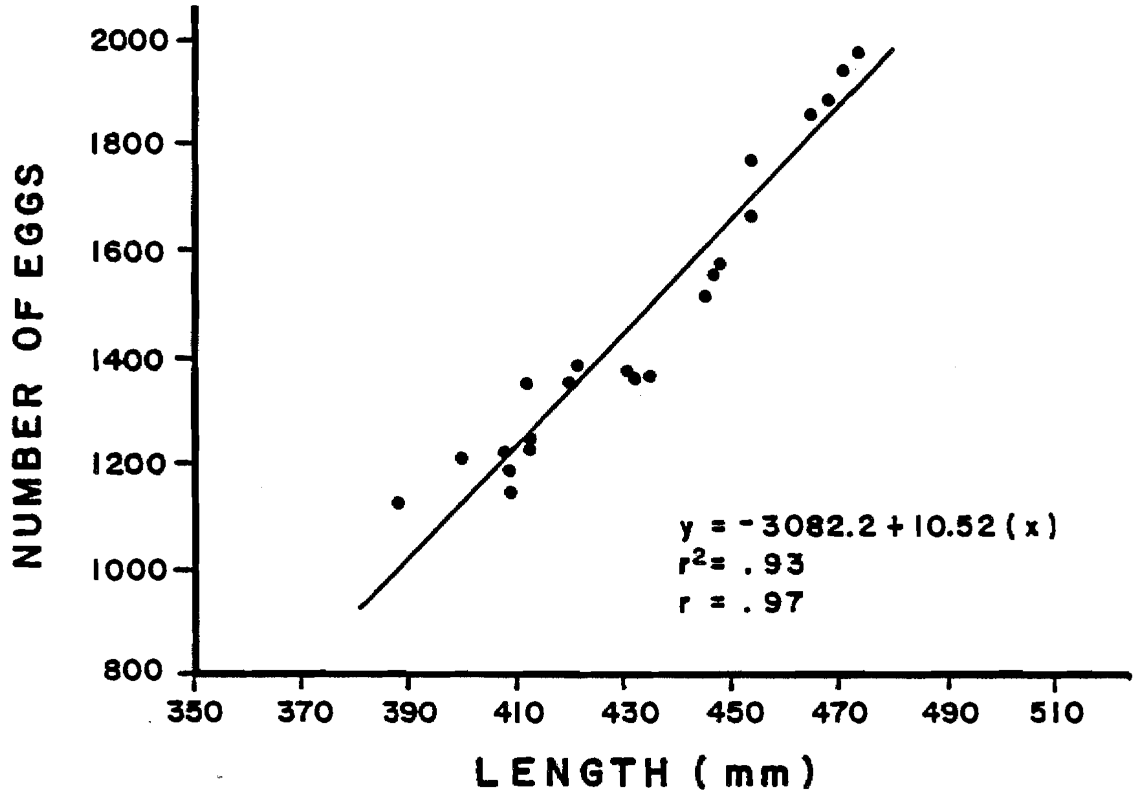
x_1 = length measurement

x_2 = weight measurement

and: coefficient of determination (r^2) = 0.93

correlation coefficient (r) = 0.97

Given the difficulty in collecting weight values from large numbers of fish in field situations and the small difference in multiple and length regression r factors, a very good estimate of pink salmon fecundities can be obtained by using a length/number of eggs regression as illustrated in Figure 2-3-20. These values assume that there is essentially no difference in fecundities of Susitna River pink salmon stocks.



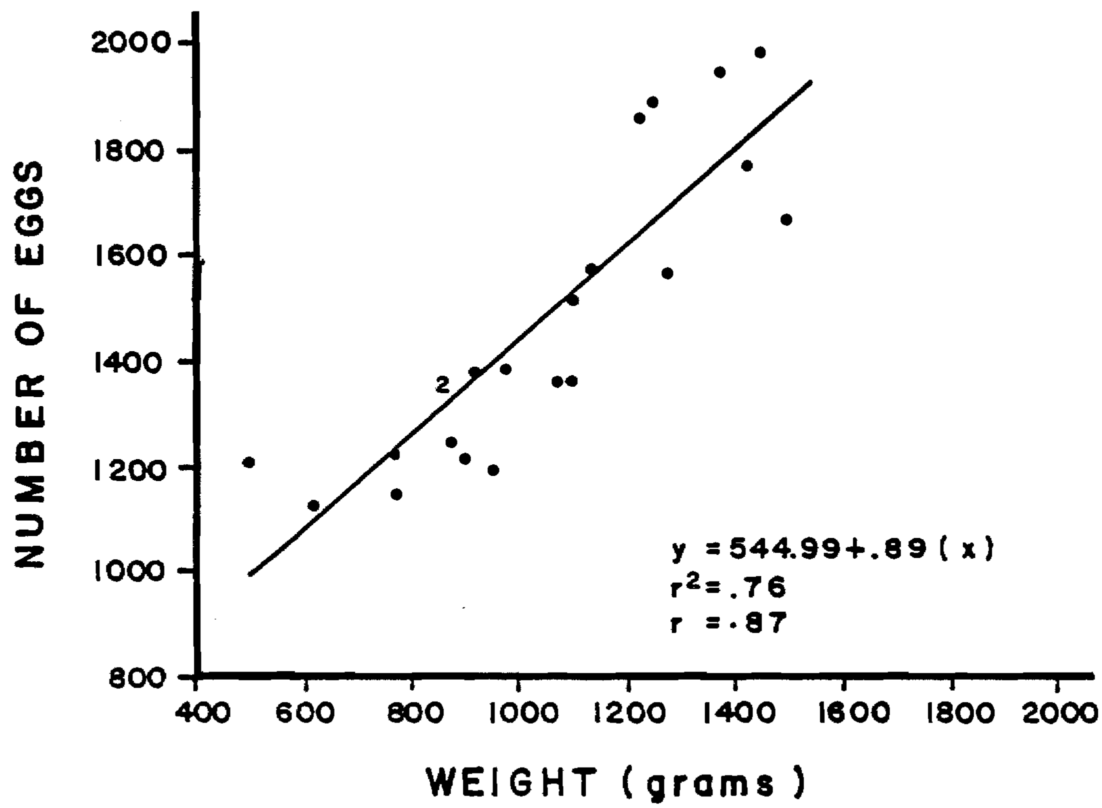


Figure 2-3-20. Number of eggs for pink salmon sampled at Sunshine Station in 1983 as a function of length and weight.

3.2.3.2 Talkeetna to Upper Devil Canyon

3.2.3.2.1 Main Channel Escapement Monitoring

The 1983 pink salmon escapement to Talkeetna Station (RM 103) was about 9,500 fish. The 95 percent confidence interval for this estimate is 8,900 to 10,100 fish (Table 2-3-31). At Curry Station (RM 120) the pink salmon escapement in 1983 was about 5,500 fish (Table 2-3-31). The 95 percent confidence interval for this estimate is 4,900 to 6,200 fish. The pink salmon escapements to Talkeetna and Curry stations were determined by the Petersen method.

The four fishwheels at Talkeetna Station (RM 103) in 1983 caught 2,213 pink salmon with 64.6 percent of the catch made by the two west bank fishwheels (Table 2-3-11 and Appendix Table 2-D-9). Based on fishwheel catch rate interpretation, the pink salmon migration began on July 23, reached a midpoint and peak on July 30 and ended on August 8 (Figure 2-3-21). The peak catch rate on July 30 averaged 3.2 fish per hour.

A total of 589 pink salmon were intercepted by the two fishwheels at Curry Station (RM 120) in 1983 (Table 2-3-11 and Appendix Table 2-D-12). The migration began and terminated on July 24 and August 12 respectively with the peak and midpoint catch both occurring on August 1. Of the 589 pink salmon captured at Curry Station 64.2 percent were intercepted by the east bank fishwheel and 35.8 percent by the west bank fishwheel showing a preference for migration along the east side of the Susitna River at this location (Figure 2-3-21).

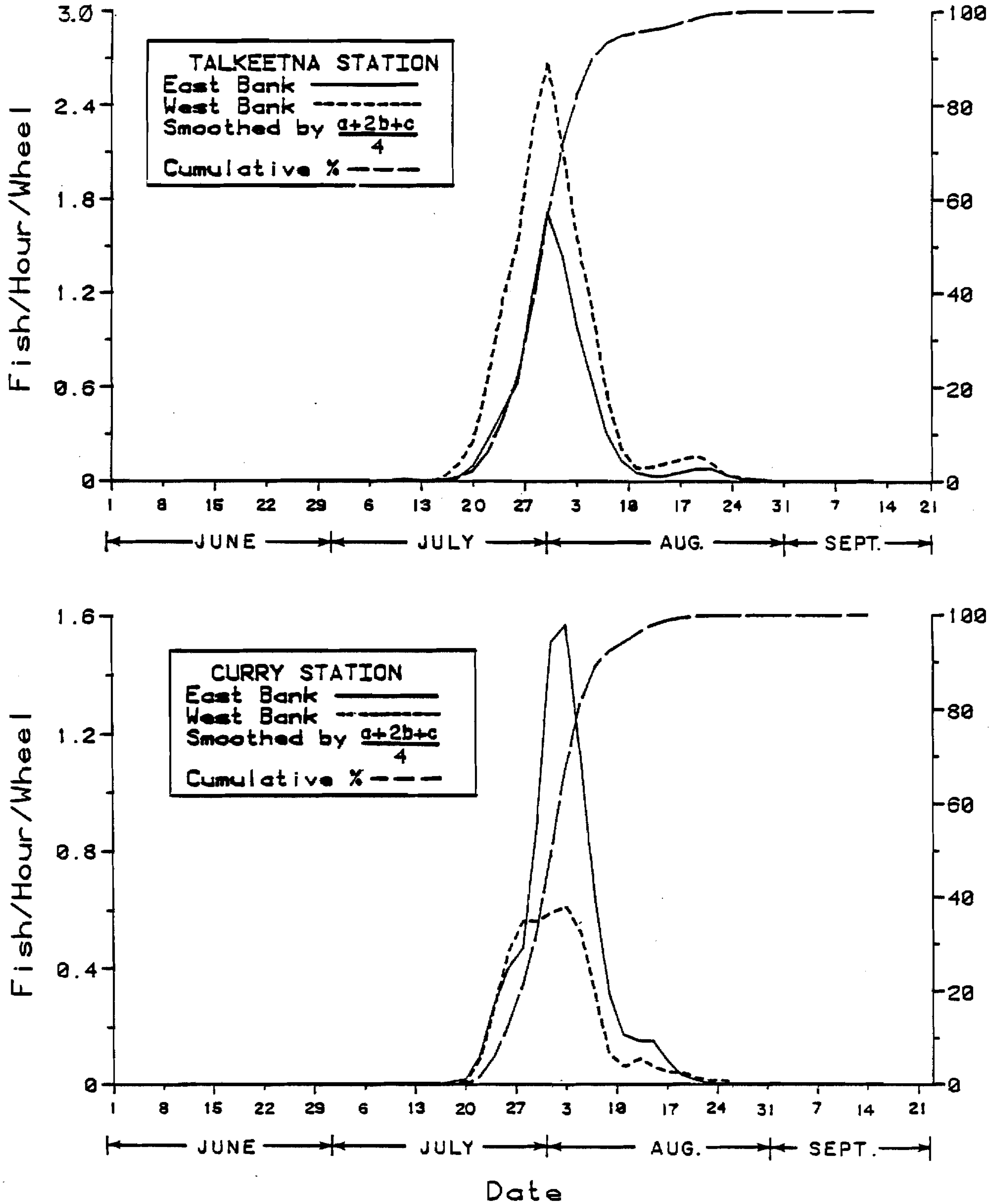


Figure 2-3-21. Mean hourly and cumulative percent fishwheel catch of pink salmon by two day periods at Talkeetna and Curry stations in 1983.

In 1983, based on tagged fish recapture data, pink salmon averaged a 5.8 mpd travel speed between Sunshine (RM 80) and Talkeetna (RM 103) stations (Figure 2-3-22). The average travel speed between Talkeetna and Curry (RM 120) stations, based on 85 tag recaptures was 7.1 mpd. Curry Station captured 26 Sunshine Station tagged pink salmon. These fish averaged a travel speed of 7.5 mpd in the 40 miles between the two stations (Figure 2-3-22). It can be concluded that pink salmon migrate at a faster speed or spend less time milling in the 17 miles between Talkeetna and Curry stations than in the 20 mile reach between Sunshine and Talkeetna stations.

A total of 674 and 391 pink salmon were sampled for length (FL) and sex data at Talkeetna (RM 103) and Curry (RM 120) stations in 1983, respectively (Table 2-3-32). At Talkeetna Station about 18 percent more females than males were sampled, for a sex ratio of 0.8:1. The males sampled at this station averaged a length of 428 mm and the females, 426 mm. At Curry Station the male to female sex ratio was 1.0:1. Both male and female pink salmon lengths averaged 425 mm at Curry Station in 1983.

3.2.3.2.2 Spawning Ground Surveys

3.2.3.2.2.1 Main Channel

In 1983, the Susitna River main channel was not surveyed for adult salmon spawning. Personnel assigned to main channel escapement monitoring at Talkeetna (RM 103) and Curry (RM 120) stations in addition to the Gold Creek stream and slough survey crew did not observe pink salmon spawning in the Susitna River main channel above RM 98.6.

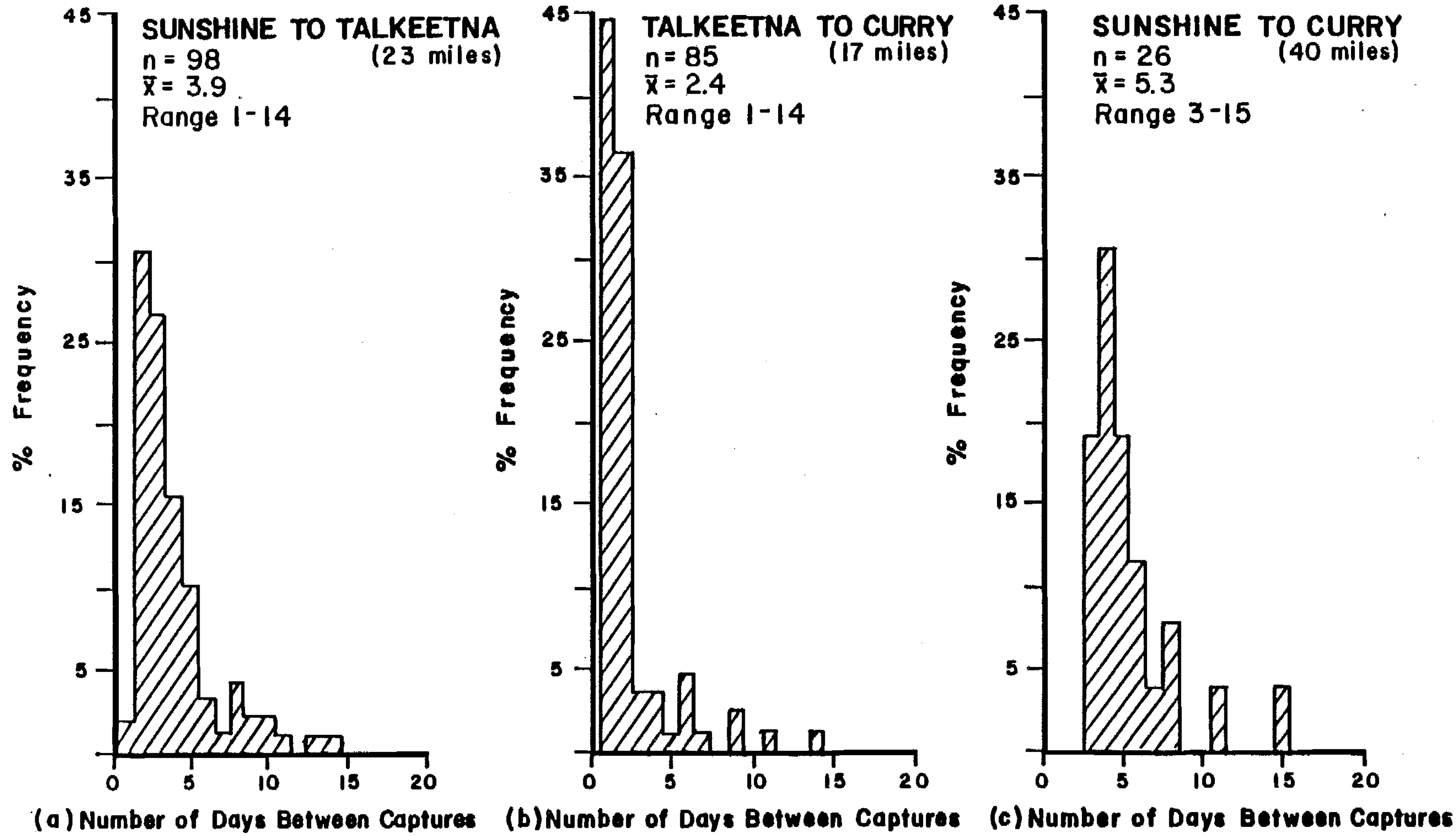


Figure 2-3-22. Migrational rates of pink salmon between (a) Sunshine and Talkeetna stations, (b) Talkeetna and Curry stations and (c) Sunshine and Curry stations, 1983.

3.2.3.2.2.2 Slough and Streams

In 1983, 35 sloughs and 20 streams were surveyed for salmon presence between RM 98.6 and 161.0 (Appendix Table 2-G-2 and 2-G-3).

A total of 21 pink salmon were observed in 7 of the 35 sloughs surveyed above RM 98.6 in 1983. Seven fish were observed in Slough 11 (RM 135.3) and Slough 20 (RM 140.0) while the remaining seven were in sloughs 8 (RM 124.7), 8A (RM 125.7), 15 (RM 137.2), 19 (RM 129.7) and 21 (RM 141.1). All 21 of these fish were considered milling, not spawning, pink salmon and consequentially pink salmon slough escapement in 1983 is reported as zero fish (Appendix Table 2-G-11).

In 1983 pink salmon spawned in 11 streams between RM 98.6 and 161.0 (Appendix Table 2-G-3). A peak count of 1,329 pink salmon was recorded in the index areas of these streams (Table 2-3-34). The majority (88%) of the fish were counted in Indian River (RM 138.6) and Portage Creek (RM 148.9). Total (1983) escapement into the 11 streams where pink salmon were found is unknown. Each index count made in 1983 was an enumeration of the number of pink salmon, present on a particular survey date, in a standard survey area. The length of the survey area depending on the stream, covered a one quarter to one mile reach starting at the stream mouth.

In 1983, aerial surveys by helicopter were conducted over Indian River (RM 138.6) and Portage Creek (RM 148.9) during the pink salmon spawning period (Appendix Table 2-G-3). Inadequate results were obtained namely due to frequent turbid water conditions and problems in scheduling helicopter time.

Peak spawning of pink salmon in streams in 1983 occurred during the first and third weeks of August (Figure 2-3-23 and Table 2-3-34).

Table 2-3-34. Peak pink salmon index escapement counts of streams surveyed by foot above RM 98.6 in order of contribution, 1983.

Stream	River Mile	Date	Number Counted			Percent Contribution
			Live	Dead	Total	
Indian River	138.6	8/19	837	49	886	66.7
Portage Creek	148.9	8/4	285	0	285	21.4
4th of July Creek	131.0	8/20	63	15	78	5.9
Lane Creek	113.6	8/15	28	0	28	2.1
Lower McKenzie Creek	116.2	8/15	17	0	28	1.3
5th of July Creek	123.7	8/13	9	0	9	0.7
Gold Creek	136.7	8/7	7	0	7	0.5
Little Portage Creek	117.7	8/22	7	0	7	0.5
Chase Creek	106.9	8/12	5	1	6	0.5
Jack Long Creek	144.5	8/12	5	0	5	0.4
Skull Creek	124.7	8/20	1	0	1	0.1
		TOTAL	1,264	65	1,329	100.0

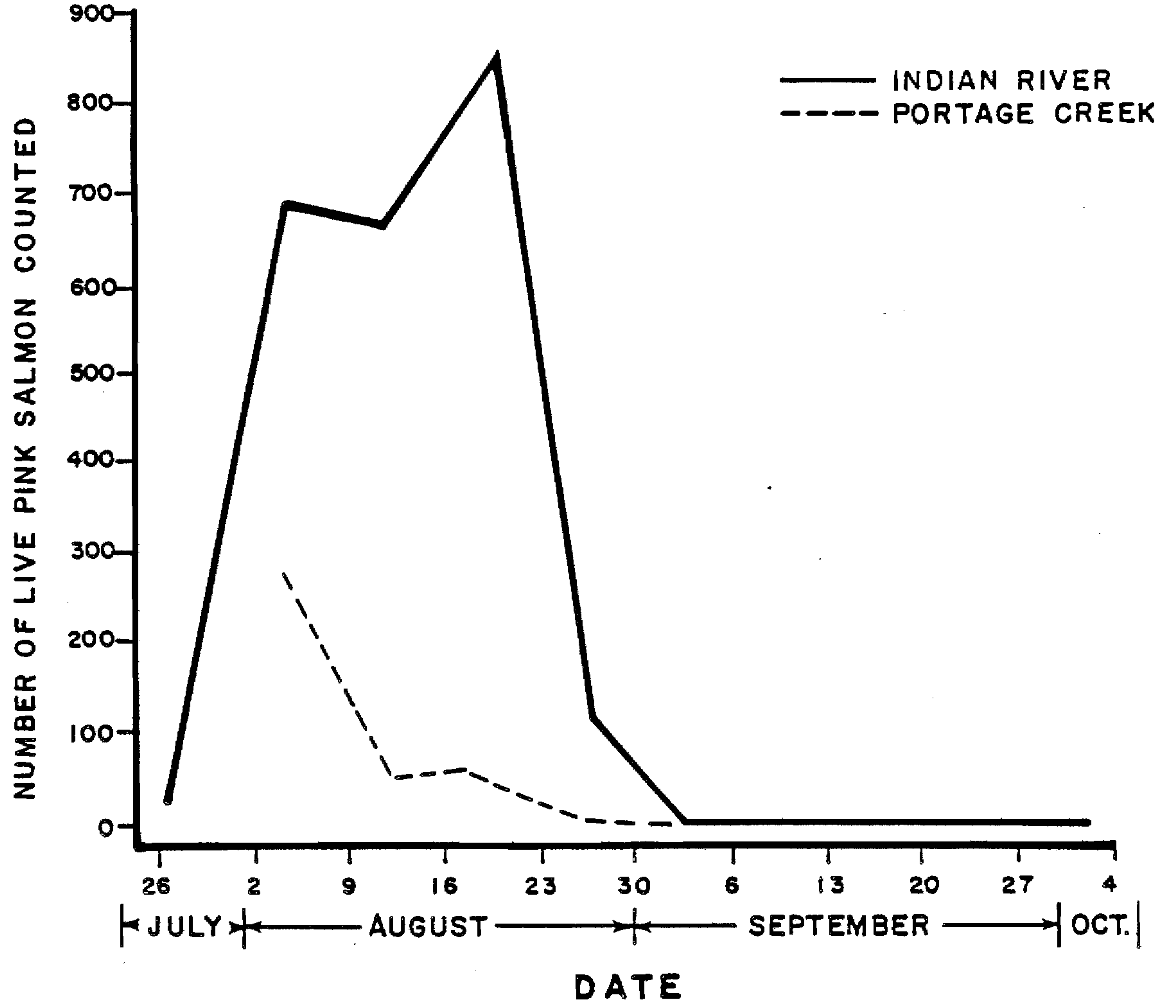


Figure 2-3-23. Peak pink salmon ground survey counts of Indian River and Portage Creek in 1983.

3.2.4 Chum Salmon

3.2.4.1 Intertidal to Talkeetna

3.2.4.1.1 Main Channel Escapement Monitoring

In 1983 chum salmon escapements were monitored in the Yentna River (RM 28) at Yentna Station (TRM 04) and in the Susitna River at Sunshine Station (RM 80) (Table 2-3-8). The Yentna River escapement, determined by SSS counters, was about 10,800 fish (Table 2-3-22). The Susitna River escapement at

Sunshine Station was about 265,800 fish as determined by the Petersen tag/recapture method (Table 2-3-35).

Table 2-3-35. Petersen population estimates with associated 95% confidence intervals for 1983 chum salmon migration to Sunshine, Talkeetna and Curry stations.

Parameter 1/	Population Estimate Location		
	Sunshine Station	Talkeetna Station	Curry Station
m	16,845	2,086	667
c	16,533	12,139	11,238
r	1,047	502	355
$\hat{N}$	265,775	50,370	21,089
95% C.I.	251,064- 282,317	46,400- 55,083	19,133- 23,490

1/ m = Number of fish marked (adjusted).
c = Total number of fish examined for marks during sampling census.
r = Total number of marked fish observed during sampling census.
$\hat{N}$ = Population estimate.
C.I. = Confidence interval around $\hat{N}$.

The timing of the 1983 chum salmon escapements into the Yentna River (RM 28) at Yentna Station (TRM 04) and in the Susitna River at Sunshine Station (RM 80) can be determined by fishwheel catches (Appendix 2-D). The migration at Yentna Station began on July 15, reach a midpoint on July 30 and ended on August 23. At Sunshine Station the onset of the migration began on July 22, reached a midpoint on August 1 and ended on September 2.

A comparison of the inseason (1983) fishwheel catches at Yentna (TRM 04) and Sunshine (RM 80) stations indicate chum salmon passed these locations in two distinct waves (Figure 2-3-24). The bimodal migration recorded at these locations may be related to: (1) differential commercial fishing effort in Cook Inlet, (2) stock differences, such as timing differences between stream and slough spawning stocks, and (3) variations in river discharge levels which caused migration cessation and or altered fishwheel catch efficiency.

A review of preliminary 1983 commercial salmon fishing data for Upper Cook Inlet indicates that fishing pressure was relatively static between early July and early August except for an eight day period beginning and ending on July 17 and 23 when extra fishing time was given to the inlet drift net fishermen. This extra fishing time resulted in 'markedly increased' catches. In fact, the highest 1983 chum salmon catch in the Central District drift fleet was recorded on July 20 at approximately 123,000 fish. Sockeye, pink and coho salmon were also caught at seasonal high levels during the July 17 to 23 commercial openings (Ruesch, pers. comm., 1983). Preliminary results of 1983 tag recovery data indicate chum salmon averaged a 10 day travel time between the inlet fishery and the lower (RM 26) Susitna River (Tarbox, pers. comm., 1983). It is therefore likely that the dramatic decline in inseason chum salmon catches at Yentna and Sunshine stations may have been partially influenced by commercial fishing in Cook Inlet as the first migration wave at Yentna and Sunshine stations ended in the first week of August about 11 and 16 days respectively after the peak commercial catch.

With respect to potential stock timing differences in the Yentna River (RM 28) affecting the chum salmon mitigation at Yentna Station (TRM 04) in

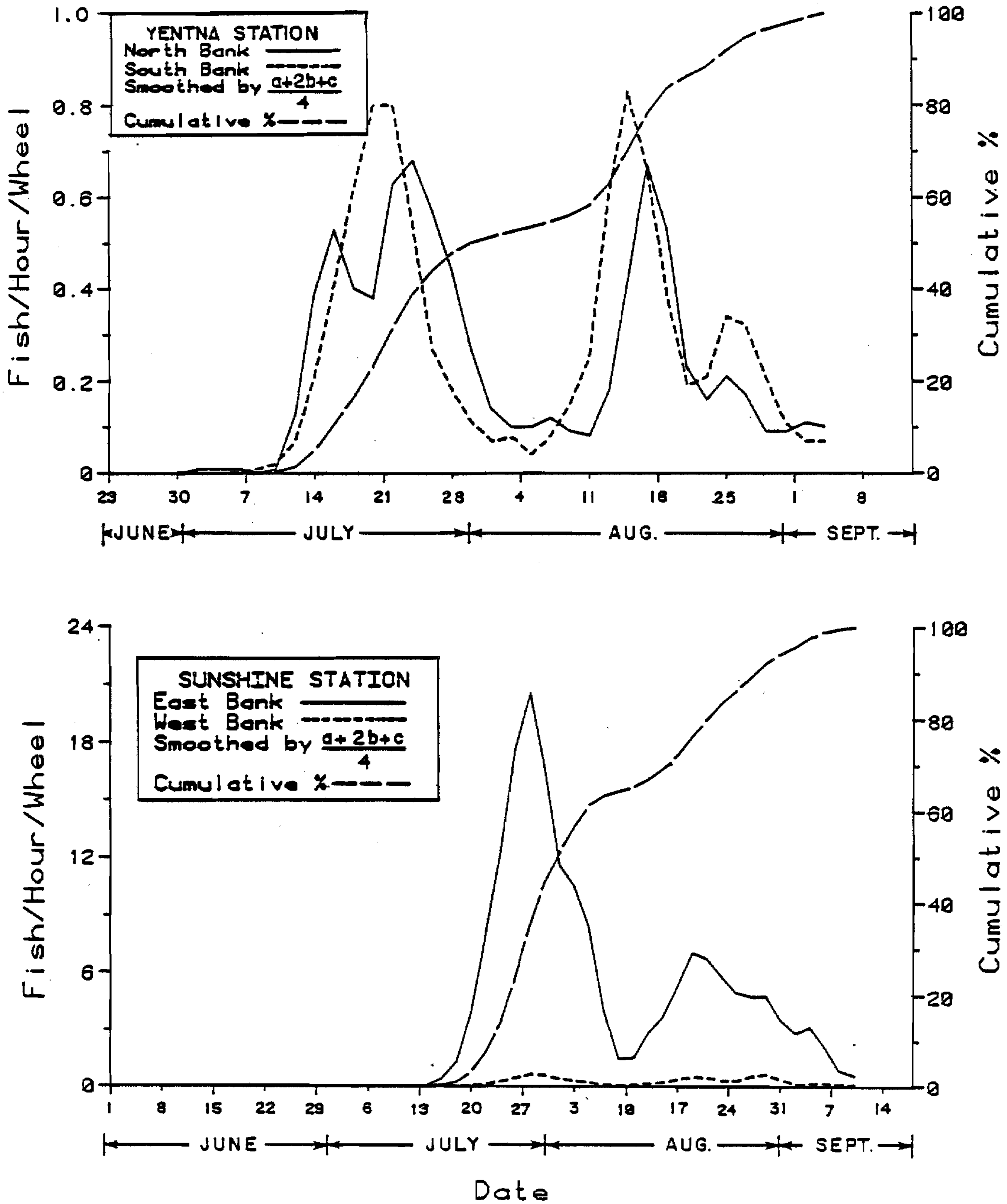


Figure 2-3-24. Mean hourly and cumulative percent fishwheel catch of chum salmon by two day periods at Yentna and Sunshine stations in 1983.

1983 there were no slough or stream surveys performed in this drainage to allow such an evaluation. However, stream and slough escapement surveys were conducted in 1983 upstream of Sunshine Station and the data indicate chum salmon in this reach of river were not segregated by time of arrival to these habitats. The surveys indicate that chum salmon were abundant in both habitats during the last week of July in 1983 (Appendix 2-G). It can therefore be surmised that the first mode that passed Sunshine Station between July 22 and August 7 was comprised of both slough and stream spawning fish as the second mode did not begin at Sunshine Station until after the second week of August. The second mode that passed Sunshine Station also was probably not a separate stock based on upstream stream and slough surveys (Appendix 2-G).

The third possible factor influencing the bimodal chum salmon migration at Yentna (TRM 04) and Sunshine (RM 80) stations in 1983 is a change in river discharge levels. A plot of the 1983 Yentna River (RM 28) and Susitna River USGS (United States Geological Survey) provisional flow data for the months of July and August show that both river systems sustained high flow events in the first week of August (Figure 2-3-25). This was the same time fishwheel catches declined at Yentna and Sunshine stations (Appendix 2-D). The sonar counts at Yentna Station also declined in this period. It appears that the high flow in early August probably was the major cause for the delay in the chum salmon migrations at Yentna and Sunshine stations and corresponding declines in station fishwheel catches. At both stations when flows returned to pre-high water levels chum salmon catches increased in the fishwheels and at the same time sonar counts also increased at Yentna Station. A similar pattern was observed in 1981 (ADF&G, 1981).

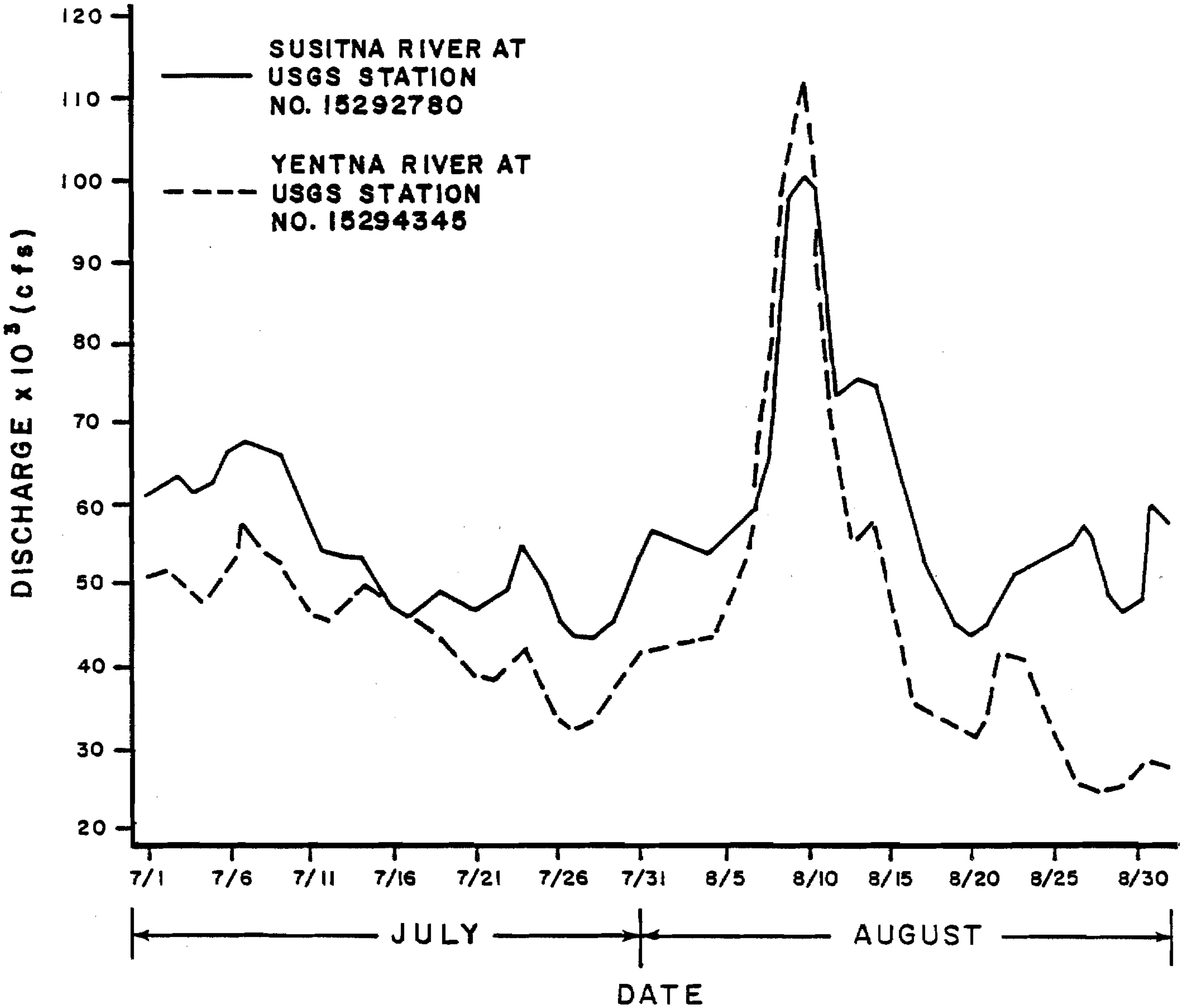


Figure 2-3-25. Provisional USGS discharge data from July 1 through August 30, 1983 for the Susitna and Yentna rivers.

Fishwheel catches recorded in 1983 at Yentna Station (TRM 04) indicate chum salmon had no strong migrational preference for the south or north bank of the Yentna River (RM 28) at this location (Appendixes Table 2-D-1 and 2-D-2). The south bank Yentna Station fishwheel caught approximately the same number of fish (50.2%) as caught by the north bank fishwheel (49.8%) (Appendix 2-D).

In the Susitna River at Sunshine Station (RM 80) about 96 percent of the station catch was made in the two east bank operated fishwheels and the remaining four percent of the catch was made in the two west bank wheels. This would indicate a strong preference for the east side of the river at Sunshine Station, based on the assumptions that stocks were mixed and fishwheel catch efficiency remained constant.

Age composition data was collected from 553 chum salmon at Yentna Station (TRM 04) and 1,043 chum salmon at Sunshine Station (RM 80) in 1983 (Table 2-3-36.) The majority of the escapement sampled at both stations were five and four year old fish in order of abundance (Figure 2-3-26). Other ages sampled included fish three and six years old. These ages accounted for less than three percent of the total age sample from each station.

Table 2-3-36. Analysis of chum salmon age data by percent from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	n	Age Class 1/			
		3_1	4_1	5_1	6_1
Yentna Station	553	2.2	46.1	51.3	0.4
Sunshine Station	1043	0.3	40.1	58.4	1.2
Talkeetna Station	620	0.8	30.3	68.7	0.2
Curry Station	456	-	27.9	72.1	-

1/ Gilbert-Rich Notation

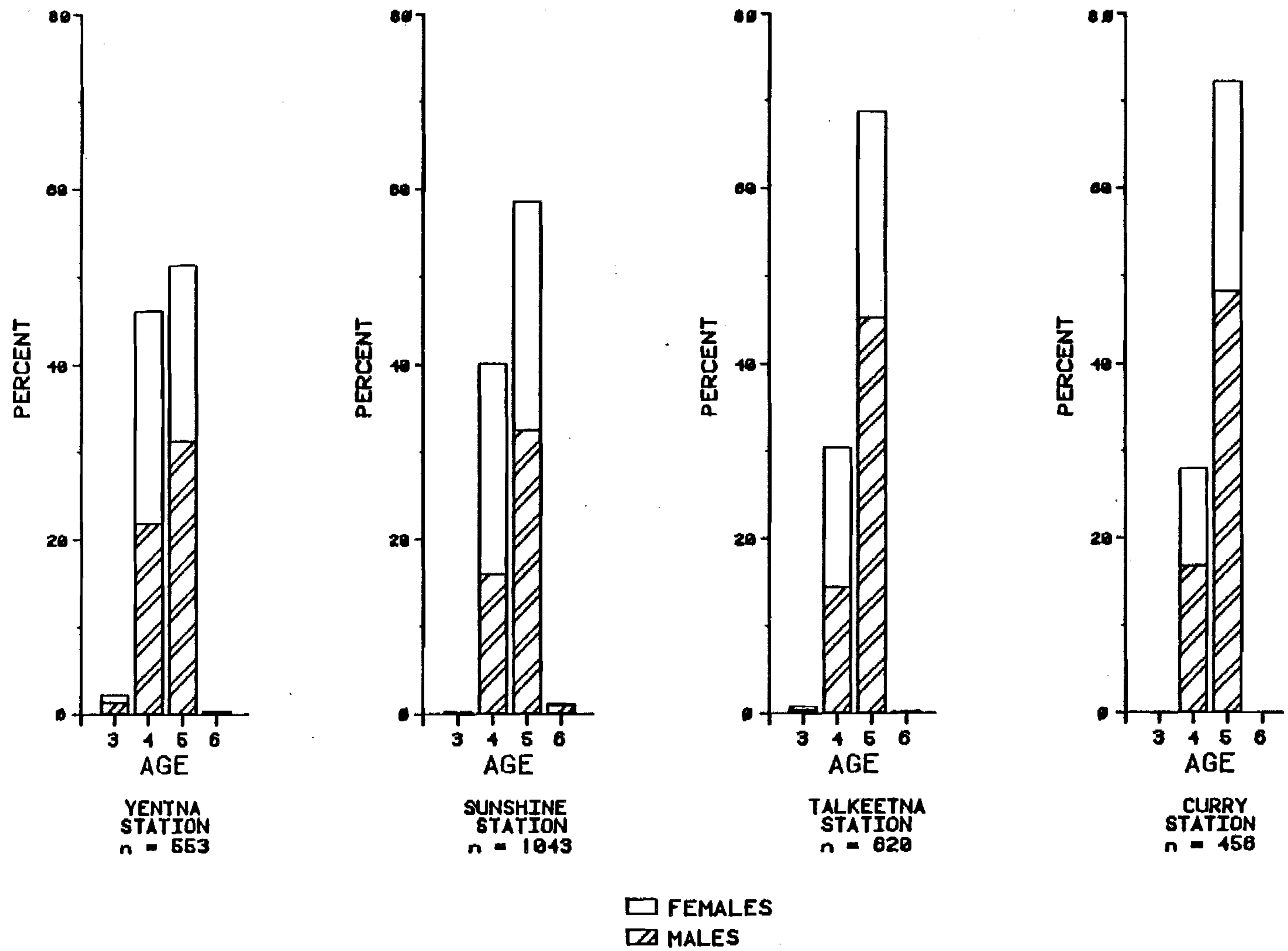


Figure 2-3-26. Age composition of fishwheel intercepted chum salmon at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Length composite data from (1983) escapement sampling at Yentna (TRM 04) and Sunshine (RM 80) stations are presented in Table 2-3-37 and Appendix Tables 2-E-13 and 2-E-14. Chum salmon averaged 593 mm in the Yentna River (RM 28) and 595 mm in the Susitna River at Sunshine Station. At Yentna and Susitna river sampling locations female chum salmon lengths were about 20 to 30 mm larger than the males.

Sex ratio data collected in 1983 from fishwheel caught chum salmon at Yentna (TRM 04) and Sunshine (RM 80) stations are summarized in Table 2-3-38. At both stations males were more numerous among the three, five and six year old fish sampled, and females outnumbered males among the four year old fish sampled. The chum salmon male to female sex ratio at Yentna Station without respect to age was 1.3:1 and at Sunshine Station, 1.0:1.

3.2.4.1.2 Fecundity

Fecundities of 27 Susitna River female chum salmon were determined from samples collected at Sunshine Station (RM 80) between July 29 and 31, 1983. The mean fecundity of the sample was 3,189 eggs per female and ranged from 2,478 to 4,076 eggs (Table 2-3-39).

The mean fecundity of Susitna River chum salmon stocks, determined from a mean length of 580 mm for 565 female chum salmon measurements collected at Sunshine Station (RM 80), is 2,850 eggs per female.

Susitna River chum salmon fecundities fall into the range reported for other stocks. The fecundity of individual female chum salmon can range from

Table 2-3-37. Analysis of chum salmon lengths, in millimeters, by age class from escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Collection Site	Age Class	n		Range Limits		Mean		95% Conf. Interval 3/		Median	
		M 1/	F 2/	M	F	M	F	M	F	M	F
Yentna Station	3_1	7	5	492-528	452-553	508	515	-	-	504	526
	4_1	121	134	462-666	489-652	582	570	575-589	566-575	584	572
	5_1	173	111	448-700	509-658	616	598	611-622	593-604	621	600
	6_1	2	-	558-610	-	584	-	-	-	584	-
	ALL 4/	351	280	448-700	452-658	602	582	597-606	578-586	606	583
		631		448-700		593		590-596		596	
Sunshine Station	3	-	3	-	515-540	-	525	-	-	-	520
	4_1	168	250	410-685	450-650	579	561	573-585	557-565	580	560
	5_1	339	271	495-750	460-750	622	598	618-626	593-603	625	600
	6_1	10	2	500-895	650-720	664	685	-	-	648	685
	ALL 4/	560	565	410-895	450-750	609	580	605-613	577-584	610	580
		1125		410-895		595		592-597		600	
Talkeetna Station	3_1	2	3	510-510	500-520	510	512	-	-	510	515
	4_1	89	99	470-680	465-630	585	572	577-593	566-579	590	575
	5_1	281	145	515-700	510-710	625	610	621-629	605-615	630	610
	6_1	1	-	650	-	650	-	-	-	650	-
	ALL 4/	441	287	470-700	365-710	614	594	611-618	589-599	620	600
		728		365-710		606		603-609		610	
Curry Station	4_1	77	50	505-640	470-640	586	579	579-592	569-588	590	590
	5_1	220	109	500-715	555-690	631	618	627-635	613-623	630	620
	ALL 4/	319	168	500-715	445-690	619	605	615-623	599-610	620	610
		487		445-715		614		611-617		615	

1/ Males 2/ Females 3/ Confidence Interval of the Mean. 4/ Composite of all aged and non-aged samples.

900-8,000 eggs. The mean fecundities of North American and Asian stocks usually range between 2,000 and 3,000 eggs per female chum salmon (Bakkala, 1970).

Table 2-3-38. Sex ratios of male and female chum salmon by age from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	Age	Sample Size	Number		Sex Ratio (M:F)
			Males	Females	
Yentna Station	3	12	7	5	1.4:1
	4	255	121	134	0.9:1
	5	284	173	111	1.6:1
	6	2	2	0	-
	All 1/	631	351	280	1.3:1
Sunshine Station	3	3	0	3	-
	4	418	168	250	0.7:1
	5	610	339	271	1.3:1
	6	12	10	2	5.0:1
	All 1/	1125	560	565	1.0:1
Talkeetna Station	3	5	2	3	0.7:1
	4	188	89	99	0.9:1
	5	426	281	145	1.9:1
	6	1	1	0	-
	All 1/	728	441	287	1.5:1
Curry Station	4	127	77	50	1.5:1
	5	329	220	109	2.0:1
	All 1/	487	319	168	1.9:1

1/ Includes all aged and non-aged samples.

Table 2-3-39. Number of eggs, length, weight and associated statistics for chum salmon sampled for fecundity at Sunshine Station in 1983.

Variables	Statistic				
	Sample Size	Mean	Standard Deviation	Standard Error of the Mean	Range
Number of Eggs	27	3,189	462	89	2,475 - 4,076
Length (mm)	27	617	43	8	524 - 708
Weight (g)	27	3,566	783	151	2,225 - 5,475

A linear regression for the chum salmon sampled for length and fecundity, and weight and fecundity had correlation coefficients of r=0.83 and r=0.84, respectively (Figure 2-3-27).

Utilizing both length and weight as independent predictor variables the following multiple regression equation was derived:

$$Y_c = 15.38 + 3.25 (x_1) + 0.33 (x_2)$$

where: Y_c = predicted number of eggs

x_1 = measured length

x_2 = measured weight

and: coefficient of determination (r^2) = 0.72

correlation coefficient (r) = 0.85

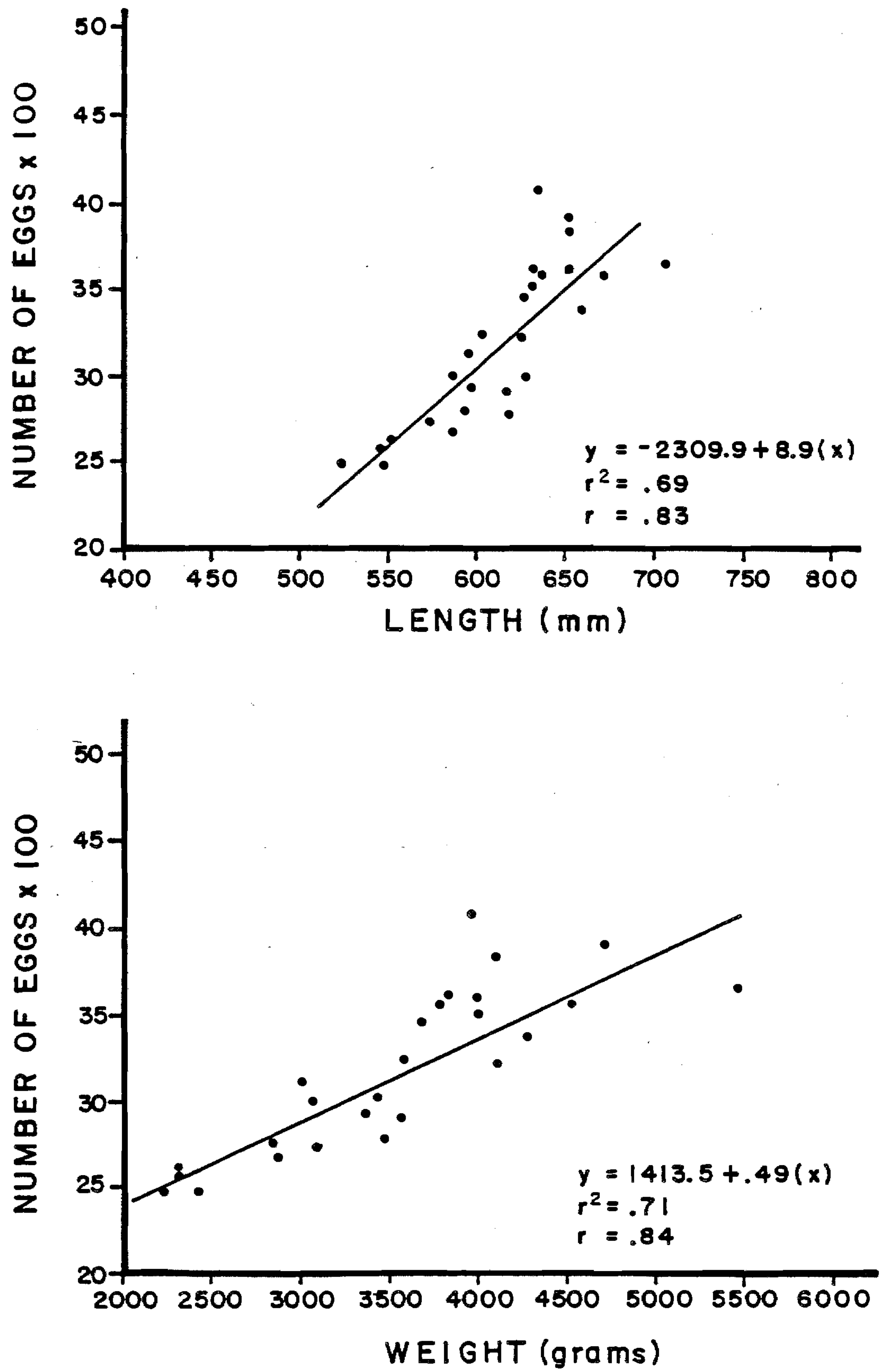


Figure 2-3-27. Number of eggs for chum salmon sampled at Sunshine Station in 1983 as a function of length and weight.

Utilization of this data for predictive purposes must include an adjustment for egg retention. This information, for chum salmon, is provided in Section 3.2.4.2.2.3.3. It should also be noted that in calculating chum salmon fecundities it was assumed that there were essentially no stock differences in number of eggs per individual female for Susitna River stocks.

Chum salmon fecundity data was further reduced for analysis by age class. This information is presented in Appendix Table 2-G-15 but due to insufficient samples sizes should be considered informative and not analytical in nature.

3.2.4.2 Talkeetna to Upper Devil Canyon

3.2.4.2.1 Main Channel Escapement Monitoring

In 1983, chum salmon escapement estimates were obtained for the Susitna River main channel at Talkeetna (RM 103) and Curry (RM 120) stations by the Petersen tag/recapture method (Table 2-3-35). Escapement to Talkeetna Station was about 50,400 fish and to Curry Station, about 21,100 fish. The 95 percent confidence limits associated to these estimates are 46,400 - 55,100 and 19,100 - 23,500 fish, respectively.

The migrational timings of the 1983 chum salmon escapements to Talkeetna (RM 103) and Curry (RM 120) stations can be determined by fishwheel catches made at these locations (Appendix 2-D). At Talkeetna Station the chum salmon migration began on July 25, reached a midpoint on August 1 and ended on August 29. Upstream 17 miles at Curry Station, the migration began on July 22, reached a midpoint on August 3 and ended on August 29.

In 1983, Talkeetna Station (RM 103) fishwheels caught 2,467 chum salmon and at Curry Station fishwheels caught 861 (Table 2-3-11). At Talkeetna Station the catch was nearly equally distributed between the east and west bank fishwheels (Figure 2-3-28). The two east bank fishwheels caught 47.3 percent of the station catch and the two west bank fishwheels landed the remaining 52.7 percent. These catch percentages indicate chum salmon had a slight preference for movement along the west bank at this location. Upstream at Curry Station, chum salmon were more numerous along the east bank than the west bank (Figure 2-3-28). The east bank fishwheel caught 68.4 percent of the station catch. The remaining 31.6 percent was landed by the west bank fishwheel. The reported preference of chum salmon for migration along the west bank at Talkeetna Station and east bank at Curry Station should be considered valid assuming no stock differention or difference in catch efficiency between east and west bank operated fishwheels at either station. Probable factors influencing chum salmon migration along a particular bank are velocity, channel configuration and water depth.

The results of sampling the 1983 chum salmon escapements to Talkeetna (RM 103) and Curry (RM 120) stations for age are provided in Table 2-3-36. The escapements to both stations were comprised almost exclusively of five and four year old fish by respective order (Figure 2-3-26). Three and six year old chum salmon were represented at a minimal level at Talkeetna Station and were not present in the escapement sampled at Curry Station.

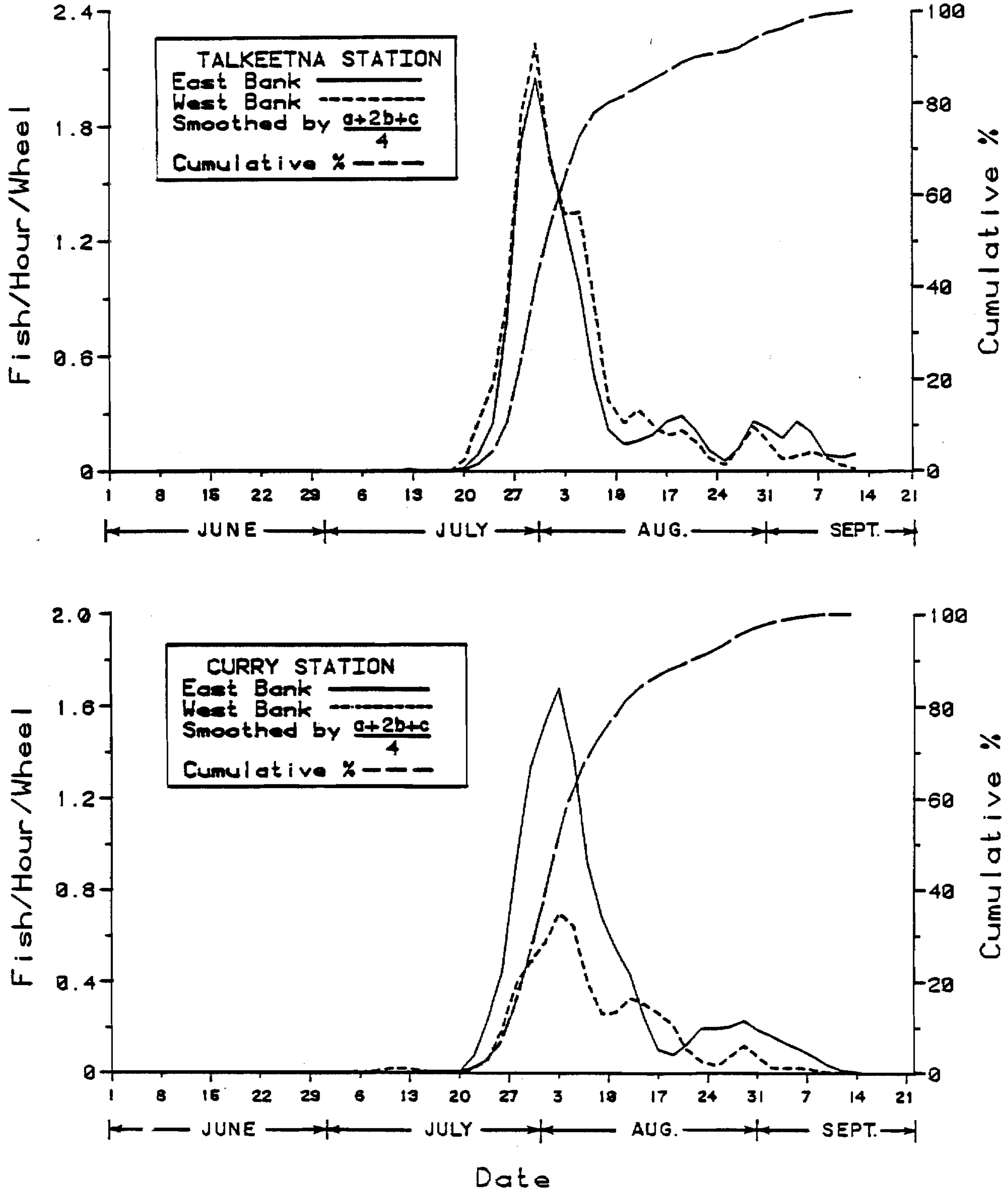


Figure 2-3-28. Mean hourly and cumulative percent fishwheel catch of chum salmon by two day periods at Talkeetna and Curry stations in 1983.

In 1983, chum salmon tagged at Sunshine Station (RM 80) were recaptured at Talkeetna (RM 103) and Curry (RM 120) stations. Recaptures were also made at Curry Station of fish released at Talkeetna Station. The results are provided in Figure 2-3-29. The data indicate chum salmon migrated upstream at an average rate of 3.8 mpd for the 23 miles between Sunshine and Talkeetna stations. About 75 percent of the tagged fish migrated from Talkeetna to Curry stations in one to five days with a mean travel rate of 6.3 mpd. A few stragglers reduced the mean. The mean rate of 3.8 mpd for the 23 miles between Sunshine and Talkeetna stations and the mean rate of 6.3 mpd for the 17 miles between Talkeetna and Curry stations equals a 4.9 mpd mean rate for 40 miles. This is close to the 4.7 mpd mean rate for fish released at Sunshine Station and recaptured at Curry Station. Overall the data indicates that chum salmon ascended at a faster rate or spend less time milling between Talkeetna and Curry stations than in the 23 miles reach downstream (Figure 2-3-29).

Length composition data collected in 1983 at Talkeetna (RM 103) and Curry (RM 120) stations are provided in Table 2-3-37 and Appendix 2-E. Generally, the male chum salmon sampled at these stations were of a larger length than the females. The average chum salmon length measured at Talkeetna Station was 606 mm and at Curry Station, 614 mm.

Sex composition (1983) data collected from escapement sampling of the Susitna River main channel above Talkeetna (RM 97.1) are provided in Table 2-3-38. The male to female chum salmon sex ratio was 1.5:1 at Talkeetna Station (RM 103). At Curry Station (RM 120), 17 miles upstream, the ratio was 1.9:1.

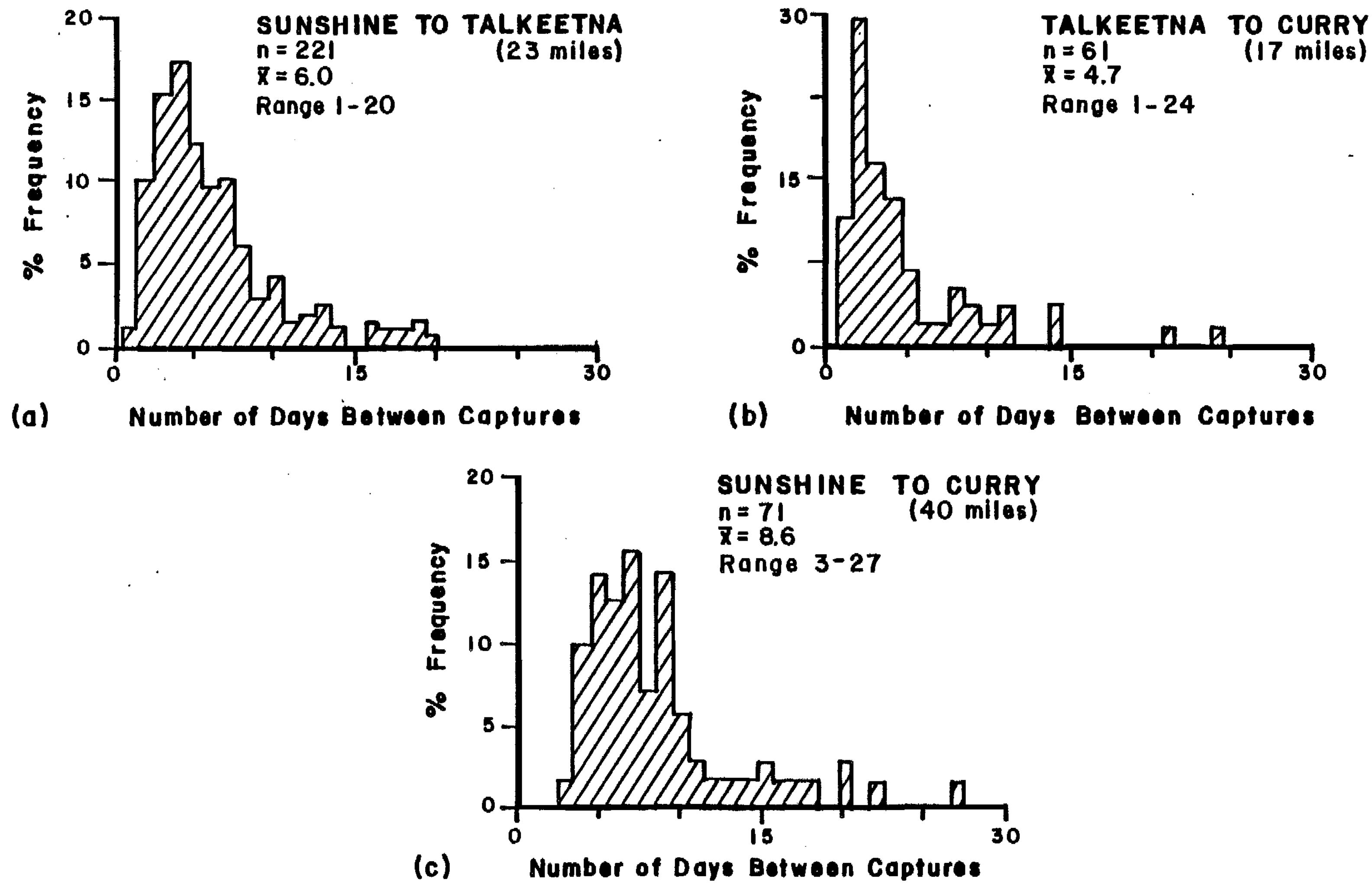


Figure 2-3-29. Migrational rates of chum salmon between (a) Sunshine and Talkeetna stations, (b) Talkeetna and Curry stations and (c) Sunshine and Curry stations, 1983.

3.2.4.2.2 Spawning Ground Surveys

3.2.4.2.2.2.1 Main Channel

In 1983, no inclusive main channel spawning ground surveys were conducted. However, six main channel chum salmon spawning areas were found in the Susitna River between RM 115.0 and 138.9 by the stream and slough survey crew stationed at Gold Creek (RM 136.7). A list of these spawning areas are provided in Appendix Table 2-G-1. Maps of these locations are in Appendix 2-G.

Chum salmon spawning was recorded at these main channel sites between September 9 and October 1. The site supporting the highest number of spawners was located downstream of the mouth of Slough 11 (RM 136.3) at RM 136.1 (Appendix Figure 2-G-9). At this location a total of 177 chum salmon were observed on September 9 and 17, 1983. The numbers of spawning chum salmon observed at the other five locations ranged from 4 to 56 fish.

3.2.4.2.2.2.2 Streams

In 1983, a total of 20 streams were surveyed for salmon presence between RM 98.6 and 161.0. The results are in Appendix Table 2-G-3.

Seven streams above RM 98.6 contained chum salmon in 1983 (Table 2-3-40). Peak spawning ground counts indicated a minimum escapement of 1,411 fish in these streams. The majority (88.4%) of the fish were counted in Indian River (RM 138.6) and Portage Creek (RM 148.9).

Table 2-3-40. Chum salmon peak 1983 escapement counts for streams above RM 98.6.

Stream	River Mile	Date	Number Counted		
			Live	Dead	Total
Lane Creek	113.6	8/15	6	0	6
Lower McKenzie Creek	116.2	8/15	1	0	1
5th of July Creek	123.7	8/5	6	0	6
4th of July Creek	131.0	8/27	143	5	148
Indian River	138.6	8/19	673	49	722
Jack Long Creek	144.5	8/12	2	0	2
Portage Creek	148.9	8/26	424	102	526
		TOTAL	1,255	156	1,411

In 1983, counts of chum salmon in Indian River (RM 138.6) made by helicopter were less than counts made on the ground (Figure 2-3-30). Since 16 miles of stream were surveyed by air and on foot only the first stream mile was surveyed, it could be concluded that: (1) aerial counts provide a poor measure of Indian River chum salmon escapement, and (2) the first mile reach of Indian River in 1983 was probably more valuable chum salmon spawning habitat than the remaining (15 miles) upstream reach.

At Portage Creek (RM 148.9) in 1983, more chum salmon were counted by helicopter in the total 25 mile reach of stream than on foot in the first quarter mile reach (Appendix 2-G-3). From a comparison of the timing differences between the ground and helicopter counts, it could be concluded that the first quarter mile reach of Portage Creek is mainly a migrational corridor and the majority of the fish enumerated in this reach during ground counts were fish that spawned upstream (Figure 2-3-30). If the first quarter

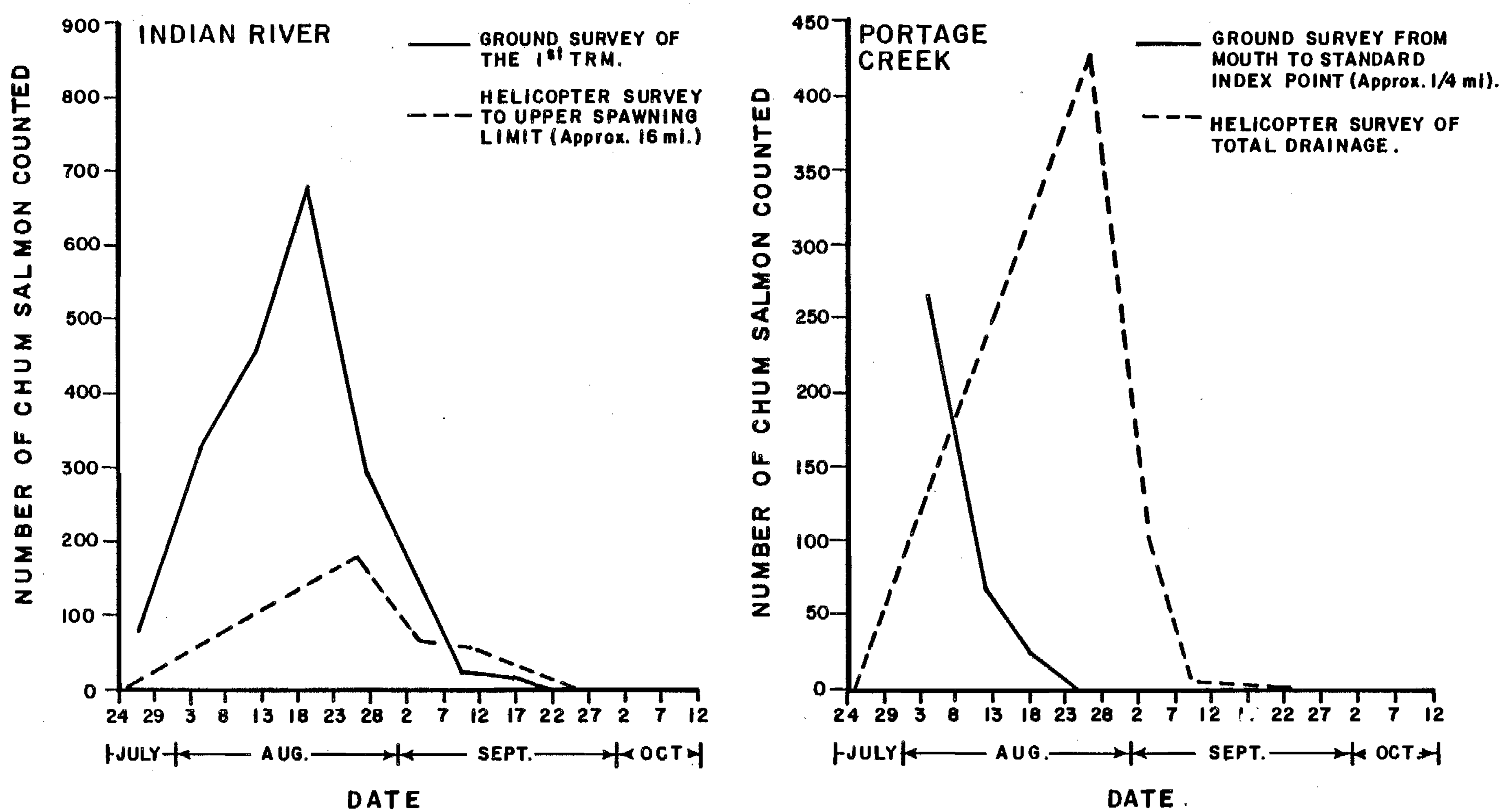


Figure 2-3-30. Peak chum salmon ground and helicopter survey counts of Indian River and Portage Creek in 1983.

mile reach of Portage Creek were of similar spawning habitat value as the upper stream reach the difference in timing of the peak counts would not be as apparent as illustrated in Figure 2-3-30.

Escapement counts in 1983 indicate chum salmon spawned in streams above RM 98.6 from the last week of July through the second week of September. The peak of spawning occurred between the first and last weeks of August.

3.2.4.2.2.3 Sloughs

3.2.4.2.2.3.1 Observation Life

In 1983, a total of 68 chum salmon were monitored for observation life in sloughs Moose (RM 123.5), A' (RM 124.6), 8A (RM 123.1), 9 (RM 128.3) and 11 (RM 135.3) The results are in Table 2-3-41.

The average observation life of a chum salmon in five sloughs was 6.9 days in 1983 (Table 2-3-41). However, observation life averages varied between sloughs and between male and female chum salmon. For example, chum salmon averaged 4.1 observation days in Slough 9 (RM 128.3) whereas in Slough 11 (RM 135.3) the average was 7.5 days. In these same sloughs the average observation life of male chum salmon was less than that recorded of female chum salmon. The difference in chum salmon observation life between sloughs can be partially attributed to variations in the visibility of fish in the sloughs. As shown in Figure 2-3-31, visibility in 1983 was restricted in Slough 9 much of the time chum salmon were present and it was here that chum

Table 2-3-41. Summary of mean number of days individual chum salmon were observed in 1983 in sloughs Moose, A', 8A, 9 and 11.

Slough + RM 1/	Males			Females			Combined		
	n	Range (days)	Mean (days)	n	Range (days)	Mean (days)	n	Range (days)	Mean (days)
Moose RM 123.5	6	2.5-11.0	9.6	1	---	11.0	7	2.5-11.0	9.8
A' RM 124.6	10	2.0-14.5	7.4	3	2.0-8.0	5.5	13	2.0-14.5	6.7
8A RM 125.1	3	4.0-6.0	4.7	2	8.5-10.0	9.3	5	4.0-10.0	6.5
9 RM 128.3	8	1.0-10.0	3.1	6	2.0-10.0	5.3	14	1.0-10.0	4.1
11 RM 135.3	13	1.5-15.5	4.8	16	1.5-30.5	9.7	29	1.5-30.5	7.5
							Mean Average =		6.9

1/ RM = River Mile

salmon averaged the lowest observation life of 4.1 days. In sloughs such as Slough 9 where restricted visibility conditions were often encountered it was difficult to locate fish. This generally lead to less observation time per fish being recorded in these habitats. There may be some differences in the average stream life of chum salmon between sloughs, with stream life being defined as a measure of the number of days a fish is physically present in a habitat without regard to visibility. However, a limitation of the observation life data we collected in 1983 is that our sample is too small to account for each differences.

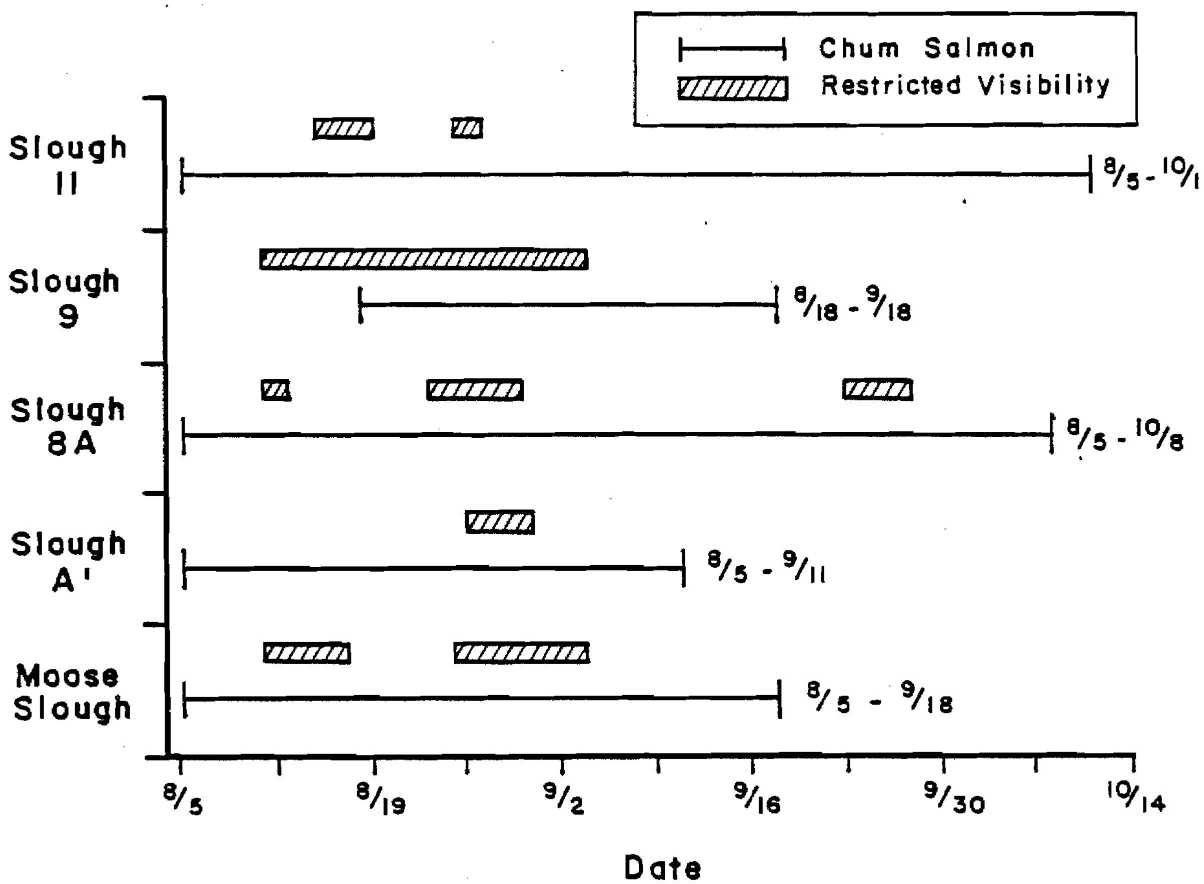


Figure 2-3-31. Periodicities of restricted visibility conditions and chum salmon life observations in 1983 in sloughs Moose, A', 8A, 9 and 11.

In 1983, not all the fish monitored for observation life were confirmed spawners (Table 2-3-42). The percentage of confirmed non-spawners varied between sloughs. At sloughs A' (RM 124.6) and 8A (RM 125.1) all the fish monitored were observed at one time to be spawning. At Moose Slough (RM 123.5) only one of the seven fish monitored spawned. In sloughs 9 (RM 128.3) and 11 (RM 135.3), 10 of the 14 fish monitored and 23 of the 29 fish monitored, respectively, spawned. The high percentage of non-spawners in Moose Slough can be attributed in part to milling activity. Of the seven fish monitored six were classified as milling fish. Two of these six fish later spawned in Slough 11.

Table 2-3-42. Percentages of chum salmon monitored for observation life in 1983 that spawned, by habitat zone, in sloughs Moose, A', 8A, 9 and 11.

Slough with RM 1/	n	Percent Spawning	Spawning Locations by Habitat Zone 2/							Percent Non-spawning 3/
			1	2	3	4	5	6	7	
Moose RM 123.5	7	14.3	100.0	0.0	-	-	-	-	-	85.7
A' RM 124.6	13	100.0	-	-	-	-	-	-	-	0.0
8A RM 125.1	5	100.0	20.0	80.0	0.0	-	-	-	-	0.0
9 RM 128.3	14	71.4	0.0	40.0	60.0	-	-	-	-	28.6
11 RM 135.3	29	79.3	39.1	52.2	0.0	8.7	0.0	0.0	0.0	20.7

1/ RM = River Mile

2/ Habitat zones defined in Appendix Figures 2-G-2 thru 2-G-5.

3/ Includes milling fish and also bear killed and other non-spawning mortalities.

Table 2-3-42 in combination with Appendix Figures 2-G-2 thru 2-G-5 summarize where the chum salmon monitored for observation life in 1983 spawned within sloughs Moose (RM 123.5), 8A (RM 125.1), 9 (RM 128.3) and 11 (RM 135.3). The most obvious finding was that spawning chum salmon generally had a higher preference towards the lower slough habitat zones than sockeye salmon. At

Slough 11 about 90 percent of the chum salmon spawned in habitat zones 1 and 2 whereas about 85 percent of the sockeye salmon spawned above habitat zone 3 (Section 3.2.2.2.2.3.1).

3.2.4.2.2.3.2 Escapement

In 1983, 35 sloughs above RM 98.6 were surveyed for salmon. The results are in Appendix Table 2-G-2.

Twenty three of the 35 sloughs surveyed above RM 98.6 contained chum salmon in 1983 (Table 2-3-43). Eighteen of these sloughs were used for spawning. Sloughs 3B (RM 101.4), 5 (RM 107.6), 6A (RM 112.3), 8D (RM 121.8) and 10 (RM 133.8) were considered milling areas based on the absence of carcasses and spawning activity.

The highest concentrations of spawning chum salmon were found in sloughs 11 (16.2%), 21 (21.8%) and 9 (11.5%) between the second week of August and the last week of September, 1983. Spawning peaked in these sloughs between the last week of August and the first week of September (Figure 2-3-32 and Appendix 2-G).

The total peak spawning count of chum salmon to sloughs above RM 98.6 for 1983 is 1,467 fish (Table 2-3-44). This count (1,467) represents an index of the total escapement (Cousens et al., 1982). An estimate of the total spawning escapement into sloughs as provided in Table 2-3-44 is 2,950 fish. This estimate represents about 14 percent of the estimated chum salmon

Table 2-3-43. Chum salmon peak 1983 escapement counts for sloughs above RM 98.6.

Slough	River Mile	Date	Number Counted		
			Live	Dead	Total
2	100.2	9/12	37	12	49
3B	101.4	8/26	3	0	3
5	107.6	8/15	1	0	1
6A	112.3	9/5	6	0	6
8D	121.8	8/3	1	0	1
8C	121.9	9/9	2	2	4
8B	122.2	9/9	104	0	104
Moose	123.5	8/5	68	0	68
A'	124.6	8/15	76	1	77
A	124.7	8/27	1	1	2
8A	125.1	8/30	34	3	37
B	126.3	9/11	3	4	7
9	128.3	9/11	105	64	169
9A	133.8	9/18	88	17	105
10	133.8	10/1	1	0	1
11	135.3	9/18	94	144	238
13	135.9	9/1	0	4	4
15	137.2	8/25	1	1	2
17	138.9	8/25	89	1	90
19	139.7	9/3	2	1	3
20	140.0	9/3	33	30	63
21	141.0	9/9	149	170	319
22	144.5	8/18	109	5	114
		TOTAL	1,007	460	1,467

escapement to Curry Station (RM 120) of 21,100 fish. The balance of the escapement, about 18,000 chum salmon, are fish which were milling and later spawned below RM 98.6, and fish which spawned in the Susitna River main channel and streams above RM 98.6.

Table 2-3-44. Total 1983 chum salmon slough escapements between RM 98.6 and 161.0.

Slough	River Mile	Total Fish Days [1]	Peak Live-Dead Survey Count	Mean Observation Life in Days	Slough Escapement	% of Total Slough Escapement	% of Curry [3] Station Escapement
2	100.2	659.0	49	6.9	96	3.3	0.5
8C	121.9		4		8 [2]	0.3	0.1
8B	122.2	1,799.8	104	6.9	261	8.9	1.2
Moose	123.5	846.1	68	9.8	86	2.9	0.4
A'	124.6	1,036.8	77	6.7	155	5.3	0.7
A	124.7		2		4 [2]	0.1	0.1
8A	125.1	730.0	37	6.5	112	3.8	0.5
B	126.3		7		14 [2]	0.5	0.1
9	128.3	1,765.0	169	4.1	430	14.6	2.0
9A	133.8	1,595.6	105	6.9	231	7.9	1.1
11	135.3	5,055.2	238	7.5	674	22.9	3.2
13	135.9		4		8 [2]	0.3	0.1
15	137.2		2		4 [2]	0.1	0.1
17	138.9	1,143.4	90	6.9	166	5.6	0.8
19	139.7		3		6 [2]	0.2	0.1
20	140.0	713.1	63	6.9	103	3.5	0.5
21	141.1	3,321.0	319	6.9	481	16.3	2.3
22	144.5	722.8	114	6.9	105	3.5	0.5
TOTAL		19,387.8	1,455	-	2,944	100.0	13.8

1/ Number of fish days were calculated for sloughs that had peak survey counts > 15 fish. Refer to Section 2.4 for detailed data analysis procedures.

2/ Total slough escapement into sloughs having peak live-dead survey counts of ≤ 15 fish were computed by multiplying the peak live-dead survey count by 2.0. This value represents the summation of the estimated slough escapement divided by the summation of the peak live-dead survey counts for all sloughs with peak survey counts ≥ 50 fish.

3/ 1983 Curry Station chum salmon escapement was approximately 21,100 fish.

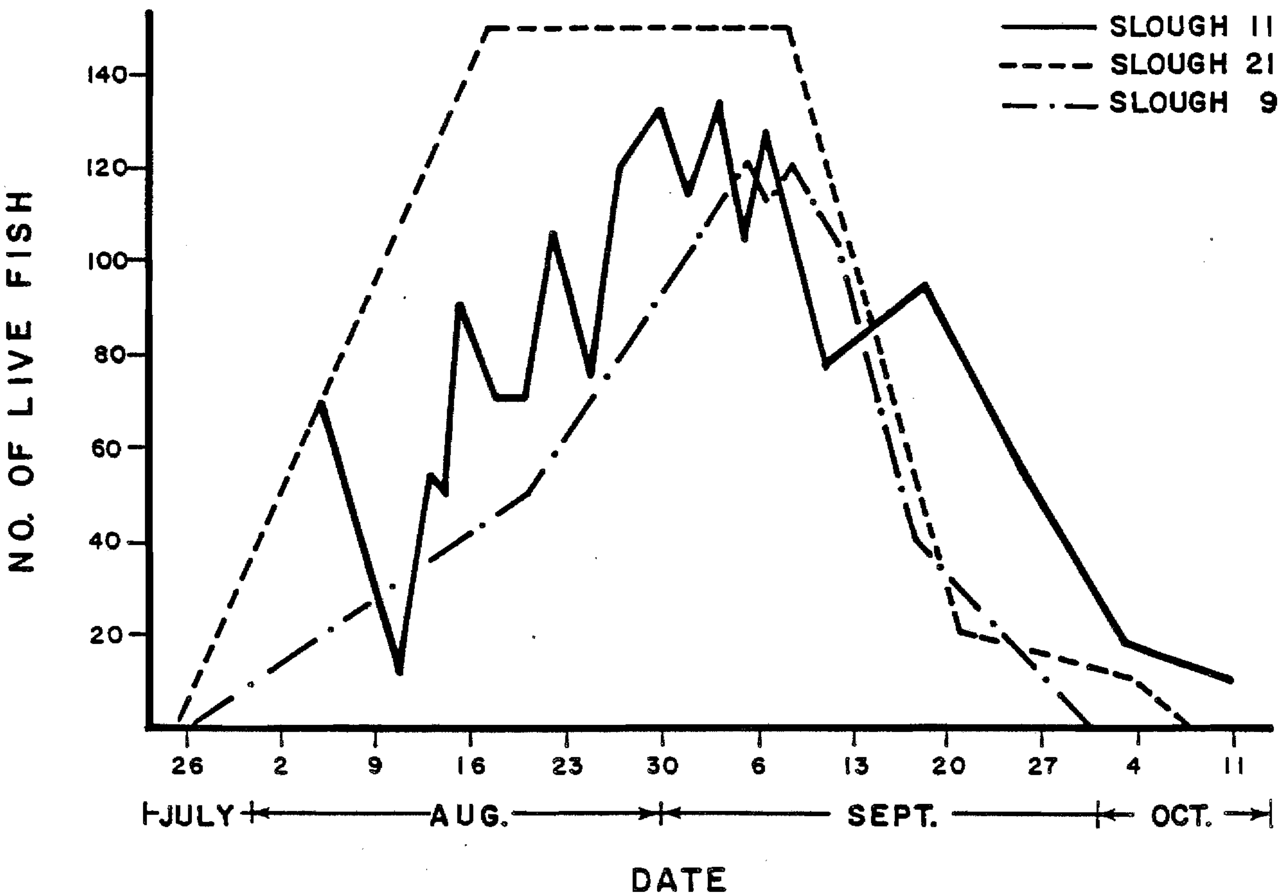


Figure 2-3-32. Chum salmon live counts by date in 1983 in sloughs 9, 11 and 21.

3.2.4.2.2.3.3 Egg Retention

In 1983, 229 female chum salmon carcasses were sampled for egg retention in 12 sloughs and one main channel spawning area between RM 98.6 and 161.0 (Table 2-3-45). The average egg retention from a composite of these samples is 114.1 eggs per female. The median retention is 5.0 eggs which indicates nearly all the females sampled had completely spawned. Less than four percent of the females sampled had died with an egg retention of more than 1,000 eggs each (Figure 2-3-33).

Table 2-3-45. Egg retention of chum salmon at selected spawning habitats in 1983 between RM 98.6 and 161.0.

Spawning Habitat with RM 1/	Sample Size	Egg Retention		
		Mean	Median	Range
Slough 2 RM 100.2	1	335.0	-	-
Moose Slough RM 123.5	7	386.4	5.0	0-1719
Slough A' RM 124.6	17	56.1	5.0	0-754
Slough 8A RM 125.1	2	4.0	4.0	1-7
Slough 9 RM 128.3	51	101.4	9.0	0-1765
Slough 9A RM 133.8	1	21.0	-	-
Main Channel RM 135.2	13	125.0	16.0	0-539
Slough 11 RM 135.3	53	150.0	2.0	0-3188
Slough 17 RM 138.9	4	39.3	27.0	3-102
Slough 19 RM 139.7	2	87.0	87.0	2-172
Slough 20 RM 140.0	12	146.3	4.0	0-1674
Slough 21 RM 141.1	64	82.5	3.5	0-1074
Slough 22 RM 144.5	2	0	-	0
Composite of all sloughs sampled	229	114.1	5.0	0-3188

1/ RM = River Mile

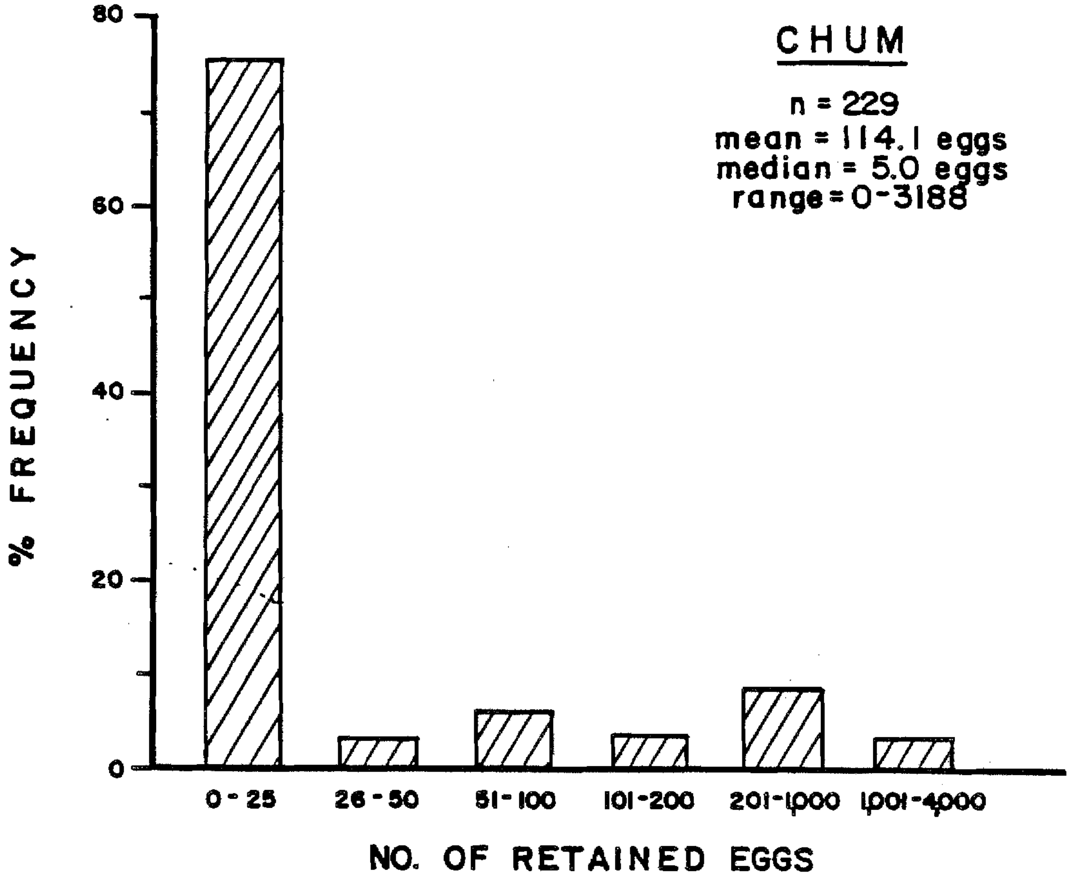


Figure 2-3-33. Percent frequency of egg numbers retained by female chum salmon sampled in sloughs above RM 98.6 in 1983.

3.2.5 Coho Salmon

3.2.5.1 Intertidal to Talkeetna

3.2.5.1.1 Main Channel Escapement Monitoring

The 1983 escapement of coho salmon into the Yentna River (RM 28) was monitored by SSS counters located at Yentna Station (TRM 04). The escapement was about 8,850 fish (Table 2-3-22). Daily coho salmon passage rates are presented in Appendix Table 2-C-3 and Appendix Figure 2-C-1.

At Sunshine Station (RM 80) the coho salmon escapement was an estimated 15,200 fish in 1983 (Table 2-3-46). This value was derived using tag/recapture estimation techniques and has an associated 95 percent confidence interval of 13,400 to 17,500 fish (Table 2-3-46).

Table 2-3-46. Petersen population estimates with associated 95% confidence intervals for 1983 coho salmon migration to Sunshine, Talkeetna and Curry stations.

Parameter 1/	Population Estimate Location		
	Sunshine Station	Talkeetna Station	Curry Station
m	2,243	364	70
c	1,243	275	117
r	183	41	10
$\hat{N}$	15,171	2,399	761
95% C.I.	13,386- 17,506	1,774- 3,325	425- 1,551

1/ m = Number of fish marked (adjusted).
c = Total number of fish examined for marks during sampling census.
r = Total number of marked fish observed during sampling census.
$\hat{N}$ = Population estimate.
C.I. = Confidence interval around $\hat{N}$.

In 1983, 574 coho salmon were intercepted by the two fishwheels operated at Yentna Station (TRM 04) over a 59 day migrational period (Table 2-3-11). Based on these fishwheel catches, the migration began on July 15, reached a midpoint on July 27 and extended through the last operational day, September 4. The migration peak occurred on about July 23 (Appendix Table 2-D-3). Coho salmon were more abundant along the south bank, where 63 percent of the fishwheel catch at this station was recorded (Figure 2-3-34).

Based on fishwheel catches the coho salmon migration to Sunshine Station (RM 80), in 1983, began on July 23, reached a midpoint on August 5 and was essentially complete by August 25. The migration reached a peak on August 4 (Appendix Table 2-D-6). Eighty-two percent of the 2,254 coho salmon were captured along the east bank at this station (Table 2-3-11 and Figure 2-3-34).

The distribution of fishwheel catch per hour as a function of time is illustrated in Figure 2-3-34 and reveals a distinct bimodal pattern in the coho salmon catch curve for fishwheels located on both banks of the river at Yentna (TRM 04) and Sunshine (RM 80) stations. This pattern is also apparent for fishwheels located at Talkeetna (RM 103) and Curry (RM 120) stations (Figure 2-3-35). Three possible explanations may serve to explain this distribution. They are: 1) delayed response to coho salmon catches in the Cook Inlet commercial fishery, 2) stock differences in migrational timing of coho salmon, and 3) alteration in migrational movements in response to a variation in seasonal Susitna River discharges. In reviewing the fishwheel

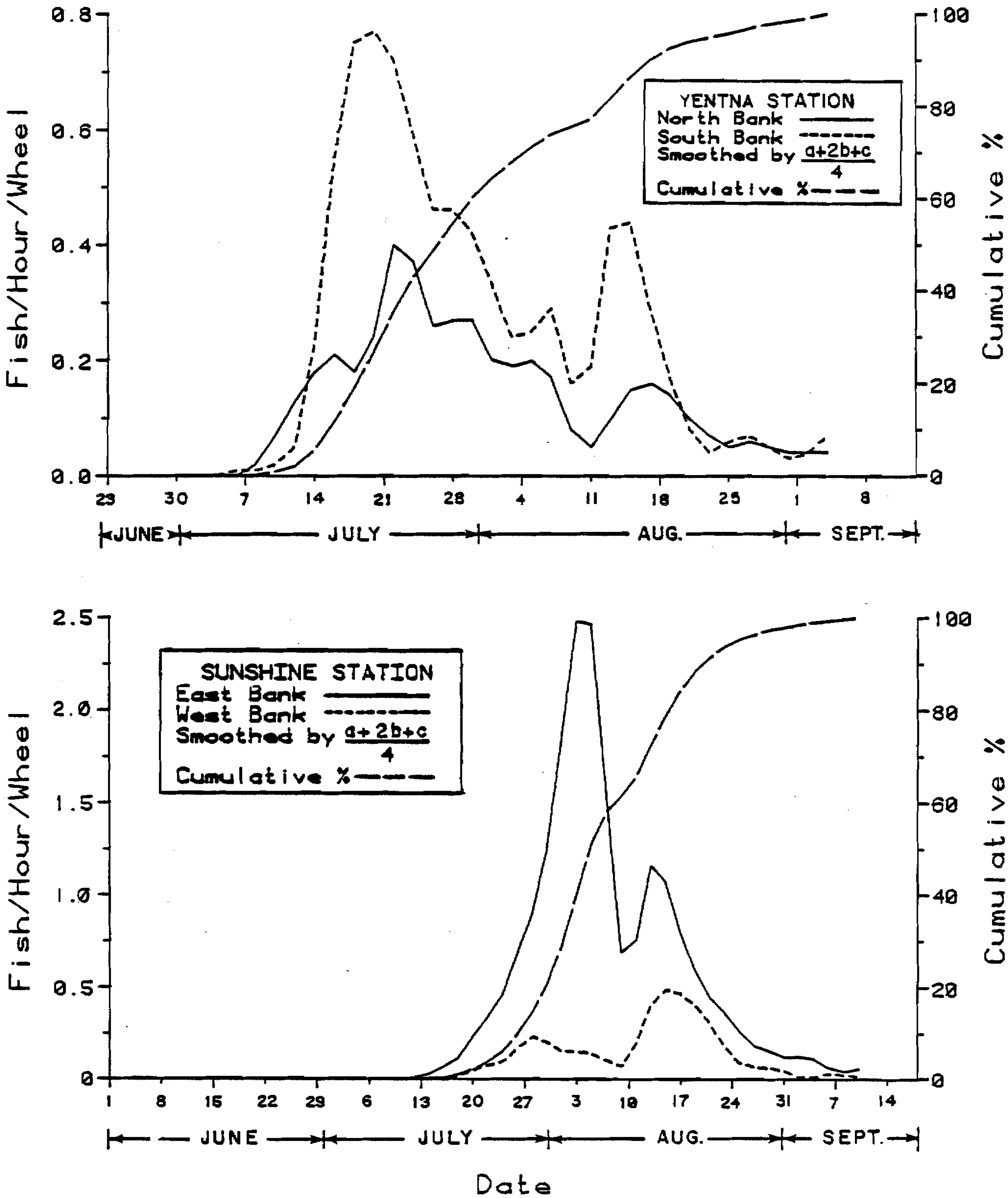


Figure 2-3-34. Mean hourly and cumulative percent fishwheel catch of coho salmon by two day periods at Yentna and Sunshine stations in 1983.

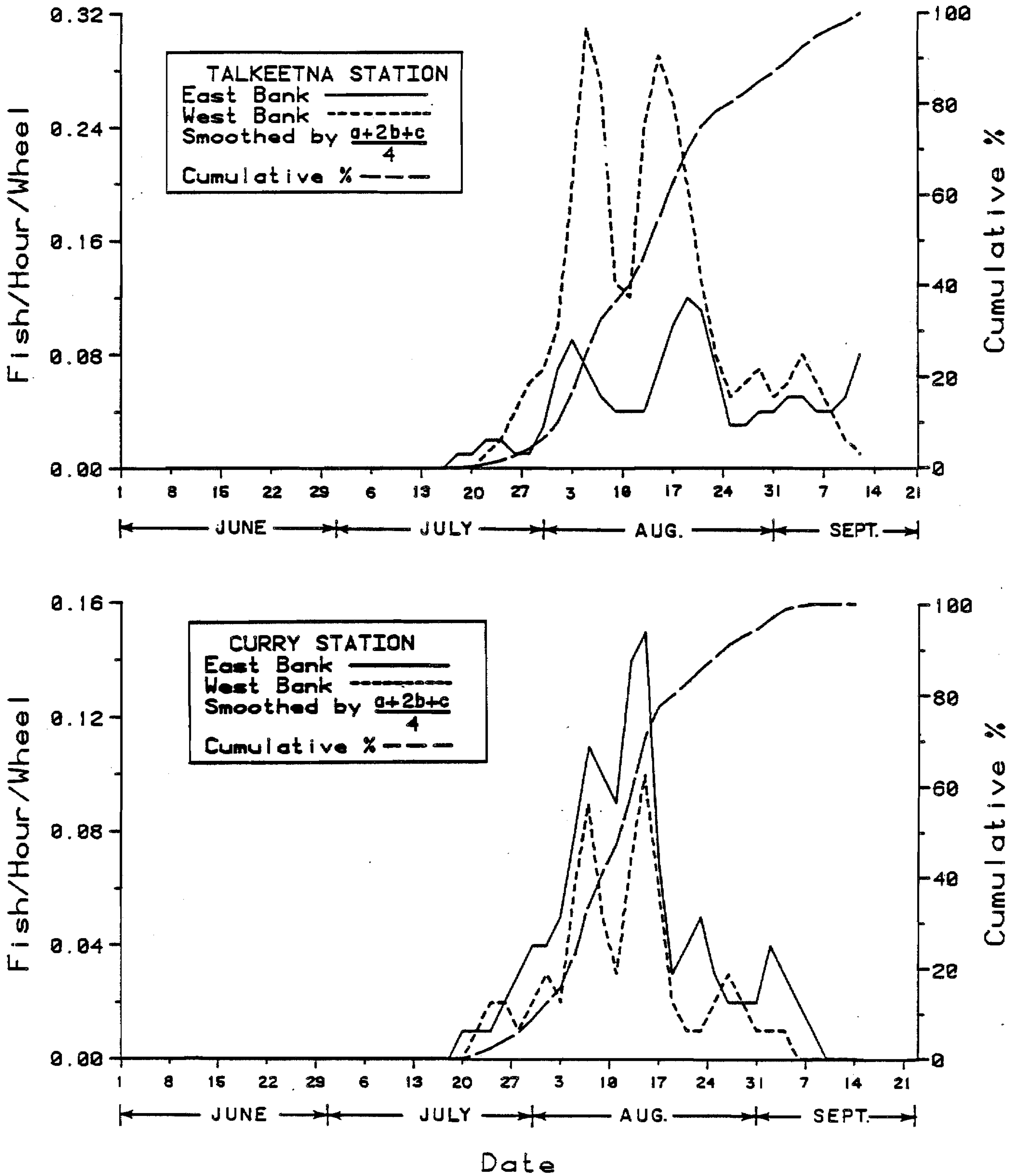


Figure 2-3-35. Mean hourly and cumulative percent fishwheel catch of coho salmon by two day periods at Talkeetna and Curry stations in 1983.

catch figures it can be seen that the low catches occur on about the same days, August 9 and 10, at all four sampling stations. Differential migrational rates for individual stocks and low catches as a result of the commercial fishery would result in low points in the fishwheel catch distribution at time intervals corresponding to coho salmon migrational rates between stations. An examination of 1983 USGS provisional Susitna and Yentna rivers discharge data shows that peak flows (flooding conditions) occurred from August 9 to 11 in both rivers (Figure 2-3-25). These peak flows correspond to the low points in the fishwheel catch per hour curve and cessation of migration during these flows would seem to be the most plausible explanation to the bimodal catch distribution at these stations.

A portion of the 1983 coho salmon escapement passing Yentna (TRM 04) and Sunshine (RM 80) stations were sampled to identify population age composition. Results are summarized in Figure 2-3-36 and Table 2-3-47. Coho salmon migrating to Yentna Station were comprised of 80.4 percent four year old fish, 16.1 percent three year old fish and 3.5 percent five year old fish. All coho salmon sampled spent at least one winter rearing in freshwater and 80.7 percent migrated to sea in their third year of life. Interestingly, 2.6 percent of the sample did not overwinter in the ocean environment but returned in the fall of the same year they migrated to sea. At Sunshine Station, 516 coho salmon ages were collected from the escapement (Table 2-3-47). About 63.3, 35.9 and 0.8 percents represented four, three and five year old fish, respectively. The majority of the coho salmon sampled (63.1%), outmigrated in their third year of life.

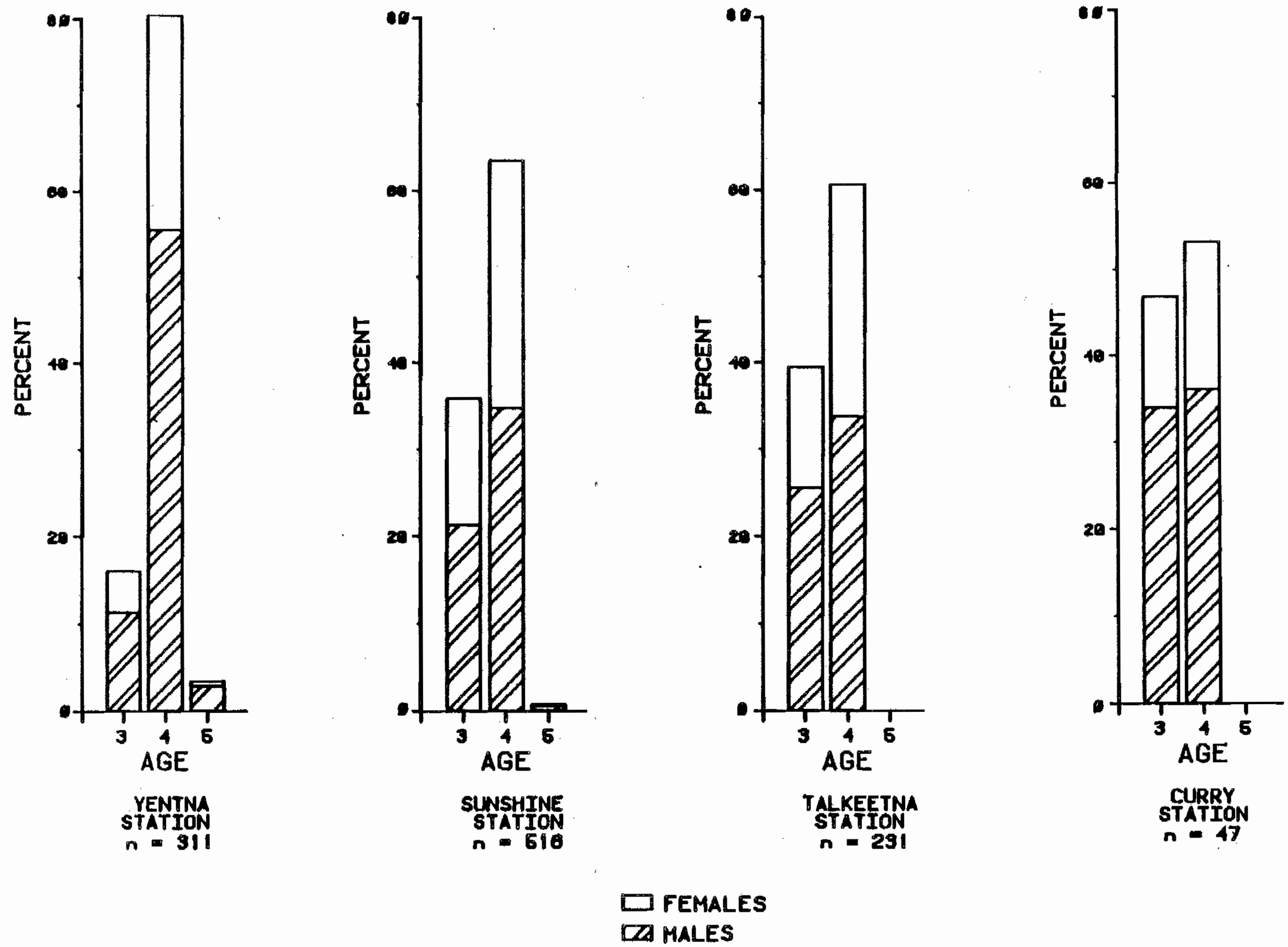


Figure 2-3-36. Age composition of fishwheel intercepted coho salmon at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Table 2-3-47. Analysis of coho salmon age data by percent from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	n	Age Class 1/					
		3_2	3_3	4_2	4_3	4_4	5_4
Yentna Station	311	14.5	1.6	0.3	79.1	1.0	3.5
Sunshine Station	516	35.9	-	0.2	63.1	-	0.8
Talkeetna Station	231	39.4	-	0.4	60.2	-	-
Curry Station	47	46.8	-	-	53.2	-	-

1/ Gilbert-Rich Notation

Length (FL) and related age information collected from a subsample of coho salmon at Yentna (TRM 04) and Sunshine (RM 80) stations in 1983 are summarized in Table 2-3-48. The mean length of all coho salmon measured at Yentna Station was 528 mm. The composite mean length of all coho salmon measured at Sunshine Station was 523 mm. Sex composition relative to age for coho salmon collected at Yentna and Sunshine stations in 1983 indicate that males were consistently more abundant than females for all ages at both sites, with overall sex ratios of 2.3:1 and 1.2:1 in the above station order (Table 2-3-49).

3.2.5.2 Talkeetna to Upper Devil Canyon

3.2.5.2.1 Main Channel Escapement Monitoring

The coho salmon escapement to Talkeetna Station (RM 103) was about 2,400 fish in 1983 (Table 2-3-46). At Curry Station (RM 120) the escapement was about 800 coho salmon (Table 2-3-46). Both estimates include an unknown number of

Table 2-3-48. Analysis of coho salmon lengths, in millimeters, by age class from escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations in 1983.

Collection Site	Age Class	n M [1/]	n F [2/]	Range Limits M	Range Limits F	Mean M	Mean F	95% Conf. Interval [3/] M	95% Conf. Interval [3/] F	Median M	Median F
Yentna Station	3_2	30	15	405-598	395-571	492	492	472-511	464-521	481	505
	3_3	5	-	240-330	-	293	-	-	-	286	-
	4_2	-	1	-	531	-	531	-	-	-	531
	4_3	170	76	320-655	387-609	543	538	534-551	528-549	556	552
	4_4	3	-	300-331	-	315	-	-	-	315	-
	5_4	9	2	552-625	542-597	596	570	-	-	592	570
	ALL [4/]	349	149	240-679	348-613	527	530	519-535	522-539	548	542
		498		240-679		528		522-534		544	
Sunshine Station	3_2	110	75	385-625	400-585	487	491	478-496	480-502	488	500
	4_2	-	1	-	475	-	475	-	-	-	475
	4_3	179	147	395-630	410-640	539	540	531-547	534-547	545	540
	5_4	3	1	600-645	570	625	570	-	-	630	570
	ALL [4/]	438	356	385-665	400-640	523	524	517-528	519-530	520	530
		794		385-665		523		520-527		525	
Talkeetna Station	3_2	59	32	380-595	395-590	482	499	468-496	481-517	470	510
	4_2	1	-	450	-	450	-	-	-	450	-
	4_3	77	62	430-640	450-680	542	552	530-553	542-561	550	555
	ALL [4/]	226	135	340-690	395-700	522	538	514-530	530-546	530	540
		361		340-700		528		522-534		540	
Curry Station	3_2	16	6	430-530	354-555	477	480	461-493	-	470	500
	4_3	17	8	480-610	500-590	554	553	534-575	-	555	560
	ALL [4/]	48	24	420-610	354-600	518	530	503-534	-	515	543
		72		354-610		522		509-535		530	

1/ Males 2/ Females 3/ Confidence Interval of the Mean. 4/ Composite of all aged and non-aged samples.

milling fish which returned downstream to spawn below the respective stations.

Table 2-3-49. Sex ratios of male and female coho salmon by age from 1983 escapement samples collected at Yentna, Sunshine, Talkeetna and Curry stations.

Collection Site	Age	Sample Size	Number		Sex Ratio (M:F)
			Males	Females	
Yentna Station	3	50	35	15	2.3:1
	4	250	173	77	2.2:1
	5	11	9	2	4.5:1
	All 1/	498	349	149	2.3:1
Sunshine Station	3	185	110	75	1.5:1
	4	327	179	148	1.2:1
	5	4	3	1	3.0:1
	All 1/	794	438	356	1.2:1
Talkeetna Station	3	91	59	32	1.8:1
	4	140	78	62	1.3:1
	All 1/	361	226	135	1.7:1
Curry Station	3	22	16	6	2.7:1
	4	25	17	8	2.1:1
	All 1/	72	48	24	2.0:1

1/ Includes all aged and non-aged samples.

As depicted in Appendix Table 2-D-9 and Figure 2-3-35, fishwheel catches indicate the 1983 coho salmon migration at Talkeetna Station (RM 103) began on July 30, reached a median on August 14 and was essentially complete by

September 7. The migration peak was on August 16. Coho salmon were more abundant along the west bank where 69 percent of the fishwheel catch at this station was recorded (Figure 2-3-35).

At Curry Station (RM 120), the 1983 coho salmon migration started on July 28, was mid-way through on August 12 and virtually complete by September 2 (Appendix Table 2-D-12 and Figure 2-3-35). The peak of migration occurred on August 15. Sixty-three percent of the 93 captures were recorded along the east bank (Figure 2-3-35).

Migrational rates were calculated from recaptures of coho salmon tagged at Sunshine (RM 80) and Talkeetna (RM 103) stations in 1983 (Figure 2-3-37). As illustrated, coho required an average of 17 days to navigate the 23 miles between Sunshine and Talkeetna stations, for a mean travel rate of 1.4 mpd. The 17 miles between Talkeetna and Curry (RM 120) stations were traveled in an average of three days for a rate of 5.7 mpd. Between Sunshine and Curry stations the average travel time was 21 days or 2.0 mpd. These differences indicate that coho salmon spend more time milling between RM 80 and 103 than between RM 103 and 120.

Two hundred thirty-one and 47 coho salmon intercepted by fishwheels at Talkeetna (RM 103) and Curry (RM 120) stations were sampled for age in 1983 (Table 2-3-47 and Figure 2-3-36). The sample collected at Talkeetna Station segregated to 60.6 percent four year old fish and 39.4 percent three year old fish. The majority of the coho salmon (60.2%) migrated to sea in their third year of life. The escapement sampled at Curry Station were comprised of 53.2 and 46.8 percent four and three years old fish, respectively. Again the

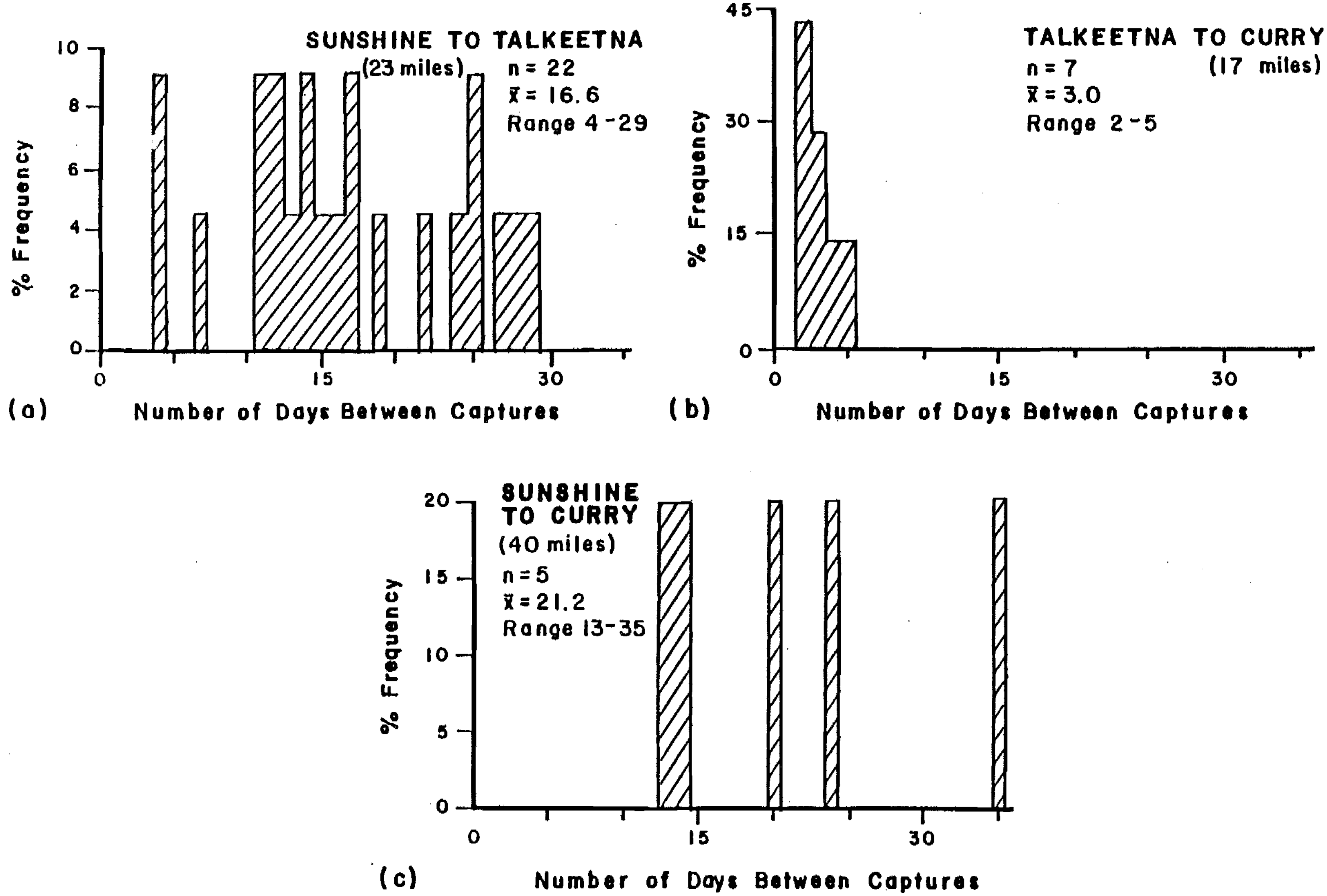


Figure 2-3-37. Migrational rates of coho salmon between (a) Sunshine and Talkeetna stations, (b) Talkeetna and Curry stations and (c) Sunshine and Curry stations, 1983.

majority of the fish, 53.2 percent, migrated to sea in their third year of life.

Length (FL) and associated age data were also collected from a subsample of the coho salmon intercepted at Talkeetna (RM 103) and Curry (RM 120) stations in 1983. The results of these measurements are presented in Table 2-3-48 and Appendix 2-E. The coho salmon sampled at Talkeetna Station averaged 528 mm and at Curry Station, 522 mm. The number of males was consistently greater than the number of females among all ages sampled at both Talkeetna and Curry stations as shown in Table 2-3-49. The overall male to female sex ratios for all fish sampled at these two stations was 1.7:1 and 2.0:1, respectively.

3.2.5.2.2 Spawning Ground Surveys

3.2.5.2.2.1 Main Channel

There was no specific Susitna River main channel spawning survey program in 1983. However, while conducting slough and stream surveys one main channel coho salmon spawning site was located at RM 131.1. As illustrated in Appendix Figure 2-G-8 this site was approximately 150 yards upstream from the confluence of 4th of July Creek. Two coho salmon were observed near redd sites here on October 1 (Appendix Table 2-G-1).

3.2.5.2.2.2 Sloughs and Streams

All 35 known Susitna River sloughs between RM 98.6 and 161.0 were surveyed for coho salmon presence in 1983. These surveys were conducted between July 26 and October 8 with the results listed in Appendix Table 2-G-2.

Coho salmon were observed in three of the 35 sloughs surveyed in 1983 although this presence was considered to represent milling, not spawning activity (Appendix Table 2-G-2).

Tributary streams to the Susitna River above RM 98.6 and below 161.0 were also surveyed regularly for coho salmon in 1983 (Appendix Table 2-G-3). Ten streams were found to have coho salmon (Table 2-3-50). These survey counts do not represent total escapements into tributaries but were counts of standard index reaches for each tributary. Helicopter surveys of selected

Table 2-3-50. Peak coho salmon index counts of streams surveyed by foot above RM 98.6, 1983.

Stream	River Mile	Date	Number Counted Live	Dead	Total
Whiskers Creek	101.4	9/15	55	0	55
Chase Creek	106.9	10/8	0	1	1
Slash Creek	111.2	10/2	2	0	2
Gash Creek	111.6	9/19	18	1	19
Lane Creek	113.6	9/19	2	0	2
L. McKenzie Creek	116.2	10/1	18	0	18
4th of July Creek	131.0	9/18	2	1	3
Indian River	138.6	8/19	27	0	27
Jack Long Creek	144.5	10/1	1	0	1
Portage Creek	148.9	8/18	2	0	2
		TOTAL	127	3	130

tributaries indicate that Whiskers Creek (RM 101.4) and Indian River (RM 138.6) were the two most important spawning tributaries in 1983 (Table 2-3-51).

Table 2-3-51. Coho salmon peak 1983 counts by helicopter of selected streams above RM 98.6.

Stream	River Mile	Date	Number Counted		
			Live	Dead	Total
Whiskers Creek	101.4	9/24	110	5	115
Chase Creek	106.9	10/1	5	1	6
Indian River	138.6	9/10	53	0	53
Portage Creek	148.9	9/25	15	0	15
		TOTAL	183	6	189

Survey observations indicate coho salmon spawning activity in streams reached a peak between the first week of September and the first week of October in 1983. At Whiskers Creek (RM 101.4) peak spawning occurred during the last two weeks of September (Appendix Table 2-G-3).

Ground and helicopter surveys in Indian River (RM 138.6) indicate that the coho salmon observed initially during foot surveys of the first mile continue to move upstream and presumably spawn in the middle and upper reaches of Indian River (Figure 2-3-38).

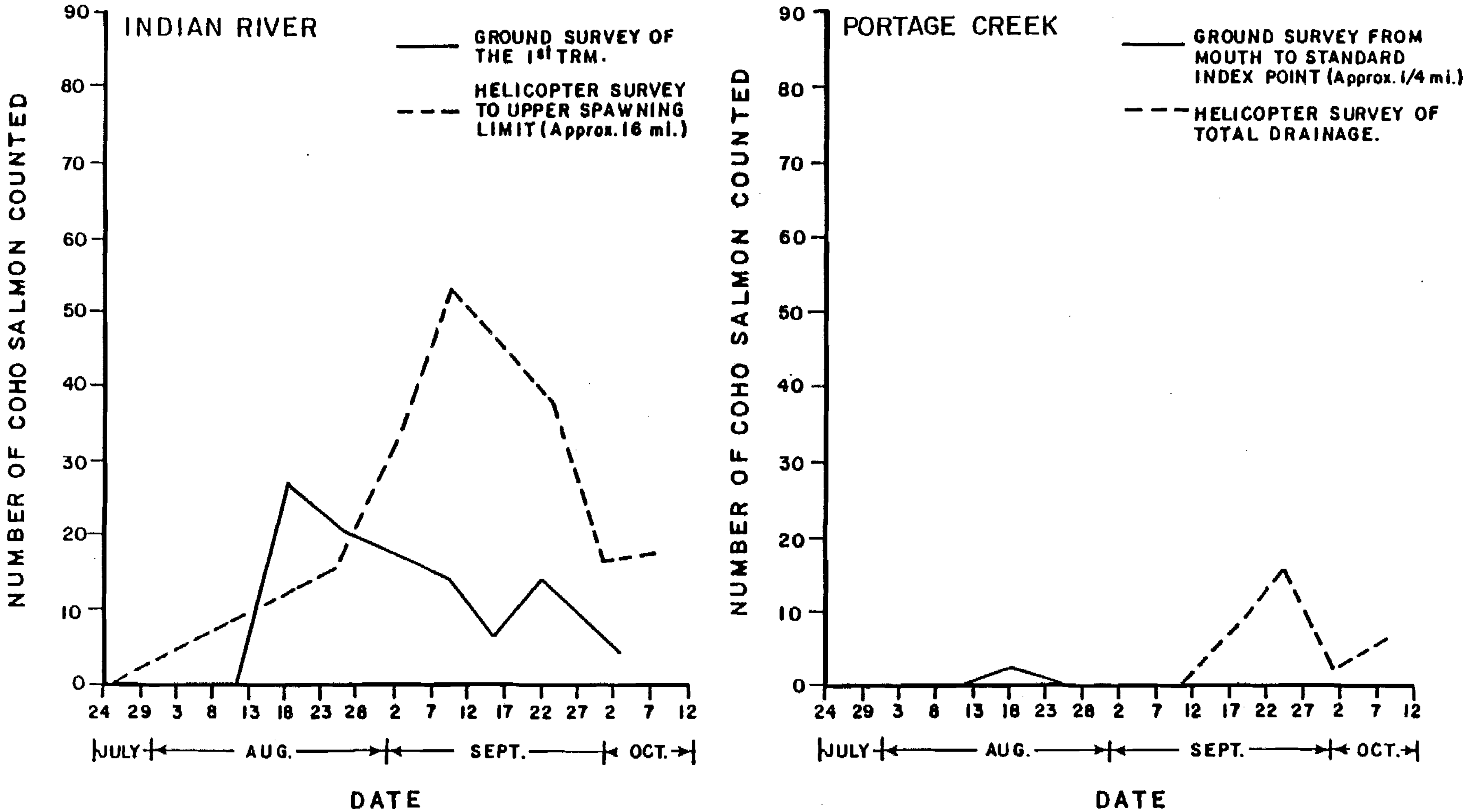


Figure 2-3-38. Peak coho salmon ground and helicopter survey counts of Indian River and Portage Creek in 1983.

3.3 Bering Cisco

3.3.1 Intertidal to Talkeetna

3.3.1.1 Main Channel Escapement Monitoring

No provision was made to estimate Bering cisco escapements or ascertain their migrational timing characteristics in 1983. However, fishwheel catches of Bering cisco were recorded incidental to adult salmon studies at both Yentna (TRM 04) and Sunshine (RM 80) stations (Table 2-3-52).

Table 2-3-52. Summary of 1983 Bering cisco interceptions by location and gear type.

Sampling Location	River Mile	Gear Type	Date		Number Caught
			First Capture	Last Capture	
Yentna Station	04	Fishwheel	8/20	9/4	24
Sunshine Station	80	Fishwheel	8/28	9/10	29
Talkeetna Station	103	Fishwheel	8/30	9/10	5
Main Channel	101.0-131.1	Gillnet and Electroshocker	9/15	10/6	9

At Yentna Station (TRM 04) fishwheels intercepted 24 Bering cisco in 1983. The first capture was recorded on August 20 and the last capture on September 4, the last day of fishwheel operation at this station (Appendix Table 2-D-3). There is insufficient information available to define any migrational timing characteristics. Most Bering cisco were found to migrate along the south bank where 67.7 percent of the fishwheel captures occurred.

Sunshine Station (RM 80) fishwheels, operational from June 3 until September 11, intercepted 29 Bering cisco in 1983 (Appendix Table 2-D-6). The first recorded fishwheel catch was on August 28 with catches continuing through September 10 (Table 2-3-52). Bering cisco exhibited an affinity for migration along the east bank at this station as evidenced by 86.2 percent of the catch occurring in east bank fishwheels.

3.3.2 Talkeetna to Upper Devil Canyon

3.3.2.1 Main Channel Escapement Monitoring

There was no program designed specifically to monitor Bering cisco abundance, migrational characteristics or spawning activities in 1983. Bering cisco information was gathered incidental to adult salmon and resident and juvenile studies.

Talkeetna Station (RM 103) fishwheels, operating from June 7 through September 12, intercepted five Bering cisco in 1983 (Table 2-3-52). The first capture was recorded on August 30 and the last on September 10 (Appendix Table 2-D-9). Three of these captures occurred in east bank fishwheels and two in west bank fishwheels. No age, length or sex data were collected from the Bering cisco intercepted at this station.

Curry Station (RM 120) fishwheels were operational from June 9 through September 14 in 1983. There were no recorded captures of Bering cisco in this time period at this station (Appendix Table 2-D-12).

While conducting related resident and juvenile studies, Su Hydro biologists captured or observed nine Bering cisco between September 16 and October 6, 1983. Eight Bering cisco were electroshocked or gillnetted in main channel sites between RM 101.0 and 102.2. The ninth was electroshocked near the confluence of Fourth of July Creek (RM 131.1) on October 6. None of the nine Bering cisco captured in the main channel were in spawning condition at the time of capture.

4.0 SUMMARY

The 1981 and 1982 data referenced in this section have been taken from the ADF&G, Phase I (1981) and Phase II (1982) Adult Anadromous Fisheries reports.

4.1 Eulachon

For the last two years (1982-83), two eulachon migrations have entered the Susitna River. In 1982 the first migration passed through the intertidal reach (RM 0-7) after ice breakup, in late May (5/16-30). A second migration followed in early June (6/1-8). In 1983, the first migration occurred in mid May (5/10-17) followed by a second migration in mid May and early June (5/19-6/6).

In 1982 eulachon entered the Susitna River at a river temperature range of 2° to 10°C and in 1983, 3° to 11°C. This is similar to the 2° to 10°C temperature range of the Columbia River (Washington) when eulachon enter that system (Smith and Saalfeld, 1955). No correlation was found between daily fluctuations in Susitna River temperature or Cook Inlet high tide level and eulachon abundance in the intertidal reach (RM 0-7).

The upper distance of eulachon migration in the Susitna River was about 50 miles in 1982 and 1983. The first migration reached RM 40.5 in 1982 and RM 28.5 in 1983. The second migration reached RM 48.5 and 50.5 in 1982 and 1983, respectively. The largest concentrations of first and second migration eulachon in both years remained in the initial 29 miles of the Susitna River main channel.

Eulachon started spawning in the Susitna River main channel within about five days of entering the river in 1982 and 1983. First migration fish spawned in 1982 between May 21 and 31 and in 1983, between May 15 and 22. Second migration eulachon spawned in 1982 between June 4 and 9 and in 1983, between May 23 and June 5.

In 1982 and 1983, first and second migration eulachon generally spawned in the same habitat type in the Susitna River main channel. In both years major spawning occurred near cut banks and riffle areas with loose sand and gravel substrate and moderate water velocity (approximately 1.5 ft/sec).

Water temperatures were colder in the Susitna River when first and second migration eulachon spawned in 1982 as compared to 1983. First migration fish spawned at temperatures averaging 5.8°C (1982) and 7.3°C (1983). Temperatures averaged 7.5°C (1982) and 8.3°C (1983) when the second migration spawned.

In 1982 and 1983, eulachon did not spawn in clear water tributaries or sloughs associated with the Susitna River. Spawning occurred in both years in the glacial Yentna River tributary but the extent was not determined.

Eulachon age, length and weight data were collected in 1982 and 1983. The two eulachon migrations in both years were comprised mainly of three year old fish (80-90%). Overall the eulachon were larger in 1982 as compared to 1983. The average fish length in 1982 for combined first and second migration eulachon was 213 mm and in 1983, 206 mm. Average fish weight in 1982 was 72 g and in 1983, 64 g.

In both years (1982-83) male eulachon ripened earlier and remained in spawning condition longer than females. Also, they lived longer. In 1982 the average pre-spawning condition male to female ratio was 1.6:1 in the first migration and 1.3:1 in the second migration. In 1983 the respective ratios were 1.2:1 and 0.6:1. These ratios were dissimilar to the male to female spawning and post-spawning condition ratios which were biased toward males due to female eulachon having a shorter stream life.

The Susitna River eulachon population supported a limited sport fishery in both years (1982-83). The 1982 harvest was in the range of 3,000 to 5,000 fish and in 1983, 500 to 2,000 fish.

In 1982 and 1983 the Susitna River escapement of first migration eulachon was in the range of several hundred thousand fish. The second migration escapement was in the range of several million eulachon in both years.

4.2 Adult Salmon

4.2.1 Chinook Salmon

4.2.1.1 Intertidal to Talkeetna

Chinook salmon escapements have been monitored for the last two years in the Susitna River at Sunshine Station (RM 80). In 1982, the escapement was about 52,900 fish and in 1983, 41 percent higher at 90,100 fish (Figure 2-4-1 and Table 2-4-1).

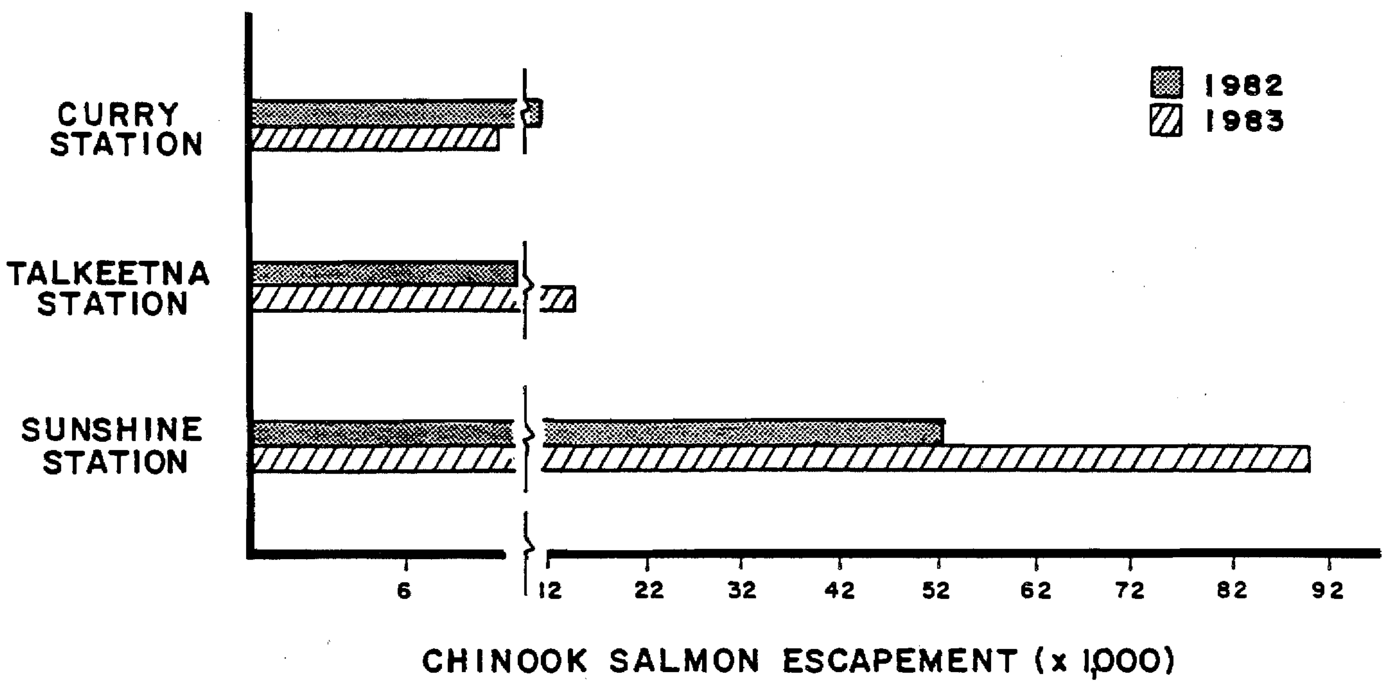


Figure 2-4-1. Minimum Susitna River chinook salmon escapements for 1982 and 1983.

Generally chinook salmon occupy the Susitna River main channel at Sunshine Station (RM 80) for a month between mid June and mid July. At Sunshine Station in 1982, the chinook salmon migration occurred between June 18 and

Table 2-4-1. Escapements by species and sampling locations for 1981, 1982 and 1983.

Sampling Location	Year	Escapement 1/					
		Chinook	Sockeye 2/	Pink	Chum	Coho	Total
Yentna Station	1981	3/	139,400	36,100	19,800	17,000	212,300
	1982		113,800	447,300	27,800	34,100	623,000
	1983		104,400	60,700	10,800	8,900	184,800
Sunshine Station	1981	4/	133,500	49,500	262,900	19,800	465,700
	1982	52,900	151,500	443,200	430,400	45,700	1,123,700
	1983	90,100	71,500	40,500	265,800	15,200	483,100
Talkeetna Station	1981	4/	4,800	2,300	20,800	3,300	31,200
	1982	10,900	3,100	73,000	49,100	5,100	141,200
	1983	14,400	4,200	9,500	50,400	2,400	80,900
Curry Station	1981	4/	2,800	1,000	13,100	1,100	18,000
	1982	11,300	1,300	58,800	29,400	2,400	103,200
	1983	9,600	1,900	5,500	21,100	800	38,900

1/ Escapement estimates were derived from tag/recapture population estimates except Yentna Station escapements which were obtained using side scan sonar.

2/ Second run sockeye salmon escapements.

3/ Yentna Station side scan sonar equipment was not operational on the dates required to estimate the total Yentna River chinook salmon escapement.

4/ Chinook salmon were not monitored for escapement in 1981.

July 9. In 1983 the migration started nine days earlier. The beginning and end dates were June 9 and July 9, respectively (Figure 2-4-2 and Appendix Table 2-D-13).

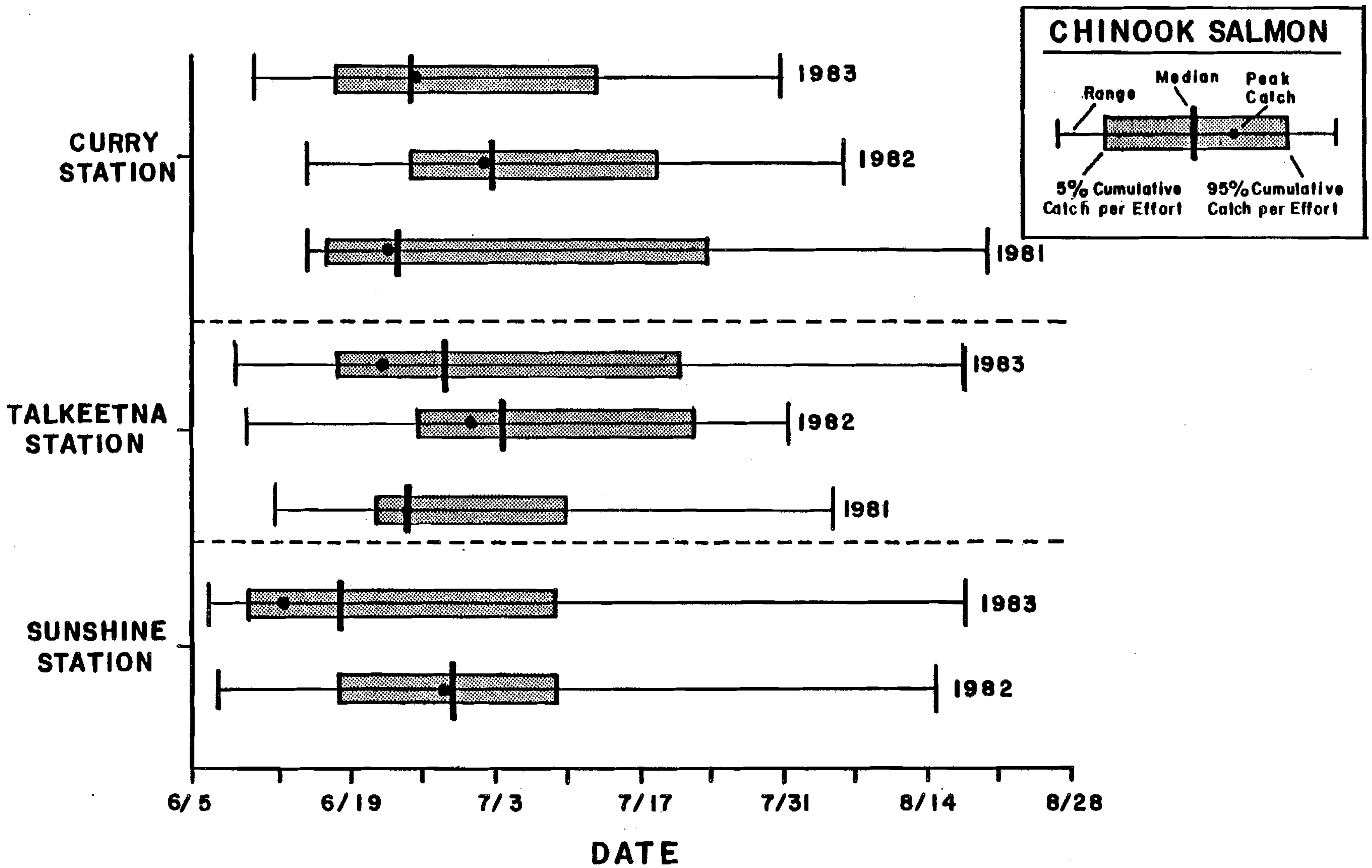


Figure 2-4-2. Migrational timing of chinook salmon based on fishwheel catch per unit effort at selected locations on the Susitna River in 1981, 1982 and 1983.

The chinook salmon escapements at Sunshine Station (RM 80) have been monitored for age, length and sex composition for the last three years. The 1981-83 escapements have included fish ranging in age from three through seven years old (Table 2-4-2). Nearly all the fish sampled in these escapements had gone to sea (smolted) in the second year of life. The dominant age group in the 1981 escapement was the four year olds (32%), in 1982 the six year olds (37%) and in 1983 again, the six year olds (45%). The average length of chinook salmon at Sunshine Station was smaller in 1981 than in 1982 and smaller in 1982 than in 1983 due to escapement age composition changes. Male to female ratios in the three years ranged from 3.5:1 (1981) to 1.2:1 (1982 and 1983) (Table 2-4-3). Generally the females were dominant in the older age groups of the 1981-83 escapements, i.e., among the five, six and seven year old fish.

4.2.1.2 Talkeetna To Upper Devil Canyon

Chinook salmon escapement estimates have been obtained by the Petersen method in the last two years for the Susitna River main channel at Talkeetna (RM 103) and Curry (RM 120) stations. In 1982 about 10,900 chinook salmon reached Talkeetna Station. A 35 percent higher escapement of 14,400 fish occurred in 1983. Seventeen miles upstream at Curry Station an estimated 11,300 chinook salmon reached this location in 1982. The 1983 escapement was about 9,600 fish (Table 2-4-1 and Figure 2-4-1).

In 1981, 1982 and 1983 chinook salmon were abundant in the Susitna River main channel at Talkeetna (RM 103) and Curry (RM 120) stations for about a month. The migration began in each of these years around the third week of June and ended in the third week of July (Figure 2-4-2 and Appendix Table 2-D-13.)

Table 2-4-2. Analysis of chinook salmon age data by percent from escapement samples collected at Sunshine, Talkeetna and Curry stations for 1981-83.

		AGE GROUP					BROOD YEAR						
LOCATION	YEAR	3	4	5	6	7	74	75	76	77	78	79	80
SUNSHINE STATION	1981	27.6	31.9	23.1	16.9	0.5	0.5	16.9	23.1	31.9	27.6	-	-
	1982	15.0	27.4	20.9	36.1	0.4	-	0.4	36.1	20.9	27.4	15.0	-
	1983	1.5	3.9	39.0	45.0	10.6	-	-	10.6	45.0	39.0	3.9	1.5
TALKEETNA STATION	1981	15.8	29.8	21.4	30.1	2.9	2.9	30.1	21.4	29.8	15.8	-	-
	1982	20.7	35.8	20.6	22.3	0.6	-	0.6	22.3	20.6	35.8	20.7	-
	1983	22.5	9.4	34.0	27.9	6.2	-	-	6.2	27.9	34.0	9.4	22.5
CURRY STATION	1981	18.5	34.3	27.8	19.4	0.0	0.0	19.4	27.8	34.3	18.5	-	-
	1982	17.0	29.3	22.5	30.8	0.5	-	0.5	30.8	22.5	29.3	17.0	-
	1983	9.4	3.9	24.4	43.5	18.8	-	-	18.8	43.5	24.4	3.9	9.4

Table 2-4-3. Average male to female sex ratios of chinook salmon escapements at Sunshine, Talkeetna and Curry stations for 1981-83.

	YEAR		
LOCATION	1981	1982	1983
SUNSHINE STATION	3.5:1	1.2:1	1.2:1
TALKEETNA STATION	2.6:1	2.3:1	2.1:1
CURRY STATION	1.9:1	2.3:1	1.4:1

Chinook salmon in 1982 and 1983 migrated at a slower rate in the 23 miles between Sunshine (RM 80) and Talkeetna (RM 103) stations than in the 17 miles between Talkeetna and Curry (RM 120) stations. The average travel rates between Sunshine and Talkeetna stations in 1982 and 1983 were 2.1 and 1.8 mpd respectively. Between Talkeetna and Curry stations for 1982 and 1983 the rates averaged 2.2 and 2.7 mpd respectively.

The ages of chinook salmon sampled in 1981-83 at Talkeetna (RM 103) and Curry (RM 120) stations have ranged from three to seven years. The majority of the escaping fish have been four, five and six year olds that went to sea (smolted) in the second year of life (Table 2-4-2). In the last three years the average length of chinook salmon at Talkeetna and Curry stations has varied primarily due to annual changes in the escapement age composition. At Talkeetna Station the average lengths were: 710 mm (1981), 642 mm (1982) and 626 mm (1983). Seventeen miles upstream at Curry Station the averages were: 668 mm (1981), 725 mm (1982) and 743 mm (1983). In all three years males were more numerous than females in the Talkeetna and Curry stations escapements (Table 2-4-3).

In 1981, 1982 and 1983 chinook salmon spawned exclusively in streams in the Susitna River reach above RM 98.6. No spawning was observed in any other habitat type including sloughs, side channels and mainstem areas. The two important chinook salmon spawning streams for the last three years have been: Indian River (RM 138.6) and Portage Creek (RM 148.9). Chinook salmon escapements into these streams have increased since 1981. The peak escapement counts recorded at Indian River were: 422 fish (1981), 1,053 fish (1982) and 1,193 fish (1983). At Portage Creek, the respective counts were: 659 fish (1981), 1,253 fish (1982) and 3,140 fish (1983).

4.2.1.3 Escapement Index Surveys

In 1983, chinook salmon escapement surveys were conducted at 19 designated index streams throughout the Susitna River drainage. Escapement counts averaged about six percent higher in 1983 than the previous seven year (1976-82) average and 50 percent higher than in 1982. The largest increases were recorded in the Chulitna River drainage (RM 98.5) and upper Susitna River reach above RM 98.6. Several chinook salmon spawning areas in 1983 supported higher escapements than in any year between 1976 and 1982.

4.2.2 Sockeye Salmon

4.2.2.1 First Run

First run sockeye salmon escapements were monitored in the Susitna River main channel at Sunshine Station (RM 80) in 1982 and 1983. The escapement in 1982 was about 5,800 fish and in 1983, about 43 percent less at 3,300 fish.

Based on fishwheel catches, first run sockeye salmon were abundant at Sunshine Station (RM 80) for three weeks, between the first and third weeks of June in 1982 and 1983 (Appendix Table 2-D-13). In both years, nearly the entire escapement migrated along the east side of the Susitna River at Sunshine Station.

The first run sockeye salmon intercepted at Sunshine Station (RM 80) in 1982 and 1983 ranged in age from four to six years old. Five year olds were dominant at 90 percent in 1982 and 71 percent in 1983. Nearly all the fish sampled in the two escapement years had gone to sea (smolted) in the second year of life (96-98%). The average length of first run fish was about 23 mm longer in 1982 at 538 mm than in 1983 at 515 mm. Sex composition samples indicated that females were more numerous than males in 1982 by 0.6:1 and in 1983 by 1.3:1.

The destination of the first run sockeye salmon in 1982 and 1983 was the Talkeetna River drainage (RM 97.1), specifically the inlet stream of Papa Bear Lake. In 1982 the peak of spawning occurred between the third week of July and the first week of August. In 1983 peak spawning occurred between the second and fourth weeks of July.

Based on fishwheel catches a small number of first run fish migrated past Sunshine Station (RM 80) and extended upstream to Talkeetna Station (RM 103) in 1982 and 1983. These fish were not documented any further upstream in the Susitna River than RM 103. The first run fish which reached Talkeetna Station in 1982 and 1983 were considered milling fish that later descended and spawned in Papa Bear Lake inlet stream.

4.2.2.2 Second Run

For three consecutive years (1981-83) second run sockeye escapements have been monitored in the main channel of the Yentna and Susitna rivers at four locations: Yentna Station (TRM 04) in the Yentna River (RM 28) and Susitna River stations, Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120).

The 1981-83 escapements of second run sockeye salmon were at minimum: 273,000 fish (1981), 265,000 fish (1982) and 176,000 fish (1983) (Figure 2-4-3 and Table 2-4-4). These estimates represent the combined, respective year escapements to the Yentna River (RM 28) at Yentna Station (TRM 04) and Susitna River at Sunshine Station (RM 80). They do not include escapements to Susitna River tributaries below RM 80 with exception of the Yentna River and therefore, should be considered minimum values.

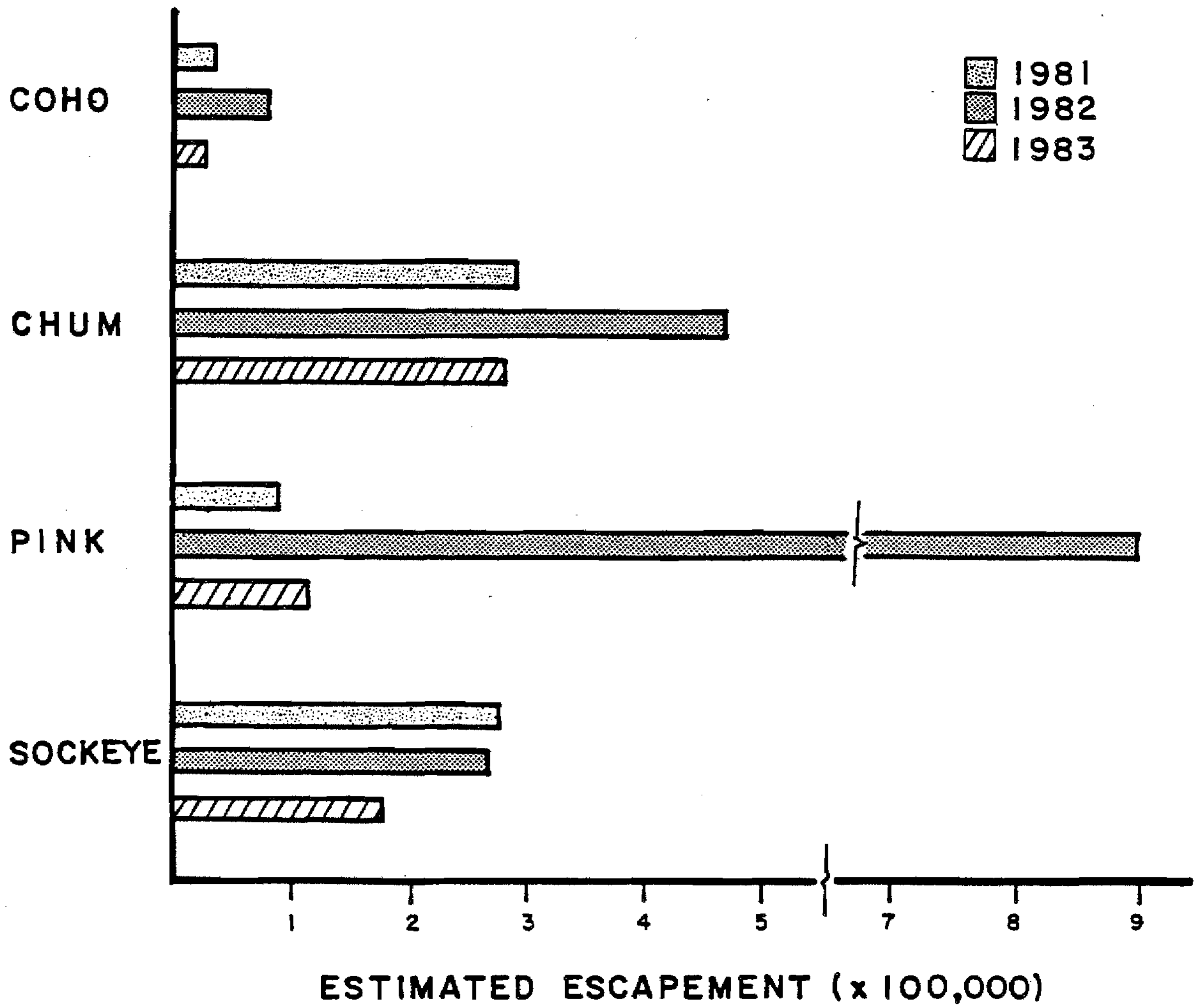


Figure 2-4-3. Minimum Susitna River sockeye, pink, chum and coho salmon escapements for 1981, 1982 and 1983.

Table 2-4-4. Minimum Susitna River escapements for sockeye, pink, chum and coho salmon in 1981, 1982 and 1983.

Year	Escapement Estimates 1/				
	Sockeye 2/	Pink	Chum	Coho	Total
1981	272,900	85,600	282,700	36,800	678,000
1982	265,300	890,500	458,200	79,000	1,693,800
1983	175,900	101,200	276,600	24,100	577,800

1/ Defined as the summation of the Yentna River escapement obtained by side scan sonar at Yentna Station and the Susitna River escapement obtained by tag/recapture population estimates at Sunshine Station. These estimates do not include escapements to Susitna River tributaries below RM 80 excluding the Yentna River (RM 28).

2/ Sockeye salmon escapement estimates do not include first run sockeye salmon.

4.2.2.2.1 Intertidal To Talkeetna

The 1981-83 second run sockeye salmon escapements into the Yentna River (RM 28) at Yentna Station (TRM 04) were: 139,400 fish (1981), 113,800 fish (1982) and 104,400 fish (1983) (Table 2-4-1). The Susitna River escapements at Sunshine Station (RM 80) were: 133,500 fish (1981), 151,500 fish (1982) and 71,500 fish (1983).

The Yentna River (RM 28) at Yentna Station (TRM 04) has averaged about the same escapement level of second run fish for the last three years as the Susitna River at Sunshine Station (RM 80) (Figure 2-4-4). Record high, 1983 commercial catches in Upper Cook Inlet contributed to low 1983 escapements at Yentna and Sunshine stations as compared to the escapements in 1981 and 1982.

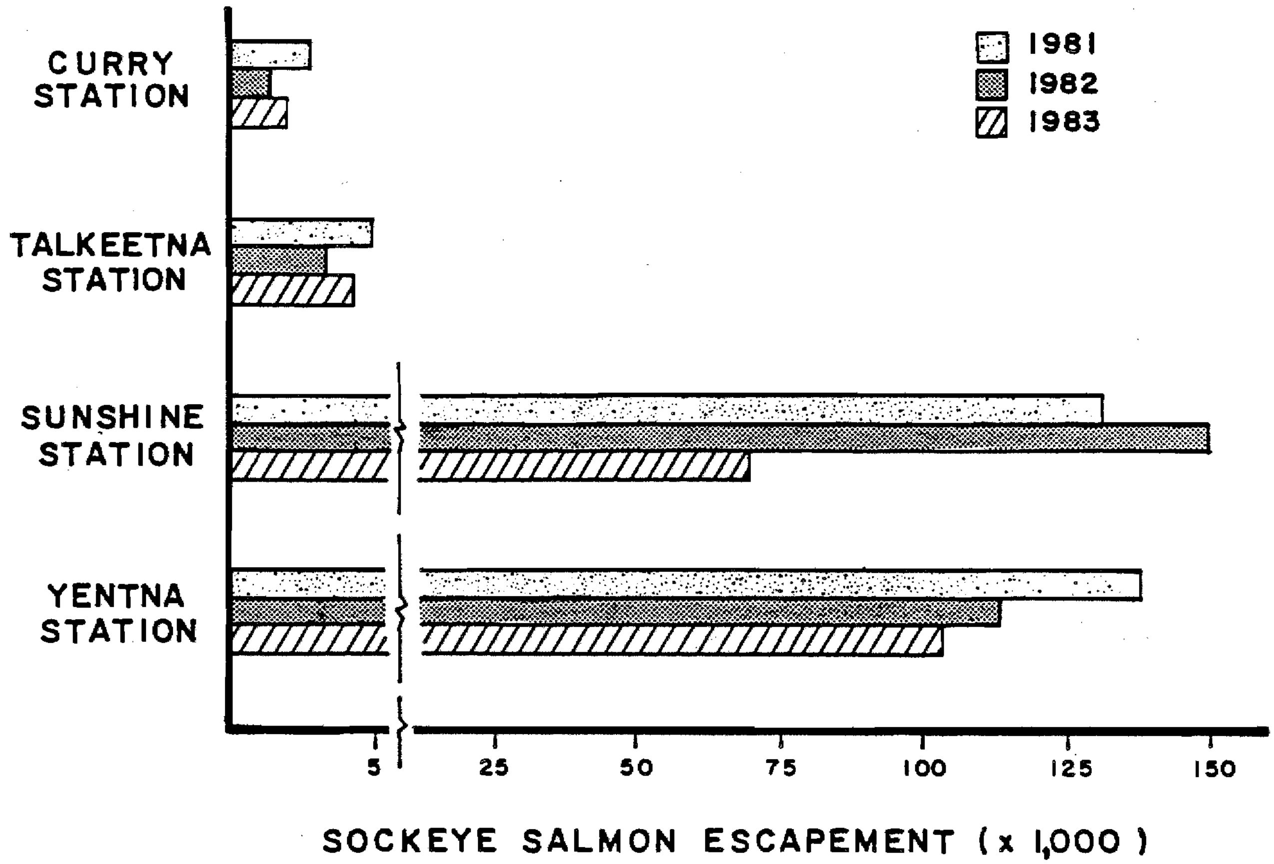


Figure 2-4-4. Minimum Susitna River sockeye salmon escapements for 1981, 1982 and 1983.

In the last three years (1981-83) second run sockeye salmon have been generally abundant in the Yentna River (RM 28) at Yentna Station (TRM 04) between the second week of July and the second week of August (Figure 2-4-5 and Appendix Table 2-D-13). Most of the second run fish reaching Yentna Station in 1981-83 passed along the south bank based on fishwheel catches. In the Susitna River at Sunshine Station (RM 80) second run fish have been abundant between the third week of July and the second week of August, and the majority of the fish passage has been along the east side of the river in all three years.

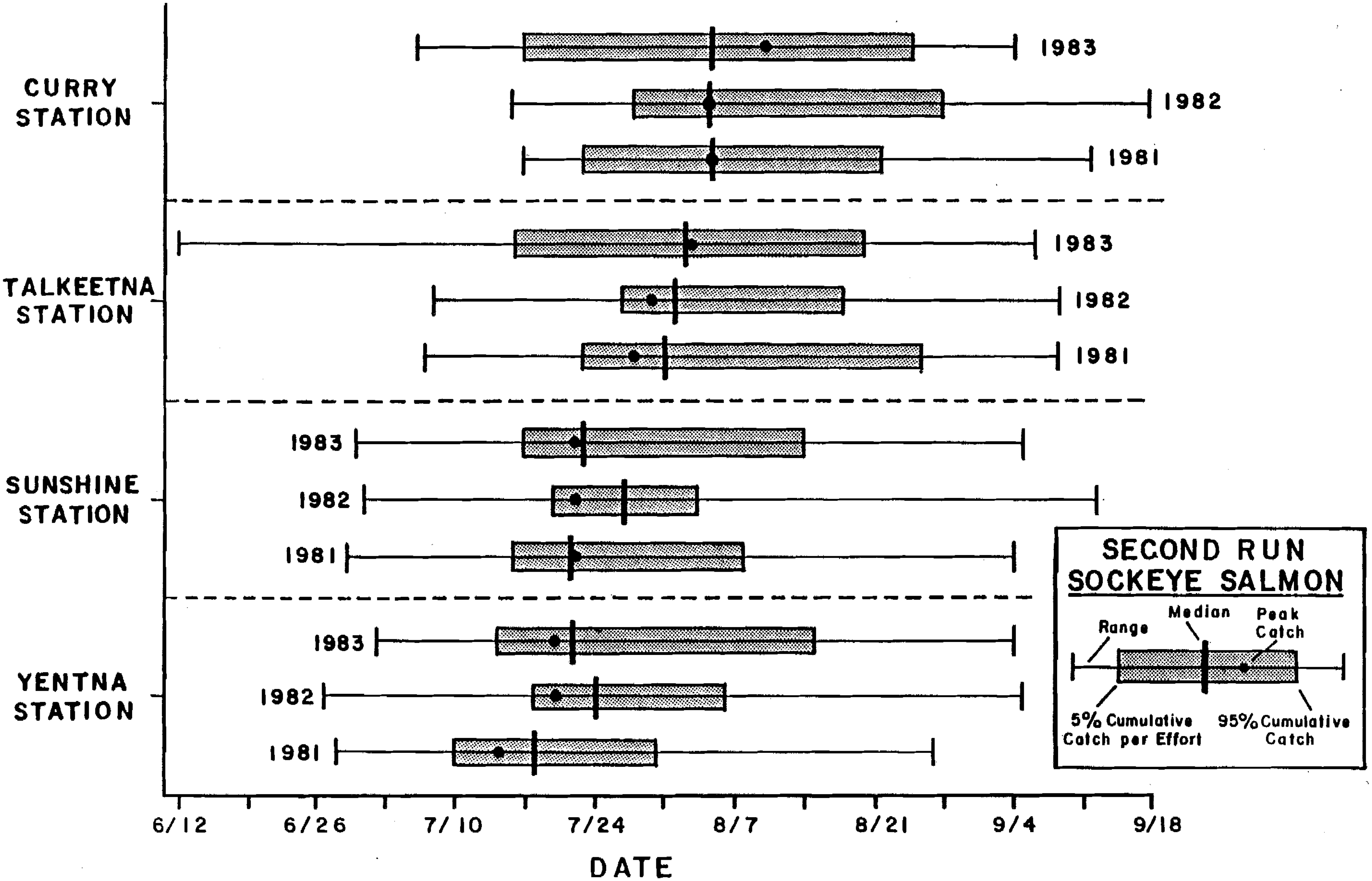


Figure 2-4-5. Migrational timing of second run sockeye salmon based on fishwheel catch per unit effort at selected locations on the Susitna River in 1981, 1982 and 1983.

The 1981-83 second run escapements into the Susitna River drainage have included fish ranging in age from three to six years old. In 1981 and 1982 five year old fish were dominant at Yentna (TRM 04) and Sunshine (RM 80) stations (57-84%). In 1983, the majority of the returning fish to these stations were four year olds (64-68%). Nearly all the fish in the 1981-83 escapements to both stations went to sea (smolted) in the second year of life (93-97%).

The average male to female ratios in the 1981-83 escapements at Yentna Station (TRM 04) were: 1.2:1 (1981), 2.1:1 (1982) and 1.5:1 (1983). At Sunshine Station (RM 80) the ratios were: 1.0:1 (1981), 0.9:1 (1982) and 1.3:1 (1983).

In 1983, sampling at Sunshine Station (RM 80) established the mean fecundity of second run sockeye salmon at 3,350 eggs per female. This is about 350 eggs less than the average 3,700 eggs per female for North American stocks (Hart, 1973). In 1981 and 1982 sockeye salmon fecundities were not evaluated.

4.2.2.2.2 Talkeetna To Upper Devil Canyon

In the last three years (1981-83), escapements of second run sockeye salmon at Talkeetna Station (RM 103) have ranged from 3,100 fish (1982) to 4,800 fish (1981) and averaged 4,000 fish (Table 2-4-1). Curry Station (RM 120) escapements have ranged between 1,300 fish (1982) to 2,800 fish (1981) and averaged 2,000 fish.

Generally, second run fish of the 1981-83 escapements have been abundant in the Susitna River main channel at Talkeetna (RM 103) and Curry (RM 120) stations for about five weeks from the third week of July to the fourth week of August (Figure 2-4-5 and Appendix Table 2-D-13).

In the last three years (1981-83) the second run escapement have shown no particular preference for movement along the east or west banks of the Susitna River at Talkeetna Station (RM 103) based on fishwheel catches. Seventeen miles upstream at Curry Station (RM 120) second run fish have favored the east bank for migration.

Second run sockeye salmon migrated above Sunshine Station (RM 80) at a slower speed in 1981 than in 1982 or 1983. The rate of travel between Sunshine and Talkeetna (RM 103) stations was 1.8 mpd in 1981 compared to 2.7 and 2.4 mpd in 1982 and 1983 respectively. A similar pattern was recorded for sockeye salmon traveling between Sunshine and Curry (RM 120) stations. In 1981 the average travel rate was 2.7 mpd whereas in 1982 and 1983, the rates were 3.4 and 3.7 mpd respectively. Further comparison of these rates indicate that in all three years second run fish milled more in the 23 miles between Sunshine and Talkeetna stations than in the 17 miles between Talkeetna and Curry stations.

Second run sockeye salmon age, length and sex samples were collected in the last three years at Talkeetna (RM 103) and Curry (RM 120) stations. The 1981-83 escapements to these stations have included fish ranging in age from three to six years old. In 1981, five year olds (69-72%) were more plentiful than four year olds (25-29%) at both stations. In 1982 at Talkeetna Station five year olds (72%) were also more numerous than four year olds (23%), but at Curry Station five year olds (37%) were about equal in frequency with the four year olds ([illegible]0%). In 1983 four year olds (56-72%) were more plentiful than five year olds (21-40%) at both stations. In all three years nearly all second run fish sampled at Talkeetna and Curry stations had gone to sea (smolted) in the second year of life (90-96%).

The average length of second run fish at the two stations varied in the last three years due to annual changes in the escapement age composition. At Talkeetna Station the average lengths were: 548 mm (1981), 547 mm (1982) and 509 mm (1983). Seventeen miles upstream at Curry Station the average lengths were: 549 mm (1981), 466 mm (1982) and 481 mm (1983). In the last three years females were more numerous than males only in 1981. The male to female ratios at Talkeetna Station were: 0.6:1 (1981), 1.3:1 (1982) and 1.6:1 (1983). The ratios at Curry Stations were: 0.8:1 (1981), 2.1:1 (1982) and 1.6:1 (1983).

The main channel of the Susitna River above the Chulitna River confluence (RM 98.6) was not a second run sockeye salmon spawning area in 1981 or 1982. A single main channel location was used for spawning in 1983. Eleven second run fish were observed spawning at the site, located between RM 138.6 and 138.9, on September 15, 1983.

Second run sockeye salmon did not spawn in streams above RM 98.6 in 1981, 1982 or 1983. They occupied 12 sloughs above RM 98.6 in 1981 and spawned in nine of them. In 1982 the respective numbers were 10 and 8, and in 1983, 11 and 8. The 1981-83 peak slough counts (highest live plus dead count) of second run fish were: 1,241 fish (1981), 607 fish (1982) and 555 fish (1983) (Table 2-4-5). The three important spawning sloughs for all three years were: Slough 11 (RM 135.3), Slough 8A (RM 125.4) and Slough 21 (RM 141.1) in order.

In 1983 the average observation life of a sockeye salmon in a slough above RM 98.6 was 11.8 days. Using this observation life estimate and slough escapement counts of live fish over time the 1983 second run escapement to sloughs above RM 98.6 calculated at 1,600 fish (Table 2-3-29). Assuming sockeye salmon averaged the same (1983) observation life, the 1981 and 1982 second run slough escapements were 2,200 and 1,500 fish respectively (Appendix Tables 2-G-12 and 2-G-13).

A percentage of fish monitored for observation life in 1983 did not spawn in the slough of first entry. A number left the slough of first entry, entered another slough and spawned. A few died before spawning from bear predation or stranding.

In 1983, slough spawning second run sockeye salmon were examined for egg retention. The average retention was 250 eggs per female. About 80 percent of the females examined had completely spawned, i.e. retained less than 25 eggs each. A similar study in the Cook Inlet drainage found that depending on the escapement year between 17 and 100 percent of the female population will completely spawn-out (retain less than 25 eggs/female) and the number of eggs retained per spawning female is correlated to spawner density (Barrett, 1974).

Table 2-4-5. Percent distribution of second run sockeye salmon in sloughs above RM 98.6 based on peak survey counts of live plus dead fish in 1981-83.

Slough	River Mile	Percent Distribution			
		1981	1982	1983	Average
1	99.6	0	0	0	0
2	100.2	0	0	0	0
3B	101.4	0.1	0	0.9	0.3
3A	101.9	0.5	0	0	0.3
4	105.2	0	0	0	0
5	107.6	0	0	0	0
6	108.2	0	0	0	0
6A	112.3	0.1	0	0	0
7	113.2	0	0	0	0
8	113.7	0	0	0	0
8D	121.8	0	0	0	0
8C	121.9	0	0.3	0	0.1
8B	122.2	0	0.8	0	0.3
Moose	123.5	0	1.3	4.0	1.2
A'	124.6	0	0	0	0
A	124.7	0	0	0	0
8A	125.4	14.3	11.2	11.9	13.0
B	126.3	-	1.3	0.3	0.6
9	128.3	0.8	0.8	0.3	0.7
9B	129.2	6.5	0.2	0	3.4
9A	133.8	0.1	0.2	0.2	0.1
10	133.8	0	0	0.2	0
11	135.3	72.0	75.2	44.7	66.3
12	135.4	0	0	0	0
13	135.9	0	0	0	0
14	135.9	0	0	0	0
15	137.2	0	0	0	0
16	137.3	0	0	0	0
17	138.9	0.5	0	1.1	0.5
18	139.1	0	0	0	0
19	139.7	1.9	0	0.9	1.1
20	140.0	0.1	0	0	0.1
21	141.1	3.1	8.7	35.5	12.0
22	144.5	-	-	0	0
21A	145.3	0	0	0	0
Total Percent		100.0	100.0	100.0	100.0
Total Fish Count		1,241	607	555	802

4.2.3 Pink Salmon

Pink salmon escapements have been monitored for the last three years (1981-83) at Yentna Station (TRM 04) in the Yentna River (RM 28) and at Sunshine (RM 80), Talkeetna (RM 103), and Curry (RM 120) stations in the Susitna River.

The 1981-83 escapements of pink salmon into the Susitna River drainage were at minimum: 86,000 fish (1981), 891,000 fish (1982) and 101,000 fish (1983) (Table 2-4-4). These estimates were based on the addition of the Yentna River (RM 28) and Susitna River escapements to RM 80 and do not include pink salmon escapements in systems below RM 80 with the exception of the Yentna River.

4.2.3.1 Intertidal To Talkeetna

Pink salmon generally have a two year life cycle. In the Susitna River the even year is the dominant escapement year. Pink salmon escapements have been monitored in the Yentna River (RM 28) at Yentna Station (TRM 04) and in the Susitna River at Sunshine Station (RM 80) for two odd (1981 and 1983) years and one even (1982) year. The 1981 odd year escapement at Yentna Station was about 36,100 fish. The 1983 escapement was about 60,700 fish, nearly twice the preceding (1981) odd year escapement. In 1982, an even escapement year, an estimated 447,300 pink salmon passed Yentna Station (Table 2-4-1 and Figure 2-4-6). At Sunshine Station the odd year pink salmon escapements of 49,500 fish (1981) and 40,500 fish (1983) were similar in magnitude while the 1982 even year escapement was considerably larger at 443,200 fish.

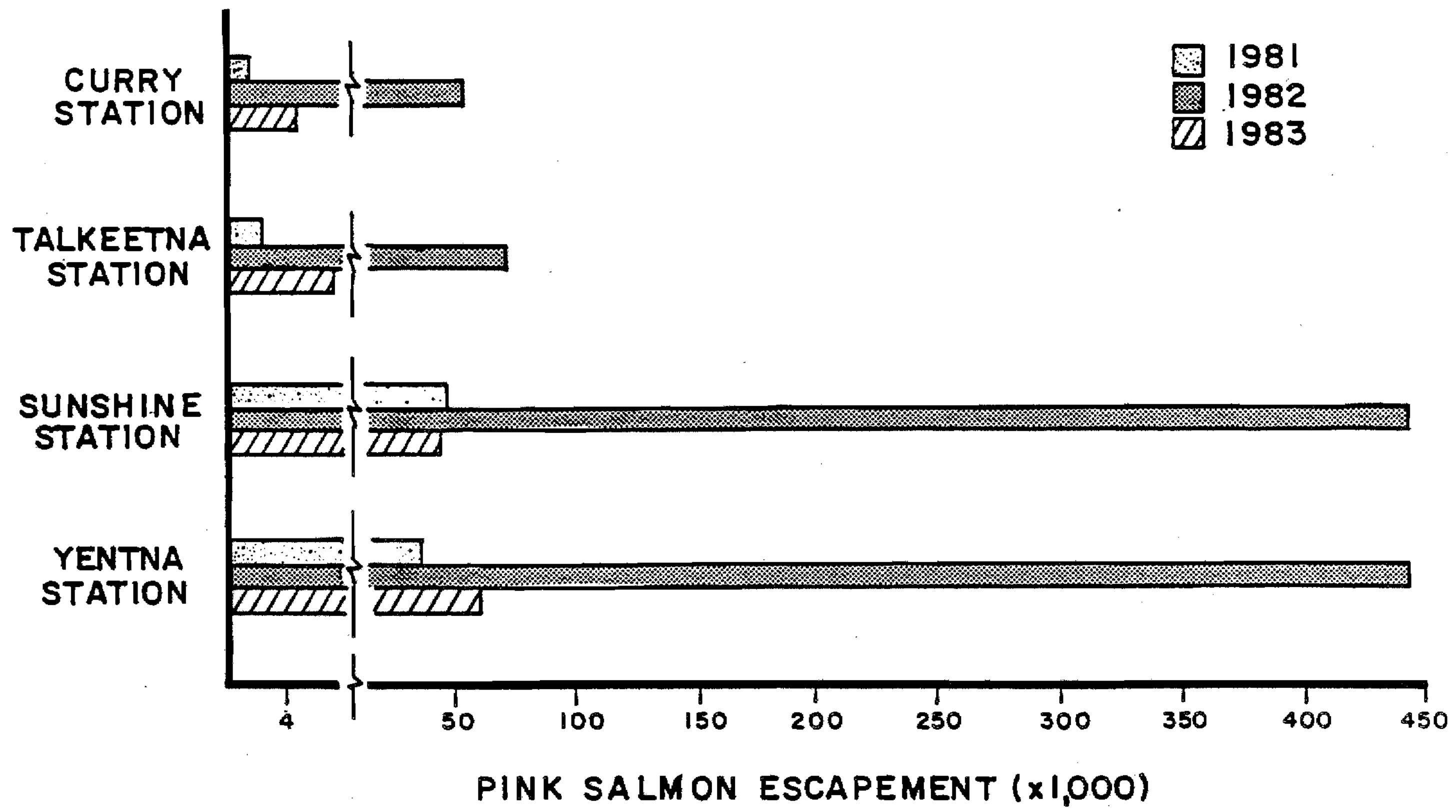


Figure 2-4-6. Minimum Susitna River pink salmon escapements for 1981, 1982 and 1983.

For the past three consecutive years (1981-83) pink salmon migrational timing information has been obtained at Yentna (TRM 04) and Sunshine (RM 80) stations. The odd year (1981 and 1983) migrations of pink salmon in the Yentna River (RM 28) at Yentna Station generally extended between the second week of July and third week of August. The even year (1982) pink salmon migration, however, was shorter in duration (Figure 2-4-7 and Appendix Table 2-D-3). The majority of the pink salmon passing Yentna Station in 1981 and 1982 migrated along the south bank, while in 1983 the majority passed along the north bank. At Sunshine Station the odd year (1981 and 1983) pink salmon

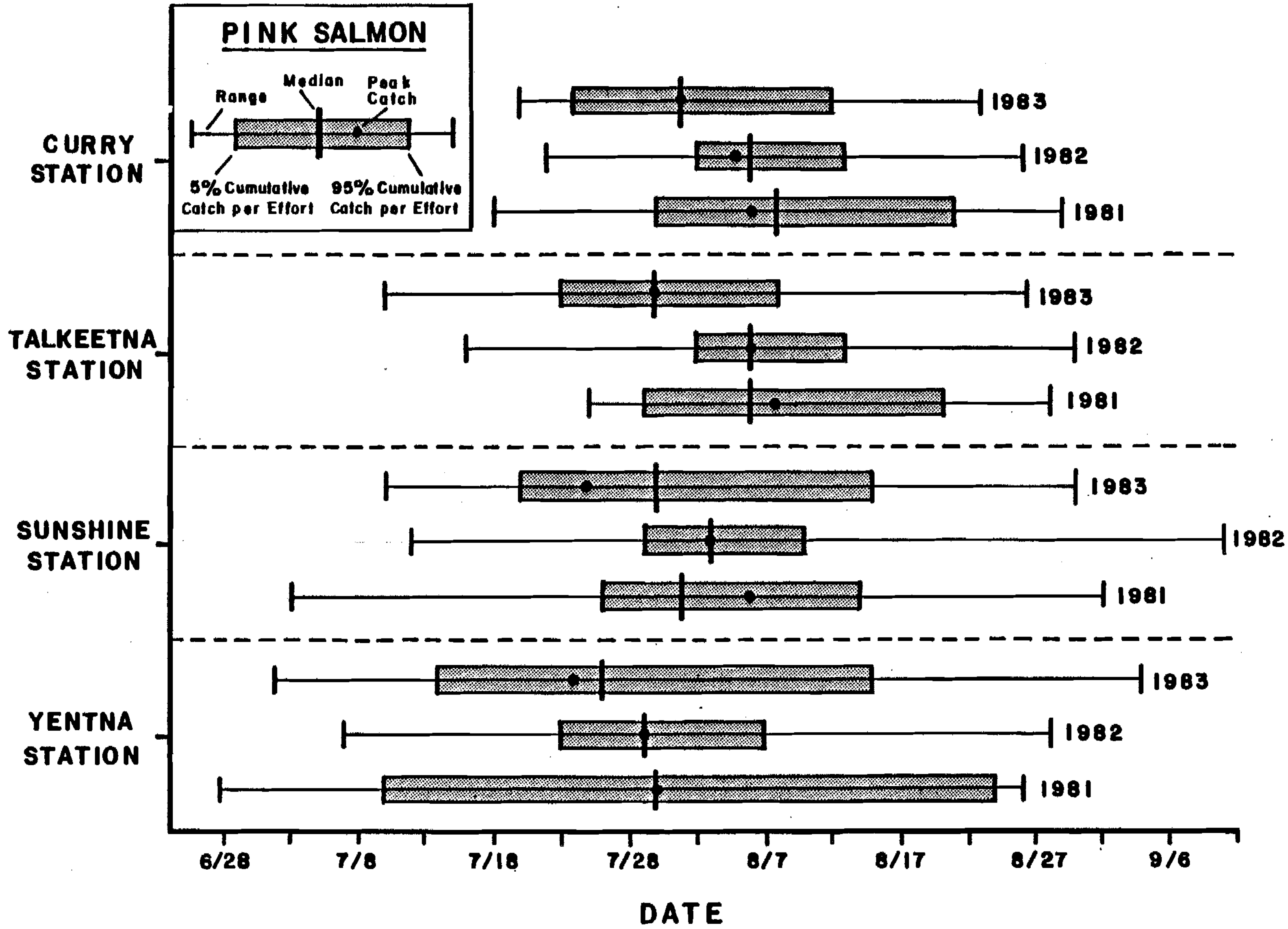


Figure 2-4-7. Migrational timing of pink salmon based on fishwheel catch per unit effort at selected locations on the Susitna River in 1981, 1982 and 1983.

migration generally extended from the third week of July through the second week of August. Again, as at Yentna Station, the even year (1982) pink salmon migration was shorter in duration than the odd year (1981 and 1983) migrations. At Sunshine Station in each of the last three years (1981-83), over 90 percent of the pink salmon migration has been along the east bank.

Length and sex data were collected from pink salmon escapements at Yentna (TRM 04) and Sunshine (RM 80) stations for the last three years (1981-83). Pink salmon were not sampled for age because the returning adults essentially represent only one age class, i.e., two year old fish. Pink salmon lengths averaged larger in 1981 than in 1982 and 1983 at both Yentna and Sunshine stations. The lengths at Yentna Station averaged: 474 mm (1981), 428 mm (1982) and 426 mm (1983). The average lengths at Sunshine Station were: 447 mm (1981), 435 mm (1982) and 429 mm (1983). Since pink salmon spend little of their life in freshwater these length differences were probably a function of the between year variability in oceanic growth. The male to female pink salmon sex ratios for the last three escapement years at Yentna Station were: 1.0:1 (1981), 0.8:1 (1982) and 0.9:1 (1983). At Sunshine Station these ratios were: 0.8:1 (1981), 1.8:1 (1982) and 1.0:1 (1983).

In 1983, the mean fecundity of pink salmon migrating to Sunshine Station (RM 80) was 1,350 eggs per female. This is within the range of average pink salmon fecundities (800-2,000) reported by Morrow (1980).

The Susitna River main channel between RM 7 and 98.6 was surveyed for pink salmon spawning in 1981 and 1982. Results indicated that pink salmon did not spawn in the main channel in either of these years. In 1983 the main channel was not specifically surveyed for spawning.

4.2.3.2 Talkeetna To Upper Devil Canyon

Pink salmon escapements have been monitored at Talkeetna (RM 103) and Curry (RM 120) stations for three consecutive years (1981-83). The (1981) odd year pink salmon escapement of 2,300 fish at Talkeetna Station was 76 percent less than the (1983) odd year escapement of 9,500 fish. The even year (1982) escapement of pink salmon was 73,000 fish (Table 2-4-1 and Figure 2-4-6). At Curry Station the 1981 pink salmon escapement was 1,000 fish, 82 percent less than the 1983 escapement of 5,500 fish. The even year (1982) escapement of pink salmon was 58,800 fish.

For the last three years (1981-83) pink salmon have been generally abundant in the Susitna River at Talkeetna (RM 103) and Curry (RM 120) stations from the last week of July through the third week of August (Figure 2-4-7 and Appendix 2-D). As at Yentna (TRM 04) and Sunshine (RM 80) stations the even year (1982) migration occurred over a shorter time span than the odd year (1981 and 1983) migrations. Based on fishwheel catches, pink salmon migrated primarily along the east bank at Talkeetna and Curry stations in all three years. The exception was in 1983 at Talkeetna Station when the majority of pink salmon migrated along the west bank.

Migrational rates of pink salmon, for the past three years (1981-83), were determined by the recapture of individuals previously tagged at downstream sites. This data (1981-83) indicated that pink salmon migrated at a slower rate between Sunshine (RM 80) and Talkeetna (RM 103) stations than between Talkeetna and Curry (RM 120) stations. This may be due, in part, to an increase in gradient and consolidation of the main channel above the Chulitna-Susitna rivers confluence. Average 1981-83 pink salmon migrational rates between Sunshine and Talkeetna stations were: 2.6 mpd (1981), 7.4 mpd (1982) and 5.9 mpd (1983). The 17 miles between Talkeetna and Curry stations were traveled at rates averaging: 6.0 mpd (1981), 10.0 mpd (1982) and 7.1 mpd (1983).

Length and sex information were collected from a portion of the pink salmon escapement passing both Talkeetna (RM 103) and Curry (RM 120) stations for three consecutive years (1981-83). Age information was not collected because pink salmon are generally two year old fish when returning to spawn. The average lengths of pink salmon generally did not vary between odd and even years or within years. In 1981 at Talkeetna and Curry stations pink salmon averaged about 430 mm in length, and in 1982 and 1983 they averaged about 425 mm in length. The male to female sex ratios at Talkeetna Station were: 1.2:1 (1981), 2.0:1 (1982) and 0.8:1 (1983). At Curry Station the sex ratios were: 0.8:1 (1981), 2.5:1 (1982) and 1.0:1 (1983).

No pink salmon spawning has been identified in the Susitna River main channel above RM 98.6 in the last three years (1981-83).

In 1981, 1982 and 1983, sloughs above RM 98.6 were not extensively used by pink salmon. Peak survey counts for these years, which include both milling and spawning pink salmon, were: 28 (1981), 507 (1982) and 21 (1983) (Table 2-4-6). The total number of pink salmon actually spawning in sloughs has been estimated for each of the last three years (1981-83). In 1981 an estimated 38 pink salmon spawned in Slough 8 (RM 113.7), the only slough used by pink salmon for spawning that year. In 1982 an estimated 297 pink salmon spawned in five sloughs. The majority of the spawning occurred in Slough 11 (RM 135.3) and Slough 20 (RM 140.0). In 1983 pink salmon did not spawn in sloughs above RM 98.6.

Tributary streams to the Susitna River between RM 98.6 and 161.0 supported essentially all the pink salmon spawning in this river reach for the last three years (1981-83). The peak index counts for all streams were: 378 (1981), 2,855 (1982) and 1,329 (1983). The two important spawning streams in 1981 were Chase (RM 106.9) and Lane (RM 113.6) creeks (Table 2-4-7). In 1982 the streams were Indian River (RM 138.6) and Fourth of July Creek (RM 131.1). The primary spawning in 1983 occurred in Indian River and Portage Creek (RM 148.9).

4.2.4 Chum Salmon

Chum salmon escapements in the Susitna River drainage for the last three years were at minimum: 283,000 fish (1981), 458,000 fish (1982) and 277,000 fish (1983) (Table 2-4-4). These estimates do not include respective year escapements to Susitna River tributaries below RM 80 with the exception of

Table 2-4-6. Percent distribution of pink salmon in sloughs above RM 98.6 based on peak survey counts of live plus dead fish in 1981-83.

Slough	River Mile	Percent Distribution			
		1981	1982	1983	Average
1	99.6	0	0	0	0
2	100.2	0	0	0	0
3B	101.4	0	0	0	0
3A	101.9	3.6	0	0	*
4	105.2	0	0	0	0
5	107.6	0	0	0	0
6	108.2	0	0	0	0
6A	112.3	0	6.9	0	6.3
7	113.2	0	0	0	0
8	113.7	89.3	0	0	4.2
8D	121.8	0	0	0	0
8C	121.9	0	0	0	0
8B	122.2	0	0	0	0
Moose	123.5	0	1.6	0	1.6
A'	124.6	0	0	0	0
A	124.7	7.1	0	4.8	0.5
8A	125.4	0	5.5	14.2	5.2
B	126.3	-	6.3	0	8.4
9	128.3	0	2.4	0	2.1
9B	129.2	0	0	0	0
9A	133.8	0	0	0	0
10	133.8	0	0	0	0
11	135.3	0	25.8	33.3	24.1
12	135.4	0	0	0	0
13	135.9	0	0	0	0
14	135.9	0	0	0	0
15	137.2	0	26.1	4.8	23.0
16	137.3	0	0	0	0
17	138.9	0	0	0	0
18	139.1	0	0	0	0
19	139.7	0	0.2	4.8	0.5
20	140.0	0	12.6	33.3	12.6
21	141.1	0	12.6	4.8	11.5
22	144.5	-	-	0	0
21A	145.3	0	0	0	0
Total Percent		100.0	100.0	100.0	100.0
Total Fish Count		28	507	21	191

* Trace

Table 2-4-7. Percent distribution of pink salmon in streams above RM 98.6 based on peak index counts in 1981-83.

Stream	River Mile	Percent Distribution		
		1981	1982	1983
Whiskers Creek	101.4	0.3	4.8	0
Chase Creek	106.9	10.1	3.8	0.5
Lane Creek	113.6	76.9	22.4	2.1
Lower McKenzie Creek	116.2	0	0.8	1.3
McKenzie Creek	116.7	0	0.6	0
Little Portage Creek	117.7	0	4.9	0.5
Fifth of July Creek	123.7	0.5	4.0	0.7
Skull Creek	124.7	2.1	0.4	0.1
Sherman Creek	130.8	1.6	0.8	0
Fourth of July Creek	131.1	7.7	24.6	5.9
Gold Creek	136.7	0	0.4	0.5
Indian River	138.6	0.5	25.9	66.6
Jack Long Creek	144.5	0.3	0.7	0.4
Portage Creek	148.9	0	5.9	21.4
Total Percent		100.0	100.0	100.0
Total Peak Counts		378	2,855	1,329

the Yentna River (RM 28) and are based on the respective year Yentna River escapement and Susitna River escapement at Sunshine Station (RM 80).

4.2.4.1 Intertidal To Talkeetna

The Yentna River (RM 28) supported higher escapement returns of chum salmon in 1981 and 1982 than in 1983. At Yentna Station (TRM 04), the 1981 escapement was about 19,800 fish, in 1982 27,800 fish and in 1983 10,800 fish (Table 2-4-1).

The 1981 chum salmon escapement into the Susitna River at Sunshine Station (RM 80) was about 40 percent lower than the 1982 escapement and nearly the same as the 1983 escapement. The last three years of escapements were: 262,900 fish (1981), 430,400 fish (1982) and 265,800 fish (1983) (Table 2-4-1). These escapements average about 16 times larger than the Yentna River (RM 28) escapements.

For three consecutive years (1981-83) chum salmon have been generally abundant in the Yentna River (RM 28) at Yentna Station (TRM 04) between the third week of July and the third week of August (Appendix Table 2-D-13). The majority of the escapement return in 1981 and 1982 traveled along the north bank at Yentna Station. In 1983, there was about an equal number of chum salmon migrating off the south and north banks based on fishwheel catches.

At Sunshine Station (RM 80) on the Susitna River chum salmon have been abundant in the last three years (1981-83) for about a five week period between the fourth week of July and the first week of September (Appendix Table 2-D-13). In all three years the majority of the fish passage has been along the east side of the river based on station fishwheel catches.

The 1981-83 chum salmon escapements into the Yentna River (RM 28) at Yentna Station (TRM 04) and in the Susitna River main channel at Sunshine Station (RM 80) have included fish ranging in age from three to five years old. Six year old fish were only identified at a low level in 1983 at these stations (0.4-1.2%). Four year old chum salmon were dominant in the 1981 and 1982 escapements to Yentna and Sunshine stations (84.1-90.3%). Five year olds were dominant (51.3-58.4%) followed by four year olds (40.1-46.1%) in 1983.

The male to female ratios in the 1981-83 chum salmon escapements at Yentna Station (TRM 04) were: 1.0:1 (1981), 1.3:1 (1982) and 1.3:1 (1983). At

Sunshine Station (RM 80) the ratios were: 0.8:1 (1981), 1.0:1 (1982) and 1.0:1 (1983).

In 1983, the mean fecundity of chum salmon reaching Sunshine Station (RM 80) was 2,800 eggs per female. This is within the mean chum salmon fecundity range (2,000-3,000 eggs) for North America stocks reported by Bakkala (1970).

In 1981, chum salmon were identified spawning in the Susitna River main channel at six locations between RM 68.3 and 97.0. In 1982, there was no spawning at these sites nor in any other main channel area between RM 7 and 98.5. In 1983, no main channel spawning surveys were conducted.

4.2.4.2 Talkeetna To Upper Devil Canyon

Over the last three years, chum salmon escapements at Talkeetna Station (RM 103) have ranged from 20,800 fish (1981) to 50,400 fish (1983) and averaged 40,100 fish (Table 2-4-1 and Figure 2-4-8). The range of escapements at Curry Station (RM 120) has been 13,100 fish (1981) to 29,400 fish (1982). The average escapement has been 21,200 fish.

At Talkeetna (RM 103) and Curry (RM 120) stations for the last three years chum salmon have been abundant in the main channel between the end of July to the end of August (Figure 2-4-9). In 1983 the migration began about a week and a half earlier than in 1981 or 1982 but ended about the same time (Appendix Table 2-D-13). In 1981, 1982 and 1983, chum salmon migrated in higher numbers along the west side of the river at Talkeetna Station than along the east side. At Curry Station most of the escapement migrated along the east side based on fishwheel catches in all three years.

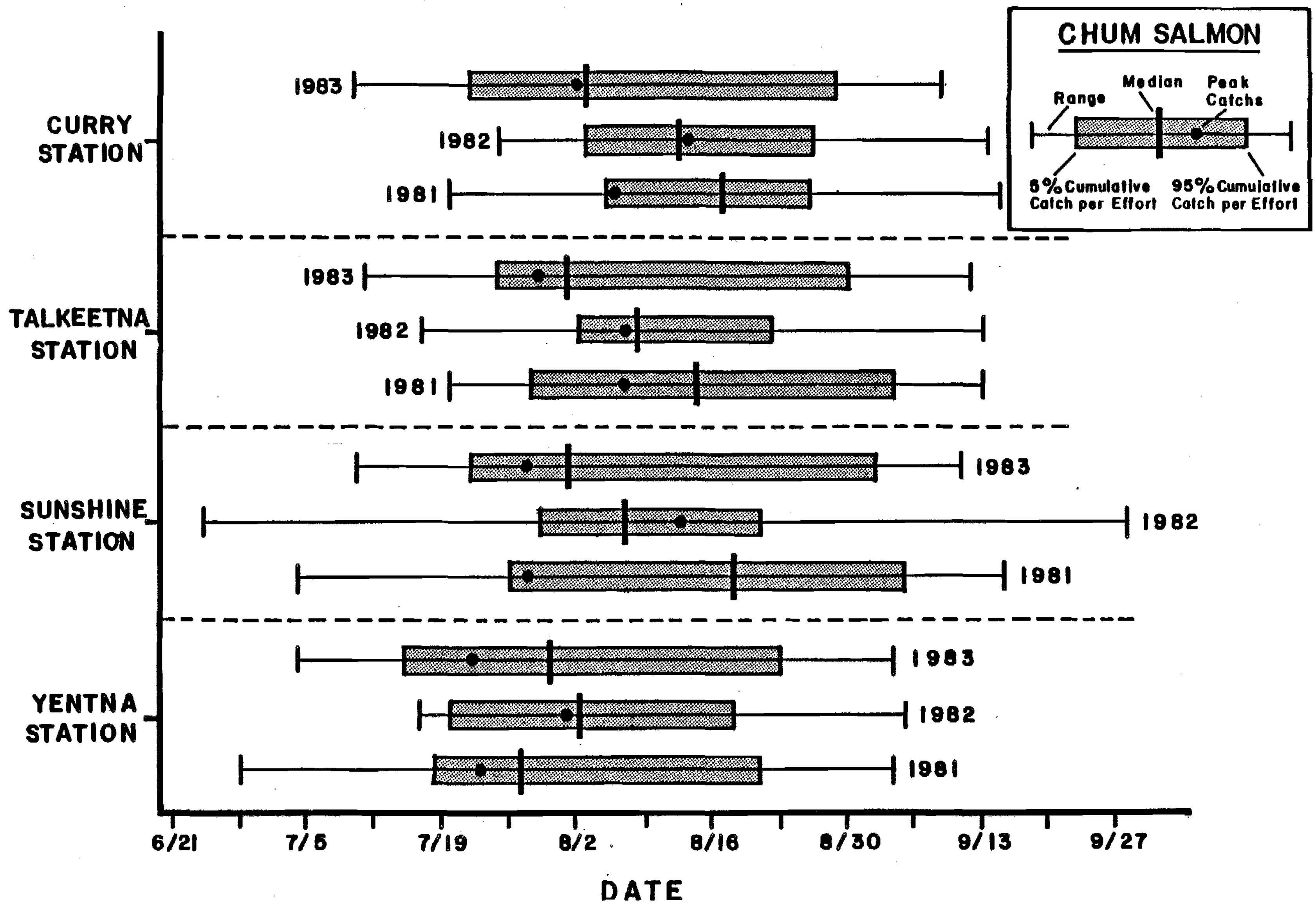


Figure 2-4-9. Migrational timing of chum salmon based on fishwheel catch per unit effort at selected locations on the Susitna River in 1981, 1982 and 1983.

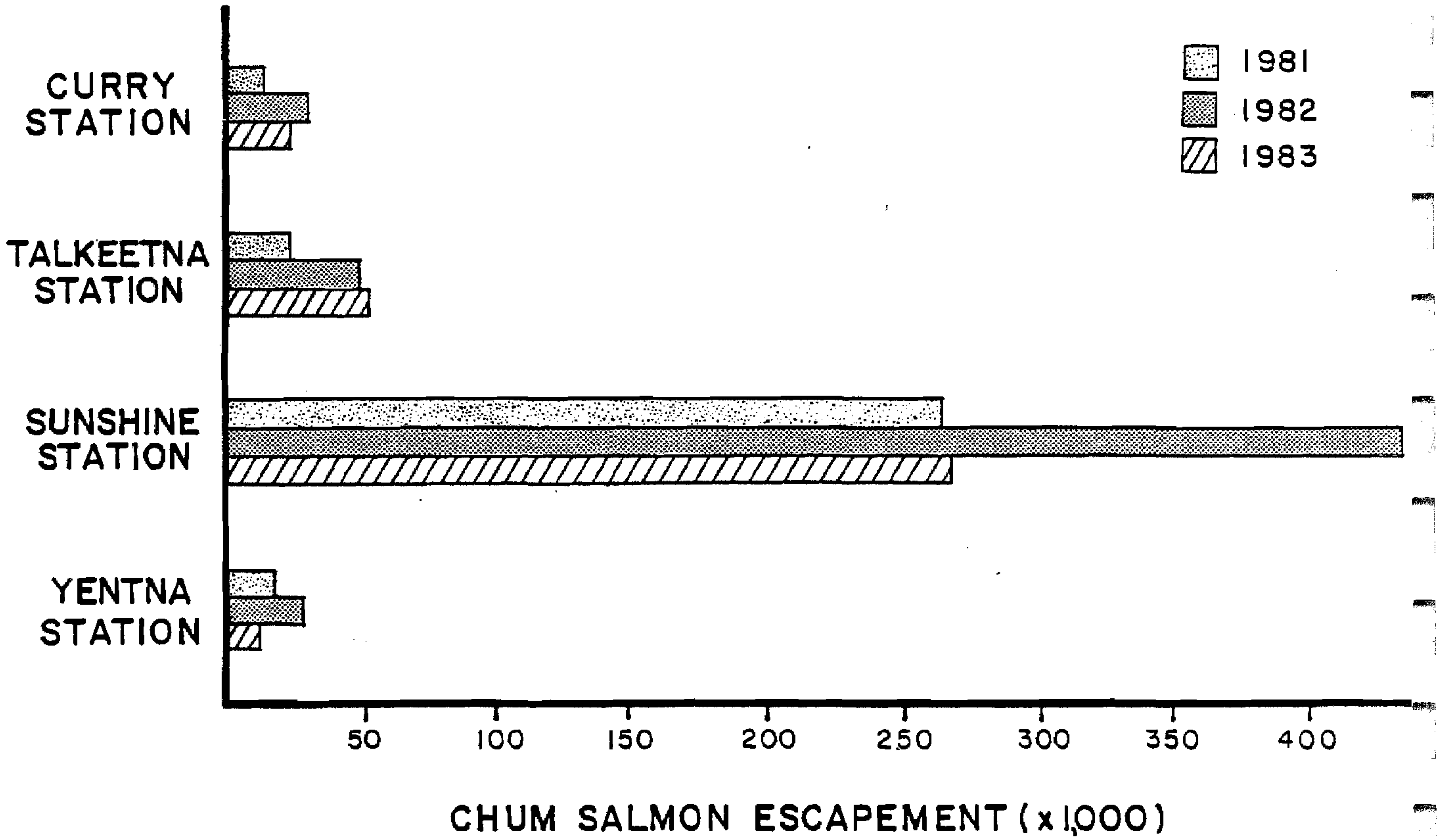


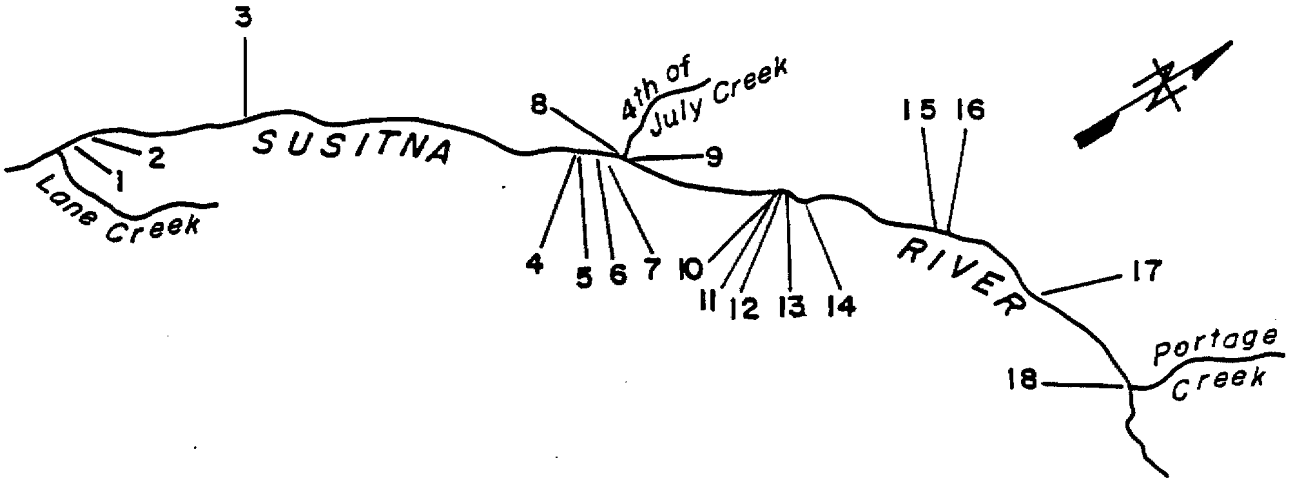
Figure 2-4-8. Minimum Susitna River chum salmon escapements for 1981, 1982 and 1983.

In 1981, 1982 and 1983, chum salmon migrated faster in the 23 miles between Sunshine (RM 80) and Talkeetna (RM 103) stations than in the 17 miles between Talkeetna and Curry (RM 120) stations. The average migrational rates between Sunshine and Talkeetna stations were: 5.1 mpd (1981), 7.4 mpd (1982) and 3.8 mpd (1983). The average rates between Talkeetna and Curry stations were: 3.8 mpd (1981), 6.5 mpd (1982) and 3.6 mpd (1983). Chum salmon are capable of averaging faster speeds. In 1982 and 1983, a number of tagged chum salmon migrated between Sunshine and Talkeetna stations in one day (23 mpd); several fish in 1981, 1982 and 1983 traveled between Talkeetna and Curry stations in one day (17 mpd); and in 1982, several fish covered the 40 miles between Sunshine and Curry stations in two days (20 mpd).

Chum salmon were sampled for age, length and sex for the last three years (1981-83) at Talkeetna (RM 103) and Curry (RM 120) stations. The 1981 and 1982 escapement returns to both stations were mainly four year old fish (84-87%) compared in 1983 to five year old fish (69-72%). In all three years the average chum salmon length was about 600 mm. Also males were more numerous than females at the two stations. The male to female ratios at Talkeetna Station were: 1.5:1 (1981), 1.9:1 (1982) and 1.5:1 (1983). At Curry Station the respective ratios were: 1.1:1, 1.1:1 and 1.9:1.

Chum salmon spawning was identified at four main channel locations above RM 98.6 in 1981, nine locations in 1982 and six locations in 1983 (Figure 2-4-10). Main channel spawning occurred in September in all three years.

In 1981 and 1982, chum salmon occupied eight streams above RM 98.6 (Table 2-4-8). In 1983, seven streams were occupied. Chum salmon were most numerous in 1981 in Fourth of July Creek (RM 131.1), Lane Creek (RM 113.6) and Indian River (RM 138.6) where the respective peak index counts were 90, 76 and 40 fish. In 1982, chum salmon were most abundant in Indian River, Fourth of July Creek and Portage Creek (RM 148.9) where 1,346, 191 and 153 fish, respectively, were counted in the index areas. In 1983, Indian River, Portage Creek and Fourth of July Creek supported the highest index area counts of 722, 526 and 148 fish, respectively.



Site Number	Location		Year	Highest No. Caught/Observed	Spawning Observation Dates
	RM	Legal			
1	114.4	S28N04W06CAB	1982	10	9/2
2	115.0	S07N28W04BCB	1983	20	9/12
3	119.0	S16N29W04CDD	1983	17	9/19
4	128.6	S30N03W16BCA	1982	10	9/5 & 9/7
5	129.2	S30N03W09B--	1981	2	9/8
6	129.8	S30N03W09DAB	1982	5	9/12
7	130.5	S30N03W10B--	1981	3	9/8
8	131.1	S30N03W03DA-	1981	3	9/7
		S30N03W03DAB	1983	4	10/1
9	131.3	S30N03W03DAD	1982	12	8/19 & 9/4
10	135.2	S31N02W19ADA	1981	6	9/6
11	136.0	S31N02W19AD-	1982	50	8/12 & 9/4
12	136.1	S20N31W02BBD	1983	110	9/9 & 9/17
13	136.8	S20N31W02BAA	1983	12	9/9
14	137.4	S31N02W17DBB	1982	25	8/19 & 9/5
15	138.6	S09N31W02DCB	1983	56	9/15
16	138.9	S31N02W09DBD	1982	16	9/4
17	143.3	S32N01W31BCB	1982	22	9/4
18	148.2	S32N01W26DCA	1982	400	8/18 & 9/5

Figure 2-4-10. Chum salmon spawning areas identified in the main channel Susitna River in 1981-83.

Table 2-4-8. Chum salmon peak index counts in streams above RM 98.6 in 1981-83.

Stream	River Mile	1981	1982	1983
Whiskers Creek	101.4	1	0	0
Chase Creek	106.9	1	0	0
Lane Creek	113.6	76	11	6
Lower McKenzie Creek	116.2	14	0	1
Little Portage Creek	117.7	0	31	0
Fifth of July Creek	123.7	0	1	6
Skull Creek	124.7	10	1	0
Sherman Creek	130.8	9	0	0
Fourth of July Creek	131.1	90	191	148
Indian River	138.6	40	1,346	722
Jack Long Creek	144.5	0	3	2
Portage Creek	148.9	0	153	526

In 1981 the chum salmon escapement to streams above RM 98.6 was lower than in 1982 or 1983 (Table 2-4-8). The peak chum salmon escapement counts for all stream index areas above RM 98.6 were: 241 fish (1981), 1,737 fish (1982) and 1,411 fish (1983).

Generally chum salmon spawning in streams above RM 98.6 occurred over a six week period from about the first week of August to the third week of September in each of the last three years (1981-83). Peak spawning occurred around the end of August in all three years.

Chum salmon occupied 20 sloughs in 1981, 17 sloughs in 1982 and 23 sloughs in 1983. The three major spawning sloughs used in 1981 and 1982 were: Slough 8A (RM 125.4), Slough 11 (RM 135.3) and Slough 21 (RM 141.1); and in 1983 the sloughs were : Slough 9 (RM 128.3), Slough 11 and Slough 21 (Table 2-4-9). Slough escapements of chum salmon were higher in 1981 and 1982 than in 1983.

Table 2-4-9. Percent distribution of chum salmon in sloughs above RM 98.6 based on peak survey counts of live plus dead fish in 1981-83.

Slough	River Mile	Percent Distribution 1981	1982	1983	Average
1	99.6	0.2	0	0	0.1
2	100.2	1.1	0	3.4	1.2
3B	101.4	0	0	0.2	*
3A	101.9	0	0	0	0
4	105.2	0	0	0	0
5	107.6	0	0.1	*	*
6	108.2	0	0	0	0
6A	112.3	0.4	0.1	0.4	0.3
7	113.2	0	0	0	0
8	113.7	11.6	0	0	4.6
8D	121.8	0	1.0	*	0.4
8C	121.9	0	2.1	0.3	0.8
8B	122.2	*	3.6	7.1	2.8
Moose	123.5	6.4	1.0	4.7	3.9
A'	124.6	5.4	0	5.3	3.3
A	124.7	1.3	0	0.1	0.6
8A	125.4	23.9	15.0	2.5	15.1
B	126.3	-	2.6	0.5	1.5
9	128.3	10.0	13.4	11.5	11.1
9B	129.2	3.5	0.2	0	1.5
9A	133.8	7.0	5.3	7.2	6.2
10	133.8	0	0.1	*	*
11	135.3	15.8	20.5	16.2	16.9
12	135.4	0	0	0	0
13	135.9	0.2	0	0.3	0.1
14	135.9	0	0	0	0
15	137.2	*	*	0.1	*
16	137.3	0.1	0	0	*
17	138.9	1.5	0.9	6.1	2.3
18	139.1	0	0	0	0
19	139.7	0.1	0	0.2	0.1
20	140.0	0.6	1.3	4.3	1.7
21	141.1	10.6	32.8	21.8	20.2
22	144.5	-	-	7.8	5.2
21A	145.3	0.3	0	0	0.1
Total Percent		100.0	100.0	100.0	100.0
Total Fish Count		2,596	2,244	1,467	2,190

* Trace

The peak escapement count (highest live plus dead count) for all sloughs above RM 98.6 totaled 2,596 fish in 1981, 2,244 fish in 1982 and 1,467 fish in 1983.

Chum salmon spawning in sloughs above RM 98.6 generally occurred over a six week period from the second week of August to the fourth week of September in each of the last three years (1981-83). Peak spawning normally occurred in the first week of September or about a week later than in neighboring streams.

The average observation life of a chum salmon in sloughs in 1983 was 6.9 days. The total chum salmon escapement to sloughs above RM 98.6 in 1983, calculated using the observation life estimate (6.9 days) and escapement survey counts of live fish over time, was about 3,000 fish. Assuming the same (1983) observation life, the 1981 and 1982 chum salmon escapements to sloughs were 4,500 and 5,100 fish, respectively (Appendix Tables 2-G-12 and 2-G-13).

In 1983, slough spawning chum salmon were examined for egg retention. The average retention was 114 eggs per female. About 80 percent of the female carcasses examined contained less than 25 eggs each indicating high spawning success. Fewer than four percent of the females sampled retained more than 1,000 eggs each. Egg retention generally has not been considered important except when spawning density is high. A retention of about 100 eggs per female would indicate spawner density was not a problem (Bakkala, 1970).

4.2.5 Coho Salmon

Coho salmon escapements have been monitored in the Yentna River (RM 28) at Yentna Station (TRM 04) and in the Susitna river at Sunshine (RM 80), Talkeetna (RM 103) and Curry (RM 120) stations for the last three years (1981-83).

Escapements into the Susitna River excluding systems below RM 80 except the Yentna River (RM 28) have been at minimum: 37,000 fish (1981), 80,000 fish (1982) and 24,100 fish (1983) (Table 2-4-4).

4.2.5.1 Intertidal To Talkeetna

The 1981 coho salmon escapement into the Yentna River (RM 28) was 50 percent less than the 1982 escapement level and 48 percent greater than the 1983 escapement level. Coho salmon escapements to Yentna Station (TRM 04) for the last three years were: 17,000 fish (1981), 34,000 fish (1982) and 8,900 fish (1983) (Table 2-4-1 and Figure 2-4-11).

The Susitna River coho salmon escapement return at Sunshine Station (RM 80) in 1981 was 58 percent less than the 1982 escapement and 21 percent larger than the 1983 escapement. The three previous years escapements were: 19,200 fish (1981), 45,700 fish (1982) and 15,200 fish (1983) (Table 2-4-1 and Figure 2-4-11).

Coho salmon were abundant in the Yentna River (RM 28) at Yentna Station (TRM 04) between the third week of July and the third week of August for the

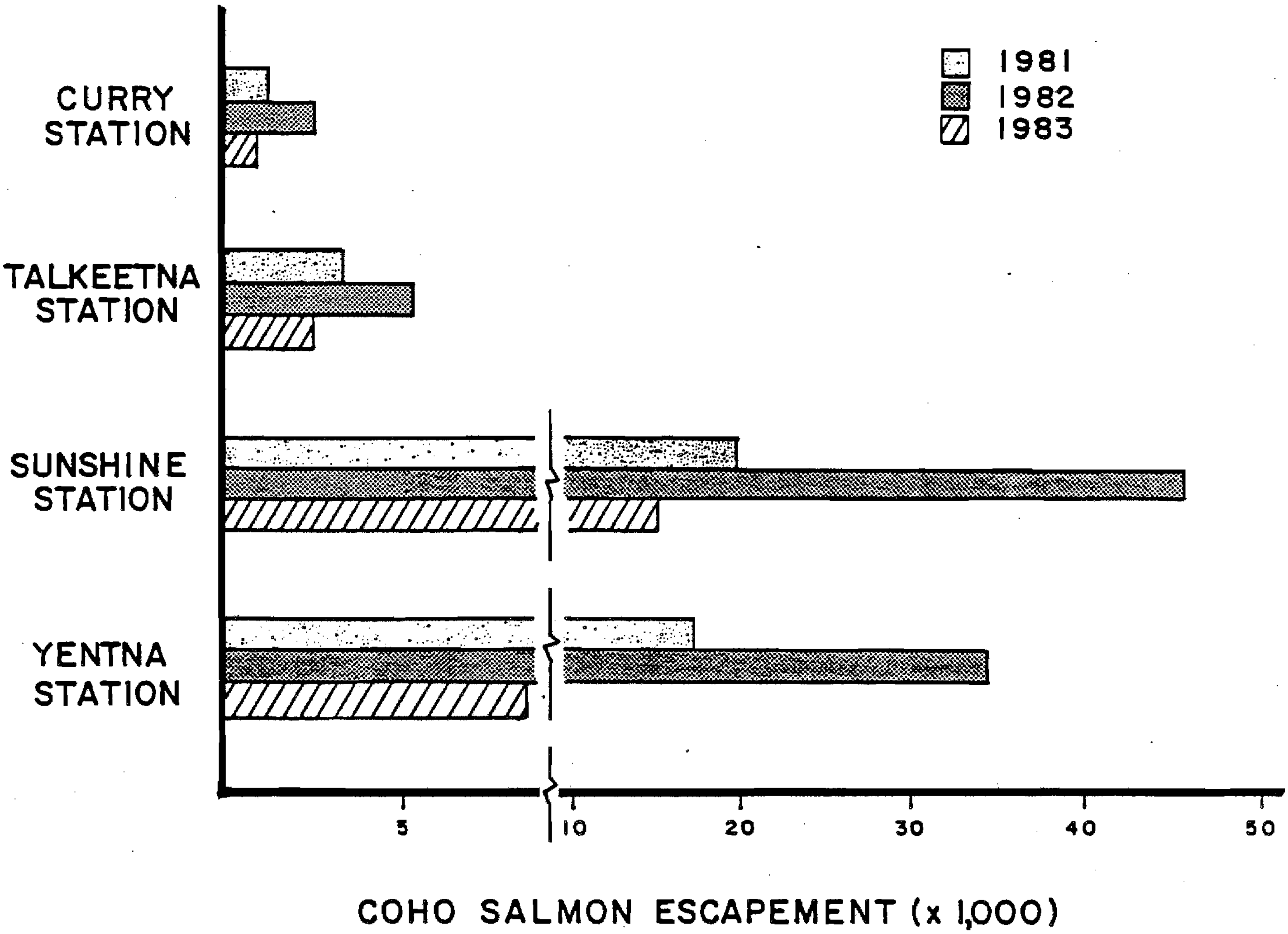


Figure 2-4-11. Minimum Susitna River coho salmon escapements for 1981, 1982 and 1983.

last three years (1981-83) (Figure 2-4-12). The majority of the coho salmon migrating past Yentna Station did so along the south bank in all three years (1981-83).

The coho salmon migration in the Susitna River at Sunshine Station (RM 80) generally extended between the fourth week of July and the last week of August in the three previous years (1981-83) (Figure 2-4-12).

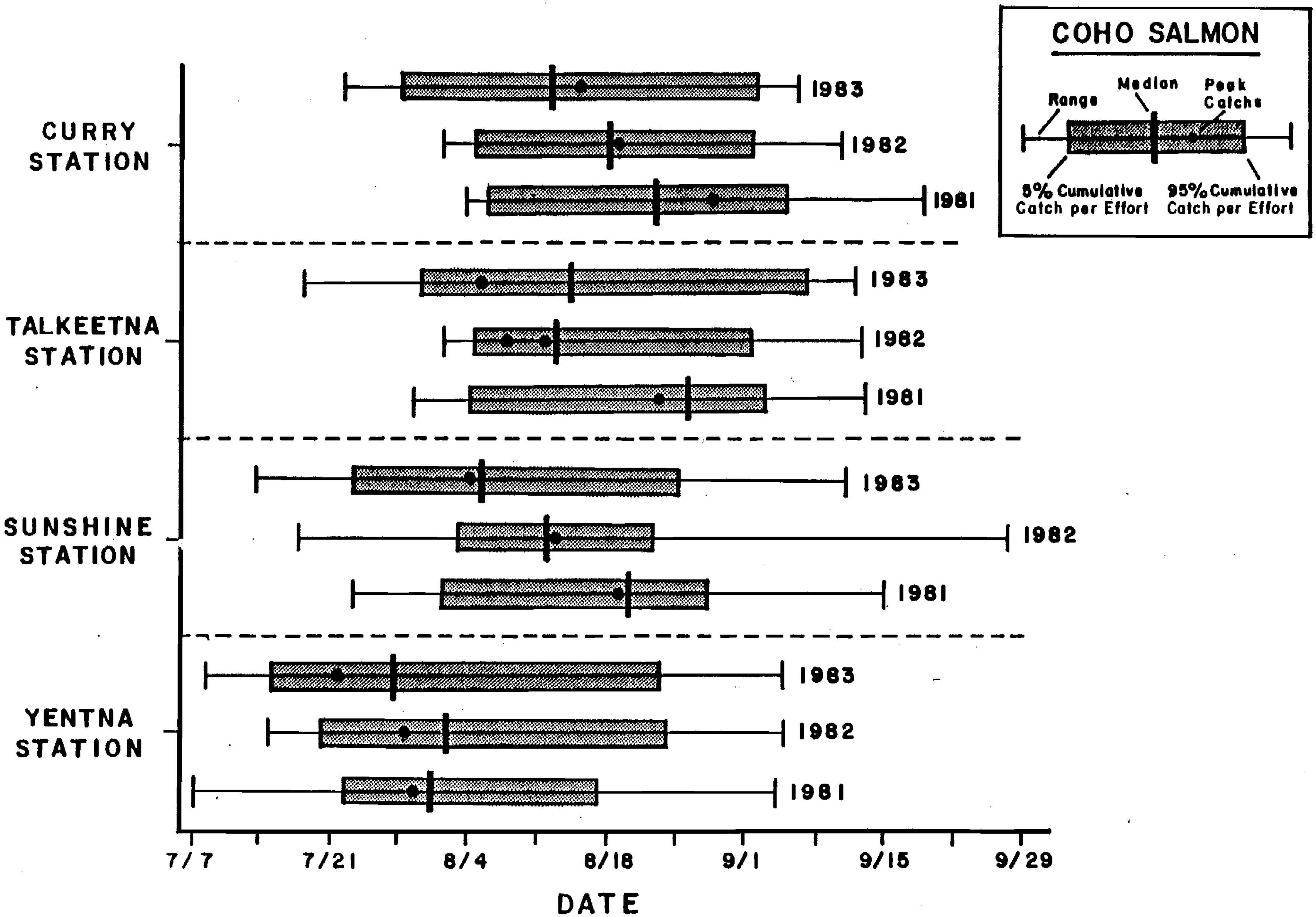


Figure 2-4-12. Migrational timing of coho salmon based on fishwheel catch per unit effort at selected locations on the Susitna River in 1981, 1982 and 1983.

In all three years, the majority of the coho salmon migration has occurred along the east bank.

Coho salmon sampled at Yentna (TRM 04) and Sunshine (RM 80) stations have ranged from three to five years of age in the last three years (1981-83). The majority of the coho salmon escapement sampled at Yentna Station were age class 4_3 in 1981 (82.9%), 1982 (66.8%) and 1983 (79.1%). Age class 3_2 coho salmon accounted for most of the remaining sample for all three years. Coho salmon sampled at Sunshine Station also were predominantly age class 4_3 fish and were: 65.1% (1981), 50.1% (1982) and 63.1% (1983). The majority of the coho salmon sampled at both Yentna and Sunshine stations in all three years (1981-83) had migrated to the ocean (smolted) in their third year of life.

A portion of the coho salmon escapements to Yentna (TRM 04) and Sunshine (RM 80) stations were measured for length in 1981, 1982 and 1983. The mean lengths of coho salmon measured at Yentna Station were: 535 mm (1981), 544 mm (1982) and 528 mm (1983). At Sunshine Station coho salmon had identical mean lengths (523 mm) in 1981 and 1983 while in 1982 this mean length was 27 mm greater.

Male coho salmon were generally more numerous than females at both Yentna (TRM 04) and Sunshine (RM 80) stations for the past three years (1981-83). The male to female coho salmon sex ratios at Yentna Station were: 0.9:1 (1981), 2.3:1 (1982) and 2.3:1 (1983). At Sunshine Station these ratios were: 1.2:1 (1981), 1.4:1 (1982) and 1.2:1 (1983).

The main channel Susitna River between RM 7 and 98.6 was surveyed for coho salmon spawning in 1981 and 1982. Survey results indicated that coho salmon did not spawn in the main channel in either of these years. In 1983 the main channel was not surveyed for adult salmon spawning.

4.2.5.2 Talkeetna To Upper Devil Canyon

Coho salmon escapements have been monitored in the Susitna River at Talkeetna (RM 103) and Curry (RM 120) stations for the past three years (1981-83). The escapements have ranged from 2,400 fish (1983) to 5,100 fish (1982). The three year average was 3,600 fish (Table 2-4-1 and Figure 2-4-11). At Curry Station the coho salmon escapements have ranged from 800 fish (1983) to 2,400 fish (1982) and averaged 1,400 fish for the three year period (1981-83).

Coho salmon were abundant in the Susitna River at Talkeetna (RM 103) and Curry (RM 120) stations for about six weeks from the last week of July through the first week of September in each of the last three years (1981-83) (Figure 2-4-12). The majority of the coho salmon migration at Talkeetna Station occurred along the west bank in all three years. At Curry Station coho salmon passed predominantly along the east bank in 1981 and 1983 and along the west bank in 1982.

Migrational rates of coho salmon in the last three years (1981-83) have been determined from recaptures of previously tagged individuals. Coho salmon traveled at a slower rate between Sunshine (RM 80) and Talkeetna (RM 103) stations in 1981 than in 1982 and at a faster rate than in 1983.

The rates were: 4.0 mpd (1981), 5.3 mpd (1982) and 1.4 mpd (1983). Coho salmon migrated faster between Talkeetna and Curry (RM 120) stations than between Sunshine and Talkeetna stations in all three years. The travel rates between Talkeetna and Curry stations were: 11.3 mpd (1981), 10.0 mpd (1982) and 5.7 mpd (1983).

The coho salmon escapements at Talkeetna (RM 103) and Curry (RM 120) stations were sampled for age, length, and sex for three consecutive years (1981-83). Coho salmon sampled at both Talkeetna and Curry stations were generally in the 520-530 mm length range in all three years (1981-83). The exception was in 1982 at Talkeetna Station when coho salmon averaged 553 mm in length. The majority of the coho salmon escapement sampled for age at Talkeetna Station in 1981 were age class 4_3 fish (84.8%). In 1982 age class 3_2 coho salmon dominated the sample (59.0%). Age class 4_3 fish were again dominant in 1983 (60.2%). This pattern was repeated at Curry Station where age class 4_2 coho salmon were dominant in 1981 (68.8%) and 1983 (53.2%), while age class 3_2 fish were dominant in 1982 (54.0%). Males were more numerous than females in all three years at Talkeetna and Curry stations. The coho salmon male to female sex ratios at Talkeetna Station were: 1.5:1 (1981), 1.5:1 (1982) and 1.7:1 (1983). At Curry Station these ratios were: 2.0:1 (1981), 1.3:1 (1982) and 2.0:1 (1983).

The Susitna River main channel between RM 98.6 and 161.0 was surveyed for coho salmon spawning in 1981 and 1982. In 1983 main channel coho salmon spawning information was acquired incidental to slough and stream surveys. In 1981 a single main channel spawning coho salmon was captured at RM 129.2 on September 2. In 1982 no main channel spawning sites were identified. One main channel coho salmon spawning site (RM 131.7) was located in 1983. This was the only main channel spawning by coho salmon reported in 1983.

Sloughs in the Susitna River between RM 98.6 and 161.0 were repetitively surveyed for coho salmon from 1981 to 1983. Based on these surveys, coho salmon did not spawn in sloughs in 1981 or 1983. In 1982, two coho salmon were observed spawning in Slough 8A (RM 125.1) on October 2. This was the only slough used by coho salmon for spawning in all three years (1981-83).

Streams tributary to the Susitna River between RM 98.6 and 161.0 were also repetitively surveyed for coho salmon in 1981, 1982 and 1983. The total peak index counts by ground survey of all streams were: 367 (1981), 428 (1982) and 130 (1983). In 1981, based on peak index counts, coho salmon were most abundant in Gash (RM 111.6) and Chase (RM 106.9) creeks (Table 2-4-10). In 1982 the streams were Whiskers (RM 101.4) and Lower McKenzie (RM 116.2) creeks. Coho salmon were found primarily in Whiskers Creek and Indian River (RM 138.6) in 1983.

4.3 Bering Cisco

Bering cisco were initially documented in the Susitna River in August, 1981. The escapement was monitored for migrational timing, relative abundance and population meristic information at Sunshine Station (RM 80) in 1981 and 1982. Bering cisco were incidentally sampled at

Table 2-4-10. Percent distribution of coho salmon in streams above RM 98.6 based on peak index counts in 1981-83.

	River Mile	Percent Distribution		
		1981	1982	1983
Whiskers Creek	101.4	19.0	36.5	42.3
Chase Creek	106.9	21.8	7.5	0.8
Slash Creek	111.2	0	1.2	1.5
Gash Creek	111.6	38.4	15.4	14.6
Lane Creek	113.6	0.8	1.0	1.5
Lower McKenzie Creek	116.2	15.3	27.6	13.9
Little Portage Creek	117.7	0	1.7	0
Fourth of July Creek	131.1	0.3	0.8	2.3
Gold Creek	136.7	0	0.2	0
Indian River	138.6	4.4	7.7	20.8
Jack Long Creek	144.5	0	0.2	0.8
Portage Creek	148.9	0	0.2	1.5
Total Percent		100.0	100.0	100.0
Total Peak Counts		367	482	130

Susitna (RM 26), Yentna (TRM 04), Talkeetna (RM 103) and Curry (RM 120) stations in 1982 and also in 1983 with the exception of Susitna Station.

In 1981, the Bering cisco escapement to the Susitna River was approximately 2.4 times greater than the 1982 escapement based on comparative year fishwheel catches at Sunshine Station (RM 80). In both years Bering cisco were abundant in the Susitna River at Sunshine Station for eight weeks from the last week of August through the third week of October.

Bering cisco were not present above the three rivers confluence (RM 98.6) in any appreciable numbers. In 1982 only one Bering cisco was captured at Talkeetna Station (RM 103) and no Bering cisco were intercepted at Curry Station (RM 120).

The Bering cisco escapement was monitored to determine population age, length and sex characteristics in 1981 and 1982. In both years information collected at all sampling locations was pooled for analysis. The Bering cisco escapement was comprised of four, five and six year old fish in 1981 and 1982. The majority in both years were five year old fish. Average lengths of Bering cisco between years were essentially the same, 335 mm in 1981 and 338 mm in 1982. Male to female sex ratios for these years were: 1.0:1 (1981) and 1.4:1 (1982).

The Susitna River main channel, side channels, sloughs and stream mouths were surveyed in 1981 and 1982 to identify Bering cisco spawning areas. No surveys were conducted in 1983. Bering cisco spawned only in Susitna River main channel habitats in 1981 and 1982. The major spawning area was the 10 mile reach between RM 75 and 85. Bering cisco spawning occurred in September and October and peaked the second week of October in both years (1981 and 1982).

Susitna River Bering cisco are probable successive year spawners (ADF&G, 1982). Further support for this premise was provided by the recapture of a Bering cisco in lower Cook Inlet in August, 1983 which had been initially tagged at RM 77.0 on October 5, 1981. The specimen was a five year old, gravid female. It is probable that this fish spawned as many as two times and was prepared to spawn again in 1983.

The known distribution of Bering cisco in the Susitna River was extended in 1983. A single Bering cisco was captured at Fourth of July Creek (RM 131.1) on October 6 redefining the upper limit of this species in the Susitna River. The previous known upper limit of the Bering cisco range was RM 103 (Talkeetna Station) based on a single capture in 1982.

REFERENCES

Alaska Department of Fish and Game. 1981. Adult anadromous fisheries project, phase I final draft report. Alaska Department of Fish and Game, Su Hydro Aquatic Studies Program, Anchorage, Alaska, USA.

________. 1982. Adult anadromous fish studies, volume 2 phase II final data report. Alaska Department of Fish and Game, Su Hydro Aquatic Studies Program, Anchorage, Alaska, USA.

________. 1983. Procedures manual final draft. Alaska Department of Fish and Game, Su Hydro Aquatic Studies Program, Anchorage, Alaska, USA.

Bakkala, R. G. 1970. Synopsis of biological data on the Chum Salmon, Oncorhynchus keta (Walbaum) 1792. FAO Species Synopsis No. 41, U.S. Fish and Wildlife Service Circular 315, Washington, D.C., USA.

Barrett, B. M. 1974. An assessment of the anadromous fish populations in the upper Susitna River watershed between Devil Canyon and the Chulitna River. Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage, Alaska, USA.

________. 1974. 1971-1973 Sockeye Salmon Fry Production Studies on Selected Streams in the Kasilof River Watershed. Alaska Department of Fish and Game, Division of Commercial Fisheries, Cook Inlet Data Report Series No. 73-8, Soldotna, Alaska, USA.

Begon, M. 1979. Investigating animal abundance: capture - recapture for biologists. Edmond Arnold, London, England.

Bendix Corporation. 1980. Installation and operation manual side scan sonar counter (1980 Model). Report No. SP-78-017, North Hollywood, California, USA.

BMDP. 1981. BMDP statistical software. University of California Press, Berkley, California, USA.

Clutter, R. I and L. E. Whitesel. 1956. Collection and interpretation of sockeye salmon scales. Bull. Int. Pac. Salmon Fish. Com., No. 9, Canada.

Cousens, N. B. F., G. A. Thomas, C. G. Swann, and M. C. Healey. 1982. A review of salmon escapement estimation techniques. Canadian Technical Report of Fisheries and Aquatic Sciences, No. 1108, Nanaimo, British Columbia, Canada.

Daniel, W. W. 1978. Applied nonparametric statistics. Houghton Mifflin Company, Boston, Massachusetts, USA.

Dixon, W. J. and R. J. Massey. 1969. Introduction to statistical analysis. McGraw-Hill. New York, New York, USA.

Franzel, J. and K. A. Nelson. 1981. Stikine River eulachon (Thaleichthys pacificus). U.S. Forest Service Report, Petersburg Ranger District, Petersburg, Alaska, USA.

Hart, J. L. 1973. Pacific fishes of Canada. Fisheries Research Board of Canada, Bulletin 180, Ottawa, Canada.

Lagler, K. F., J. E. Bardach and R. R. Miller. 1962. Ichthyology. John Wiley and Sons, Inc., New York, New York, USA.

McPhail, J. D. and C. C. Lindsey. 1970. Freshwater fishes of northwestern Canada and Alaska. Fisheries Research Board of Canada, Bulletin 173, Ottawa, Canada.

Meehan, W. R. 1961. Use of a fishwheel in salmon research management. Transactions of the American Fisheries Society Vol. 90: 490-494.

Morrow, J. E. 1980. The freshwater fishes of Alaska. Alaska Northwest Publishing Company, Anchorage, Alaska, USA.

Neilson, J. D, and G. H. Geen. 1981. Enumeration of spawning salmon from spawner residence time and aerial counts. Transactions of the American Fisheries Society 110:554-556.

Ruesch, P. 1983. Personal Communication. Alaska Department of Fish and Game, Division of Commercial Fisheries, Soldotna, Alaska, USA.

Schaefer, M.B. 1951. A study of the spawning populations of sockeye salmon in the Harrison River system, with special reference to the problem of enumeration by means of marked members. International Pacific Salmon Fisheries Commission, Bulletin IV, New Westminster, British Columbia, Canada.

Seber, G. A. and R. Felton. 1981. Tag loss and the Petersen mark-recapture experiment. Biometrika 68 (1): 211 - 219.

Smith, W. E. and R. W. Saalfeld. 1955. Studies on Columbia River smelt Thaleichthys pacificus (Richardson). Fisheries Research Papers, Washington Department of Fisheries, 1(2):2-26.

Snyder, George R. 1970. Thermal Pollution of Columbia River Might Threaten Smelt. Commerical Fisheries Review, 27(1):58-74.

Tarbox, K. 1983. Personal Communication. Alaska Department of Fish and Game, Division of Commercial Fisheries, Soldotna, Alaska, USA.

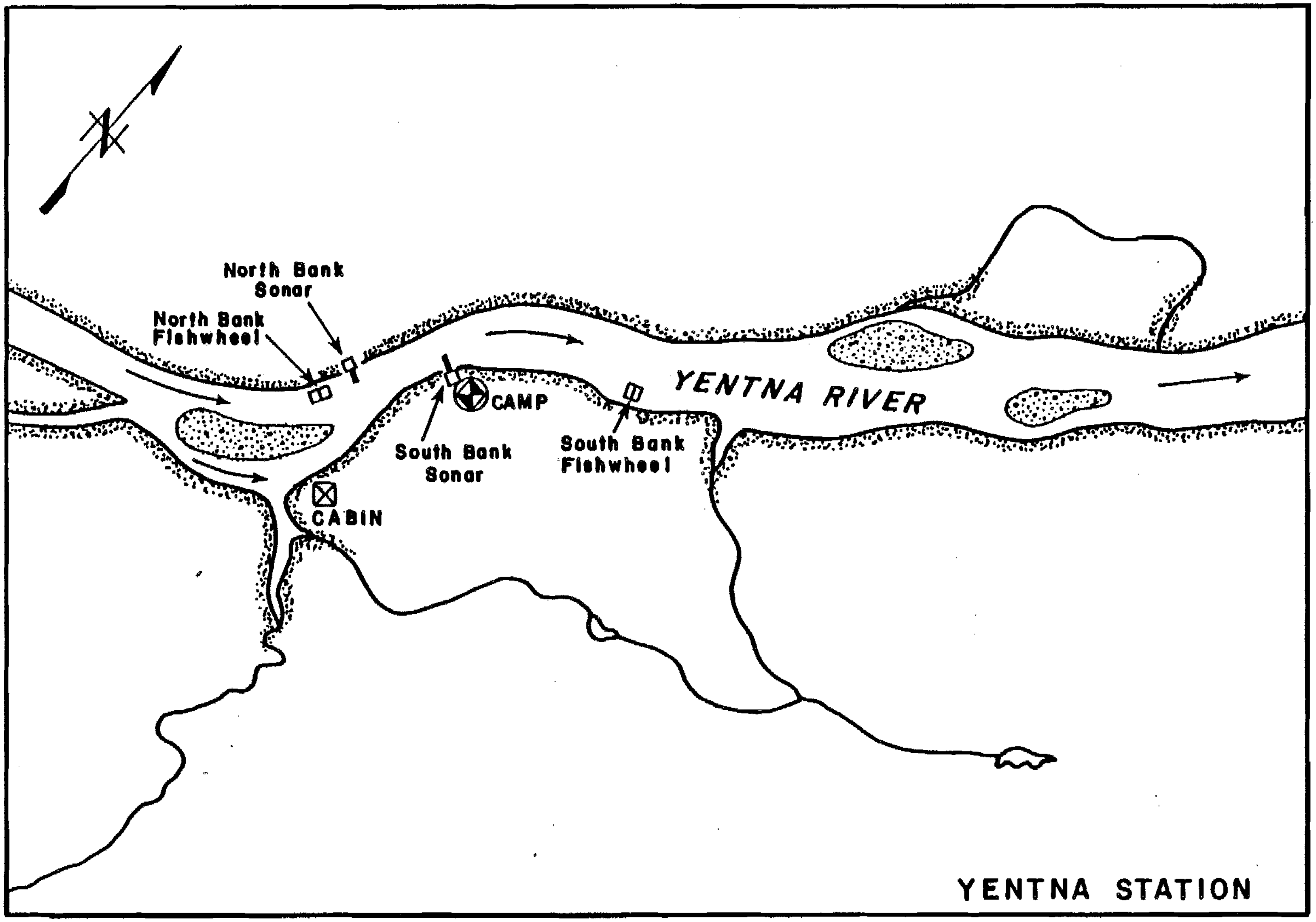
Thompson, F. M. and B. M. Barrett. 1983. Analysis of the species selectivity of fishwheels for the capture of adult salmon in the Susitna River In Synopsis of the 1982 aquatic studies and analysis of fish and habitat relationships. Alaska Department of Fish and Game, Su Hydro Aquatic Studies Program, Anchorage, Alaska, USA.

U.S. Coast Guard. 1982. Personal Communication. Anchorage, Alaska, USA.

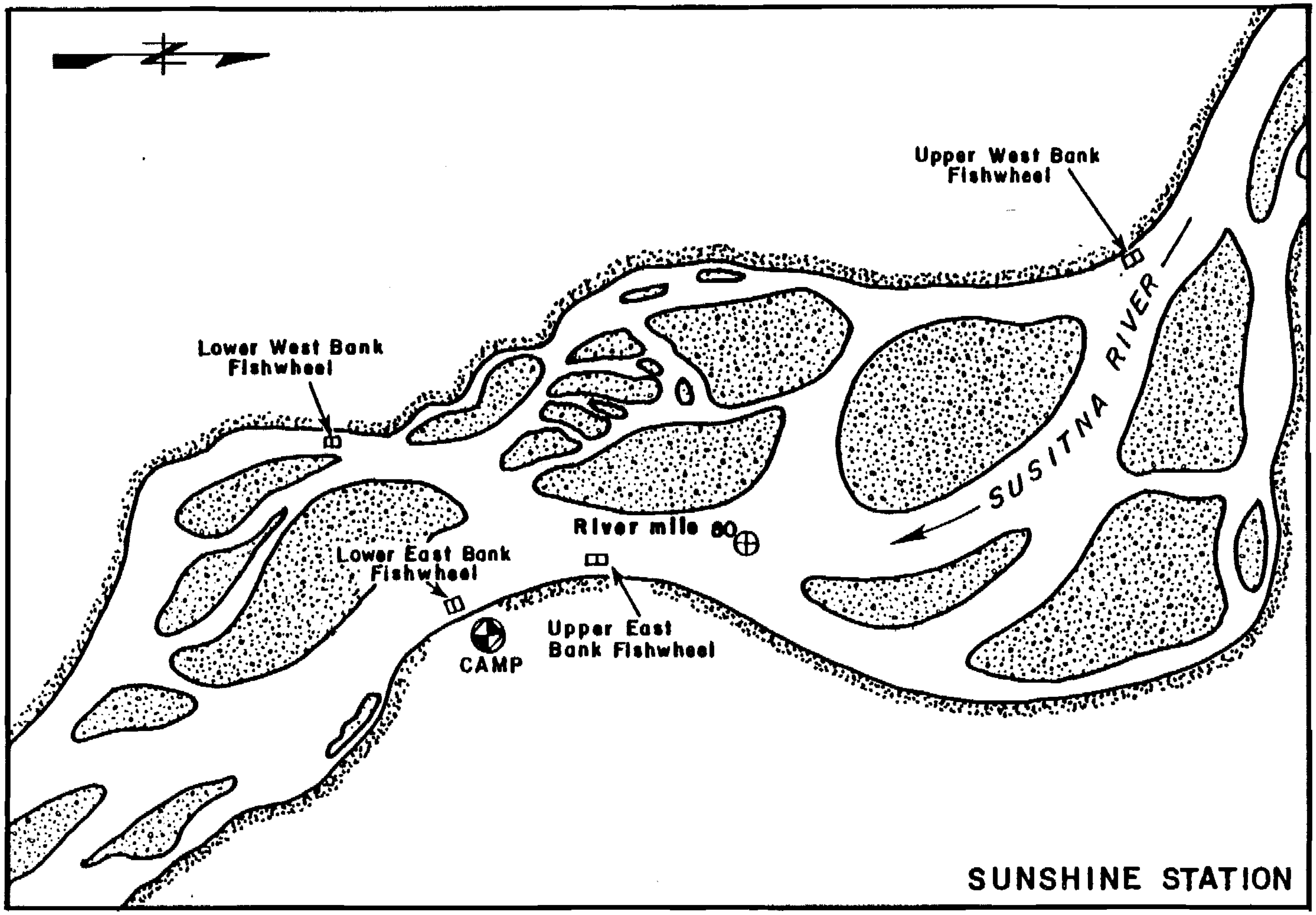
APPENDIX 2-A

SUSITNA AND YENTNA RIVERS

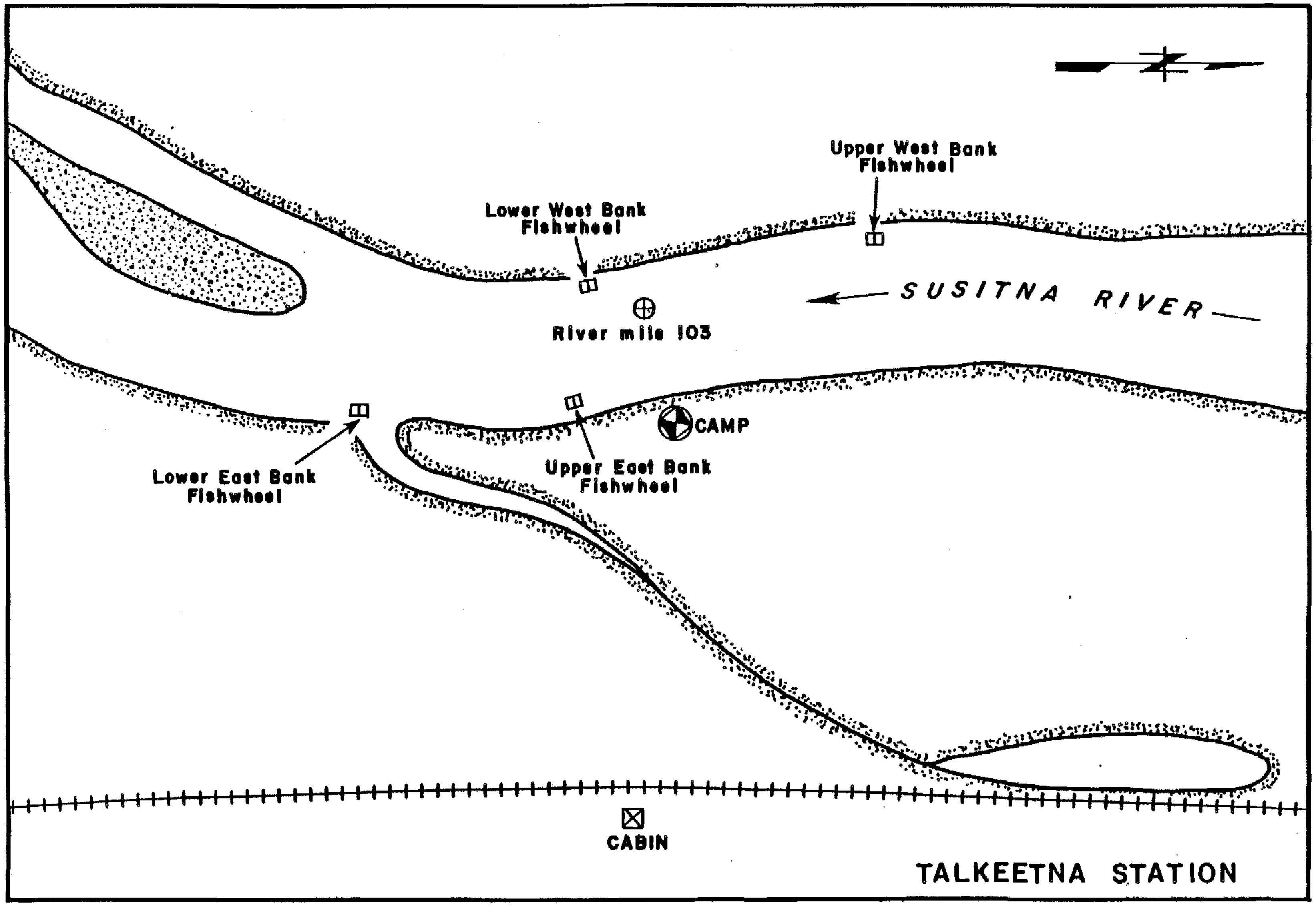
SAMPLING LOCATIONS



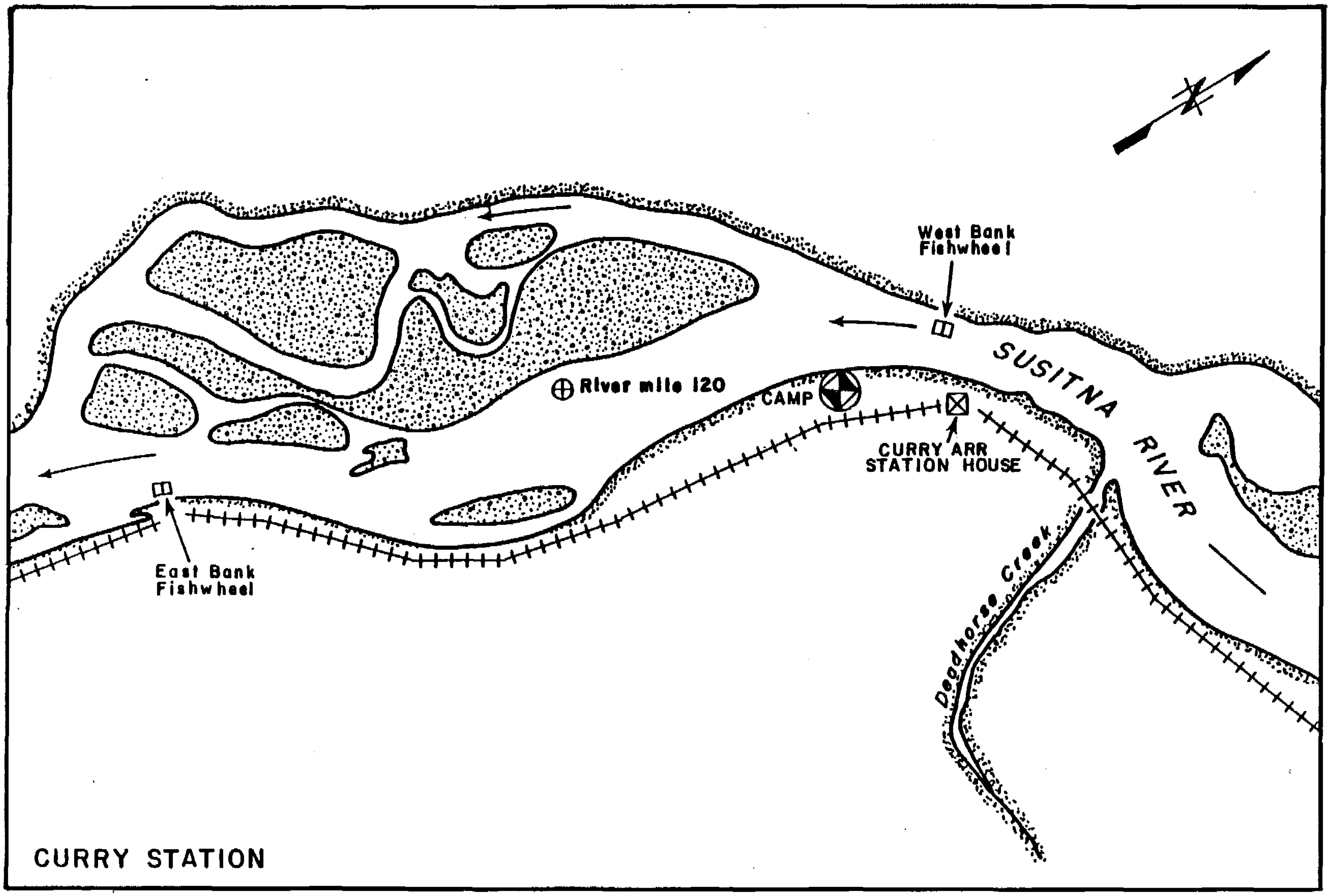
Appendix Figure 2-A-1. Yentna Station with sonar and fishwheel locations defined,1983.



Appendix Figure 2-A-2. Sunshine Station with fishwheel locations defined,1983.



Appendix Figure 2-A-3. Talkeetna Station with fishwheel locations defined, 1983.



Appendix Figure 2-A-4. Curry Station with fishwheel locations defined,1983.

APPENDIX 2-B

DIPNET AND ELECTROSHOCKER

EULACHON CATCH

Appendix Table 2-B-1. Dipnet and electroshocker catches of eulachon in the Susitna River main channel, 1983.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
10	4.5	0	0	0	2	0	0	DIPNET
11	4.5	3	0	0	1	0	0	DIPNET
11	4.5	7	0	0	2	0	0	DIPNET
12	4.5	39	6	0	12	0	0	DIPNET
12	4.5	19	2	0	5	0	0	DIPNET
13	4.5	56	4	0	22	1	0	DIPNET
14	4.5	39	14	0	45	2	0	DIPNET
15	4.5	2	1	0	0	0	0	DIPNET
15	4.5	11	0	0	3	0	0	DIPNET
15	12.5	10	4	2	7	1	1	DIPNET
15	13.1	0	0	0	0	0	0	DIPNET
15	13.8	24	48	18	18	5	4	DIPNET
15	14.4	2	2	0	2	0	0	DIPNET
15	14.5	8	6	0	13	0	0	DIPNET
16	4.5	10	3	0	4	0	0	DIPNET
16	7.6	34	12	0	50	4	0	DIPNET
16	7.6	1	1	0	1	1	0	DIPNET
16	8.3	0	1	0	2	1	0	DIPNET
16	8.5	0	0	0	0	0	0	DIPNET
17	4.5	10	1	4	5	1	0	DIPNET
17	9.8	0	0	0	0	0	0	DIPNET
17	13.8	0	1	1	0	0	0	DIPNET

Appendix Table 2-B-1. Continued.

Date	River Mile	Eulachon Catch						Method
		Male			Female			
		Pre	Spawning	Post	Pre	Spawning	Post	
MAY								
17	15.0	10	10	9	15	1	2	DIPNET
17	16.5	1	3	3	0	0	0	DIPNET
17	18.2	17	82	16	3	0	1	DIPNET
17	19.7	5	8	3	3	0	0	DIPNET
17	19.8	2	0	0	2	0	0	DIPNET
17	21.5	2	7	1	29	1	3	DIPNET
17	22.1	0	0	0	0	0	0	DIPNET
17	23.0	4	11	2	7	1	0	DIPNET
18	26.6	0	15	39	0	0	1	DIPNET
18	26.6	2	47	15	0	0	0	ELECTROSHOCK
18	27.1	0	0	1	0	0	0	DIPNET
18	27.5	0	0	0	0	0	0	DIPNET
18	28.1	1	1	1	0	0	0	DIPNET
18	28.5	0	0	3	0	0	0	DIPNET
18	31.0	0	0	0	0	0	0	DIPNET
18	34.8	0	0	0	0	0	0	DIPNET
18	36.8	0	0	0	0	0	0	DIPNET
18	47.8	0	0	0	0	0	0	DIPNET
19	4.5	12	24	10	22	0	0	DIPNET
19	5.8	0	0	0	0	0	0	DIPNET
19	6.9	1	1	0	0	0	0	DIPNET
19	9.6	0	0	0	0	0	0	DIPNET
19	12.5	3	52	22	5	1	0	DIPNET

Appendix Table 2-B-1. Continued.

Date	River Mile	Eulachon Catch						Method
		Male			Female			
		Pre	Spawning	Post	Pre	Spawning	Post	
MAY								
19	13.8	0	1	0	0	0	0	DIPNET
19	15.0	11	17	7	8	1	0	DIPNET
19	15.0	10	21	6	2	1	0	DIPNET
19	16.2	4	53	8	2	0	0	DIPNET
19	16.5	0	3	4	0	0	0	DIPNET
19	18.2	0	11	0	0	8	0	DIPNET
19	20.2	3	8	0	0	1	0	DIPNET
19	22.1	0	0	0	0	0	0	DIPNET
19	22.5	0	1	2	0	0	0	DIPNET
19	22.6	0	4	1	0	1	0	DIPNET
20	6.3	0	0	3	0	0	0	ELECTROSHOCK
20	7.9	6	2	0	1	0	0	ELECTROSHOCK
20	9.8	22	10	2	10	2	0	ELECTROSHOCK
20	12.5	18	33	1	10	6	0	ELECTROSHOCK
20	14.0	17	25	8	2	0	0	ELECTROSHOCK
20	16.2	2	22	5	1	1	0	ELECTROSHOCK
20	18.2	14	13	8	3	3	0	ELECTROSHOCK
20	20.3	2	3	0	2	0	0	ELECTROSHOCK
20	21.8	1	5	2	1	2	0	ELECTROSHOCK
20	26.6	14	90	21	1	1	0	ELECTROSHOCK
20	28.4	0	0	0	0	0	0	ELECTROSHOCK
20	31.0	0	0	0	0	0	0	ELECTROSHOCK
20	35.0	0	0	0	0	0	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
20	35.3	0	0	0	0	0	0	ELECTROSHOCK
20	36.8	0	0	0	0	0	0	ELECTROSHOCK
20	38.4	0	0	0	0	0	0	ELECTROSHOCK
20	39.9	0	0	0	0	0	0	ELECTROSHOCK
20	41.3	0	0	0	0	0	0	ELECTROSHOCK
20	43.4	0	0	0	0	0	0	ELECTROSHOCK
21	4.5	39	9	0	86	0	0	DIPNET
21	6.7	43	17	1	54	0	1	DIPNET
21	12.8	4	0	0	3	0	0	DIPNET
21	14.1	9	3	0	22	0	0	DIPNET
21	14.5	52	26	0	35	0	0	ELECTROSHOCK
21	15.0	52	64	0	22	7	0	ELECTROSHOCK
21	15.8	0	0	0	3	0	0	DIPNET
21	18.2	20	40	4	16	0	0	ELECTROSHOCK
21	18.9	35	190	6	3	0	0	ELECTROSHOCK
21	23.2	31	25	0	18	0	0	DIPNET
21	25.5	17	13	3	5	2	0	DIPNET
22	23.7	40	20	0	60	0	0	DIPNET
22	24.2	38	10	0	19	0	0	DIPNET
22	24.7	15	16	2	21	1	0	DIPNET
22	25.4	21	11	0	6	0	0	DIPNET
22	25.5	16	14	0	17	2	0	DIPNET
22	25.5	10	4	0	17	1	0	DIPNET

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
22	26.2	33	22	1	20	1	0	DIPNET
22	27.1	38	3	1	18	2	0	DIPNET
22	27.3	11	21	2	5	3	0	DIPNET
22	27.4	21	7	0	10	0	0	DIPNET
22	27.7	21	47	0	30	2	0	DIPNET
22	27.8	22	14	0	22	0	0	DIPNET
22	28.9	10	10	0	45	2	0	DIPNET
22	31.0	20	18	1	35	0	0	DIPNET
22	31.0	1	0	0	0	0	0	DIPNET
22	32.9	0	0	0	0	0	0	DIPNET
22	33.7	62	11	0	45	0	0	DIPNET
22	34.7	7	1	0	3	0	0	DIPNET
22	34.7	0	0	0	0	0	0	DIPNET
22	34.8	0	0	0	0	0	0	DIPNET
22	35.0	25	7	0	15	0	0	DIPNET
22	35.4	4	2	0	5	0	0	DIPNET
22	36.8	21	4	0	9	0	0	DIPNET
22	37.1	9	2	0	0	0	0	DIPNET
22	38.5	1	0	0	0	0	0	DIPNET
22	38.5	0	0	0	0	0	0	DIPNET
22	39.0	0	0	0	0	0	0	DIPNET
22	41.4	0	0	0	0	0	0	DIPNET
22	41.4	0	0	0	0	0	0	DIPNET

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
22	43.4	0	0	0	0	0	0	DIPNET
23	4.5	37	13	0	61	0	0	DIPNET
23	8.4	9	10	0	44	2	0	DIPNET
23	9.0	6	15	0	26	5	0	DIPNET
23	9.7	10	14	0	38	5	0	DIPNET
23	11.5	31	9	0	46	1	0	DIPNET
23	20.7	16	16	0	39	0	0	DIPNET
23	20.8	24	12	0	52	2	0	DIPNET
23	21.3	18	20	0	28	0	0	DIPNET
23	21.4	26	14	0	25	2	0	DIPNET
23	22.1	16	10	0	34	1	3	DIPNET
23	22.5	14	17	0	49	1	0	DIPNET
23	23.0	28	21	0	43	5	0	DIPNET
24	12.5	3	11	1	50	10	1	DIPNET
24	13.1	2	15	0	69	15	0	DIPNET
24	13.1	1	2	0	0	0	1	DIPNET
24	13.3	1	4	0	35	8	0	DIPNET
24	13.4	4	20	0	20	4	0	DIPNET
24	13.8	5	12	0	38	9	1	DIPNET
24	13.8	5	8	0	8	1	3	DIPNET
24	14.7	6	15	0	19	8	0	DIPNET
24	14.9	2	19	0	45	21	0	DIPNET
24	15.0	7	30	0	26	8	0	DIPNET

Appendix Table 2-B-1. Continued.

Date	River Mile	Eulachon Catch						Method
		Male			Female			
		Pre	Spawning	Post	Pre	Spawning	Post	
MAY								
24	15.5	4	16	0	19	14	0	DIPNET
24	15.5	0	8	0	6	7	1	DIPNET
24	15.5	1	20	1	32	28	0	DIPNET
24	15.5	2	12	0	32	29	1	DIPNET
24	15.7	4	18	0	50	9	0	DIPNET
24	16.2	4	14	0	58	5	0	DIPNET
24	16.5	3	3	0	60	10	0	DIPNET
24	17.1	1	8	0	39	8	0	DIPNET
24	17.2	1	46	0	3	6	0	DIPNET
24	17.7	24	54	0	50	9	0	DIPNET
24	18.2	6	94	0	4	28	2	DIPNET
24	18.7	0	25	5	0	3	1	DIPNET
24	19.3	2	39	1	1	3	4	DIPNET
24	19.8	0	32	0	7	10	2	DIPNET
24	19.8	0	47	3	9	7	8	DIPNET
24	21.3	0	42	7	4	7	12	DIPNET
24	22.5	0	25	0	0	12	0	DIPNET
24	23.3	1	43	0	10	2	0	DIPNET
24	23.7	0	40	2	12	7	2	DIPNET
24	24.8	0	54	0	20	18	0	DIPNET
25	6.1	2	11	16	0	2	5	DIPNET
25	8.9	0	0	0	0	0	0	DIPNET
25	9.0	3	22	0	1	3	0	DIPNET

Appendix Table 2-B-1. Continued.

Date	River Mile	Eulachon Catch						Method
		Male			Female			
		Pre	Spawning	Post	Pre	Spawning	Post	
MAY								
25	9.8	1	18	2	2	7	1	DIPNET
25	11.7	1	35	2	1	7	0	DIPNET
25	14.3	0	24	3	2	4	1	DIPNET
25	17.1	0	27	0	0	42	0	DIPNET
25	19.0	0	12	1	3	11	2	DIPNET
25	22.0	0	8	1	5	18	0	DIPNET
25	24.3	1	19	2	5	22	2	DIPNET
25	27.8	0	18	0	2	12	0	DIPNET
25	29.6	0	24	0	4	6	0	DIPNET
25	32.0	1	23	0	15	9	0	DIPNET
25	32.1	0	0	0	0	0	0	DIPNET
25	34.0	0	23	0	7	12	0	DIPNET
25	36.0	1	22	0	14	13	0	DIPNET
25	38.2	5	24	0	10	4	0	DIPNET
25	39.8	0	1	0	1	2	0	DIPNET
25	39.8	10	26	0	3	1	0	DIPNET
25	41.6	3	25	0	2	8	1	DIPNET
25	44.0	0	20	0	4	5	0	ELECTROSHOCK
25	44.9	3	12	0	1	9	1	ELECTROSHOCK
25	47.0	3	8	0	10	5	0	ELECTROSHOCK
25	47.0	0	0	0	0	0	0	ELECTROSHOCK
25	49.2	9	40	0	0	5	0	ELECTROSHOCK
25	53.3	0	0	0	0	0	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

Date	River Mile	Eulachon Catch						Method
		Male			Female			
		Pre	Spawning	Post	Pre	Spawning	Post	
MAY								
25	53.3	0	0	0	0	0	0	ELECTROSHOCK
25	55.7	0	0	0	0	0	0	ELECTROSHOCK
26	4.5	58	203	96	10	13	16	DIPNET
26	6.3	0	15	11	1	1	1	DIPNET
26	7.5	0	2	1	0	0	0	DIPNET
26	8.5	0	25	10	1	2	1	DIPNET
26	9.0	0	24	11	0	2	0	DIPNET
26	12.0	0	29	2	2	4	0	DIPNET
26	25.5	12	65	95	22	34	50	DIPNET
27	41.5	1	64	14	0	7	2	ELECTROSHOCK
27	41.7	0	121	5	1	19	1	ELECTROSHOCK
27	43.2	0	0	1	0	0	0	ELECTROSHOCK
27	43.2	0	0	0	0	0	0	ELECTROSHOCK
27	43.7	0	65	15	0	3	6	ELECTROSHOCK
27	44.1	0	10	0	0	5	0	ELECTROSHOCK
27	46.8	0	0	0	0	0	0	ELECTROSHOCK
27	47.6	0	1	0	0	0	0	ELECTROSHOCK
27	49.2	0	0	0	0	0	0	ELECTROSHOCK
27	49.5	0	0	0	0	0	0	ELECTROSHOCK
27	50.3	0	37	5	0	4	50	ELECTROSHOCK
27	50.5	0	0	0	0	0	0	ELECTROSHOCK
27	51.0	0	0	0	0	0	0	ELECTROSHOCK
27	52.8	0	0	0	0	0	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
27	55.0	0	0	0	0	0	0	ELECTROSHOCK
27	57.0	0	0	0	0	0	0	ELECTROSHOCK
27	59.6	0	0	0	0	0	0	ELECTROSHOCK
28	4.5	5	156	203	0	1	13	DIPNET
28	4.8	0	24	19	0	0	0	ELECTROSHOCK
28	14.5	0	36	28	0	1	3	ELECTROSHOCK
28	14.9	0	14	33	0	0	0	ELECTROSHOCK
28	15.3	0	53	20	0	2	0	ELECTROSHOCK
28	26.2	0	13	0	0	34	0	DIPNET
28	26.6	0	50	61	0	0	0	DIPNET
28	27.1	0	56	53	0	3	1	DIPNET
28	27.8	0	33	25	0	1	0	DIPNET
28	31.5	0	0	1	1	0	0	DIPNET
28	34.3	0	5	1	0	1	0	DIPNET
28	36.9	0	0	0	0	0	0	DIPNET
28	38.2	0	0	0	0	0	0	DIPNET
28	39.2	4	30	4	2	1	0	DIPNET
28	40.3	0	22	3	0	0	0	DIPNET
29	27.4	3	20	16	0	0	0	ELECTROSHOCK
29	27.5	0	30	5	0	3	0	DIPNET
29	30.9	0	0	0	0	0	0	ELECTROSHOCK
29	31.4	0	63	24	0	3	0	ELECTROSHOCK
29	31.7	0	54	10	1	1	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
29	33.0	0	19	5	0	0	0	ELECTROSHOCK
29	33.7	0	75	8	0	5	0	ELECTROSHOCK
29	35.0	0	24	18	0	0	0	ELECTROSHOCK
29	35.0	0	0	0	0	0	0	ELECTROSHOCK
29	37.0	0	60	35	0	2	0	ELECTROSHOCK
29	37.0	0	57	33	0	3	0	ELECTROSHOCK
29	38.5	0	0	0	0	0	0	ELECTROSHOCK
29	39.0	0	54	12	0	0	0	ELECTROSHOCK
30	25.5	0	81	6	0	43	1	DIPNET
30	44.7	0	0	0	0	0	0	ELECTROSHOCK
30	48.0	0	0	0	0	0	0	ELECTROSHOCK
30	50.3	0	0	0	0	0	0	ELECTROSHOCK
30	53.4	0	0	0	0	0	0	ELECTROSHOCK
30	56.0	0	0	0	0	0	0	ELECTROSHOCK
30	56.2	0	0	0	0	0	0	ELECTROSHOCK
30	58.6	0	0	0	0	0	0	ELECTROSHOCK
31	4.5	0	173	130	0	9	3	DIPNET
31	6.4	0	41	0	0	31	0	ELECTROSHOCK
31	8.2	0	60	17	0	2	0	ELECTROSHOCK
31	9.8	0	39	45	0	0	0	ELECTROSHOCK
31	12.5	0	43	27	0	4	2	ELECTROSHOCK
31	15.0	0	43	26	0	2	1	ELECTROSHOCK
31	18.2	0	48	32	0	0	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
MAY								
31	21.0	0	2	1	0	0	1	ELECTROSHOCK
31	23.0	0	7	5	0	0	0	ELECTROSHOCK
31	25.4	0	20	19	0	0	0	ELECTROSHOCK
31	29.0	0	0	0	0	0	0	ELECTROSHOCK
31	31.5	0	0	0	0	0	0	ELECTROSHOCK
31	37.0	0	0	0	0	0	0	ELECTROSHOCK
31	39.0	0	0	0	0	0	0	ELECTROSHOCK
31	39.0	0	0	0	0	0	0	ELECTROSHOCK
JUNE								
01	3.0	0	1	0	0	0	0	ELECTROSHOCK
01	4.0	0	4	0	0	0	0	ELECTROSHOCK
01	6.0	0	0	0	0	0	0	ELECTROSHOCK
01	10.0	0	0	0	0	0	0	ELECTROSHOCK
01	16.0	0	0	0	0	0	0	ELECTROSHOCK
01	17.0	0	0	0	0	0	0	ELECTROSHOCK
01	29.5	0	9	1	0	0	0	ELECTROSHOCK
01	31.3	0	0	0	0	0	0	ELECTROSHOCK
02	5.9	0	0	0	0	0	0	ELECTROSHOCK
02	6.5	0	2	5	0	0	0	ELECTROSHOCK
02	9.5	0	0	4	0	0	0	ELECTROSHOCK
02	9.8	0	2	3	0	0	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

Date	River Mile	Eulachon Catch						Method
		Male			Female			
		Pre	Spawning	Post	Pre	Spawning	Post	
JUNE								
02	12.5	0	12	11	0	0	1	ELECTROSHOCK
02	13.8	0	2	6	0	0	0	ELECTROSHOCK
02	15.0	0	4	6	0	0	0	ELECTROSHOCK
02	15.0	0	4	8	0	1	0	ELECTROSHOCK
02	16.2	0	0	0	0	0	0	ELECTROSHOCK
02	16.5	0	0	0	0	0	0	ELECTROSHOCK
02	18.2	0	4	11	0	0	0	ELECTROSHOCK
02	18.9	0	56	54	0	2	1	ELECTROSHOCK
02	21.5	0	1	0	0	0	0	ELECTROSHOCK
02	22.5	0	3	1	0	0	0	ELECTROSHOCK
02	23.0	0	0	3	0	0	0	ELECTROSHOCK
02	23.7	0	0	0	0	0	0	ELECTROSHOCK
03	4.5	0	17	18	1	0	1	DIPNET
04	6.3	0	16	7	0	0	1	ELECTROSHOCK
04	9.8	0	0	0	0	0	0	ELECTROSHOCK
04	12.5	0	1	0	0	0	0	ELECTROSHOCK
04	14.9	0	0	0	0	0	0	ELECTROSHOCK
04	18.9	0	36	0	0	2	1	ELECTROSHOCK
04	23.0	0	0	0	0	0	0	ELECTROSHOCK
04	25.5	0	0	0	0	0	0	ELECTROSHOCK
04	27.9	0	0	0	0	0	0	ELECTROSHOCK
04	37.1	0	0	0	0	0	0	ELECTROSHOCK
04	39.9	0	0	0	0	0	0	ELECTROSHOCK

Appendix Table 2-B-1. Continued.

		Eulachon Catch						
		Male			Female			
Date	River Mile	Pre	Spawning	Post	Pre	Spawning	Post	Method
JUNE								
04	44.3	0	0	0	0	0	0	ELECTROSHOCK
04	48.1	0	0	0	0	0	0	ELECTROSHOCK
04	50.3	0	0	0	0	0	0	ELECTROSHOCK
05	4.5	0	1	0	0	0	1	DIPNET
06	4.5	0	0	6	0	0	50	DIPNET
06	6.3	0	0	4	0	0	111	ELECTROSHOCK
06	9.8	0	0	0	0	0	0	ELECTROSHOCK
06	12.5	0	0	0	0	0	0	ELECTROSHOCK
06	13.8	0	0	0	0	0	0	ELECTROSHOCK
06	15.5	0	0	0	0	0	0	ELECTROSHOCK
06	16.2	0	0	0	0	0	0	ELECTROSHOCK
06	18.2	0	0	0	0	0	0	ELECTROSHOCK
06	18.9	0	0	0	0	0	0	ELECTROSHOCK
06	21.5	0	0	0	0	0	0	ELECTROSHOCK
06	22.5	0	0	0	0	0	0	ELECTROSHOCK
06	23.0	0	0	0	0	0	0	ELECTROSHOCK
07	4.5	0	0	2	0	0	28	DIPNET
08	4.5	0	0	0	0	0	4	DIPNET

APPENDIX 2-C

SONAR

1. DAILY YENTNA STATION SONAR COUNTS

2. FIGURE OF DAILY AND CUMULATIVE PERCENT
   OF SONAR COUNTS BY SPECIES

Appendix Table 2-C-1. Yentna station north bank daily and cumulative sonar counts by species, 1983.

DATE	TOTAL DAILY COUNT	CHINOOK DAILY	CHINOOK CUM	SOCKEYE DAILY	SOCKEYE CUM	PINK DAILY	PINK CUM	CHUM DAILY	CHUM CUM	COHO DAILY	COHO CUM	MISC. DAILY	MISC. CUM
063083	91	19	19	37	37	20	20	2	2	5	5	8	8
070183	59	12	31	24	61	13	33	1	3	4	9	5	13
070283	73	15	46	30	91	16	49	1	4	5	14	6	19
070383	27	6	52	11	102	6	55	0	4	2	16	2	21
070483	59	12	64	24	126	13	68	1	5	4	20	5	26
070583	47	10	74	19	145	10	78	1	6	3	23	4	30
070683	59	12	86	24	169	13	91	1	7	4	27	5	35
070783	29	6	92	12	181	6	97	1	8	2	29	2	37
070883	35	7	99	14	195	8	105	1	9	2	31	3	40
070983	57	12	111	23	218	13	118	1	10	3	34	5	45
071083	59	12	123	24	242	13	131	1	11	4	38	5	50
071183	63	13	136	26	268	14	145	1	12	4	42	5	55
071283	86	18	154	35	303	19	164	2	14	5	47	7	62
071383	73	1	155	23	326	40	204	7	21	2	49	0	62
071483	380	5	160	119	445	206	410	36	57	12	61	2	64
071583	386	7	167	128	573	163	573	55	112	24	85	9	73
071683	647	12	179	215	788	273	846	92	204	40	125	15	88
071783	815	5	184	107	895	586	1432	76	280	31	156	10	98
071883	1068	0	184	91	986	920	2352	27	307	15	171	15	113
071983	1901	0	184	162	1148	1638	3990	47	354	27	198	27	140
072083	4627	0	184	964	2112	3036	7026	217	571	169	367	241	381
072183	3309	0	184	689	2801	2172	9198	155	726	121	488	172	553
072283	1191	0	184	288	3089	495	9693	241	967	154	642	13	566
072383	2385	0	184	446	3535	1559	11252	234	1201	124	766	22	588
072483	1713	0	184	321	3856	1119	12371	168	1369	89	855	16	604

Appendix Table 2-C-1. Continued.

DATE	TOTAL	CHINOOK		SOCKEYE		PINK		CHUM		COHO		MISC.	
	DAILY COUNT	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM
072583	981	0	184	155	4011	708	13079	75	1444	26	881	17	621
072683	1446	0	184	229	4240	1044	14123	110	1554	38	919	25	646
072783	1223	0	184	197	4437	915	15038	66	1620	35	954	10	656
072883	1266	0	184	244	4681	920	15958	56	1676	36	990	10	666
072983	594	0	184	111	4792	450	16408	14	1690	19	1009	0	666
073083	365	2	186	51	4843	286	16694	9	1699	13	1022	4	670
073183	193	1	187	30	4873	157	16851	2	1701	2	1024	1	671
080183	215	0	187	55	4928	139	16990	7	1708	12	1036	2	673
080283	1761	0	187	452	5380	1144	18134	55	1763	96	1132	14	687
080383	207	1	188	91	5471	101	18235	3	1766	8	1140	3	690
080483	211	1	189	93	5564	103	18338	3	1769	8	1148	3	693
080583	168	3	192	29	5593	118	18456	7	1776	11	1159	0	693
080683	215	3	195	37	5630	152	18608	9	1785	14	1173	0	693
080783	288	4	199	50	5680	203	18811	12	1797	19	1192	0	693
080883	278	2	201	58	5738	135	18946	49	1846	27	1219	7	700
080983	18	0	201	4	5742	9	18955	3	1849	2	1221	0	700
081083	0	0	201	0	5742	0	18955	0	1849	0	1221	0	700
081183	190	1	202	39	5781	92	19047	34	1883	19	1240	5	705
081283	398	2	204	83	5864	193	19240	71	1954	39	1279	10	715
081383	386	2	206	81	5945	187	19427	69	2023	38	1317	9	724
081483	572	4	210	119	6064	277	19704	102	2125	56	1373	14	738
081583	398	2	212	83	6147	193	19897	71	2196	39	1412	10	748
081683	973	0	212	199	6346	298	20195	298	2494	63	1475	115	863
081783	1028	0	212	210	6556	315	20510	315	2809	66	1541	122	985
081883	466	0	212	95	6651	143	20653	143	2952	30	1571	55	1040

Appendix Table 2-C-1. Continued.

DATE	TOTAL DAILY COUNT	CHINOOK DAILY	CHINOOK CUM	SOCKEYE DAILY	SOCKEYE CUM	PINK DAILY	PINK CUM	CHUM DAILY	CHUM CUM	COHO DAILY	COHO CUM	MISC. DAILY	MISC. CUM
081983	336	2	214	60	6711	54	20707	95	3047	32	1603	93	1133
082083	282	2	216	50	6761	45	20752	80	3127	27	1630	78	1211
082183	219	1	217	39	6800	35	20787	62	3189	21	1651	61	1272
082283	166	1	218	29	6829	27	20814	47	3236	16	1667	46	1318
082383	317	2	220	56	6885	51	20865	90	3326	30	1697	88	1406
082483	261	2	222	46	6931	42	20907	74	3400	25	1722	72	1478
082583	215	1	223	38	6969	35	20942	61	3461	20	1742	60	1538
082683	86	1	224	15	6984	14	20956	24	3485	8	1750	24	1562
082783	210	1	225	37	7021	34	20990	60	3545	20	1770	58	1620
082883	197	1	226	35	7056	31	21021	56	3601	19	1789	55	1675
082983	155	1	227	27	7083	25	21046	44	3645	15	1804	43	1718
083083	95	1	228	17	7100	15	21061	27	3672	9	1813	26	1744
083183	130	1	229	23	7123	21	21082	37	3709	12	1825	36	1780
090183	63	0	229	11	7134	10	21092	18	3727	6	1831	18	1798
090283	61	0	229	11	7145	10	21102	17	3744	6	1837	17	1815
090383	86	1	230	15	7160	14	21116	24	3768	8	1845	24	1839
090483	56	0	230	10	7170	9	21125	16	3784	5	1850	16	1855
090583	13	0	230	2	7172	2	21127	4	3788	1	1851	4	1859

Appendix Table 2-C-2. Yentna station south bank daily and cumulative sonar counts by species,1983.

DATE	TOTAL DAILY COUNT	CHINOOK DAILY	CHINOOK CUM	SOCKEYE DAILY	SOCKEYE CUM	PINK DAILY	PINK CUM	CHUM DAILY	CHUM CUM	COHO DAILY	COHO CUM	MISC. DAILY	MISC. CUM
063083	30	5	5	15	15	6	6	1	1	1	1	2	2
070183	18	3	8	10	25	4	10	0	1	0	1	1	3
070283	24	4	12	13	38	5	15	0	1	0	1	2	5
070383	67	12	24	35	73	13	28	1	2	1	2	5	10
070483	123	21	45	65	138	24	52	2	4	2	4	9	19
070583	111	19	64	58	196	22	74	2	6	2	6	8	27
070683	57	10	74	30	226	11	85	1	7	1	7	4	31
070783	45	8	82	23	249	9	94	1	8	1	8	3	34
070883	24	4	86	13	262	5	99	0	8	0	8	2	36
070983	37	6	92	19	281	7	106	1	9	1	9	3	39
071083	70	12	104	37	318	14	120	1	10	1	10	5	44
071183	127	22	126	67	385	25	145	2	12	2	12	9	53
071283	242	41	167	126	511	48	193	5	17	5	17	17	70
071383	572	13	180	355	866	164	357	19	36	13	30	8	78
071483	3642	80	260	2263	3129	1044	1401	121	157	80	110	54	132
071583	3167	0	260	2468	5597	390	1791	179	336	114	224	16	148
071683	5032	0	260	3637	9234	773	2564	170	506	433	657	19	167
071783	6184	0	260	3511	12745	1970	4534	254	760	449	1106	0	167
071883	9316	25	285	4974	17719	3484	8018	429	1189	404	1510	0	167
071983	25453	0	285	17817	35536	5438	13456	983	2172	1041	2551	174	341
072083	26508	46	331	21504	57040	3800	17256	602	2774	417	2968	139	480
072183	18668	0	331	12552	69592	4524	21780	637	3411	573	3541	382	862
072283	6450	0	331	2730	72322	2773	24553	495	3906	366	3907	86	948
072383	7527	0	331	3319	75641	2899	27452	701	4607	514	4421	94	1042
072483	6225	0	331	2620	78261	2871	30323	210	4817	419	4840	105	1147

Appendix Table 2-C-2. Continued.

DATE	TOTAL	CHINOOK		SOCKEYE		PINK		CHUM		COHO		MISC.	
	DAILY COUNT	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM
072583	5830	19	350	3756	82017	1647	31970	130	4947	222	5062	56	1203
072683	6675	21	371	4302	86319	1886	33856	148	5095	254	5316	64	1267
072783	3715	0	371	2544	88863	833	34689	45	5140	248	5564	45	1312
072883	1710	0	371	926	89789	490	35179	98	5238	185	5749	11	1323
072983	1155	0	371	764	90553	268	35447	28	5266	95	5844	0	1323
073083	1137	0	371	753	91306	264	35711	27	5293	93	5937	0	1323
073183	763	4	375	387	91693	297	36008	4	5297	71	6008	0	1323
080183	800	4	379	406	92099	311	36319	4	5301	75	6083	0	1323
080283	760	4	383	386	92485	295	36614	4	5305	71	6154	0	1323
080383	583	0	383	331	92816	206	36820	19	5324	27	6181	0	1323
080483	544	0	383	333	93149	191	37011	0	5324	20	6201	0	1323
080583	617	0	383	378	93527	217	37228	0	5324	22	6223	0	1323
080683	642	0	383	301	93828	243	37471	47	5371	51	6274	0	1323
080783	501	0	383	235	94063	189	37660	37	5408	40	6314	0	1323
080883	514	0	383	241	94304	194	37854	38	5446	41	6355	0	1323
080983	96	0	383	45	94349	36	37890	7	5453	8	6363	0	1323
081083	111	0	383	52	94401	42	37932	8	5461	9	6372	0	1323
081183	652	0	383	306	94707	246	38178	48	5509	52	6424	0	1323
081283	923	0	383	511	95218	258	38436	77	5586	75	6499	2	1325
081383	1005	0	383	556	95774	280	38716	84	5670	82	6581	3	1328
081483	476	0	383	200	95974	186	38902	57	5727	30	6611	3	1331
081583	335	0	383	115	96089	131	39033	64	5791	24	6635	1	1332
081683	212	0	383	73	96162	83	39116	40	5831	15	6650	1	1333
081783	278	0	383	102	96264	69	39185	55	5886	27	6677	25	1358
081883	332	0	383	121	96385	83	39268	66	5952	32	6709	30	1388

Appendix Table 2-C-2. Continued.

DATE	TOTAL DAILY COUNT	CHINOOK DAILY	CHINOOK CUM	SOCKEYE DAILY	SOCKEYE CUM	PINK DAILY	PINK CUM	CHUM DAILY	CHUM CUM	COHO DAILY	COHO CUM	MISC. DAILY	MISC. CUM
081983	266	0	383	97	96482	66	39334	53	6005	26	6735	24	1412
082083	399	0	383	146	96628	100	39434	79	6084	38	6773	36	1448
082183	212	0	383	60	96688	10	39444	91	6175	24	6797	27	1475
082283	70	0	383	20	96708	3	39447	30	6205	8	6805	9	1484
082383	134	0	383	38	96746	6	39453	58	6263	15	6820	17	1501
082483	237	0	383	67	96813	11	39464	102	6365	27	6847	30	1531
082583	179	0	383	51	96864	8	39472	77	6442	20	6867	23	1554
082683	156	0	383	44	96908	7	39479	67	6509	18	6885	20	1574
082783	323	0	383	92	97000	15	39494	139	6648	36	6921	41	1615
082883	221	0	383	63	97063	10	39504	95	6743	25	6946	28	1643
082983	149	0	383	42	97105	7	39511	64	6807	17	6963	19	1662
083083	64	0	383	18	97123	3	39514	28	6835	7	6970	8	1670
083183	61	0	383	17	97140	3	39517	26	6861	7	6977	8	1678
090183	56	0	383	16	97156	3	39520	24	6885	6	6983	7	1685
090283	38	0	383	11	97167	2	39522	16	6901	4	6987	5	1690
090383	68	0	383	19	97186	3	39525	29	6930	8	6995	9	1699
090483	84	0	383	24	97210	4	39529	36	6966	9	7004	11	1710
090583	111	0	383	32	97242	5	39534	48	7014	12	7016	14	1724

Appendix Table 2-C-3. Yentna station daily and cumulative sonar counts by species,1983.

DATE	TOTAL DAILY COUNT	CHINOOK DAILY	CHINOOK CUM	SOCKEYE DAILY	SOCKEYE CUM	PINK DAILY	PINK CUM	CHUM DAILY	CHUM CUM	COHO DAILY	COHO CUM	MISC. DAILY	MISC. CUM
063083	121	24	24	52	52	26	26	3	3	6	6	10	10
070183	77	15	39	34	86	17	43	1	4	4	10	6	16
070283	97	19	58	43	129	21	64	1	5	5	15	8	24
070383	94	18	76	46	175	19	83	1	6	3	18	7	31
070483	182	33	109	89	264	37	120	3	9	6	24	14	45
070583	158	29	138	77	341	32	152	3	12	5	29	12	57
070683	116	22	160	54	395	24	176	2	14	5	34	9	66
070783	74	14	174	35	430	15	191	2	16	3	37	5	71
070883	59	11	185	27	457	13	204	1	17	2	39	5	76
070983	94	18	203	42	499	20	224	2	19	4	43	8	84
071083	129	24	227	61	560	27	251	2	21	5	48	10	94
071183	190	35	262	93	653	39	290	3	24	6	54	14	108
071283	328	59	321	161	814	67	357	7	31	10	64	24	132
071383	645	14	335	378	1192	204	561	26	57	15	79	8	140
071483	4022	85	420	2382	3574	1250	1811	157	214	92	171	56	196
071583	3553	7	427	2596	6170	553	2364	234	448	138	309	25	221
071683	5679	12	439	3852	10022	1046	3410	262	710	473	782	34	255
071783	6999	5	444	3618	13640	2556	5966	330	1040	480	1262	10	265
071883	10384	25	469	5065	18705	4404	10370	456	1496	419	1681	15	280
071983	27354	0	469	17979	36684	7076	17446	1030	2526	1068	2749	201	481
072083	31135	46	515	22468	59152	6836	24282	819	3345	586	3335	380	861
072183	21977	0	515	13241	72393	6696	30978	792	4137	694	4029	554	1415
072283	7641	0	515	3018	75411	3268	34246	736	4873	520	4549	99	1514
072383	9912	0	515	3765	79176	4458	38704	935	5808	638	5187	116	1630
072483	7938	0	515	2941	82117	3990	42694	378	6186	508	5695	121	1751

Appendix Table 2-C-3. Continued.

DATE	TOTAL DAILY COUNT	CHINOOK DAILY	CHINOOK CUM	SOCKEYE DAILY	SOCKEYE CUM	PINK DAILY	PINK CUM	CHUM DAILY	CHUM CUM	COHO DAILY	COHO CUM	MISC. DAILY	MISC. CUM
072583	6811	19	534	3911	86028	2355	45049	205	6391	248	5943	73	1824
072683	8121	21	555	4531	90559	2930	47979	258	6649	292	6235	89	1913
072783	4938	0	555	2741	93300	1748	49727	111	6760	283	6518	55	1968
072883	2976	0	555	1170	94470	1410	51137	154	6914	221	6739	21	1989
072983	1749	0	555	875	95345	718	51855	42	6956	114	6853	0	1989
073083	1502	2	557	804	96149	550	52405	36	6992	106	6959	4	1993
073183	956	5	562	417	96566	454	52859	6	6998	73	7032	1	1994
080183	1015	4	566	461	97027	450	53309	11	7009	87	7119	2	1996
080283	2521	4	570	838	97865	1439	54748	59	7068	167	7286	14	2010
080383	790	1	571	422	98287	307	55055	22	7090	35	7321	3	2013
080483	755	1	572	426	98713	294	55349	3	7093	28	7349	3	2016
080583	785	3	575	407	99120	335	55684	7	7100	33	7382	0	2016
080683	857	3	578	338	99458	395	56079	56	7156	65	7447	0	2016
080783	789	4	582	285	99743	392	56471	49	7205	59	7506	0	2016
080883	792	2	584	299	100042	329	56800	87	7292	68	7574	7	2023
080983	114	0	584	49	100091	45	56845	10	7302	10	7584	0	2023
081083	111	0	584	52	100143	42	56887	8	7310	9	7593	0	2023
081183	842	1	585	345	100488	338	57225	82	7392	71	7664	5	2028
081283	1321	2	587	594	101082	451	57676	148	7540	114	7778	12	2040
081383	1391	2	589	637	101719	467	58143	153	7693	120	7898	12	2052
081483	1048	4	593	319	102038	463	58606	159	7852	86	7984	17	2069
081583	733	2	595	198	102236	324	58930	135	7987	63	8047	11	2080
081683	1185	0	595	272	102508	381	59311	338	8325	78	8125	116	2196
081783	1306	0	595	312	102820	384	59695	370	8695	93	8218	147	2343
081883	798	0	595	216	103036	226	59921	209	8904	62	8280	85	2428

Appendix Table 2-C-3. Continued.

DATE	TOTAL	CHINOOK		SOCKEYE		PINK		CHUM		COHO		MISC.	
	DAILY COUNT	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM	DAILY	CUM
081983	602	2	597	157	103193	120	60041	148	9052	58	8338	117	2545
082083	681	2	599	196	103389	145	60186	159	9211	65	8403	114	2659
082183	431	1	600	99	103488	45	60231	153	9364	45	8448	88	2747
082283	236	1	601	49	103537	30	60261	77	9441	24	8472	55	2802
082383	451	2	603	94	103631	57	60318	148	9589	45	8517	105	2907
082483	498	2	605	113	103744	53	60371	176	9765	52	8569	102	3009
082583	394	1	606	89	103833	43	60414	138	9903	40	8609	83	3092
082683	242	1	607	59	103892	21	60435	91	9994	26	8635	44	3136
082783	533	1	608	129	104021	49	60484	199	10193	56	8691	99	3235
082883	418	1	609	98	104119	41	60525	151	10344	44	8735	83	3318
082983	304	1	610	69	104188	32	60557	108	10452	32	8767	62	3380
083083	159	1	611	35	104223	18	60575	55	10507	16	8783	34	3414
083183	191	1	612	40	104263	24	60599	63	10570	19	8802	44	3458
090183	119	0	612	27	104290	13	60612	42	10612	12	8814	25	3483
090283	99	0	612	22	104312	12	60624	33	10645	10	8824	22	3505
090383	154	1	613	34	104346	17	60641	53	10698	16	8840	33	3538
090483	140	0	613	34	104380	13	60654	52	10750	14	8854	27	3565
090583	124	0	613	34	104414	7	60661	52	10802	13	8867	18	3583

Appendix Table 2-C-4. Sector distribution of north bank sonar counts, adjusted for debris, at Yentna Station, 1983.

Date	Sector 1	2	3	4	5	6	7	8	9	10	11	12	Total
June 30[1/]	40	4	0	0	0	0	0	0	4	0	40	0	88
July													
1	36	1	2	1	0	0	0	0	0	3	2	11	56
2	47	18	4	3	0	0	0	0	0	2	0	0	74
3	12	13	2	0	0	0	0	0	0	0	0	0	27
4	35	21	3	1	0	0	0	0	0	0	0	1	61
5	16	21	10	0	0	0	0	0	0	0	0	0	47
6	25	19	10	1	0	0	0	1	0	0	0	1	57
7	20	9	2	0	0	0	0	0	0	0	0	0	31
8	10	11	9	1	0	0	1	0	0	2	1	0	35
9	14	29	11	3	0	0	0	0	0	0	0	0	57
10	26	18	12	0	0	0	0	0	0	0	0	0	56
11	37	15	7	1	0	0	0	1	0	0	0	3	64
12	49	24	9	3	0	0	0	0	0	0	0	1	86
13	39	28	10	0	0	0	0	1	0	0	1	0	79
14	92	81	54	18	0	1	7	20	19	37	17	33	379
15	101	77	63	16	1	0	5	16	20	18	44	26	387
16	122	132	177	13	1	0	13	23	36	50	22	61	650
17	174	140	122	23	4	0	24	37	54	46	72	135	831
18	320	198	138	19	1	0	29	54	33	60	75	164	1091
19	330	492	321	23	1	1	37	67	124	120	166	286	1968
20	1049	1076	794	71	8	0	71	115	187	274	376	733	4754
21	489	736	671	86	8	0	55	128	206	225	245	466	3315
22	344	342	236	17	1	0	13	17	40	83	45	69	1207
23	548	346	187	36	1	0	49	90	153	272	352	352	2386
24	604	266	149	19	1	0	28	64	79	136	183	184	1713
25	247	163	89	14	2	0	29	19	66	109	87	147	972
26	583	312	103	19	0	1	11	8	41	70	89	210	1447
27	540	232	53	13	1	0	13	19	34	67	61	191	1224
28	522	206	56	14	0	0	16	5	51	117	77	202	1266
29	255	108	66	3	0	0	4	5	12	29	51	61	594
30	165	83	60	7	2	0	1	2	11	13	19	2	365
31	41	70	52	18	7	1	0	0	1	1	0	3	194
August													
1	20	57	69	10	8	3	0	1	1	6	12	27	214
2	19	58	40	16	7	5	3	2	4	7	3	12	176
3	13	67	51	9	4	5	1	0	2	15	22	17	206
4	42	64	49	7	0	0	0	1	2	10	19	24	218
5	52	50	34	5	0	0	1	2	1	4	6	13	168

Appendix Table 2-C-4. Continued.

Date	Sector 1	2	3	4	5	6	7	8	9	10	11	12	Total
August													
6	51	70	29	0	1	0	2	2	7	3	35	19	219
7	139	57	45	14	0	0	1	6	6	8	6	33	315
8	2/	59	30	1	0	0	1	2	2	0	4	7	-
9	2/	9	0	0	0	0	0	0	0	0	0	0	-
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	117	57	22	2	0	0	1	1	0	0	0	0	200
12	119	126	76	19	7	2	4	3	14	50	3/	3/	-
13	87	127	81	16	0	1	11	13	4	2	15	32	389
14	246	64	37	12	0	0	7	11	50	51	56	47	581
15	100	78	35	10	0	0	10	18	15	17	35	94	412
16	400	110	89	9	1	1	19	19	17	55	75	204	999
17	509	163	43	14	1	1	9	17	21	41	69	141	1029
18	295	68	21	1	2	0	9	16	10	4	26	20	472
19	202	61	12	4	1	0	1	0	5	10	26	16	338
20	156	70	31	5	1	0	1	1	4	7	4	1	281
21	133	66	6	1	2	0	1	0	3	0	5	3	220
22	167	32	11	1	0	0	3	0	4	0	4	1	223
23	200	77	19	3	1	0	1	4	4	3	2	14	328
24	149	55	25	0	1	0	6	1	4	12	4	9	266
25	117	36	13	4	1	0	0	1	0	0	10	34	216
26	53	4	9	1	0	0	1	0	0	0	0	5	73
27	147	41	3	2	0	0	3	0	0	1	10	3	210
28	178	9	7	0	0	0	1	0	0	0	1	0	196
29	138	8	4	0	0	0	0	0	0	1	1	2	154
30	86	4	3	1	0	0	0	0	0	0	0	1	95
31	118	10	3	0	0	0	0	0	0	1	3	1	136
September													
1	60	0	2	0	0	0	0	0	2	0	0	0	64
2	58	0	1	0	0	0	0	0	4	8	1	1	73
3	69	12	1	0	0	0	0	0	0	0	4	14	100
4	56	1	1	0	0	0	0	0	0	0	0	0	58
5	8	3	3	0	0	0	0	0	0	0	0	0	14
TOTAL	11,117	6,870	4,281	590	70	20	498	808	1,341	2,000	2,479	4,130	34,204
PERCENT	32.6	20.1	12.5	1.7	0.2	0.0	1.5	2.4	3.9	5.8	7.2	12.1	

1/ 60 foot substrate deployed
2/ No data due to extreme high water
3/ No data due to debri on sectors 11 and 12

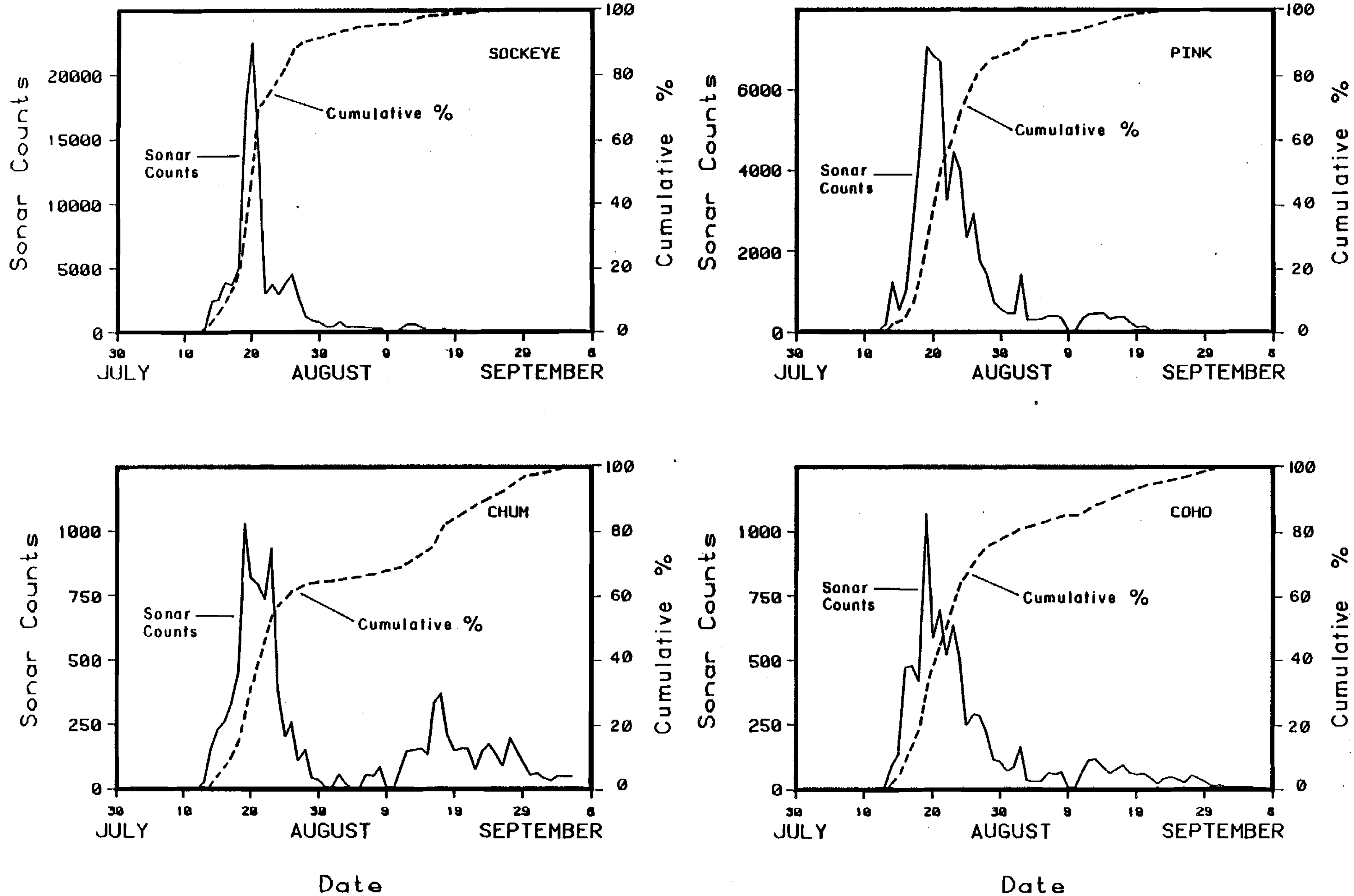
Appendix Table 2-C-5. Sector distribution of south bank sonar counts, adjusted for debris, at Yentna Station, 1983.

Date	Sector 1	2	3	4	5	6	7	8	9	10	11	12	Total
June													
30	37	15	0	0	0	0	0	0	0	9	0	0	61
July													
1	18	2	0	0	0	0	0	0	0	0	0	0	20
2	19	4	2	0	0	0	0	0	0	0	0	0	25
3	37	22	4	3	0	0	0	0	0	1	0	0	67
4	62	41	8	5	1	0	2	2	0	2	0	1	124
5	70	22	13	5	1	0	0	0	0	0	0	0	111
6	27	21	9	1	0	0	0	0	0	0	0	0	58
7	28	14	2	0	0	0	0	0	0	0	0	0	44
8	23	1	1	0	0	0	0	0	0	0	0	0	25
9	3[illegible]	5	0	0	0	0	0	0	0	0	0	0	37
10	56	10	4	0	0	0	0	0	0	0	0	0	70
11	103	15	6	1	0	0	0	0	0	3	0	0	128
12	158	58	14	0	0	0	0	1	0	2	5	3	241
13	240	149	87	17	0	0	1	6	8	9	25	30	572
14	1541	1266	631	69	4	0	15	4	7	11	10	84	3642
15	1207	998	665	98	14	0	31	32	12	22	13	74	3166
16	2089	1439	1080	164	25	0	40	17	43	42	49	44	5032
17	2351	1934	1420	230	25	1	35	45	21	33	23	65	6183
18	3716	3110	1914	325	29	4	26	14	25	41	27	85	9316
19	12173	7327	4477	820	98	3	135	54	50	77	86	69	25369
20	14038	6635	4275	699	76	7	137	99	121	156	153	117	26513
21	10018	4848	2546	385	47	1	148	141	125	158	120	132	18669
22	3594	1930	814	54	1	0	11	5	4	23	11	3	6450
23	3415	2182	1198	180	25	3	77	82	51	134	85	95	7527
24	2949	1745	889	188	22	2	82	44	46	79	52	126	6224
25	2980	1142	803	174	39	2	123	81	62	98	74	251	5829
26	3794	1174	653	249	59	6	129	123	92	95	65	207	6646
27	1614	763	475	135	28	5	121	135	95	89	86	168	3714
28	592	398	241	78	13	3	60	4	72	76	34	139	1710
29	404	264	146	25	3	0	14	9	14	24	11	241	1155
30	509	392	184	10	2	0	10	5	2	3	19	2	1138
31	370	254	122	13	1	0	1	1	0	0	0	1	763
August													
1	366	238	136	20	5	0	2	5	0	4	3	21	800
2	314	289	130	13	1	0	0	1	1	2	1	8	760
3	206	244	113	8	1	0	2	2	0	5	1	2	584
4	218	210	97	9	1	0	1	2	0	2	1	3	544

Appendix Table 2-C-5. Continued.

Date	Sector 1	2	3	4	5	6	7	8	9	10	11	12	Total
August													
5	310	211	86	6	0	0	0	0	0	0	1	3	617
6	306	226	99	9	1	0	1	0	0	0	0	0	642
7	199	165	117	14	0	0	3	0	1	0	0	1	500
8	316	172	84	9	0	0	0	0	0	0	0	0	581
9	2/	18	1	0	0	0	0	0	0	0	0	0	-
10	2/	16	0	0	0	0	0	0	0	0	0	0	-
11	2/	82	18	0	0	0	0	0	0	0	0	0	-
12	433	325	86	16	3	0	6	4	2	7	11	34	927
13	425	426	64	24	8	1	16	4	6	6	2	22	1004
14	449	26	0	0	0	0	0	0	0	0	0	0	475
15	307	27	0	0	0	0	0	0	0	0	0	1	335
16	151	10	0	0	0	0	1	0	0	10	18	21	211
17	187	4	0	0	0	0	0	0	2	26	25	34	278
18	266	6	0	0	0	0	0	0	0	28	20	11	331
19	199	31	5	0	0	0	7	2	6	9	3	4	266
20	308	49	15	1	3	0	3	9	1	8	2	0	399
21	153	30	3	0	0	0	5	0	3	9	1	8	212
22	61	5	1	0	0	0	1	0	0	0	0	2	70
23	114	10	18	0	0	0	0	0	0	0	0	0	142
24	181	28	4	1	0	0	0	1	2	5	3	12	237
25	90	14	3	1	1	0	7	11	4	9	23	17	180
26	75	9	1	0	0	0	3	4	2	8	27	27	156
27	220	29	17	2	0	0	6	7	6	3	23	9	322
28	154	21	10	0	0	0	1	2	1	11	12	9	221
29	130	12	3	1	0	0	1	0	0	1	0	1	149
30	45	8	1	0	0	0	7	0	0	0	0	3	64
31	35	11	0	0	0	0	9	0	0	0	4	0	59
September													
1	40	5	0	0	0	0	0	0	1	5	1	3	55
2	20	5	2	0	0	0	1	2	0	3	3	2	38
3	52	5	1	1	4	0	0	1	0	0	3	1	68
4	63	8	7	1	0	0	2	2	0	0	1	0	84
5	50	14	0	0	0	0	0	16	0	0	5	0	85
TOTAL	74,707	41,053	23,786	4,064	541	38	1,283	979	888	1,348	1,142	2,196	152,025
PERCENT	49.2	27.0	15.6	2.7	0.4	0.0	0.8	0.6	0.6	0.9	0.8	1.4	

1/ 60 foot substrate deployed.
2/ No data due to extreme high water



Appendix Figure 2-C-1. Daily and cumulative percent sonar counts by species at Yentna Station,1983.

APPENDIX 2-D

DAILY FISHWHEEL CATCH DATA

Appendix Table 2-D-1. Yentna station north bank fishwheel daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
063083	1	24.0	3	3	0	0	0	0	0	0	0	0	0	0	0	3	3
070183	1	24.0	2	5	0	0	0	0	0	0	0	0	0	0	0	2	5
070283	1	24.0	4	9	1	1	1	1	0	0	0	0	0	0	0	6	11
070383	1	24.0	0	9	1	2	3	4	0	0	0	0	0	1	1	5	16
070483	1	24.0	6	15	5	7	2	6	1	1	0	0	0	2	3	16	32
070583	1	24.0	8	23	4	11	3	9	0	1	0	0	0	1	4	16	48
070683	1	24.0	2	25	4	15	0	9	0	1	0	0	0	1	5	7	55
070783	1	24.0	0	25	3	18	1	10	0	1	0	0	0	0	5	4	59
070883	1	24.0	3	28	9	27	1	11	0	1	0	0	0	1	6	14	73
070983	1	24.0	2	30	6	33	1	12	0	1	3	3	0	0	6	12	85
071083	1	24.0	0	30	6	39	1	13	0	1	0	3	0	5	11	12	97
071183	1	24.0	2	32	10	49	7	20	1	2	4	7	0	1	12	25	122
071283	1	24.0	2	34	18	67	16	36	1	3	3	10	0	2	14	42	164
071383	1	24.0	1	35	25	92	55	91	6	9	4	14	0	0	14	91	255
071483	1	24.0	2	37	45	137	66	157	15	24	3	17	0	1	15	132	387
071583	1	24.0	4	41	34	171	33	190	22	46	6	23	0	3	18	102	489
071683	1	24.0	0	41	36	207	56	246	8	54	7	30	0	2	20	109	598
071783	1	24.0	1	42	21	228	115	361	15	69	6	36	0	2	22	160	758
071883	1	24.0	0	42	13	241	128	489	5	74	2	38	0	0	22	148	906
071983	1	24.0	0	42	11	252	114	603	2	76	2	40	0	4	26	133	1039
072083	1	23.5	0	42	21	273	74	677	4	80	3	43	0	3	29	105	1144
072183	1	24.0	0	42	19	292	52	729	5	85	4	47	0	7	36	87	1231
072283	1	24.0	0	42	43	335	74	803	36	121	23	70	0	2	38	178	1409
072383	1	24.0	0	42	43	378	52	855	18	139	12	82	0	0	38	125	1534
072483	1	24.0	0	42	18	396	161	1016	14	153	5	87	0	3	41	201	1735
072583	1	23.0	0	42	15	411	90	1106	7	160	3	90	0	3	44	118	1853
072683	1	24.0	0	42	39	450	156	1262	19	179	6	96	0	3	47	223	2076
072783	1	24.0	0	42	39	489	181	1443	13	192	7	103	0	2	49	242	2318
072883	1	24.0	0	42	48	537	181	1624	11	203	7	110	0	2	51	249	2567

Appendix Table 2-D-1. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
072983	1	24.0	0	42	48	585	194	1818	6	209	8	118	0	0	51	256	2823
073083	1	24.0	1	43	27	612	151	1969	5	214	7	125	0	2	53	193	3016
073183	1	23.0	1	44	26	638	135	2104	2	216	2	127	0	1	54	167	3183
080183	1	24.0	0	44	26	664	110	2214	4	220	5	132	0	1	55	146	3329
080283	1	24.0	0	44	40	704	57	2271	4	224	9	141	0	1	56	111	3440
080383	1	24.0	1	45	40	744	30	2301	0	224	1	142	0	1	57	73	3513
080483	1	24.0	0	45	41	785	60	2361	3	227	6	148	0	2	59	112	3625
080583	1	24.0	2	47	18	803	33	2394	2	229	3	151	0	0	59	58	3683
080683	1	24.0	0	47	5	808	43	2437	1	230	1	152	0	0	59	50	3733
080783	1	24.0	1	48	11	819	62	2499	5	235	9	161	0	0	59	88	3821
080883	1	23.0	0	48	5	824	28	2527	5	240	3	164	0	0	59	41	3862
080983	1	6.0	0	48	1	825	1	2528	0	240	0	164	0	0	59	2	3864
081083	1	3.0	0	48	0	825	0	2528	0	240	0	164	0	0	59	0	3864
081183	1	24.0	0	48	0	825	0	2528	0	240	0	164	0	0	59	0	3864
081283	1	24.0	0	48	2	827	5	2533	5	245	2	166	0	0	59	14	3878
081383	1	24.0	1	49	8	835	23	2556	5	250	4	170	0	2	61	43	3921
081483	1	24.0	0	49	11	846	6	2562	4	254	2	172	0	0	61	23	3944
081583	1	24.0	0	49	7	853	16	2578	10	264	5	177	0	2	63	40	3984
081683	1	23.0	0	49	16	869	19	2597	25	289	4	181	0	3	66	67	4051
081783	1	24.0	0	49	9	878	24	2621	19	308	4	185	0	11	77	67	4118
081883	1	24.0	0	49	13	891	14	2635	13	321	4	189	0	8	85	52	4170
081983	1	24.0	1	50	13	904	11	2646	11	332	3	192	0	9	94	48	4218
082083	1	24.0	0	50	5	909	5	2651	7	339	2	194	1	4	99	24	4242
082183	1	24.0	0	50	2	911	3	2654	1	340	2	196	0	1	100	9	4251
082283	1	24.0	0	50	0	911	1	2655	1	341	2	198	0	0	100	4	4255
082383	1	24.0	0	50	2	913	1	2656	3	344	2	200	0	1	101	9	4264
082483	1	24.0	0	50	2	915	1	2657	9	353	0	200	0	0	101	12	4276

Appendix Table 2-D-1. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
082583	1	24.0	0	50	1	916	0	2657	5	358	1	201	1	2	104	10	4286
082683	1	24.0	0	50	3	919	1	2658	1	359	1	202	1	3	108	10	4296
082783	1	24.0	0	50	1	920	1	2659	7	366	3	205	1	5	114	18	4314
082883	1	24.0	0	50	1	921	3	2662	3	369	0	205	0	7	121	14	4328
082983	1	24.0	0	50	2	923	0	2662	0	369	2	207	0	4	125	8	4336
083083	1	24.0	0	50	1	924	0	2662	3	372	2	209	0	2	127	8	4344
083183	1	24.0	0	50	2	926	2	2664	1	373	0	209	0	0	127	5	4349
090183	1	24.0	0	50	0	926	0	2664	2	375	2	211	1	2	130	7	4356
090283	1	24.0	0	50	4	930	2	2666	5	380	0	211	2	1	133	14	4370
090383	1	24.0	0	50	2	932	0	2666	1	381	2	213	1	1	135	7	4377
090483	1	24.0	0	50	1	933	1	2667	3	384	0	213	0	1	136	6	4383

Appendix Table 2-D-2. Yentna station south bank fishwheel daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
063083	1	24.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
070183	1	24.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
070283	1	24.0	3	3	1	1	0	0	0	0	0	0	0	0	0	4	4
070383	1	24.0	4	7	5	6	1	1	0	0	0	0	0	1	1	11	15
070483	1	24.0	1	8	1	7	2	3	0	0	0	0	0	1	2	5	20
070583	1	24.0	1	9	9	16	0	3	0	0	0	0	0	2	4	12	32
070683	1	24.0	2	11	5	21	0	3	0	0	0	0	0	2	6	9	41
070783	1	24.0	2	13	4	25	1	4	0	0	0	0	0	0	6	7	48
070883	1	24.0	1	14	3	28	4	8	0	0	1	1	0	0	6	9	57
070983	1	24.0	4	18	3	31	4	12	1	1	0	1	0	0	6	12	69
071083	1	24.0	3	21	4	35	4	16	0	1	0	1	0	2	8	13	82
071183	1	24.0	5	26	15	50	8	24	1	2	1	2	0	2	10	32	114
071283	1	24.0	1	27	32	82	7	31	1	3	1	3	0	1	11	43	157
071383	1	24.0	3	30	34	116	33	64	0	3	3	6	0	2	13	75	232
071483	1	24.0	3	33	135	251	45	109	9	12	3	9	0	2	15	197	429
071583	1	24.0	0	33	152	403	24	133	11	23	7	16	0	1	16	195	624
071683	1	24.0	0	33	193	596	41	174	9	32	23	39	0	1	17	267	891
071783	1	24.0	0	33	180	776	101	275	13	45	23	62	0	0	17	317	1208
071883	1	24.0	1	34	197	973	138	413	17	62	16	78	0	0	17	369	1577
071983	1	15.8	0	34	308	1281	94	507	17	79	18	96	0	3	20	440	2017
072083	1	24.0	1	35	464	1745	82	589	13	92	9	105	0	3	23	572	2589
072183	1	16.0	0	35	197	1942	71	660	10	102	9	114	0	6	29	293	2882
072283	1	18.5	0	35	127	2069	129	789	23	125	17	131	0	4	33	300	3182
072383	1	24.0	0	35	71	2140	62	851	15	140	11	142	0	2	35	161	3343
072483	1	24.0	0	35	125	2265	137	988	10	150	20	162	0	5	40	297	3640
072583	1	15.0	1	36	57	2322	47	1035	2	152	5	167	0	2	42	114	3754
072683	1	24.0	0	36	146	2468	42	1077	5	157	7	174	0	1	43	201	3955
072783	1	24.0	0	36	113	2581	37	1114	2	159	11	185	0	2	45	165	4120
072883	1	24.0	0	36	85	2666	45	1159	9	168	17	202	0	1	46	157	4277

Appendix Table 2-D-2. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
072983	1	24.0	0	36	91	2757	40	1199	3	171	10	212	0	0	46	144	4421
073083	1	24.0	0	36	46	2803	8	1207	2	173	7	219	0	0	46	63	4484
073183	1	24.0	1	37	40	2843	42	1249	1	174	10	229	0	0	46	94	4578
080183	1	24.0	0	37	58	2901	33	1282	0	174	8	237	0	0	46	99	4677
080283	1	24.0	0	37	66	2967	28	1310	1	175	8	245	0	0	46	103	4780
080383	1	23.0	0	37	56	3023	48	1358	6	181	2	247	0	0	46	112	4892
080483	1	24.0	0	37	88	3111	36	1394	0	181	3	250	0	0	46	127	5019
080583	1	24.0	0	37	48	3159	42	1436	0	181	5	255	0	0	46	95	5114
080683	1	3.2	0	37	4	3163	8	1444	0	181	2	257	0	0	46	14	5128
080783	1	24.0	0	37	35	3198	32	1476	1	182	7	264	0	0	46	75	5203
080883	1	23.0	0	37	22	3220	21	1497	9	191	4	268	0	0	46	56	5259
080983	1	6.0	0	37	0	3220	0	1497	1	192	0	268	0	0	46	1	5260
081083	1	3.0	0	37	2	3222	0	1497	0	192	0	268	0	0	46	2	5262
081183	1	24.0	0	37	14	3236	1	1498	1	193	0	268	0	0	46	16	5278
081283	1	24.0	0	37	70	3306	36	1534	13	206	11	279	0	0	46	130	5408
081383	1	24.0	0	37	148	3454	74	1608	20	226	21	300	0	1	47	264	5672
081483	1	24.0	0	37	74	3528	69	1677	21	247	11	311	0	1	48	176	5848
081583	1	24.0	0	37	52	3580	51	1728	27	274	8	319	0	0	48	138	5986
081683	1	24.0	0	37	35	3615	48	1776	21	295	10	329	0	1	49	115	6101
081783	1	23.0	0	37	22	3637	25	1801	9	304	4	333	0	10	59	70	6171
081883	1	24.0	0	37	17	3654	8	1809	12	316	2	335	0	4	63	43	6214
081983	1	24.0	0	37	8	3662	4	1813	6	322	6	341	0	0	63	24	6238
082083	1	24.0	0	37	10	3672	2	1815	4	326	3	344	0	0	63	19	6257
082183	1	24.0	0	37	14	3686	3	1818	3	329	0	344	1	0	64	21	6278
082283	1	24.0	0	37	6	3692	0	1818	0	329	0	344	0	0	64	6	6284
082383	1	24.0	0	37	7	3699	0	1818	4	333	1	345	0	0	64	12	6296
082483	1	24.0	0	37	2	3701	2	1820	16	349	2	347	1	0	65	23	6319

Appendix Table 2-D-2. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
082583	1	24.0	0	37	2	3703	0	1820	9	358	1	348	0	0	65	12	6331
082683	1	24.0	0	37	1	3704	1	1821	4	362	2	350	2	0	67	10	6341
082783	1	24.0	0	37	0	3704	0	1821	7	369	2	352	1	0	68	10	6351
082883	1	24.0	0	37	1	3705	0	1821	10	379	1	353	1	1	70	14	6365
082983	1	24.0	0	37	3	3708	0	1821	4	383	2	355	3	2	75	14	6379
083083	1	16.0	0	37	1	3709	0	1821	1	384	0	355	1	0	76	3	6382
083183	1	24.0	0	37	1	3710	0	1821	0	384	0	355	2	0	78	3	6385
090183	1	24.0	0	37	4	3714	1	1822	0	384	0	355	0	0	78	5	6390
090283	1	24.0	0	37	0	3714	0	1822	4	388	2	357	2	0	80	8	6398
090383	1	24.0	0	37	1	3715	0	1822	1	389	2	359	0	0	80	4	6402
090483	1	24.0	0	37	0	3715	0	1822	2	391	2	361	2	0	82	6	6408

Appendix Table 2-D-3. Yentna station fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
063083	2	48.0	3	3	0	0	0	0	0	0	0	0	0	0	0	3	3
070183	2	48.0	2	5	0	0	0	0	0	0	0	0	0	0	0	2	5
070283	2	48.0	7	12	2	2	1	1	0	0	0	0	0	0	0	10	15
070383	2	48.0	4	16	6	8	4	5	0	0	0	0	0	2	2	16	31
070483	2	48.0	7	23	6	14	4	9	1	1	0	0	0	3	5	21	52
070583	2	48.0	9	32	13	27	3	12	0	1	0	0	0	3	8	28	80
070683	2	48.0	4	36	9	36	0	12	0	1	0	0	0	3	11	16	96
070783	2	48.0	2	38	7	43	2	14	0	1	0	0	0	0	11	11	107
070883	2	48.0	4	42	12	55	5	19	0	1	1	1	0	1	12	23	130
070983	2	48.0	6	48	9	64	5	24	1	2	3	4	0	0	12	24	154
071083	2	48.0	3	51	10	74	5	29	0	2	0	4	0	7	19	25	179
071183	2	48.0	7	58	25	99	15	44	2	4	5	9	0	3	22	57	236
071283	2	48.0	3	61	50	149	23	67	2	6	4	13	0	3	25	85	321
071383	2	48.0	4	65	59	208	88	155	6	12	7	20	0	2	27	166	487
071483	2	48.0	5	70	180	388	111	266	24	36	6	26	0	3	30	329	816
071583	2	48.0	4	74	186	574	57	323	33	69	13	39	0	4	34	297	1113
071683	2	48.0	0	74	229	803	97	420	17	86	30	69	0	3	37	376	1489
071783	2	48.0	1	75	201	1004	216	636	28	114	29	98	0	2	39	477	1966
071883	2	48.0	1	76	210	1214	266	902	22	136	18	116	0	0	39	517	2483
071983	2	39.7	0	76	319	1533	208	1110	19	155	20	136	0	7	46	573	3056
072083	2	47.5	1	77	485	2018	156	1266	17	172	12	148	0	6	52	677	3733
072183	2	40.0	0	77	216	2234	123	1389	15	187	13	161	0	13	65	380	4113
072283	2	42.5	0	77	170	2404	203	1592	59	246	40	201	0	6	71	478	4591
072383	2	48.0	0	77	114	2518	114	1706	33	279	23	224	0	2	73	286	4877
072483	2	48.0	0	77	143	2661	298	2004	24	303	25	249	0	8	81	498	5375
072583	2	38.0	1	78	72	2733	137	2141	9	312	8	257	0	5	86	232	5607
072683	2	48.0	0	78	185	2918	198	2339	24	336	13	270	0	4	90	424	6031
072783	2	48.0	0	78	152	3070	218	2557	15	351	18	288	0	4	94	407	6438
072883	2	48.0	0	78	133	3203	226	2783	20	371	24	312	0	3	97	406	6844

Appendix Table 2-D-3. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
072983	2	48.0	0	78	139	3342	234	3017	9	380	18	330	0	0	97	400	7244
073083	2	48.0	1	79	73	3415	159	3176	7	387	14	344	0	2	99	256	7500
073183	2	47.0	2	81	66	3481	177	3353	3	390	12	356	0	1	100	261	7761
080183	2	48.0	0	81	84	3565	143	3496	4	394	13	369	0	1	101	245	8006
080283	2	48.0	0	81	106	3671	85	3581	5	399	17	386	0	1	102	214	8220
080383	2	47.0	1	82	96	3767	78	3659	6	405	3	389	0	1	103	185	8405
080483	2	48.0	0	82	129	3896	96	3755	3	408	9	398	0	2	105	239	8644
080583	2	48.0	2	84	66	3962	75	3830	2	410	8	406	0	0	105	153	8797
080683	2	27.2	0	84	9	3971	51	3881	1	411	3	409	0	0	105	64	8861
080783	2	48.0	1	85	46	4017	94	3975	6	417	16	425	0	0	105	163	9024
080883	2	46.0	0	85	27	4044	49	4024	14	431	7	432	0	0	105	97	9121
080983	2	12.0	0	85	1	4045	1	4025	1	432	0	432	0	0	105	3	9124
081083	2	6.0	0	85	2	4047	0	4025	0	432	0	432	0	0	105	2	9126
081183	2	48.0	0	85	14	4061	1	4026	1	433	0	432	0	0	105	16	9142
081283	2	48.0	0	85	72	4133	41	4067	18	451	13	445	0	0	105	144	9286
081383	2	48.0	1	86	156	4289	97	4164	25	476	25	470	0	3	108	307	9593
081483	2	48.0	0	86	85	4374	75	4239	25	501	13	483	0	1	109	199	9792
081583	2	48.0	0	86	59	4433	67	4306	37	538	13	496	0	2	111	178	9970
081683	2	47.0	0	86	51	4484	67	4373	46	584	14	510	0	4	115	182	10152
081783	2	47.0	0	86	31	4515	49	4422	28	612	8	518	0	21	136	137	10289
081883	2	48.0	0	86	30	4545	22	4444	25	637	6	524	0	12	148	95	10384
081983	2	48.0	1	87	21	4566	15	4459	17	654	9	533	0	9	157	72	10456
082083	2	48.0	0	87	15	4581	7	4466	11	665	5	538	1	4	162	43	10499
082183	2	48.0	0	87	16	4597	6	4472	4	669	2	540	1	1	164	30	10529
082283	2	48.0	0	87	6	4603	1	4473	1	670	2	542	0	0	164	10	10539
082383	2	48.0	0	87	9	4612	1	4474	7	677	3	545	0	1	165	21	10560
082483	2	48.0	0	87	4	4616	3	4477	25	702	2	547	1	0	166	35	10595

Appendix Table 2-D-3. Continued.

			Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
Date	No. of Wheels	Wheel Hours	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
082583	2	48.0	0	87	3	4619	0	4477	14	716	2	549	1	2	169	22	10617
082683	2	48.0	0	87	4	4623	2	4479	5	721	3	552	3	3	175	20	10637
082783	2	48.0	0	87	1	4624	1	4480	14	735	5	557	2	5	182	28	10665
082883	2	48.0	0	87	2	4626	3	4483	13	748	1	558	1	8	191	28	10693
082983	2	48.0	0	87	5	4631	0	4483	4	752	4	562	3	6	200	22	10715
083083	2	40.0	0	87	2	4633	0	4483	4	756	2	564	1	2	203	11	10726
083183	2	48.0	0	87	3	4636	2	4485	1	757	0	564	2	0	205	8	10734
090183	2	48.0	0	87	4	4640	1	4486	2	759	2	566	1	2	208	12	10746
090283	2	48.0	0	87	4	4644	2	4488	9	768	2	568	4	1	213	22	10768
090383	2	48.0	0	87	3	4647	0	4488	2	770	4	572	1	1	215	11	10779
090483	2	48.0	0	87	1	4648	1	4489	5	775	2	574	2	1	218	12	10791

Appendix Table 2-D-4. Sunshine station east bank fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
060383	1	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060483	1	24.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060583	2	28.0	5	5	10	10	0	0	0	0	0	0	0	0	0	15	15
060683	2	48.0	15	20	29	39	0	0	0	0	0	0	0	0	0	44	59
060783	2	48.0	32	52	33	72	0	0	0	0	0	0	0	0	0	65	124
060883	2	48.0	36	88	48	120	0	0	0	0	0	0	0	0	0	84	208
060983	2	46.0	71	159	73	193	0	0	0	0	0	0	0	2	2	146	354
061083	2	48.0	100	259	73	266	0	0	0	0	0	0	0	1	3	174	528
061183	2	48.0	96	355	36	302	0	0	0	0	0	0	0	0	3	132	660
061283	2	48.0	187	542	32	334	0	0	0	0	0	0	0	0	3	219	879
061383	2	47.0	272	814	21	355	0	0	0	0	0	0	0	3	6	296	1175
061483	2	47.0	326	1140	15	370	0	0	0	0	0	0	0	0	6	341	1516
061583	2	48.0	162	1302	17	387	0	0	0	0	0	0	0	0	6	179	1695
061683	2	48.0	142	1444	13	400	0	0	0	0	0	0	0	0	6	155	1850
061783	2	48.0	127	1571	9	409	0	0	0	0	0	0	0	0	6	136	1986
061883	2	48.0	161	1732	7	416	0	0	0	0	0	0	0	0	6	168	2154
061983	2	46.5	259	1991	7	423	0	0	0	0	0	0	0	0	6	266	2420
062083	2	48.0	167	2158	4	427	0	0	0	0	0	0	0	0	6	171	2591
062183	2	48.0	172	2330	4	431	0	0	0	0	0	0	0	0	6	176	2767
062283	2	48.0	155	2485	1	432	0	0	0	0	0	0	0	0	6	156	2923
062383	2	45.0	124	2609	3	435	0	0	0	0	0	0	0	0	6	127	3050
062483	2	48.0	57	2666	2	437	0	0	0	0	0	0	0	0	6	59	3109
062583	2	48.0	72	2738	0	437	0	0	0	0	0	0	0	0	6	72	3181
062683	2	48.0	77	2815	1	438	0	0	0	0	0	0	0	0	6	78	3259
062783	2	48.0	65	2880	0	438	0	0	0	0	0	0	0	0	6	65	3324
062883	2	48.0	48	2928	1	439	0	0	0	0	0	0	0	0	6	49	3373
062983	2	48.0	49	2977	0	439	0	0	0	0	0	0	0	0	6	49	3422
063083	2	48.0	32	3009	1	440	0	0	0	0	0	0	0	0	6	33	3455
070183	2	48.0	52	3061	1	441	0	0	0	0	0	0	0	0	6	53	3508

Appendix Table 2-D-4. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070283	2	45.0	49	3110	1	442	0	0	0	0	0	0	0	0	6	50	3558
070383	2	48.0	33	3143	2	444	0	0	0	0	0	0	0	0	6	35	3593
070483	2	48.0	42	3185	1	445	0	0	0	0	0	0	0	0	6	43	3636
070583	2	47.0	25	3210	2	447	0	0	0	0	0	0	0	0	6	27	3663
070683	2	47.0	21	3231	4	451	0	0	0	0	0	0	0	0	6	25	3688
070783	2	48.0	12	3243	3	454	0	0	0	0	0	0	0	0	6	15	3703
070883	2	48.0	10	3253	3	457	0	0	0	0	0	0	0	0	6	13	3716
070983	2	47.0	25	3278	2	459	0	0	0	0	0	0	0	1	7	28	3744
071083	2	48.0	27	3305	7	466	2	2	1	1	0	0	0	0	7	37	3781
071183	2	48.0	17	3322	6	472	2	4	0	1	0	0	0	0	7	25	3806
071283	2	48.0	24	3346	16	488	2	6	1	2	0	0	0	0	7	43	3849
071383	2	48.0	14	3360	14	502	4	10	1	3	2	2	0	0	7	35	3884
071483	2	48.0	11	3371	53	555	2	12	4	7	2	4	0	0	7	72	3956
071583	2	48.0	9	3380	48	603	6	18	11	18	3	7	0	0	7	77	4033
071683	2	48.0	8	3388	102	705	11	29	25	43	2	9	0	0	7	148	4181
071783	2	48.0	13	3401	180	885	27	56	46	89	5	14	0	0	7	271	4452
071883	2	48.0	5	3406	167	1052	30	86	54	143	7	21	0	0	7	263	4715
071983	2	48.0	8	3414	175	1227	22	108	107	250	8	29	0	0	7	320	5035
072083	2	48.0	5	3419	269	1496	42	150	171	421	8	37	0	0	7	495	5530
072183	2	48.0	7	3426	764	2260	107	257	377	798	19	56	0	0	7	1274	6804
072283	2	48.0	8	3434	1055	3315	89	346	478	1276	24	80	0	0	7	1654	8458
072383	2	48.0	5	3439	609	3924	149	495	719	1995	15	95	0	1	8	1498	9956
072483	2	48.0	4	3443	219	4143	134	629	316	2311	14	109	0	0	8	687	10643
072583	2	48.0	2	3445	211	4354	193	822	752	3063	34	143	0	0	8	1192	11835
072683	2	48.0	4	3449	151	4505	150	972	1036	4099	43	186	0	0	8	1384	13219
072783	2	43.0	4	3453	108	4613	113	1085	911	5010	25	211	0	0	8	1161	14380
072883	2	48.0	3	3456	113	4726	108	1193	1155	6165	49	260	0	0	8	1428	15808

Appendix Table 2-D-4. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
072983	2	48.0	0	3456	91	4817	123	1316	913	7078	46	306	0	0	8	1173	16981
073083	2	48.0	0	3456	59	4876	143	1459	854	7932	68	374	0	0	8	1124	18105
073183	2	48.0	1	3457	46	4922	171	1630	372	8304	90	464	0	0	8	680	18785
080183	2	48.0	0	3457	43	4965	105	1735	339	8643	87	551	0	0	8	574	19359
080283	2	48.0	1	3458	56	5021	130	1865	556	9199	115	666	0	0	8	858	20217
080383	2	48.0	0	3458	62	5083	145	2010	695	9894	135	801	0	0	8	1037	21254
080483	2	48.0	1	3459	59	5142	133	2143	555	10449	143	944	0	0	8	891	22145
080583	2	48.0	0	3459	82	5224	140	2283	264	10713	133	1077	0	0	8	619	22764
080683	2	48.0	0	3459	41	5265	89	2372	198	10911	76	1153	0	0	8	404	23168
080783	2	48.0	0	3459	38	5303	41	2413	123	11034	65	1218	0	0	8	267	23435
080883	2	47.0	0	3459	21	5324	25	2438	68	11102	32	1250	0	0	8	146	23581
080983	2	43.0	0	3459	5	5329	3	2441	4	11106	1	1251	0	0	8	13	23594
081083	2	48.0	0	3459	7	5336	11	2452	15	11121	10	1261	0	0	8	43	23637
081183	2	48.0	0	3459	22	5358	39	2491	76	11197	45	1306	0	0	8	182	23819
081283	2	48.0	0	3459	34	5392	71	2562	226	11423	102	1408	0	1	9	434	24253
081383	2	48.0	0	3459	25	5417	42	2604	119	11542	47	1455	0	1	10	234	24487
081483	2	48.0	0	3459	24	5441	42	2646	117	11659	58	1513	0	1	11	242	24729
081583	2	48.0	0	3459	28	5469	45	2691	190	11849	35	1548	0	0	11	298	25027
081683	2	47.0	0	3459	23	5492	38	2729	163	12012	45	1593	0	1	12	270	25297
081783	2	48.0	0	3459	25	5517	34	2763	290	12302	31	1624	0	2	14	382	25679
081883	2	48.0	1	3460	26	5543	30	2793	361	12663	34	1658	0	3	17	455	26134
081983	2	48.0	0	3460	14	5557	11	2804	461	13124	22	1680	0	0	17	508	26642
082083	2	48.0	0	3460	12	5569	10	2814	414	13538	24	1704	0	4	21	464	27106
082183	2	48.0	0	3460	1	5570	2	2816	174	13712	13	1717	0	1	22	191	27297
082283	2	48.0	0	3460	7	5577	2	2818	252	13964	22	1739	0	4	26	287	27584
082383	2	48.0	0	3460	2	5579	1	2819	314	14278	17	1756	0	1	27	335	27919
082483	2	48.0	0	3460	1	5580	1	2820	281	14559	16	1772	0	0	27	299	28218

Appendix Table 2-D-4. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
082583	2	48.0	0	3460	1	5581	2	2822	200	14759	8	1780	0	4	31	215	28433
082683	2	48.0	0	3460	0	5581	0	2822	175	14934	5	1785	0	1	32	181	28614
082783	2	48.0	0	3460	0	5581	0	2822	181	15115	9	1794	0	9	41	199	28813
082883	2	48.0	0	3460	1	5582	1	2823	381	15496	12	1806	0	5	46	400	29213
082983	2	48.0	0	3460	3	5585	2	2825	228	15724	6	1812	0	2	48	241	29454
083083	2	48.0	0	3460	0	5585	1	2826	215	15939	4	1816	2	0	50	222	29676
083183	2	48.0	0	3460	0	5585	0	2826	45	15984	3	1819	2	0	52	50	29726
090183	2	48.0	0	3460	0	5585	0	2826	121	16105	9	1828	2	1	55	133	29859
090283	2	48.0	0	3460	0	5585	0	2826	86	16191	4	1832	1	1	57	92	29951
090383	2	48.0	0	3460	1	5586	0	2826	192	16383	7	1839	5	4	66	209	30160
090483	2	48.0	0	3460	0	5586	0	2826	218	16601	5	1844	4	5	75	232	30392
090583	2	47.0	0	3460	0	5586	0	2826	89	16690	3	1847	3	3	81	98	30490
090683	2	47.0	0	3460	0	5586	0	2826	85	16775	2	1849	1	0	82	88	30578
090783	2	48.0	0	3460	0	5586	0	2826	20	16795	2	1851	3	1	86	26	30604
090883	2	47.0	0	3460	0	5586	0	2826	25	16820	0	1851	0	1	87	26	30630
090983	2	48.0	0	3460	0	5586	0	2826	28	16848	3	1854	1	1	89	33	30663
091083	2	47.0	0	3460	0	5586	0	2826	27	16875	4	1858	1	1	91	33	30696
091183	2	20.0	0	3460	0	5586	0	2826	14	16889	1	1859	0	0	91	15	30711

Appendix Table 2-D-5. Sunshine station west bank fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
060483	1	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060583	1	24.0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
060683	1	24.0	6	7	0	0	0	0	0	0	0	0	0	0	0	6	7
060783	2	31.0	8	15	0	0	0	0	0	0	0	0	0	0	0	8	15
060883	2	48.0	20	35	0	0	0	0	0	0	0	0	0	0	0	20	35
060983	2	44.0	23	58	0	0	0	0	0	0	0	0	0	0	0	23	58
061083	2	48.0	44	102	0	0	0	0	0	0	0	0	0	0	0	44	102
061183	2	48.0	50	152	1	1	0	0	0	0	0	0	0	0	0	51	153
061283	2	48.0	34	186	0	1	0	0	0	0	0	0	0	0	0	34	187
061383	2	48.0	56	242	0	1	0	0	0	0	0	0	0	1	1	57	244
061483	2	48.0	29	271	0	1	0	0	0	0	0	0	0	0	1	29	273
061583	2	48.0	23	294	0	1	0	0	0	0	0	0	0	0	1	23	296
061683	2	48.0	10	304	0	1	0	0	0	0	0	0	0	0	1	10	306
061783	2	48.0	8	312	0	1	0	0	0	0	0	0	0	0	1	8	314
061883	2	48.0	9	321	0	1	0	0	0	0	0	0	0	0	1	9	323
061983	2	48.0	16	337	0	1	0	0	0	0	0	0	0	0	1	16	339
062083	2	47.0	6	343	0	1	0	0	0	0	0	0	0	0	1	6	345
062183	2	48.0	2	345	0	1	0	0	0	0	0	0	0	1	2	3	348
062283	2	48.0	0	345	0	1	0	0	0	0	0	0	0	0	2	0	348
062383	2	48.0	2	347	0	1	0	0	0	0	0	0	0	0	2	2	350
062483	2	48.0	1	348	0	1	0	0	0	0	0	0	0	0	2	1	351
062583	2	48.0	1	349	0	1	0	0	0	0	0	0	0	0	2	1	352
062683	2	47.0	1	350	0	1	0	0	0	0	0	0	0	0	2	1	353
062783	2	47.0	1	351	0	1	0	0	0	0	0	0	0	0	2	1	354
062883	2	48.0	0	351	0	1	0	0	0	0	0	0	0	0	2	0	354
062983	2	48.0	0	351	0	1	0	0	0	0	0	0	0	1	3	1	355
063083	2	48.0	1	352	0	1	0	0	0	0	0	0	0	0	3	1	356
070183	2	48.0	0	352	0	1	0	0	0	0	0	0	0	0	3	0	356
070283	2	48.0	2	354	0	1	0	0	0	0	0	0	0	0	3	2	358

Appendix Table 2-D-5. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070383	2	48.0	0	354	0	1	0	0	0	0	0	0	0	0	3	0	358
070483	2	48.0	4	358	0	1	0	0	0	0	0	0	0	0	3	4	362
070583	2	48.0	1	359	0	1	0	0	0	0	0	0	0	0	3	1	363
070683	2	46.0	1	360	1	2	0	0	0	0	0	0	0	0	3	2	365
070783	2	48.0	1	361	0	2	0	0	0	0	0	0	0	0	3	1	366
070883	2	48.0	1	362	0	2	0	0	0	0	0	0	0	0	3	1	367
070983	2	47.0	0	362	0	2	0	0	0	0	0	0	0	0	3	0	367
071083	2	48.0	2	364	3	5	0	0	0	0	0	0	0	1	4	6	373
071183	2	48.0	1	365	4	9	0	0	0	0	0	0	0	0	4	5	378
071283	2	48.0	1	366	3	12	0	0	0	0	0	0	0	0	4	4	382
071383	2	48.0	0	366	1	13	0	0	0	0	0	0	0	0	4	1	383
071483	2	48.0	2	368	10	23	0	0	1	1	0	0	0	0	4	13	396
071583	2	48.0	2	370	17	40	1	1	0	1	0	0	0	0	4	20	416
071683	2	48.0	1	371	31	71	0	1	0	1	0	0	0	0	4	32	448
071783	2	48.0	0	371	55	126	1	2	1	2	0	0	0	0	4	57	505
071883	2	48.0	0	371	34	160	2	4	2	4	1	1	0	0	4	39	544
071983	2	48.0	0	371	87	247	4	8	1	5	2	3	0	1	5	95	639
072083	2	48.0	1	372	131	378	7	15	3	8	2	5	0	0	5	144	783
072183	2	48.0	0	372	249	627	8	23	10	18	5	10	0	0	5	272	1055
072283	2	48.0	0	372	318	945	12	35	5	23	5	15	0	0	5	340	1395
072383	2	48.0	0	372	417	1362	22	57	17	40	5	20	0	0	5	461	1856
072483	2	48.0	0	372	53	1415	8	65	3	43	0	20	0	0	5	64	1920
072583	2	48.0	0	372	144	1559	25	90	15	58	9	29	0	0	5	193	2113
072683	2	48.0	0	372	151	1710	27	117	30	88	8	37	0	0	5	216	2329
072783	2	46.0	0	372	121	1831	31	148	27	115	14	51	0	0	5	193	2522
072883	2	48.0	0	372	104	1935	27	175	40	155	12	63	0	0	5	183	2705
072983	2	48.0	0	372	147	2082	27	202	36	191	13	76	0	0	5	223	2928

Appendix Table 2-D-5. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
073083	2	48.0	0	372	46	2128	9	211	22	213	7	83	0	0	5	84	3012
073183	2	48.0	0	372	13	2141	6	217	8	221	6	89	0	0	5	33	3045
080183	2	48.0	0	372	8	2149	6	223	19	240	5	94	0	0	5	38	3083
080283	2	48.0	0	372	13	2162	1	224	6	246	5	99	0	0	5	25	3108
080383	2	48.0	0	372	21	2183	7	231	23	269	10	109	0	0	5	61	3169
080483	2	48.0	0	372	16	2199	7	238	11	280	10	119	0	0	5	44	3213
080583	2	48.0	0	372	5	2204	7	245	6	286	5	124	0	0	5	23	3236
080683	2	48.0	0	372	5	2209	0	245	1	287	6	130	0	0	5	12	3248
080783	2	48.0	0	372	3	2212	0	245	0	287	4	134	0	0	5	7	3255
080883	2	30.0	0	372	2	2214	0	245	2	289	1	135	0	0	5	5	3260
080983	1	24.0	0	372	0	2214	0	245	0	289	0	135	0	0	5	0	3260
081083	1	24.0	0	372	0	2214	0	245	0	289	0	135	0	0	5	0	3260
081183	2	36.0	0	372	25	2239	3	248	5	294	10	145	0	0	5	43	3303
081283	2	48.0	0	372	72	2311	7	255	13	307	41	186	0	0	5	133	3436
081383	2	48.0	0	372	18	2329	1	256	7	314	8	194	0	0	5	34	3470
081483	2	48.0	0	372	15	2344	1	257	12	326	4	198	0	0	5	32	3502
081583	2	43.0	0	372	48	2392	1	258	5	331	37	235	0	0	5	91	3593
081683	2	48.0	0	372	18	2410	0	258	7	338	13	248	0	0	5	38	3631
081783	2	48.0	0	372	30	2440	1	259	25	363	34	282	0	1	6	91	3722
081883	2	48.0	0	372	36	2476	0	259	25	388	27	309	0	0	6	88	3810
081983	2	48.0	0	372	26	2502	0	259	39	427	11	320	0	3	9	79	3889
082083	2	48.0	0	372	26	2528	0	259	24	451	23	343	0	3	12	76	3965
082183	2	48.0	0	372	11	2539	0	259	16	467	9	352	0	0	12	36	4001
082283	2	48.0	0	372	1	2540	0	259	9	476	6	358	0	0	12	16	4017
082383	2	48.0	0	372	7	2547	0	259	14	490	9	367	0	0	12	30	4047
082483	2	48.0	0	372	3	2550	0	259	17	507	5	372	0	0	12	25	4072
082583	2	43.0	0	372	4	2554	0	259	6	513	3	375	0	0	12	13	4085

Appendix Table 2-D-5. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
082683	2	48.0	0	372	1	2555	0	259	14	527	3	378	0	0	12	18	4103
082783	2	48.0	0	372	0	2555	0	259	36	563	1	379	0	0	12	37	4140
082883	2	48.0	0	372	1	2556	0	259	67	630	6	385	1	10	23	85	4225
082983	2	48.0	0	372	2	2558	0	259	23	653	2	387	1	2	26	30	4255
083083	2	48.0	0	372	0	2558	0	259	10	663	1	388	0	2	28	13	4268
083183	2	46.0	0	372	0	2558	0	259	5	668	2	390	1	1	30	9	4277
090183	2	48.0	0	372	1	2559	0	259	1	669	0	390	0	0	30	2	4279
090283	2	48.0	0	372	0	2559	0	259	3	672	1	391	0	1	31	5	4284
090383	2	48.0	0	372	0	2559	0	259	7	679	0	391	0	0	31	7	4291
090483	2	48.0	0	372	1	2560	0	259	10	689	0	391	0	1	32	12	4303
090583	2	48.0	0	372	1	2561	0	259	8	697	1	392	0	1	33	11	4314
090683	2	26.0	0	372	0	2561	0	259	7	704	2	394	1	0	34	10	4324
090783	1	21.0	0	372	0	2561	0	259	1	705	1	395	0	0	34	2	4326
090883	1	24.0	0	372	0	2561	0	259	1	706	0	395	0	0	34	1	4327
090983	1	24.0	0	372	0	2561	0	259	2	708	0	395	0	0	34	2	4329
091083	1	24.0	0	372	0	2561	0	259	1	709	0	395	0	0	34	1	4330
091183	1	10.0	0	372	0	2561	0	259	2	711	0	395	0	0	34	2	4332

Appendix Table 2-D-6. Sunshine station fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
060383	1	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060483	2	28.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060583	3	52.0	6	6	10	10	0	0	0	0	0	0	0	0	0	16	16
060683	3	72.0	21	27	29	39	0	0	0	0	0	0	0	0	0	50	66
060783	4	79.0	40	67	33	72	0	0	0	0	0	0	0	0	0	73	139
060883	4	96.0	56	123	48	120	0	0	0	0	0	0	0	0	0	104	243
060983	4	90.0	94	217	73	193	0	0	0	0	0	0	0	2	2	169	412
061083	4	96.0	144	361	73	266	0	0	0	0	0	0	0	1	3	218	630
061183	4	96.0	146	507	37	303	0	0	0	0	0	0	0	0	3	183	813
061283	4	96.0	221	728	32	335	0	0	0	0	0	0	0	0	3	253	1066
061383	4	95.0	328	1056	21	356	0	0	0	0	0	0	0	4	7	353	1419
061483	4	95.0	355	1411	15	371	0	0	0	0	0	0	0	0	7	370	1789
061583	4	96.0	185	1596	17	388	0	0	0	0	0	0	0	0	7	202	1991
061683	4	96.0	152	1748	13	401	0	0	0	0	0	0	0	0	7	165	2156
061783	4	96.0	135	1883	9	410	0	0	0	0	0	0	0	0	7	144	2300
061883	4	96.0	170	2053	7	417	0	0	0	0	0	0	0	0	7	177	2477
061983	4	94.5	275	2328	7	424	0	0	0	0	0	0	0	0	7	282	2759
062083	4	95.0	173	2501	4	428	0	0	0	0	0	0	0	0	7	177	2936
062183	4	96.0	174	2675	4	432	0	0	0	0	0	0	0	1	8	179	3115
062283	4	96.0	155	2830	1	433	0	0	0	0	0	0	0	0	8	156	3271
062383	4	93.0	126	2956	3	436	0	0	0	0	0	0	0	0	8	129	3400
062483	4	96.0	58	3014	2	438	0	0	0	0	0	0	0	0	8	60	3460
062583	4	96.0	73	3087	0	438	0	0	0	0	0	0	0	0	8	73	3533
062683	4	95.0	78	3165	1	439	0	0	0	0	0	0	0	0	8	79	3612
062783	4	95.0	66	3231	0	439	0	0	0	0	0	0	0	0	8	66	3678
062883	4	96.0	48	3279	1	440	0	0	0	0	0	0	0	0	8	49	3727
062983	4	96.0	49	3328	0	440	0	0	0	0	0	0	0	1	9	50	3777
063083	4	96.0	33	3361	1	441	0	0	0	0	0	0	0	0	9	34	3811
070183	4	96.0	52	3413	1	442	0	0	0	0	0	0	0	0	9	53	3864

Appendix Table 2-D-6. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070283	4	93.0	51	3464	1	443	0	0	0	0	0	0	0	0	9	52	3916
070383	4	96.0	33	3497	2	445	0	0	0	0	0	0	0	0	9	35	3951
070483	4	96.0	46	3543	1	446	0	0	0	0	0	0	0	0	9	47	3998
070583	4	95.0	26	3569	2	448	0	0	0	0	0	0	0	0	9	28	4026
070683	4	93.0	22	3591	5	453	0	0	0	0	0	0	0	0	9	27	4053
070783	4	96.0	13	3604	3	456	0	0	0	0	0	0	0	0	9	16	4069
070883	4	96.0	11	3615	3	459	0	0	0	0	0	0	0	0	9	14	4083
070983	4	94.0	25	3640	2	461	0	0	0	0	0	0	0	1	10	28	4111
071083	4	96.0	29	3669	10	471	2	2	1	1	0	0	0	1	11	43	4154
071183	4	96.0	18	3687	10	481	2	4	0	1	0	0	0	0	11	30	4184
071283	4	96.0	25	3712	19	500	2	6	1	2	0	0	0	0	11	47	4231
071383	4	96.0	14	3726	15	515	4	10	1	3	2	2	0	0	11	36	4267
071483	4	96.0	13	3739	63	578	2	12	5	8	2	4	0	0	11	85	4352
071583	4	96.0	11	3750	65	643	7	19	11	19	3	7	0	0	11	97	4449
071683	4	96.0	9	3759	133	776	11	30	25	44	2	9	0	0	11	180	4629
071783	4	96.0	13	3772	235	1011	28	58	47	91	5	14	0	0	11	328	4957
071883	4	96.0	5	3777	201	1212	32	90	56	147	8	22	0	0	11	302	5259
071983	4	96.0	8	3785	262	1474	26	116	108	255	10	32	0	1	12	415	5674
072083	4	96.0	6	3791	400	1874	49	165	174	429	10	42	0	0	12	639	6313
072183	4	96.0	7	3798	1013	2887	115	280	387	816	24	66	0	0	12	1546	7859
072283	4	96.0	8	3806	1373	4260	101	381	483	1299	29	95	0	0	12	1994	9853
072383	4	96.0	5	3811	1026	5286	171	552	736	2035	20	115	0	1	13	1959	11812
072483	4	96.0	4	3815	272	5558	142	694	319	2354	14	129	0	0	13	751	12563
072583	4	96.0	2	3817	355	5913	218	912	767	3121	43	172	0	0	13	1385	13948
072683	4	96.0	4	3821	302	6215	177	1089	1066	4187	51	223	0	0	13	1600	15548
072783	4	89.0	4	3825	229	6444	144	1233	938	5125	39	262	0	0	13	1354	16902
072883	4	96.0	3	3828	217	6661	135	1368	1195	6320	61	323	0	0	13	1611	18513

Appendix Table 2-D-6. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
072983	4	96.0	0	3828	238	6899	150	1518	949	7269	59	382	0	0	13	1396	19909
073083	4	96.0	0	3828	105	7004	152	1670	876	8145	75	457	0	0	13	1208	21117
073183	4	96.0	1	3829	59	7063	177	1847	380	8525	96	553	0	0	13	713	21830
080183	4	96.0	0	3829	51	7114	111	1958	358	8883	92	645	0	0	13	612	22442
080283	4	96.0	1	3830	69	7183	131	2089	562	9445	120	765	0	0	13	883	23325
080383	4	96.0	0	3830	83	7266	152	2241	718	10163	145	910	0	0	13	1098	24423
080483	4	96.0	1	3831	75	7341	140	2381	566	10729	153	1063	0	0	13	935	25358
080583	4	96.0	0	3831	87	7428	147	2528	270	10999	138	1201	0	0	13	642	26000
080683	4	96.0	0	3831	46	7474	89	2617	199	11198	82	1283	0	0	13	416	26416
080783	4	96.0	0	3831	41	7515	41	2658	123	11321	69	1352	0	0	13	274	26690
080883	4	77.0	0	3831	23	7538	25	2683	70	11391	33	1385	0	0	13	151	26841
080983	3	67.0	0	3831	5	7543	3	2686	4	11395	1	1386	0	0	13	13	26854
081083	3	72.0	0	3831	7	7550	11	2697	15	11410	10	1396	0	0	13	43	26897
081183	4	84.0	0	3831	47	7597	42	2739	81	11491	55	1451	0	0	13	225	27122
081283	4	96.0	0	3831	106	7703	78	2817	239	11730	143	1594	0	1	14	567	27689
081383	4	96.0	0	3831	43	7746	43	2860	126	11856	55	1649	0	1	15	268	27957
081483	4	96.0	0	3831	39	7785	43	2903	129	11985	62	1711	0	1	16	274	28231
081583	4	91.0	0	3831	76	7861	46	2949	195	12180	72	1783	0	0	16	389	28620
081683	4	95.0	0	3831	41	7902	38	2987	170	12350	58	1841	0	1	17	308	28928
081783	4	96.0	0	3831	55	7957	35	3022	315	12665	65	1906	0	3	20	473	29401
081883	4	96.0	1	3832	62	8019	30	3052	386	13051	61	1967	0	3	23	543	29944
081983	4	96.0	0	3832	40	8059	11	3063	500	13551	33	2000	0	3	26	587	30531
082083	4	96.0	0	3832	38	8097	10	3073	438	13989	47	2047	0	7	33	540	31071
082183	4	96.0	0	3832	12	8109	2	3075	190	14179	22	2069	0	1	34	227	31298
082283	4	96.0	0	3832	8	8117	2	3077	261	14440	28	2097	0	4	38	303	31601
082383	4	96.0	0	3832	9	8126	1	3078	328	14768	26	2123	0	1	39	365	31966
082483	4	96.0	0	3832	4	8130	1	3079	298	15066	21	2144	0	0	39	324	32290

Appendix Table 2-D-6. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
082583	4	91.0	0	3832	5	8135	2	3081	206	15272	11	2155	0	4	43	228	32518
082683	4	96.0	0	3832	1	8136	0	3081	189	15461	8	2163	0	1	44	199	32717
082783	4	96.0	0	3832	0	8136	0	3081	217	15678	10	2173	0	9	53	236	32953
082883	4	96.0	0	3832	2	8138	1	3082	448	16126	18	2191	1	15	69	485	33438
082983	4	96.0	0	3832	5	8143	2	3084	251	16377	8	2199	1	4	74	271	33709
083083	4	96.0	0	3832	0	8143	1	3085	225	16602	5	2204	2	2	78	235	33944
083183	4	94.0	0	3832	0	8143	0	3085	50	16652	5	2209	3	1	82	59	34003
090183	4	96.0	0	3832	1	8144	0	3085	122	16774	9	2218	2	1	85	135	34138
090283	4	96.0	0	3832	0	8144	0	3085	89	16863	5	2223	1	2	88	97	34235
090383	4	96.0	0	3832	1	8145	0	3085	199	17062	7	2230	5	4	97	216	34451
090483	4	96.0	0	3832	1	8146	0	3085	228	17290	5	2235	4	6	107	244	34695
090583	4	95.0	0	3832	1	8147	0	3085	97	17387	4	2239	3	4	114	109	34804
090683	4	73.0	0	3832	0	8147	0	3085	92	17479	4	2243	2	0	116	98	34902
090783	3	69.0	0	3832	0	8147	0	3085	21	17500	3	2246	3	1	120	28	34930
090883	3	71.0	0	3832	0	8147	0	3085	26	17526	0	2246	0	1	121	27	34957
090983	3	72.0	0	3832	0	8147	0	3085	30	17556	3	2249	1	1	123	35	34992
091083	3	71.0	0	3832	0	8147	0	3085	28	17584	4	2253	1	1	125	34	35026
091183	3	30.0	0	3832	0	8147	0	3085	16	17600	1	2254	0	0	125	17	35043

Appendix Table 2-D-7. Talkeetna station east bank fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
060783	2	48.0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
060883	2	48.0	3	4	0	0	0	0	0	0	0	0	0	0	0	3	4
060983	2	48.0	2	6	0	0	0	0	0	0	0	0	0	0	0	2	6
061083	2	48.0	1	7	0	0	0	0	0	0	0	0	0	0	0	1	7
061183	2	48.0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
061283	2	48.0	4	11	0	0	0	0	0	0	0	0	0	0	0	4	11
061383	2	48.0	1	12	1	1	0	0	0	0	0	0	0	0	0	2	13
061483	2	48.0	2	14	0	1	0	0	0	0	0	0	0	0	0	2	15
061583	2	48.0	5	19	0	1	0	0	0	0	0	0	0	0	0	5	20
061683	2	48.0	2	21	1	2	0	0	0	0	0	0	0	0	0	3	23
061783	2	48.0	1	22	0	2	0	0	0	0	0	0	0	0	0	1	24
061883	2	48.0	19	41	0	2	0	0	0	0	0	0	0	0	0	19	43
061983	2	48.0	27	68	0	2	0	0	0	0	0	0	0	2	2	29	72
062083	2	48.0	13	81	0	2	0	0	0	0	0	0	0	0	2	13	85
062183	2	48.0	23	104	0	2	0	0	0	0	0	0	0	0	2	23	108
062283	2	48.0	41	145	1	3	0	0	0	0	0	0	0	0	2	42	150
062383	2	48.0	26	171	0	3	0	0	0	0	0	0	0	1	3	27	177
062483	2	48.0	25	196	1	4	0	0	0	0	0	0	0	1	4	27	204
062583	2	46.0	29	225	0	4	0	0	0	0	0	0	0	0	4	29	233
062683	2	48.0	30	255	0	4	0	0	0	0	0	0	0	0	4	30	263
062783	2	48.0	33	288	0	4	0	0	0	0	0	0	0	0	4	33	296
062883	2	48.0	21	309	0	4	0	0	0	0	0	0	0	0	4	21	317
062983	2	48.0	25	334	0	4	0	0	0	0	0	0	0	0	4	25	342
063083	2	48.0	24	358	0	4	0	0	0	0	0	0	0	0	4	24	366
070183	2	47.5	15	373	1	5	0	0	0	0	0	0	0	0	4	16	382
070283	2	48.0	16	389	0	5	0	0	0	0	0	0	0	0	4	16	398
070383	2	48.0	20	409	2	7	0	0	0	0	0	0	0	0	4	22	420
070483	2	47.5	11	420	0	7	0	0	0	0	0	0	0	0	4	11	431
070583	2	48.0	16	436	0	7	0	0	0	0	0	0	0	0	4	16	447

Appendix Table 2-D-7. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
070683	2	48.0	11	447	1	8	0	0	0	0	0	0	0	0	4	12	459
070783	2	48.0	15	462	0	8	0	0	0	0	0	0	0	2	6	17	476
070883	2	48.0	12	474	2	10	0	0	0	0	0	0	0	0	6	14	490
070983	2	44.0	10	484	0	10	0	0	0	0	0	0	0	1	7	11	501
071083	2	44.0	6	490	0	10	1	1	0	0	0	0	0	1	8	8	509
071183	2	46.0	3	493	1	11	0	1	1	1	0	0	0	0	8	5	514
071283	2	48.0	9	502	0	11	0	1	0	1	0	0	0	0	8	9	523
071383	2	48.0	8	510	1	12	0	1	0	1	0	0	0	0	8	9	532
071483	2	48.0	7	517	0	12	0	1	0	1	0	0	0	0	8	7	539
071583	2	48.0	3	520	2	14	0	1	0	1	0	0	0	0	8	5	544
071683	2	46.0	4	524	2	16	0	1	0	1	0	0	0	2	10	8	552
071783	2	48.0	7	531	3	19	1	2	0	1	0	0	0	2	12	13	565
071883	2	48.0	2	533	1	20	1	3	0	1	1	1	0	0	12	5	570
071983	2	48.0	1	534	1	21	1	4	0	1	0	1	0	0	12	3	573
072083	2	44.0	4	538	2	23	6	10	1	2	0	1	0	2	14	15	588
072183	2	45.5	6	544	2	25	12	22	2	4	3	4	0	1	15	26	614
072283	2	48.0	0	544	4	29	10	32	3	7	0	4	0	3	18	20	634
072383	2	46.0	1	545	3	32	25	57	10	17	0	4	0	0	18	39	673
072483	2	48.0	2	547	4	36	24	81	14	31	1	5	0	0	18	45	718
072583	2	48.0	1	548	4	40	20	101	12	43	1	6	0	0	18	38	756
072683	2	48.0	1	549	9	49	30	131	30	73	0	6	0	0	18	70	826
072783	2	48.0	2	551	3	52	43	174	88	161	1	7	0	0	18	137	963
072883	2	46.0	3	554	10	62	47	221	99	260	0	7	0	0	18	159	1122
072983	2	46.0	0	554	12	74	104	325	119	379	1	8	0	1	19	237	1359
073083	2	48.0	2	556	15	89	120	445	110	489	1	9	0	0	19	248	1607
073183	2	48.0	3	559	13	102	68	513	72	561	1	10	0	0	19	157	1764
080183	2	41.0	2	561	9	111	36	549	49	610	4	14	0	0	19	100	1864

Appendix Table 2-D-7. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
080283	2	48.0	1	562	8	119	34	583	34	644	3	17	0	0	19	80	1944
080383	2	48.0	0	562	23	142	71	654	101	745	9	26	0	0	19	204	2148
080483	2	48.0	2	564	17	159	39	693	58	803	4	30	0	0	19	120	2268
080583	2	48.0	0	564	12	171	21	714	43	846	2	32	0	0	19	78	2346
080683	2	47.5	1	565	8	179	14	728	15	861	2	34	0	0	19	40	2386
080783	2	47.0	0	565	14	193	6	734	20	881	2	36	0	0	19	42	2428
080883	2	48.0	0	565	6	199	12	746	15	896	2	38	0	0	19	35	2463
080983	2	46.0	0	565	1	200	1	747	4	900	2	40	0	0	19	8	2471
081083	2	47.0	1	566	0	200	0	747	1	901	0	40	0	0	19	2	2473
081183	2	47.5	0	566	2	202	2	749	6	907	4	44	0	0	19	14	2487
081283	2	48.0	0	566	5	207	0	749	18	925	2	46	0	0	19	25	2512
081383	2	48.0	0	566	1	206	3	752	2	927	2	48	0	0	19	8	2520
081483	2	48.0	0	566	0	208	2	754	4	931	2	50	0	0	19	8	2528
081583	2	48.0	0	566	2	210	2	756	9	940	3	53	0	0	19	16	2544
081683	2	46.0	0	566	3	213	3	759	7	947	7	60	0	1	20	21	2565
081783	2	48.0	0	566	6	219	3	762	21	968	5	65	0	0	20	35	2600
081883	2	48.0	0	566	7	226	4	766	19	987	6	71	0	2	22	38	2638
081983	2	48.0	0	566	2	228	4	770	12	999	4	75	0	0	22	22	2660
082083	2	48.0	0	566	4	232	3	773	5	1004	1	76	0	2	24	15	2675
082183	2	48.0	0	566	0	232	7	780	17	1021	12	88	0	0	24	36	2711
082283	2	48.0	0	566	4	236	1	781	3	1024	3	91	0	0	24	11	2722
082383	2	48.0	0	566	3	239	1	782	2	1026	2	93	0	0	24	8	2730
082483	2	48.0	0	566	2	241	0	782	4	1030	2	95	0	0	24	8	2738
082583	2	47.5	0	566	0	241	0	782	4	1034	0	95	0	1	25	5	2743
082683	2	48.0	0	566	0	241	1	783	0	1034	1	96	0	0	25	2	2745
082783	2	48.0	0	566	0	241	0	783	0	1034	2	98	0	0	25	2	2747
082883	2	45.0	0	566	1	242	0	783	26	1060	4	102	0	1	26	32	2779

Appendix Table 2-D-7. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
082983	2	48.0	0	566	1	243	0	783	12	1072	1	103	0	3	29	17	2796
083083	2	48.0	0	566	2	245	0	783	17	1089	2	105	1	2	32	24	2820
083183	2	48.0	0	566	0	245	0	783	3	1092	0	105	0	2	34	5	2825
090183	2	48.0	0	566	0	245	0	783	4	1096	3	108	0	0	34	7	2832
090283	2	48.0	0	566	0	245	0	783	0	1096	3	111	0	0	34	3	2835
090383	2	48.0	0	566	0	245	0	783	20	1116	2	113	0	0	34	22	2857
090483	2	46.0	0	566	0	245	0	783	18	1134	3	116	0	0	34	21	2878
090583	2	48.0	0	566	0	245	0	783	1	1135	0	116	0	1	35	2	2880
090683	2	46.0	0	566	1	246	0	783	15	1150	3	119	0	0	35	19	2899
090783	2	44.0	0	566	0	246	0	783	5	1155	4	123	0	0	35	9	2908
090883	2	48.0	0	566	0	246	0	783	0	1155	1	124	1	0	36	2	2910
090983	2	48.0	0	566	0	246	0	783	1	1156	0	124	0	0	36	1	2911
091083	2	48.0	0	566	0	246	0	783	4	1160	2	126	1	0	37	7	2918
091183	2	48.0	0	566	0	246	0	783	6	1166	2	128	0	0	37	8	2926
091283	2	24.0	0	566	0	246	0	783	2	1168	4	132	0	2	39	8	2934

Appendix Table 2-D-8. Talkeetna station west bank fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
060783	2	35.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060883	2	48.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060983	2	48.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
061083	2	48.0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
061183	2	48.0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
061283	2	48.0	1	1	1	1	0	0	0	0	0	0	0	0	1	2	3
061383	2	48.0	2	3	0	1	0	0	0	0	0	0	0	0	1	2	5
061483	2	48.0	2	5	1	2	0	0	0	0	0	0	0	0	1	3	8
061583	2	48.0	5	10	0	2	0	0	0	0	0	0	0	0	1	5	13
061683	2	47.0	1	11	0	2	0	0	0	0	0	0	0	0	1	1	14
061783	2	48.0	3	14	0	2	0	0	0	0	0	0	0	0	1	3	17
061883	2	48.0	9	23	0	2	0	0	0	0	0	0	0	0	1	9	26
061983	2	48.0	9	32	1	3	0	0	0	0	0	0	0	1	2	11	37
062083	2	48.0	13	45	1	4	0	0	0	0	0	0	0	0	2	14	51
062183	2	48.0	15	60	2	6	0	0	0	0	0	0	0	0	2	17	68
062283	2	48.0	33	93	1	7	0	0	0	0	0	0	0	0	2	34	102
062383	2	47.5	25	118	0	7	0	0	0	0	0	0	0	0	2	25	127
062483	2	48.0	24	142	0	7	0	0	0	0	0	0	0	0	2	24	151
062583	2	48.0	28	170	0	7	0	0	0	0	0	0	0	0	2	28	179
062683	2	45.5	24	194	0	7	0	0	0	0	0	0	0	0	2	24	203
062783	2	48.0	32	226	0	7	0	0	0	0	0	0	0	0	2	32	235
062883	2	48.0	8	234	0	7	0	0	0	0	0	0	0	0	2	8	243
062983	2	48.0	12	246	0	7	0	0	0	0	0	0	0	0	2	12	255
063083	2	48.0	9	255	0	7	0	0	0	0	0	0	0	0	2	9	264
070183	2	42.0	13	268	0	7	0	0	0	0	0	0	0	0	2	13	277
070283	2	48.0	9	277	0	7	0	0	0	0	0	0	0	0	2	9	286
070383	2	48.0	23	300	1	8	0	0	0	0	0	0	0	0	2	24	310
070483	2	48.0	15	315	0	8	0	0	0	0	0	0	0	0	2	15	325
070583	2	48.0	19	334	0	8	0	0	0	0	0	0	0	0	2	19	344

Appendix Table 2-D-8. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070683	2	48.0	16	350	0	8	0	0	0	0	0	0	0	0	2	16	360
070783	2	48.0	17	367	0	8	0	0	0	0	0	0	0	0	2	17	377
070883	2	48.0	4	371	0	8	0	0	0	0	0	0	0	0	2	4	381
070983	2	48.0	4	375	0	8	0	0	0	0	0	0	0	0	2	4	385
071083	2	48.0	12	387	0	8	1	1	0	0	0	0	0	1	3	14	399
071183	2	46.0	5	392	1	9	0	1	0	0	0	0	0	0	3	6	405
071283	2	48.0	8	400	0	9	0	1	0	0	0	0	0	0	3	8	413
071383	2	48.0	5	405	0	9	0	1	0	0	0	0	0	0	3	5	418
071483	2	48.0	6	411	1	10	0	1	0	0	0	0	0	0	3	7	425
071583	2	48.0	8	419	2	12	0	1	0	0	0	0	0	1	4	11	436
071683	2	44.0	3	422	4	16	1	2	0	0	0	0	0	1	5	9	445
071783	2	48.0	5	427	1	17	5	7	0	0	0	0	0	2	7	13	458
071883	2	48.0	4	431	1	18	4	11	0	0	0	0	0	2	9	11	469
071983	2	48.0	1	432	3	21	6	17	0	0	0	0	0	0	9	10	479
072083	2	46.0	3	435	3	24	17	34	0	0	0	0	0	0	9	23	502
072183	2	48.0	4	439	3	27	15	49	8	8	0	0	0	1	10	31	533
072283	2	48.0	6	445	6	33	27	76	16	24	0	0	0	2	12	57	590
072383	2	48.0	2	447	11	44	77	153	17	41	1	1	0	1	13	109	699
072483	2	48.0	3	450	7	51	67	220	35	76	1	2	0	1	14	114	813
072583	2	48.0	2	452	9	60	41	261	20	96	0	2	0	1	15	73	886
072683	2	44.0	1	453	16	76	70	331	28	124	3	5	0	1	16	119	1005
072783	2	48.0	1	454	18	94	128	459	95	219	2	7	0	0	16	244	1249
072883	2	46.0	2	456	6	100	80	539	91	310	4	11	0	1	17	184	1433
072983	2	48.0	0	456	13	113	140	679	168	478	1	12	0	1	18	323	1756
073083	2	48.0	0	456	15	128	185	864	117	595	5	17	0	1	19	323	2079
073183	2	48.0	0	456	10	138	96	960	38	633	6	23	0	0	19	150	2229
080183	2	48.0	1	457	9	147	72	1032	60	693	3	26	0	0	19	145	2374

Appendix Table 2-D-8. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
080283	2	48.0	0	457	15	162	51	1083	23	716	2	28	0	0	19	91	2465
080383	2	48.0	2	459	18	180	106	1189	110	826	13	41	0	0	19	249	2714
080483	2	48.0	1	460	11	191	69	1258	112	938	21	62	0	0	19	214	2928
080583	2	48.0	1	461	10	201	43	1301	40	978	17	79	0	0	19	111	3039
080683	2	48.0	0	461	12	213	30	1331	52	1030	18	97	0	0	19	112	3151
080783	2	48.0	2	463	10	223	12	1343	30	1060	11	108	0	0	19	65	3216
080883	2	47.0	0	463	15	238	13	1356	16	1076	6	114	0	0	19	50	3266
080983	2	47.0	0	463	5	243	2	1358	6	1082	3	117	0	1	20	17	3283
081083	2	48.0	0	463	1	244	1	1359	3	1085	0	117	0	0	20	5	3288
081183	2	47.0	0	463	0	244	2	1361	10	1095	3	120	0	1	21	16	3304
081283	2	48.0	0	463	6	250	5	1366	21	1116	20	140	0	0	21	52	3356
081383	2	48.0	0	463	2	252	6	1372	26	1142	12	152	0	0	21	46	3402
081483	2	48.0	0	463	4	256	4	1376	12	1154	13	165	0	1	22	34	3436
081583	2	48.0	0	463	6	262	7	1383	4	1158	12	177	0	1	23	30	3466
081683	2	48.0	0	463	2	264	6	1389	7	1165	16	193	0	2	25	33	3499
081783	2	48.0	0	463	3	267	7	1396	6	1171	12	205	0	1	26	29	3528
081883	2	48.0	1	464	5	272	11	1407	19	1190	9	214	0	0	26	45	3573
081983	2	48.0	0	464	5	277	6	1413	8	1198	9	223	0	0	26	28	3601
082083	2	46.0	0	464	2	279	4	1417	6	1204	8	231	0	0	26	20	3621
082183	2	48.0	0	464	1	280	9	1426	9	1213	5	236	0	1	27	25	3646
082283	2	48.0	0	464	2	282	0	1426	1	1214	4	240	0	0	27	7	3653
082383	2	48.0	0	464	1	283	1	1427	0	1214	2	242	0	0	27	4	3657
082483	2	48.0	0	464	3	286	2	1429	5	1219	6	248	0	0	27	16	3673
082583	2	48.0	0	464	0	286	0	1429	0	1219	0	248	0	0	27	0	3673
082683	2	48.0	0	464	0	286	1	1430	1	1220	0	248	0	0	27	2	3675
082783	2	48.0	0	464	0	286	0	1430	0	1220	2	250	0	1	28	3	3678
082883	2	48.0	0	464	0	286	0	1430	27	1247	5	255	0	6	34	38	3716

Appendix Table 2-D-8. Continued.

			Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
Date	No. of Wheels	Wheel Hours	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
082983	2	48.0	0	464	0	286	0	1430	13	1260	7	262	0	1	35	21	3737
083083	2	48.0	0	464	1	287	0	1430	6	1266	1	263	0	0	35	8	3745
083183	2	48.0	0	464	0	287	0	1430	2	1268	0	263	0	2	37	4	3749
090183	2	48.0	0	464	2	289	0	1430	1	1269	2	265	0	0	37	5	3754
090283	2	48.0	0	464	0	289	0	1430	2	1271	4	269	0	1	38	7	3761
090383	2	48.0	0	464	0	289	0	1430	1	1272	5	274	0	0	38	6	3767
090483	2	48.0	0	464	0	289	0	1430	9	1281	6	280	0	4	42	19	3786
090583	2	48.0	0	464	1	290	0	1430	5	1286	0	280	1	0	43	7	3793
090683	2	44.0	0	464	0	290	0	1430	4	1290	4	284	0	0	43	8	3801
090783	2	48.0	0	464	0	290	0	1430	6	1296	1	285	1	1	45	9	3810
090883	2	48.0	0	464	0	290	0	1430	2	1298	4	289	0	1	46	7	3817
090983	2	48.0	0	464	0	290	0	1430	0	1298	0	289	0	0	46	0	3817
091083	2	48.0	0	464	0	290	0	1430	0	1298	0	289	0	0	46	0	3817
091183	2	48.0	0	464	0	290	0	1430	0	1298	1	290	0	1	47	2	3819
091283	2	24.0	0	464	0	290	0	1430	1	1299	0	290	0	0	47	1	3820

Appendix Table 2-D-9. Talkeetna station fishwheels daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
060783	4	83.0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
060883	4	96.0	3	4	0	0	0	0	0	0	0	0	0	0	0	3	4
060983	4	96.0	2	6	0	0	0	0	0	0	0	0	0	0	0	2	6
061083	4	96.0	1	7	0	0	0	0	0	0	0	0	0	1	1	2	8
061183	4	96.0	0	7	0	0	0	0	0	0	0	0	0	0	1	0	8
061283	4	96.0	5	12	1	1	0	0	0	0	0	0	0	0	1	6	14
061383	4	96.0	3	15	1	2	0	0	0	0	0	0	0	0	1	4	18
061483	4	96.0	4	19	1	3	0	0	0	0	0	0	0	0	1	5	23
061583	4	96.0	10	29	0	3	0	0	0	0	0	0	0	0	1	10	33
061683	4	95.0	3	32	1	4	0	0	0	0	0	0	0	0	1	4	37
061783	4	96.0	4	36	0	4	0	0	0	0	0	0	0	0	1	4	41
061883	4	96.0	28	64	0	4	0	0	0	0	0	0	0	0	1	28	69
061983	4	96.0	36	100	1	5	0	0	0	0	0	0	0	3	4	40	109
062083	4	96.0	26	126	1	6	0	0	0	0	0	0	0	0	4	27	136
062183	4	96.0	38	164	2	8	0	0	0	0	0	0	0	0	4	40	176
062283	4	96.0	74	238	2	10	0	0	0	0	0	0	0	0	4	76	252
062383	4	95.5	51	289	0	10	0	0	0	0	0	0	0	1	5	52	304
062483	4	96.0	49	338	1	11	0	0	0	0	0	0	0	1	6	51	355
062583	4	94.0	57	395	0	11	0	0	0	0	0	0	0	0	6	57	412
062683	4	93.5	54	449	0	11	0	0	0	0	0	0	0	0	6	54	466
062783	4	96.0	65	514	0	11	0	0	0	0	0	0	0	0	6	65	531
062883	4	96.0	29	543	0	11	0	0	0	0	0	0	0	0	6	29	560
062983	4	96.0	37	580	0	11	0	0	0	0	0	0	0	0	6	37	597
063083	4	96.0	33	613	0	11	0	0	0	0	0	0	0	0	6	33	630
070183	4	89.5	28	641	1	12	0	0	0	0	0	0	0	0	6	29	659
070283	4	96.0	25	666	0	12	0	0	0	0	0	0	0	0	6	25	684
070383	4	96.0	43	709	3	15	0	0	0	0	0	0	0	0	6	46	730
070483	4	95.5	26	735	0	15	0	0	0	0	0	0	0	0	6	26	756
070583	4	96.0	35	770	0	15	0	0	0	0	0	0	0	0	6	35	791

Appendix Table 2-D-9. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070683	4	96.0	27	797	1	16	0	0	0	0	0	0	0	0	6	28	819
070783	4	96.0	32	829	0	16	0	0	0	0	0	0	0	2	8	34	853
070883	4	96.0	16	845	2	18	0	0	0	0	0	0	0	0	8	18	871
070983	4	92.0	14	859	0	18	0	0	0	0	0	0	0	1	9	15	886
071083	4	92.0	18	877	0	18	2	2	0	0	0	0	0	2	11	22	908
071183	4	92.0	8	885	2	20	0	2	1	1	0	0	0	0	11	11	919
071283	4	96.0	17	902	0	20	0	2	0	1	0	0	0	0	11	17	936
071383	4	96.0	13	915	1	21	0	2	0	1	0	0	0	0	11	14	950
071483	4	96.0	13	928	1	22	0	2	0	1	0	0	0	0	11	14	964
071583	4	96.0	11	939	4	26	0	2	0	1	0	0	0	1	12	16	980
071683	4	90.0	7	946	6	32	1	3	0	1	0	0	0	3	15	17	997
071783	4	96.0	12	958	4	36	6	9	0	1	0	0	0	4	19	26	1023
071883	4	96.0	6	964	2	38	5	14	0	1	1	1	0	2	21	16	1039
071983	4	96.0	2	966	4	42	7	21	0	1	0	1	0	0	21	13	1052
072083	4	90.0	7	973	5	47	23	44	1	2	0	1	0	2	23	38	1090
072183	4	93.5	10	983	5	52	27	71	10	12	3	4	0	2	25	57	1147
072283	4	96.0	6	989	10	62	37	108	19	31	0	4	0	5	30	77	1224
072383	4	94.0	3	992	14	76	102	210	27	58	1	5	0	1	31	148	1372
072483	4	96.0	5	997	11	87	91	301	49	107	2	7	0	1	32	159	1531
072583	4	96.0	3	1000	13	100	61	362	32	139	1	8	0	1	33	111	1642
072683	4	92.0	2	1002	25	125	100	462	58	197	3	11	0	1	34	189	1831
072783	4	96.0	3	1005	21	146	171	633	183	380	3	14	0	0	34	381	2212
072883	4	92.0	5	1010	16	162	127	760	190	570	4	18	0	1	35	343	2555
072983	4	94.0	0	1010	25	187	244	1004	287	857	2	20	0	2	37	560	3115
073083	4	96.0	2	1012	30	217	305	1309	227	1084	6	26	0	1	38	571	3686
073183	4	96.0	3	1015	23	240	164	1473	110	1194	7	33	0	0	38	307	3993
080183	4	89.0	3	1018	18	258	108	1581	109	1303	7	40	0	0	38	245	4238

Appendix Table 2-D-9. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
080283	4	96.0	1	1019	23	281	85	1666	57	1360	5	45	0	0	38	171	4409
080383	4	96.0	2	1021	41	322	177	1843	211	1571	22	67	0	0	38	453	4862
080483	4	96.0	3	1024	28	350	108	1951	170	1741	25	92	0	0	38	334	5196
080583	4	96.0	1	1025	22	372	64	2015	83	1824	19	111	0	0	38	189	5385
080683	4	95.5	1	1026	20	392	44	2059	67	1891	20	131	0	0	38	152	5537
080783	4	95.0	2	1028	24	416	18	2077	50	1941	13	144	0	0	38	107	5644
080883	4	95.0	0	1028	21	437	25	2102	31	1972	8	152	0	0	38	85	5729
080983	4	93.0	0	1028	6	443	3	2105	10	1982	5	157	0	1	39	25	5754
081083	4	95.0	1	1029	1	444	1	2106	4	1986	0	157	0	0	39	7	5761
081183	4	94.5	0	1029	2	446	4	2110	16	2002	7	164	0	1	40	30	5791
081283	4	96.0	0	1029	11	457	5	2115	39	2041	22	186	0	0	40	77	5868
081383	4	96.0	0	1029	3	460	9	2124	28	2069	14	200	0	0	40	54	5922
081483	4	96.0	0	1029	4	464	6	2130	16	2085	15	215	0	1	41	42	5964
081583	4	96.0	0	1029	8	472	9	2139	13	2098	15	230	0	1	42	46	6010
081683	4	94.0	0	1029	5	477	9	2148	14	2112	23	253	0	3	45	54	6064
081783	4	96.0	0	1029	9	486	10	2158	27	2139	17	270	0	1	46	64	6128
081883	4	96.0	1	1030	12	498	15	2173	38	2177	15	285	0	2	48	83	6211
081983	4	96.0	0	1030	7	505	10	2183	20	2197	13	298	0	0	48	50	6261
082083	4	94.0	0	1030	6	511	7	2190	11	2208	9	307	0	2	50	35	6296
082183	4	96.0	0	1030	1	512	16	2206	26	2234	17	324	0	1	51	61	6357
082283	4	96.0	0	1030	6	518	1	2207	4	2238	7	331	0	0	51	18	6375
082383	4	96.0	0	1030	4	522	2	2209	2	2240	4	335	0	0	51	12	6387
082483	4	96.0	0	1030	5	527	2	2211	9	2249	8	343	0	0	51	24	6411
082583	4	95.5	0	1030	0	527	0	2211	4	2253	0	343	0	1	52	5	6416
082683	4	96.0	0	1030	0	527	2	2213	1	2254	1	344	0	0	52	4	6420
082783	4	96.0	0	1030	0	527	0	2213	0	2254	4	348	0	1	53	5	6425
082883	4	93.0	0	1030	1	528	0	2213	53	2307	9	357	0	7	60	70	6495

Appendix Table 2-D-9. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
082983	4	96.0	0	1030	1	529	0	2213	25	2332	8	365	0	4	64	38	6533
083083	4	96.0	0	1030	3	532	0	2213	23	2355	3	368	1	2	67	32	6565
083183	4	96.0	0	1030	0	532	0	2213	5	2360	0	368	0	4	71	9	6574
090183	4	96.0	0	1030	2	534	0	2213	5	2365	5	373	0	0	71	12	6586
090283	4	96.0	0	1030	0	534	0	2213	2	2367	7	380	0	1	72	10	6596
090383	4	96.0	0	1030	0	534	0	2213	21	2388	7	387	0	0	72	28	6624
090483	4	94.0	0	1030	0	534	0	2213	27	2415	9	396	0	4	76	40	6664
090583	4	96.0	0	1030	1	535	0	2213	6	2421	0	396	1	1	78	9	6673
090683	4	90.0	0	1030	1	536	0	2213	19	2440	7	403	0	0	78	27	6700
090783	4	92.0	0	1030	0	536	0	2213	11	2451	5	408	1	1	80	18	6718
090883	4	96.0	0	1030	0	536	0	2213	2	2453	5	413	1	1	82	9	6727
090983	4	96.0	0	1030	0	536	0	2213	1	2454	0	413	0	0	82	1	6728
091083	4	96.0	0	1030	0	536	0	2213	4	2458	2	415	1	0	83	7	6735
091183	4	96.0	0	1030	0	536	0	2213	6	2464	3	418	0	1	84	10	6745
091283	4	48.0	0	1030	0	536	0	2213	3	2467	4	422	0	2	86	9	6754

Appendix Table 2-D-10. Curry station east bank fishwheel daily and cumulative catch by species, 1983.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
061083	1	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
061183	1	24.0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
061283	1	24.0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	2
061383	1	24.0	1	2	0	0	0	0	0	0	0	0	0	0	1	1	3
061483	1	24.0	2	4	0	0	0	0	0	0	0	0	0	0	1	2	5
061583	1	24.0	1	5	0	0	0	0	0	0	0	0	0	0	1	1	6
061683	1	24.0	4	9	0	0	0	0	0	0	0	0	0	0	1	4	10
061783	1	21.0	7	16	0	0	0	0	0	0	0	0	0	1	2	8	18
061883	1	24.0	21	37	0	0	0	0	0	0	0	0	0	1	3	22	40
061983	1	24.0	39	76	0	0	0	0	0	0	0	0	0	1	4	40	80
062083	1	24.0	21	97	0	0	0	0	0	0	0	0	0	1	5	22	102
062183	1	24.0	55	152	0	0	0	0	0	0	0	0	0	2	7	57	159
062283	1	24.0	38	190	0	0	0	0	0	0	0	0	0	3	10	41	200
062383	1	24.0	59	249	0	0	0	0	0	0	0	0	0	0	10	59	259
062483	1	24.0	37	286	0	0	0	0	0	0	0	0	0	0	10	37	296
062583	1	24.0	53	339	0	0	0	0	0	0	0	0	0	0	10	53	349
062683	1	24.0	34	373	0	0	0	0	0	0	0	0	0	1	11	35	384
062783	1	24.0	18	391	0	0	0	0	0	0	0	0	0	0	11	18	402
062883	1	24.0	15	406	0	0	0	0	0	0	0	0	0	0	11	15	417
062983	1	24.0	9	415	0	0	0	0	0	0	0	0	0	0	11	9	426
063083	1	24.0	18	433	0	0	0	0	0	0	0	0	0	0	11	18	444
070183	1	24.0	23	456	0	0	0	0	0	0	0	0	0	0	11	23	467
070283	1	24.0	17	473	0	0	0	0	0	0	0	0	0	0	11	17	484
070383	1	14.0	6	479	0	0	0	0	0	0	0	0	0	1	12	7	491
070483	1	24.0	10	489	0	0	0	0	0	0	0	0	0	2	14	12	503
070583	1	24.0	26	515	0	0	0	0	0	0	0	0	0	0	14	26	529
070683	1	24.0	7	522	1	1	0	0	0	0	0	0	0	0	14	8	537
070783	1	24.0	4	526	1	2	0	0	0	0	0	0	0	0	14	5	542
070883	1	24.0	10	536	0	2	0	0	0	0	0	0	0	0	14	10	552

Appendix Table 2-D-10. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070983	1	20.0	4	540	0	2	0	0	0	0	0	0	0	0	14	4	556
071083	1	23.5	7	547	0	2	0	0	0	0	0	0	0	0	14	7	563
071183	1	24.0	4	551	0	2	0	0	0	0	0	0	0	0	14	4	567
071283	1	24.0	9	560	0	2	0	0	0	0	0	0	0	0	14	9	576
071383	1	24.0	3	563	0	2	0	0	0	0	0	0	0	1	15	4	580
071483	1	24.0	4	567	2	4	0	0	0	0	0	0	0	1	16	7	587
071583	1	24.0	6	573	0	4	0	0	0	0	0	0	0	1	17	7	594
071683	1	22.0	0	573	0	4	0	0	0	0	0	0	0	0	17	0	594
071783	1	24.0	1	574	2	6	0	0	1	1	0	0	0	1	18	5	599
071883	1	24.0	0	574	1	7	0	0	0	1	0	0	0	0	18	1	600
071983	1	24.0	2	576	1	8	0	0	0	1	0	0	0	0	18	3	603
072083	1	24.0	2	578	1	9	1	1	0	1	0	0	0	1	19	5	608
072183	1	24.0	0	578	3	12	1	2	0	1	0	0	0	0	19	4	612
072283	1	24.0	0	578	3	15	0	2	1	2	1	1	0	0	19	5	617
072383	1	24.0	3	581	4	19	6	8	3	5	0	1	0	1	20	17	634
072483	1	24.0	4	585	7	26	11	19	10	15	0	1	0	0	20	32	666
072583	1	24.0	0	585	5	31	10	29	3	18	1	2	0	1	21	20	686
072683	1	24.0	0	585	3	34	8	37	16	34	0	2	0	0	21	27	713
072783	1	24.0	0	585	7	41	17	54	16	50	0	2	0	1	22	41	754
072883	1	24.0	0	585	5	46	6	60	20	70	1	3	0	0	22	32	786
072983	1	24.0	1	586	1	47	6	66	42	112	1	4	0	1	23	52	838
073083	1	24.0	0	586	3	50	21	87	44	156	1	5	0	0	23	69	907
073183	1	24.0	1	587	3	53	43	130	18	174	2	7	0	0	23	67	974
080183	1	24.0	0	587	4	57	50	180	31	205	0	7	0	0	23	85	1059
080283	1	24.0	0	587	9	66	40	220	54	259	1	8	0	0	23	104	1163
080383	1	24.0	0	587	1	67	36	256	53	312	1	9	0	0	23	91	1254
080483	1	24.0	0	587	7	74	38	294	40	352	0	9	0	0	23	85	1339
080583	1	24.0	0	587	5	79	18	312	19	371	3	12	0	0	23	45	1384
080683	1	24.0	0	587	4	83	18	330	14	385	4	16	0	0	23	40	1424

Appendix Table 2-D-10. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
080783	1	24.0	0	587	5	88	9	339	28	413	4	20	0	0	23	46	1470
080883	1	24.0	0	587	4	92	10	349	30	443	3	23	0	0	23	47	1517
080983	1	24.0	0	587	6	98	3	352	4	447	0	23	0	0	23	13	1530
081083	1	24.0	0	587	3	101	2	354	4	451	2	25	0	0	23	11	1541
081183	1	24.0	0	587	3	104	4	358	17	468	3	28	0	0	23	27	1568
081283	1	24.0	0	587	6	110	5	363	22	490	5	33	0	0	23	38	1606
081383	1	24.0	0	587	10	120	2	365	5	495	0	33	0	0	23	17	1623
081483	1	24.0	0	587	5	125	5	370	5	500	4	37	0	0	23	19	1642
081583	1	24.0	0	587	4	129	4	374	3	503	7	44	0	0	23	18	1660
081683	1	24.0	0	587	2	131	1	375	1	504	1	45	0	1	24	6	1666
081783	1	24.0	0	587	3	134	2	377	2	506	0	45	0	0	24	7	1673
081883	1	24.0	0	587	4	138	1	378	4	510	1	46	0	1	25	11	1684
081983	1	24.0	0	587	1	139	0	378	1	511	0	46	0	1	26	3	1687
082083	1	24.0	0	587	4	143	0	378	0	511	2	48	0	1	27	7	1694
082183	1	24.0	0	587	1	144	0	378	3	514	0	48	0	1	28	5	1699
082283	1	24.0	0	587	4	148	0	378	8	522	2	50	0	1	29	15	1714
082383	1	24.0	0	587	2	150	0	378	6	528	1	51	0	0	29	9	1723
082483	1	24.0	0	587	3	153	0	378	4	532	1	52	0	0	29	8	1731
082583	1	24.0	0	587	1	154	0	378	4	536	0	52	0	0	29	5	1736
082683	1	24.0	0	587	1	155	0	378	2	538	1	53	0	0	29	4	1740
082783	1	24.0	0	587	2	157	0	378	7	545	0	53	0	0	29	9	1749
082883	1	24.0	0	587	0	157	0	378	11	556	1	54	0	3	32	15	1764
082983	1	24.0	0	587	2	159	0	378	3	559	0	54	0	1	33	6	1770
083083	1	24.0	0	587	1	160	0	378	7	566	0	54	0	0	33	8	1778
083183	1	24.0	0	587	0	160	0	378	0	566	0	54	0	0	33	0	1778
090183	1	24.0	0	587	0	160	0	378	5	571	0	54	0	2	35	7	1785
090283	1	24.0	0	587	0	160	0	378	3	574	3	57	0	3	38	9	1794
090383	1	24.0	0	587	1	161	0	378	0	574	1	58	0	1	39	3	1797
090483	1	21.0	0	587	2	163	0	378	6	580	0	58	0	0	39	8	1805

Appendix Table 2-D-10. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
090583	1	24.0	0	587	0	163	0	378	3	583	0	58	0	1	40	4	1809
090683	1	24.0	0	587	0	163	0	378	1	584	1	59	0	0	40	2	1811
090783	1	24.0	0	587	0	163	0	378	4	588	0	59	0	0	40	4	1815
090883	1	24.0	0	587	0	163	0	378	0	588	0	59	0	0	40	0	1815
090983	1	24.0	0	587	0	163	0	378	1	589	0	59	0	0	40	1	1816
091083	1	24.0	0	587	0	163	0	378	0	589	0	59	0	0	40	0	1816
091183	1	24.0	0	587	0	163	0	378	0	589	0	59	0	0	40	0	1816
091283	1	24.0	0	587	0	163	0	378	0	589	0	59	0	0	40	0	1816
091383	1	24.0	0	587	0	163	0	378	0	589	0	59	0	0	40	0	1816
091483	1	12.0	0	587	0	163	0	378	0	589	0	59	0	0	40	0	1816

Appendix Table 2-D-11. Curry station west bank fishwheel daily and cumulative catch by species ,1983.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
060983	1	11.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
061083	1	24.0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
061183	1	24.0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
061283	1	24.0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
061383	1	24.0	3	4	0	0	0	0	0	0	0	0	0	0	0	3	4
061483	1	24.0	1	5	0	0	0	0	0	0	0	0	0	0	0	1	5
061583	1	24.0	0	5	0	0	0	0	0	0	0	0	0	1	1	1	6
061683	1	24.0	4	9	0	0	0	0	0	0	0	0	0	0	1	4	10
061783	1	24.0	2	11	0	0	0	0	0	0	0	0	0	0	1	2	12
061883	1	24.0	17	28	0	0	0	0	0	0	0	0	0	0	1	17	29
061983	1	24.0	19	47	0	0	0	0	0	0	0	0	0	0	1	19	48
062083	1	24.0	21	68	0	0	0	0	0	0	0	0	0	1	2	22	70
062183	1	24.0	23	91	0	0	0	0	0	0	0	0	0	0	2	23	93
062283	1	24.0	23	114	0	0	0	0	0	0	0	0	0	0	2	23	116
062383	1	24.0	30	144	0	0	0	0	0	0	0	0	0	0	2	30	146
062483	1	24.0	26	170	0	0	0	0	0	0	0	0	0	1	3	27	173
062583	1	24.0	33	203	0	0	0	0	0	0	0	0	0	0	3	33	206
062683	1	24.0	36	239	0	0	0	0	0	0	0	0	0	0	3	36	242
062783	1	24.0	26	265	0	0	0	0	0	0	0	0	0	0	3	26	268
062883	1	24.0	13	278	0	0	0	0	0	0	0	0	0	0	3	13	281
062983	1	24.0	21	299	0	0	0	0	0	0	0	0	0	0	3	21	302
063083	1	24.0	19	318	0	0	0	0	0	0	0	0	0	0	3	19	321
070183	1	24.0	11	329	0	0	0	0	0	0	0	0	0	0	3	11	332
070283	1	24.0	26	355	0	0	0	0	0	0	0	0	0	0	3	26	358
070383	1	24.0	19	374	0	0	0	0	0	0	0	0	0	0	3	19	377
070483	1	24.0	9	383	0	0	0	0	0	0	0	0	0	0	3	9	386
070583	1	24.0	12	395	0	0	0	0	0	0	0	0	0	0	3	12	398
070683	1	24.0	6	401	1	1	0	0	0	0	0	0	0	1	4	8	406
070783	1	24.0	5	406	0	1	0	0	0	0	0	0	0	0	4	5	411

Appendix Table 2-D-11. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
070883	1	24.0	7	413	0	1	0	0	0	0	0	0	0	0	4	7	418
070983	1	24.0	12	425	0	1	0	0	0	0	0	0	0	0	4	12	430
071083	1	24.0	2	427	0	1	0	0	1	1	0	0	0	1	5	4	434
071183	1	24.0	13	440	0	1	0	0	0	1	0	0	0	0	5	13	447
071283	1	24.0	7	447	1	2	0	0	1	2	0	0	0	0	5	9	456
071383	1	24.0	10	457	0	2	0	0	0	2	0	0	0	0	5	10	466
071483	1	24.0	3	460	0	2	0	0	0	2	0	0	0	0	5	3	469
071583	1	24.0	4	464	0	2	0	0	0	2	0	0	0	0	5	4	473
071683	1	24.0	2	466	1	3	0	0	0	2	0	0	0	1	6	4	477
071783	1	24.0	0	466	1	4	0	0	0	2	0	0	0	0	6	1	478
071883	1	24.0	0	466	0	4	0	0	0	2	0	0	0	0	6	0	478
071983	1	24.0	2	468	0	4	0	0	0	2	0	0	0	0	6	2	480
072083	1	24.0	1	469	0	4	0	0	0	2	0	0	0	0	6	1	481
072183	1	24.0	2	471	0	4	0	0	0	2	0	0	0	0	6	2	483
072283	1	24.0	1	472	0	4	1	1	1	3	0	0	0	0	6	3	486
072383	1	24.0	2	474	0	4	5	6	1	4	1	1	0	0	6	9	495
072483	1	24.0	0	474	0	4	10	16	0	4	0	1	0	0	6	10	505
072583	1	24.0	1	475	2	6	2	18	4	8	0	1	0	0	6	9	514
072683	1	24.0	0	475	2	8	18	36	5	13	1	2	0	0	6	26	540
072783	1	24.0	0	475	1	9	16	52	12	25	0	2	0	0	6	29	569
072883	1	24.0	0	475	4	13	17	69	8	33	0	2	0	0	6	29	598
072983	1	24.0	0	475	1	14	9	78	14	47	0	2	0	0	6	24	622
073083	1	24.0	1	476	3	17	12	90	12	59	1	3	0	1	7	30	652
073183	1	24.0	1	477	1	18	15	105	11	70	1	4	0	0	7	29	681
080183	1	24.0	0	477	0	18	17	122	12	82	1	5	0	0	7	30	711
080283	1	24.0	0	477	1	19	17	139	24	106	0	5	0	0	7	42	753
080383	1	24.0	0	477	0	19	11	150	14	120	0	5	0	0	7	25	778
080483	1	24.0	0	477	2	21	14	164	23	143	1	6	0	0	7	40	818
080583	1	24.0	0	477	2	23	15	179	13	156	1	7	0	0	7	31	849

Appendix Table 2-D-11. Continued.

Date	No. of Wheels	Wheel Hours	Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
			Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	Cum.	Daily	Cum.
080683	1	24.0	0	477	1	24	12	191	8	164	3	10	0	0	7	24	873
080783	1	24.0	0	477	0	24	2	193	5	169	4	14	0	0	7	11	884
080883	1	24.0	0	477	0	24	2	195	11	180	1	15	0	0	7	14	898
080983	1	24.0	0	477	0	24	0	195	4	184	0	15	0	0	7	4	902
081083	1	24.0	0	477	1	25	0	195	1	185	0	15	0	0	7	2	904
081183	1	24.0	0	477	0	25	1	196	6	191	0	15	0	0	7	7	911
081283	1	24.0	0	477	4	29	2	198	19	210	3	18	0	0	7	28	939
081383	1	24.0	0	477	0	29	6	204	4	214	1	19	0	0	7	11	950
081483	1	24.0	0	477	1	30	1	205	6	220	3	22	0	0	7	11	961
081583	1	24.0	0	477	0	30	0	205	4	224	3	25	0	0	7	7	968
081683	1	24.0	0	477	4	34	1	206	4	228	1	26	0	0	7	10	978
081783	1	24.0	0	477	1	35	1	207	10	238	2	28	0	0	7	14	992
081883	1	24.0	0	477	0	35	2	209	8	246	0	28	0	0	7	10	1002
081983	1	24.0	0	477	0	35	1	210	4	250	0	28	0	1	8	6	1008
082083	1	24.0	0	477	2	37	0	210	2	252	1	29	0	0	8	5	1013
082183	1	24.0	0	477	0	37	0	210	0	252	0	29	0	0	8	0	1013
082283	1	24.0	0	477	0	37	0	210	3	255	0	29	0	1	9	4	1017
082383	1	24.0	0	477	0	37	1	211	1	256	0	29	0	0	9	2	1019
082483	1	24.0	0	477	0	37	0	211	0	256	1	30	0	0	9	1	1020
082583	1	24.0	0	477	0	37	0	211	0	256	0	30	0	0	9	0	1020
082683	1	24.0	0	477	0	37	0	211	0	256	0	30	0	0	9	0	1020
082783	1	24.0	0	477	0	37	0	211	2	258	2	32	0	0	9	4	1024
082883	1	24.0	0	477	0	37	0	211	2	260	1	33	0	0	9	3	1027
082983	1	24.0	0	477	1	38	0	211	8	268	0	33	0	0	9	9	1036
083083	1	24.0	0	477	0	38	0	211	1	269	0	33	0	0	9	1	1037
083183	1	24.0	0	477	0	38	0	211	0	269	0	33	0	0	9	0	1037
090183	1	24.0	0	477	0	38	0	211	0	269	0	33	0	0	9	0	1037
090283	1	24.0	0	477	0	38	0	211	1	270	1	34	0	0	9	2	1039
090383	1	24.0	0	477	0	38	0	211	0	270	0	34	0	0	9	0	1039

Appendix Table 2-D-11. Continued.

Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous Cum.	Total Catch All Species Daily	Total Catch All Species Cum.
090483	1	24.0	0	477	0	38	0	211	0	270	0	34	0	0	9	0	1039
090583	1	24.0	0	477	0	38	0	211	2	272	0	34	0	0	9	2	1041
090683	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
090783	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
090883	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
090983	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
091083	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
091183	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
091283	1	24.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
091383	1	20.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041
091483	1	12.0	0	477	0	38	0	211	0	272	0	34	0	0	9	0	1041

Appendix Table 2-D-12. Curry station fishwheels daily and cumulative catch by species, 1983.

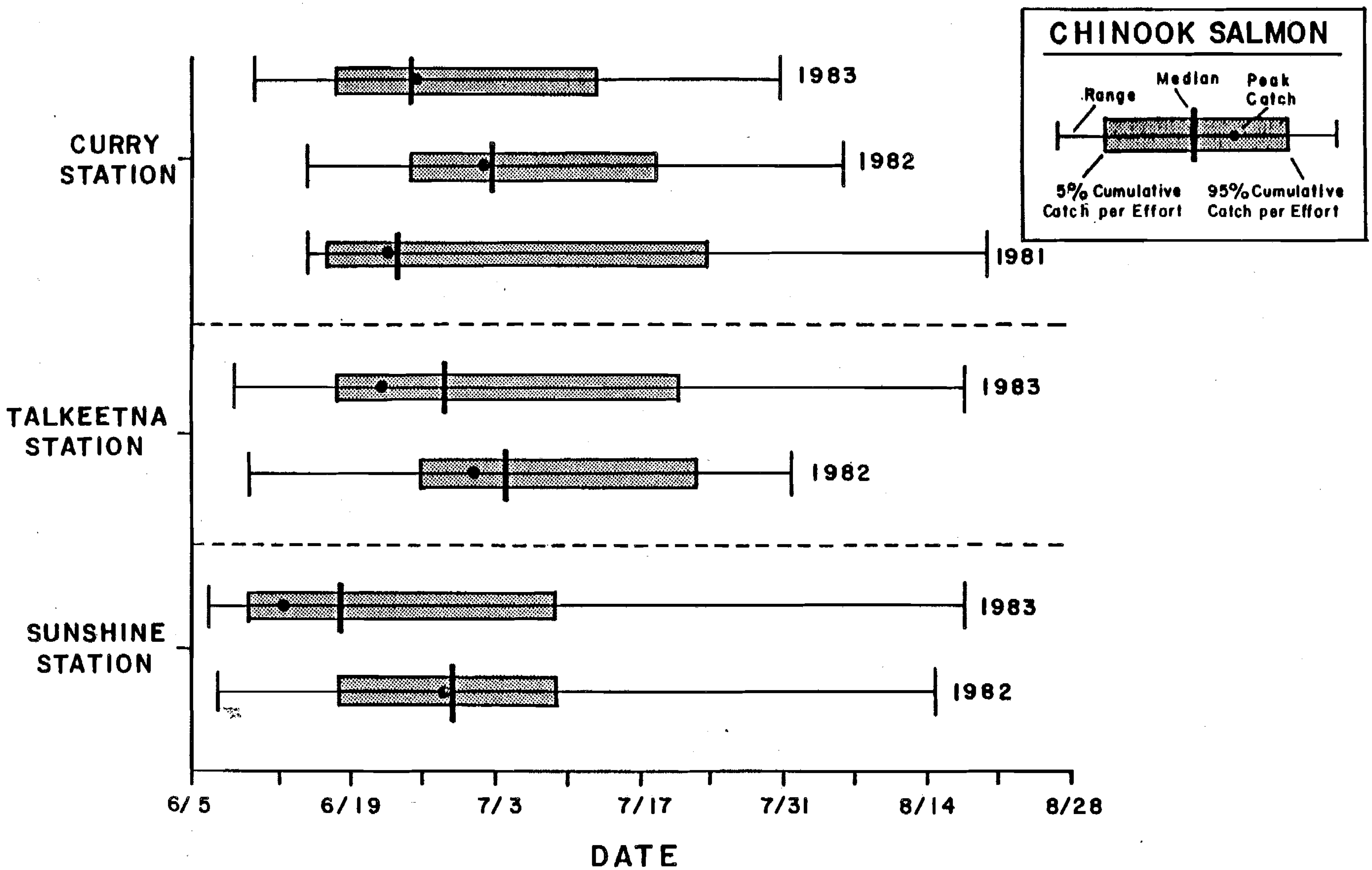
Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous CUM.	Total Catch All Species Daily	Total Catch All Species Cum.
060983	1	11.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
061083	2	31.5	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
061183	2	48.0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	2
061283	2	48.0	0	2	0	0	0	0	0	0	0	0	0	1	1	1	3
061383	2	48.0	4	6	0	0	0	0	0	0	0	0	0	0	1	4	7
061483	2	48.0	3	9	0	0	0	0	0	0	0	0	0	0	1	3	10
061583	2	48.0	1	10	0	0	0	0	0	0	0	0	0	1	2	2	12
061683	2	48.0	8	18	0	0	0	0	0	0	0	0	0	0	2	8	20
061783	2	45.0	9	27	0	0	0	0	0	0	0	0	0	1	3	10	30
061883	2	48.0	38	65	0	0	0	0	0	0	0	0	0	1	4	39	69
061983	2	48.0	58	123	0	0	0	0	0	0	0	0	0	1	5	59	128
062083	2	48.0	42	165	0	0	0	0	0	0	0	0	0	2	7	44	172
062183	2	48.0	78	243	0	0	0	0	0	0	0	0	0	2	9	80	252
062283	2	48.0	61	304	0	0	0	0	0	0	0	0	0	3	12	64	316
062383	2	48.0	89	393	0	0	0	0	0	0	0	0	0	0	12	89	405
062483	2	48.0	63	456	0	0	0	0	0	0	0	0	0	1	13	64	469
062583	2	48.0	86	542	0	0	0	0	0	0	0	0	0	0	13	86	555
062683	2	48.0	70	612	0	0	0	0	0	0	0	0	0	1	14	71	626
062783	2	48.0	44	656	0	0	0	0	0	0	0	0	0	0	14	44	670
062883	2	48.0	28	684	0	0	0	0	0	0	0	0	0	0	14	28	698
062983	2	48.0	30	714	0	0	0	0	0	0	0	0	0	0	14	30	728
063083	2	48.0	37	751	0	0	0	0	0	0	0	0	0	0	14	37	765
070183	2	48.0	34	785	0	0	0	0	0	0	0	0	0	0	14	34	799
070283	2	48.0	43	828	0	0	0	0	0	0	0	0	0	0	14	43	842
070383	2	38.0	25	853	0	0	0	0	0	0	0	0	0	1	15	26	868
070483	2	48.0	19	872	0	0	0	0	0	0	0	0	0	2	17	21	889
070583	2	48.0	38	910	0	0	0	0	0	0	0	0	0	0	17	38	927
070683	2	48.0	13	923	2	2	0	0	0	0	0	0	0	1	18	16	943
070783	2	48.0	9	932	1	3	0	0	0	0	0	0	0	0	18	10	953

Appendix Table 2-D-12. Continued.

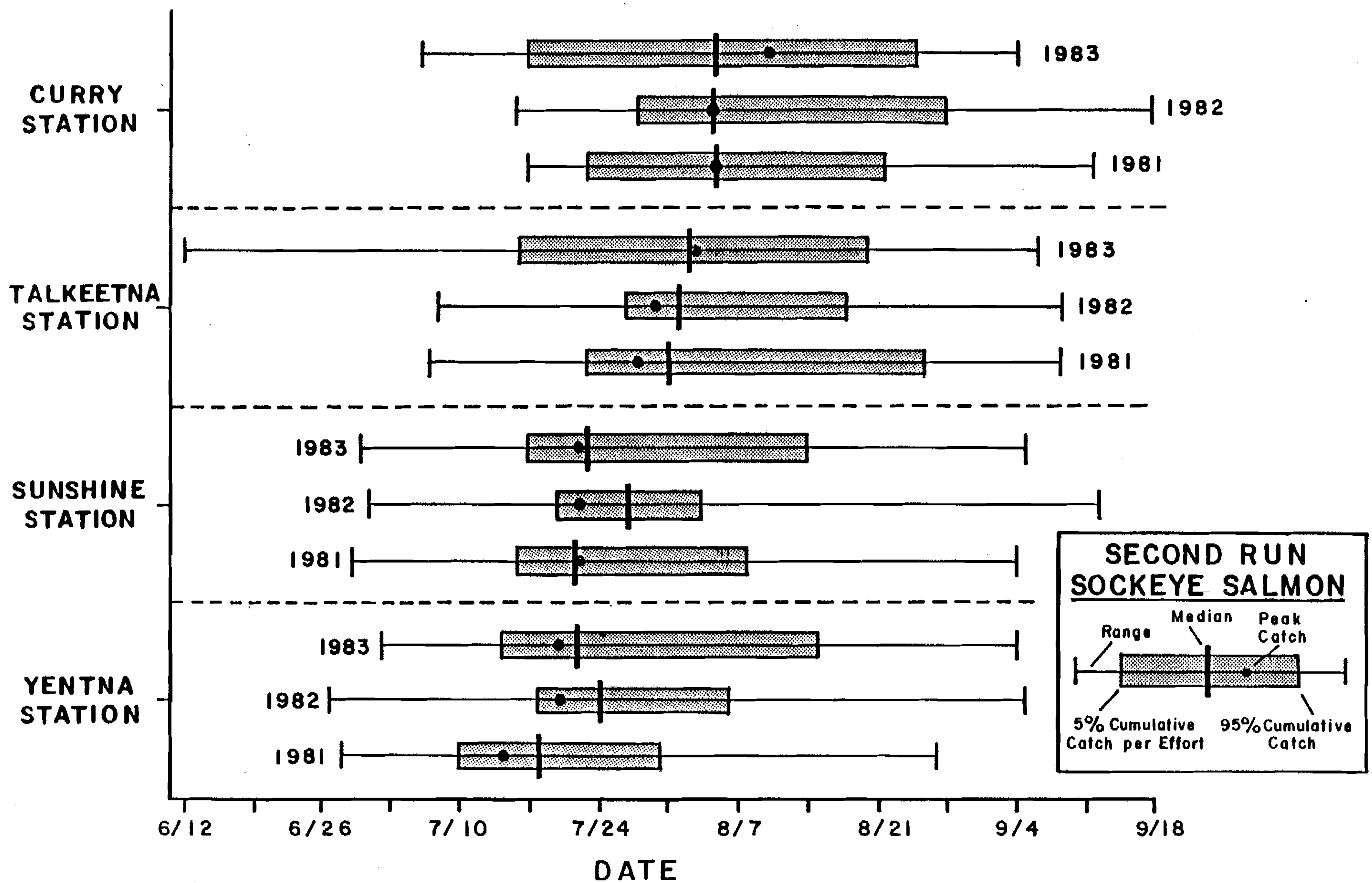
			Chinook		Sockeye		Pink		Chum		Coho		Miscellaneous			Total Catch All Species	
Date	No. of Wheels	Wheel Hours	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Bering Cisco	Other	CUM.	Daily	Cum.
070883	2	48.0	17	949	0	3	0	0	0	0	0	0	0	0	18	17	970
070983	2	44.0	16	965	0	3	0	0	0	0	0	0	0	0	18	16	986
071083	2	47.5	9	974	0	3	0	0	1	1	0	0	0	1	19	11	997
071183	2	48.0	17	991	0	3	0	0	0	1	0	0	0	0	19	17	1014
071283	2	48.0	16	1007	1	4	0	0	1	2	0	0	0	0	19	18	1032
071383	2	48.0	13	1020	0	4	0	0	0	2	0	0	0	1	20	14	1046
071483	2	48.0	7	1027	2	6	0	0	0	2	0	0	0	1	21	10	1056
071583	2	48.0	10	1037	0	6	0	0	0	2	0	0	0	1	22	11	1067
071683	2	46.0	2	1039	1	7	0	0	0	2	0	0	0	1	23	4	1071
071783	2	48.0	1	1040	3	10	0	0	1	3	0	0	0	1	24	6	1077
071883	2	48.0	0	1040	1	11	0	0	0	3	0	0	0	0	24	1	1078
071983	2	48.0	4	1044	1	12	0	0	0	3	0	0	0	0	24	5	1083
072083	2	48.0	3	1047	1	13	1	1	0	3	0	0	0	1	25	6	1089
072183	2	48.0	2	1049	3	16	1	2	0	3	0	0	0	0	25	6	1095
072283	2	48.0	1	1050	3	19	1	3	2	5	1	1	0	0	25	8	1103
072383	2	48.0	5	1055	4	23	11	14	4	9	1	2	0	1	26	26	1129
072483	2	48.0	4	1059	7	30	21	35	10	19	0	2	0	0	26	42	1171
072583	2	48.0	1	1060	7	37	12	47	7	26	1	3	0	1	27	29	1200
072683	2	48.0	0	1060	5	42	26	73	21	47	1	4	0	0	27	53	1253
072783	2	48.0	0	1060	8	50	33	106	28	75	0	4	0	1	28	70	1323
072883	2	48.0	0	1060	9	59	23	129	28	103	1	5	0	0	28	61	1384
072983	2	48.0	1	1061	2	61	15	144	56	159	1	6	0	1	29	76	1460
073083	2	48.0	1	1062	6	67	33	177	56	215	2	8	0	1	30	99	1559
073183	2	48.0	2	1064	4	71	58	235	29	244	3	11	0	0	30	96	1655
080183	2	48.0	0	1064	4	75	67	302	43	287	1	12	0	0	30	115	1770
080283	2	48.0	0	1064	10	85	57	359	78	365	1	13	0	0	30	146	1916
080383	2	48.0	0	1064	1	86	47	406	67	432	1	14	0	0	30	116	2032
080483	2	48.0	0	1064	9	95	52	458	63	495	1	15	0	0	30	125	2157
080583	2	48.0	0	1064	7	102	33	491	32	527	4	19	0	0	30	76	2233

Appendix Table 2-D-12. Continued.

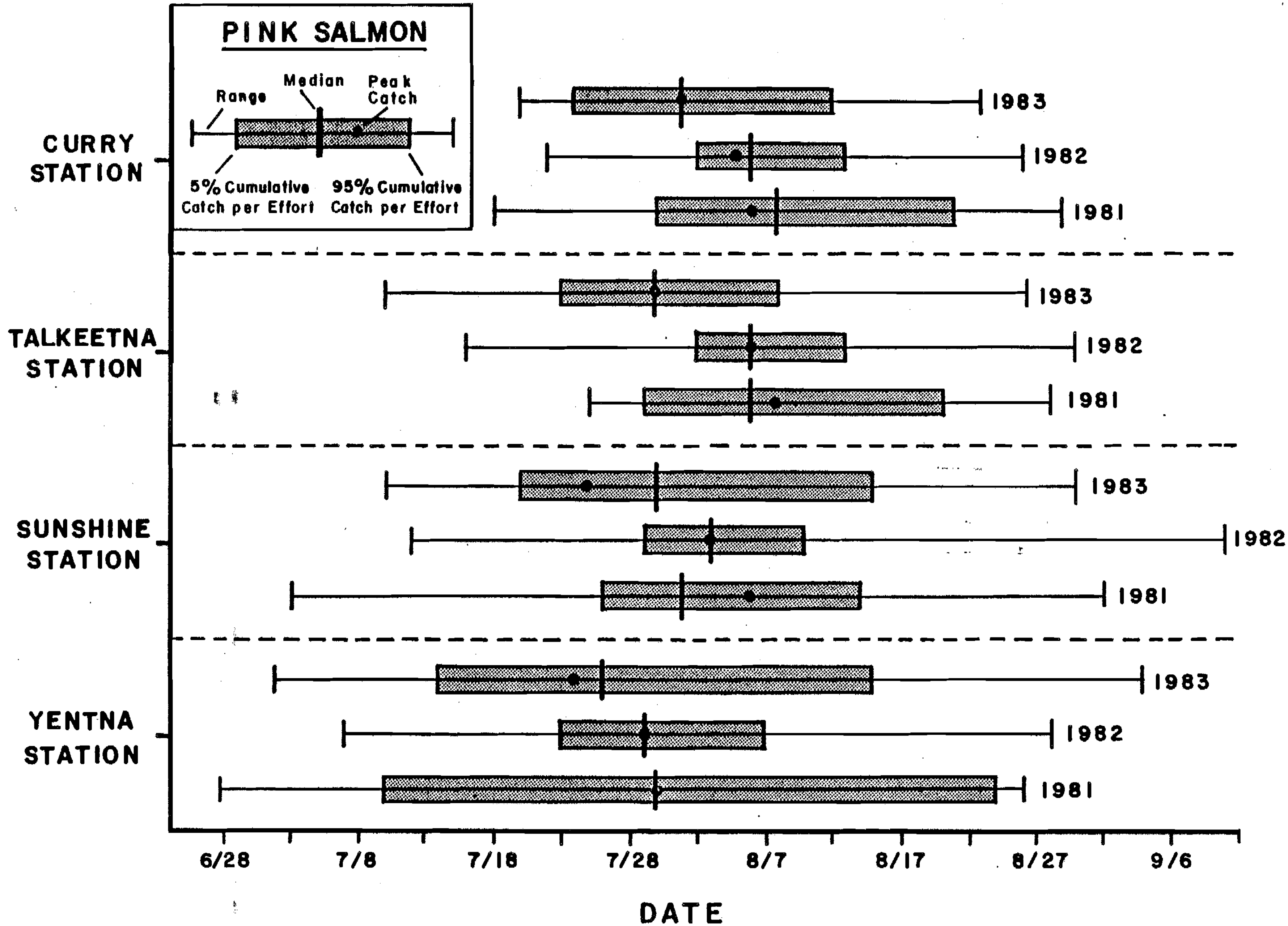
Date	No. of Wheels	Wheel Hours	Chinook Daily	Chinook Cum.	Sockeye Daily	Sockeye Cum.	Pink Daily	Pink Cum.	Chum Daily	Chum Cum.	Coho Daily	Coho Cum.	Miscellaneous Bering Cisco	Miscellaneous Other	Miscellaneous CUM.	Total Catch All Species Daily	Total Catch All Species Cum.
080683	2	48.0	0	1064	5	107	30	521	22	549	7	26	0	0	30	64	2297
080783	2	48.0	0	1064	5	112	11	532	33	582	8	34	0	0	30	57	2354
080883	2	48.0	0	1064	4	116	12	544	41	623	4	38	0	0	30	61	2415
080983	2	48.0	0	1064	6	122	3	547	8	631	0	38	0	0	30	17	2432
081083	2	48.0	0	1064	4	126	2	549	5	636	2	40	0	0	30	13	2445
081183	2	48.0	0	1064	3	129	5	554	23	659	3	43	0	0	30	34	2479
081283	2	48.0	0	1064	10	139	7	561	41	700	8	51	0	0	30	66	2545
081383	2	48.0	0	1064	10	149	8	569	9	709	1	52	0	0	30	28	2573
081483	2	48.0	0	1064	6	155	6	575	11	720	7	59	0	0	30	30	2603
081583	2	48.0	0	1064	4	159	4	579	7	727	10	69	0	0	30	25	2628
081683	2	48.0	0	1064	6	165	2	581	5	732	2	71	0	1	31	16	2644
081783	2	48.0	0	1064	4	169	3	584	12	744	2	73	0	0	31	21	2665
081883	2	48.0	0	1064	4	173	3	587	12	756	1	74	0	1	32	21	2686
081983	2	48.0	0	1064	1	174	1	588	5	761	0	74	0	2	34	9	2695
082083	2	48.0	0	1064	6	180	0	588	2	763	3	77	0	1	35	12	2707
082183	2	48.0	0	1064	1	181	0	588	3	766	0	77	0	1	36	5	2712
082283	2	48.0	0	1064	4	185	0	588	11	777	2	79	0	2	38	19	2731
082383	2	48.0	0	1064	2	187	1	589	7	784	1	80	0	0	38	11	2742
082483	2	48.0	0	1064	3	190	0	589	4	788	2	82	0	0	38	9	2751
082583	2	48.0	0	1064	1	191	0	589	4	792	0	82	0	0	38	5	2756
082683	2	48.0	0	1064	1	192	0	589	2	794	1	83	0	0	38	4	2760
082783	2	48.0	0	1064	2	194	0	589	9	803	2	85	0	0	38	13	2773
082883	2	48.0	0	1064	0	194	0	589	13	816	2	87	0	3	41	18	2791
082983	2	48.0	0	1064	3	197	0	589	11	827	0	87	0	1	42	15	2806
083083	2	48.0	0	1064	1	198	0	589	8	835	0	87	0	0	42	9	2815
083183	2	48.0	0	1064	0	198	0	589	0	835	0	87	0	0	42	0	2815
090183	2	48.0	0	1064	0	198	0	589	5	840	0	87	0	2	44	7	2822
090283	2	48.0	0	1064	0	198	0	589	4	844	4	91	0	3	47	11	2833
090383	2	48.0	0	1064	1	199	0	589	0	844	1	92	0	1	48	3	2836



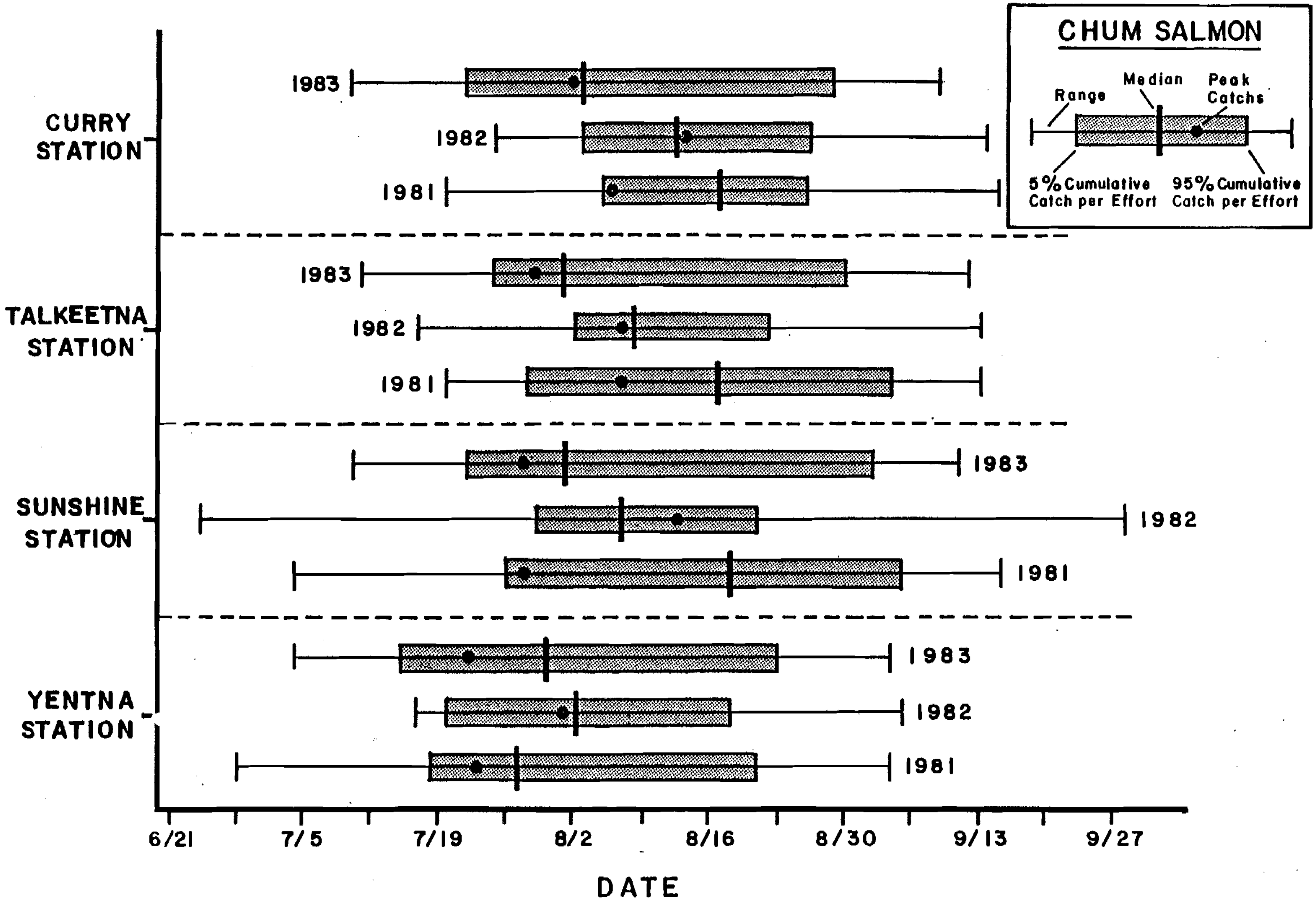
Appendix Figure 2-D-1. Migrational timing of chinook salmon, based on cumulative fishwheel catch per hour at selected sampling locations in the Susitna River basin in 1981, 1982 and 1983.



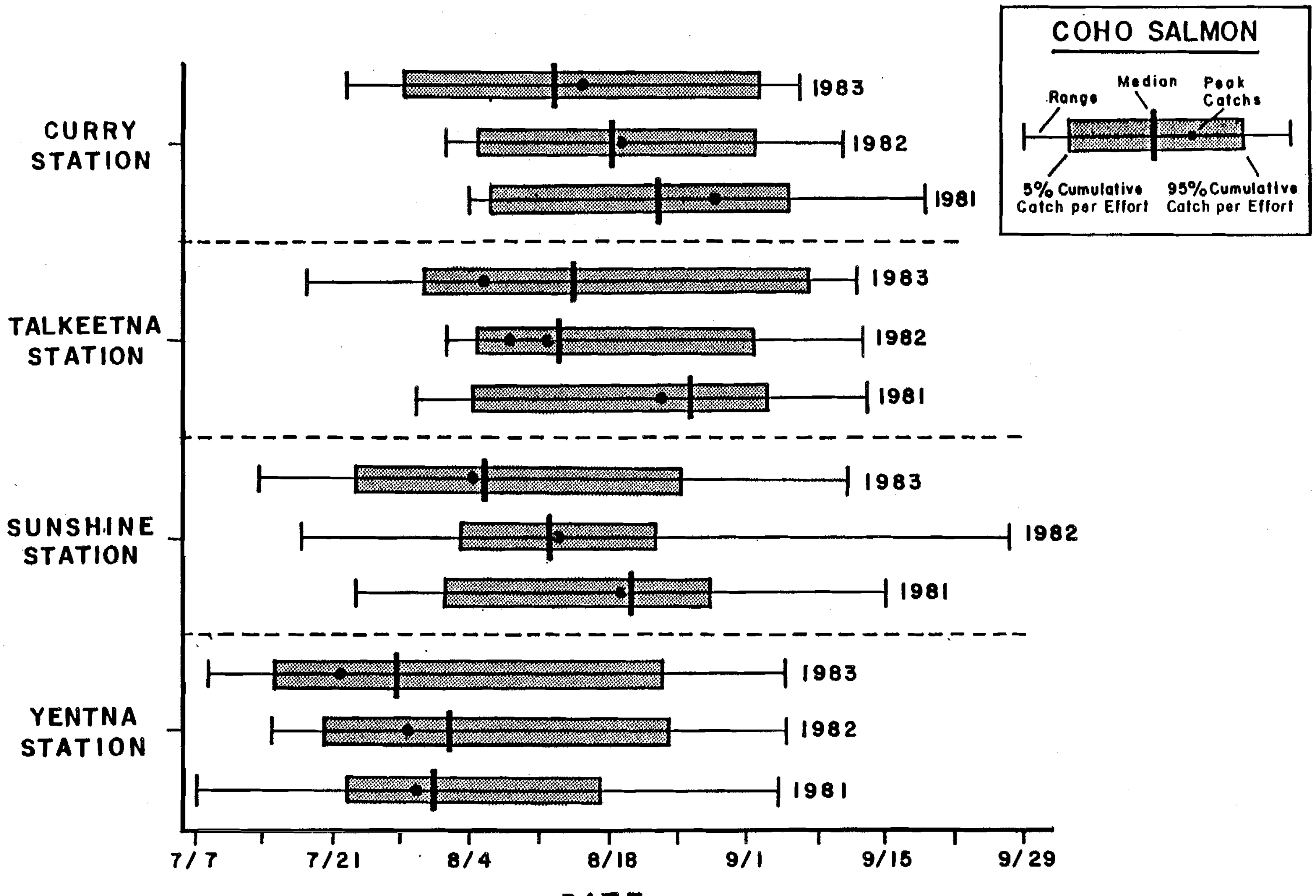
Appendix Figure 2-D-2. Migrational timing of second run sockeye salmon, based on cumulative fishwheel catch per hour at selected sampling locations in the Susitna River basin in 1981, 1982 and 1983.



Appendix Figure 2-D-3. Migrational timing of pink salmon, based on cumulative fishwheel catch per hour at selected sampling locations in the Susitna River basin in 1981, 1982 and 1983.



Appendix Figure 2-D-4. Migrational timing of chum salmon, based on cumulative fishwheel catch per hour at selected sampling locations in the Susitna River basin in 1981, 1982 and 1983.



Appendix Figure 2-D-5. Migrational timing of coho salmon, based on cumulative fishwheel catc.. per hour at selected sampling locations in the Susitna River basin in 1981, 1982 and 1983.

Appendix Table 2-D-13 . Migrational timing by species at main channel sampling locations on the Yentna and Susitna rivers based on cumulative percent of fishwheel catch per unit of effort,1983.

			Cumulative Percent of Fishwheel Catch Per Unit Effort 1/				
Station	Species	Year	0%	5%	50%	95%	100%
Sunshine	Chinook	1981	---	---	---	---	---
		1982	6/6	6/18	6/30	7/9	8/15
		1983	6/5	6/9	6/18	7/9	8/18
Talkeetna		1981	---	---	---	---	---
		1982	6/9	6/26	7/4	7/23	8/1
		1983	6/7	6/18	6/28	7/21	8/18
Curry		1981	6/15	6/17	6/24	7/24	8/20
		1982	6/15	6/25	7/3	7/19	8/6
		1983	6/10	6/18	6/25	7/13	7/31
Yentna	Sockeye 2nd run	1981	6/28	7/10	7/18	7/30	8/27
		1982	6/27	7/18	7/24	8/6	9/5
		1983	7/2	7/14	7/22	8/15	9/4
Sunshine	1st run	1981	---	---	---	---	---
		1982	6/4	6/9	6/13	6/21	6/28
		1983	6/5	6/6	6/10	6/19	6/28
Sunshine	2nd run	1981	6/29	7/16	7/22	8/8	9/4
		1982	7/1	7/20	7/27	8/3	9/13
		1983	6/30	7/17	7/23	8/14	9/5
Talkeetna	2nd run	1981	7/7	7/23	7/31	8/26	9/9
		1982	7/8	7/27	8/1	8/18	9/9
		1983	7/1	7/15	8/1	8/18	9/6
Curry	2nd run	1981	7/17	7/23	8/5	8/22	9/12
		1982	7/16	7/27	8/5	8/28	9/18
		1983	7/6	7/17	8/5	8/25	9/4

Appendix Table 2-D-13. Continued.

Station	Species	Year	Cumulative Percent of Fishwheel Catch Per Unit Effort 1/ 0%	5%	50%	95%	100%
Yentna	Pink	1981	6/28	7/10	7/30	8/24	8/26
		1982	7/7	7/23	7/29	8/7	8/28
		1983	7/2	7/14	7/26	8/15	9/4
Sunshine		1981	7/3	7/26	8/1	8/14	9/1
		1982	7/12	7/29	8/3	8/10	9/10
		1983	7/10	7/20	7/30	8/15	8/30
Talkeetna		1981	7/25	7/29	8/6	8/20	8/28
		1982	7/16	8/2	8/6	8/13	8/30
		1983	7/10	7/23	7/30	8/8	8/26
Curry		1981	7/18	7/30	8/8	8/21	8/29
		1982	7/22	8/2	8/6	8/13	8/26
		1983	7/20	7/24	8/1	8/12	8/23
Yentna	Chum	1981	6/28	7/18	7/27	8/21	9/4
		1982	7/17	7/20	8/2	8/18	9/5
		1983	7/4	7/15	7/30	8/23	9/4
Sunshine		1981	7/4	7/26	8/18	9/5	9/15
		1982	6/24	7/29	8/7	8/21	9/28
		1983	7/10	7/22	8/1	9/2	9/11
Talkeetna		1981	7/20	7/28	8/17	9/4	9/13
		1982	7/17	8/2	8/8	8/22	9/13
		1983	7/11	7/25	8/1	8/30	9/12
Curry		1981	7/20	8/5	8/17	8/26	9/15
		1982	7/25	8/3	8/12	8/26	9/14
		1983	7/10	7/22	8/3	8/29	9/9

Appendix Table 2-D-13. Continued.

			Cumulative Percent of Fishwheel Catch Per Unit Effort 1/				
Station	Species	Year	0%	5%	50%	95%	100%
Yentna	Coho	1981	7/7	7/22	7/31	8/17	9/4
		1982	7/15	7/20	8/2	8/24	9/5
		1983	7/8	7/15	7/27	8/23	9/4
Sunshine		1981	7/23	8/1	8/20	8/28	9/15
		1982	7/18	8/3	8/12	8/23	9/28
		1983	7/13	7/23	8/5	8/25	9/11
Talkeetna		1981	7/29	8/4	8/26	9/3	9/13
		1982	8/2	8/5	8/13	9/2	9/13
		1983	7/18	7/30	8/14	9/7	9/12
Curry		1981	8/4	8/6	8/23	9/5	9/19
		1982	8/2	8/5	8/18	9/2	9/11
		1983	7/22	7/28	8/12	9/2	9/6

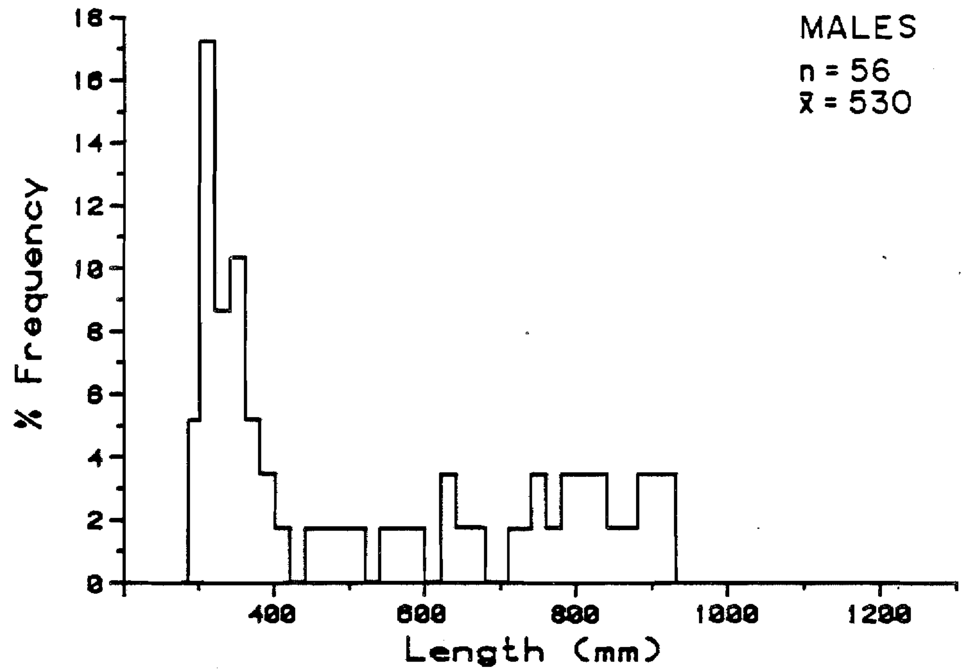
1/ Date upon which greater than or equal to 0, 5, 50, 95 and 100 percent of the cumulative catch per unit of effort occurred. Unit effort is defined as fishwheel catch per hour. These dates were defined only for salmon escapements which were monitored from start to completion.

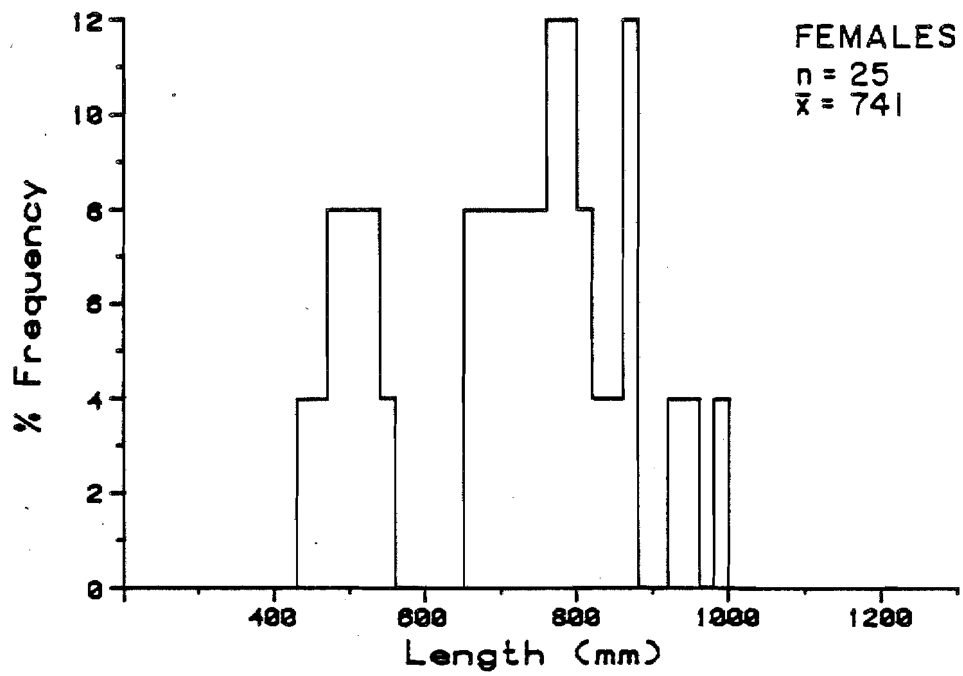
APPENDIX 2-E

LENGTH FREQUENCIES OF

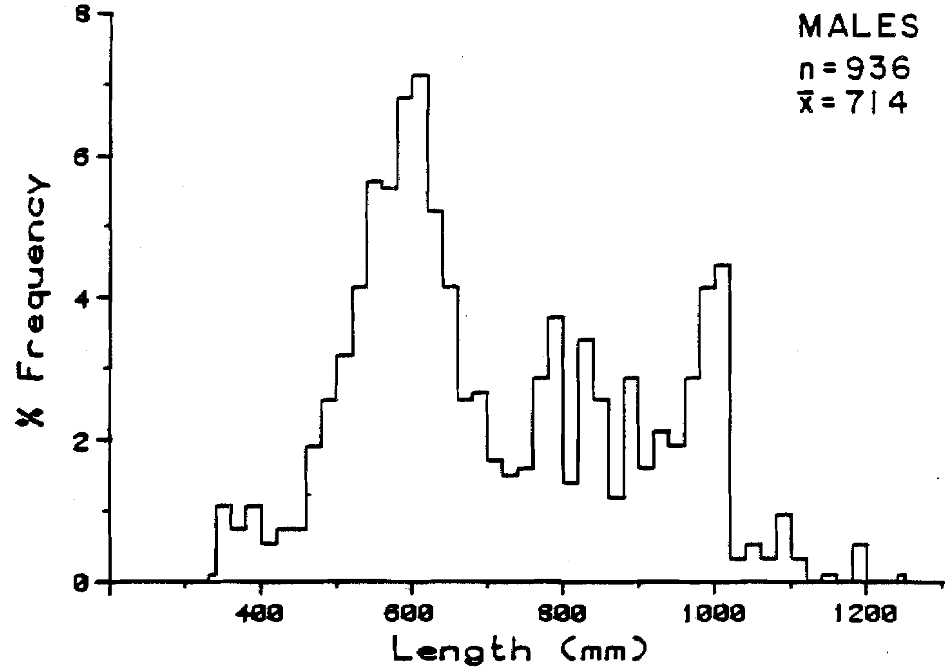
CHINOOK, SOCKEYE, PINK, CHUM

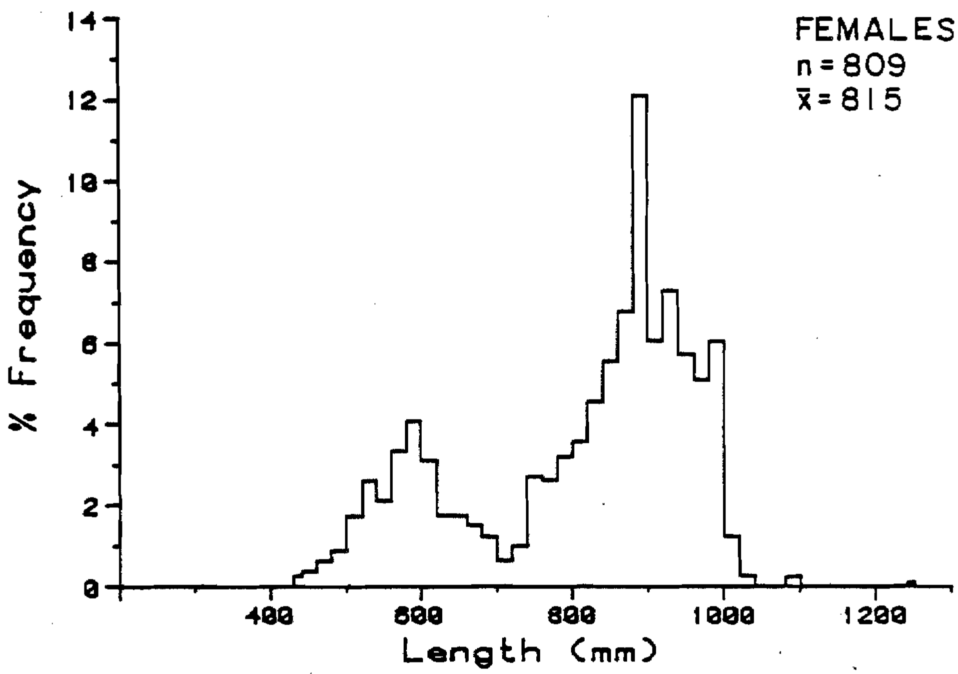
AND COHO SALMON



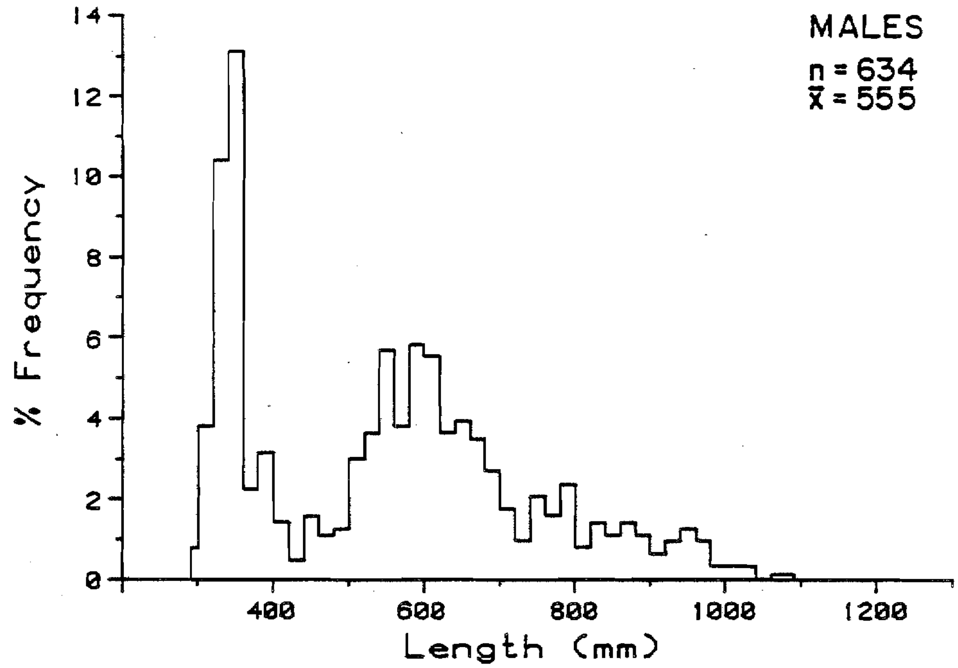


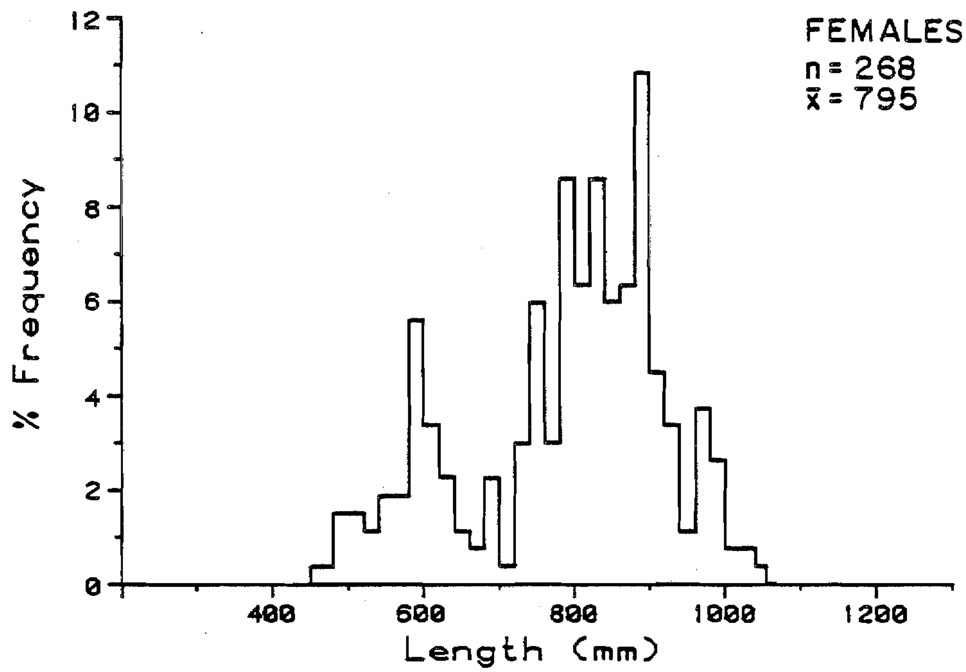
Appendix Figure 2-E-1. Length frequencies of chinook salmon by sex from fishwheel catches at Yentna Station, 1983.



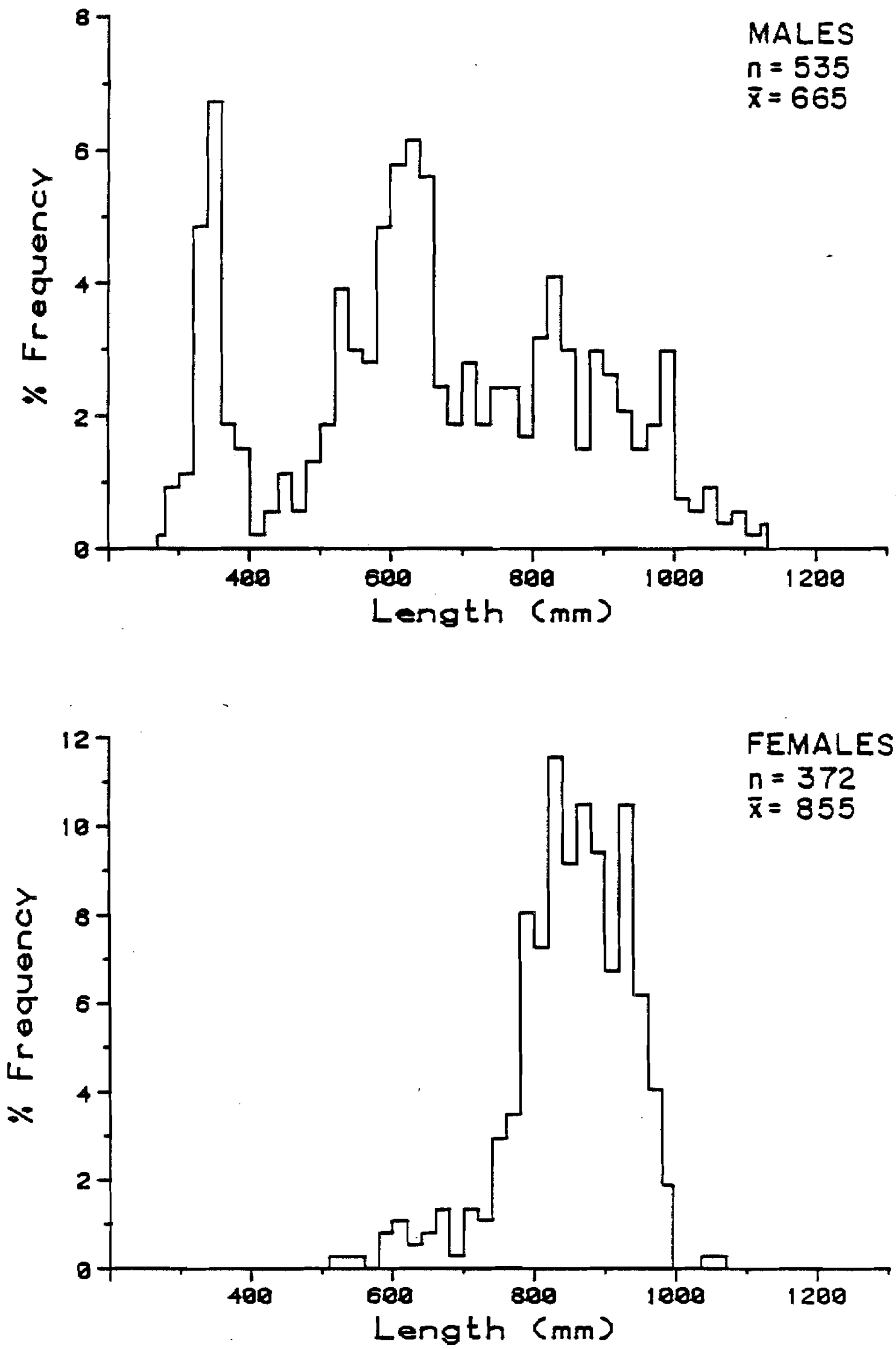


Appendix Figure 2-E-2. Length frequencies of chinook salmon by sex from fishwheel catches at Sunshine Station,1983.

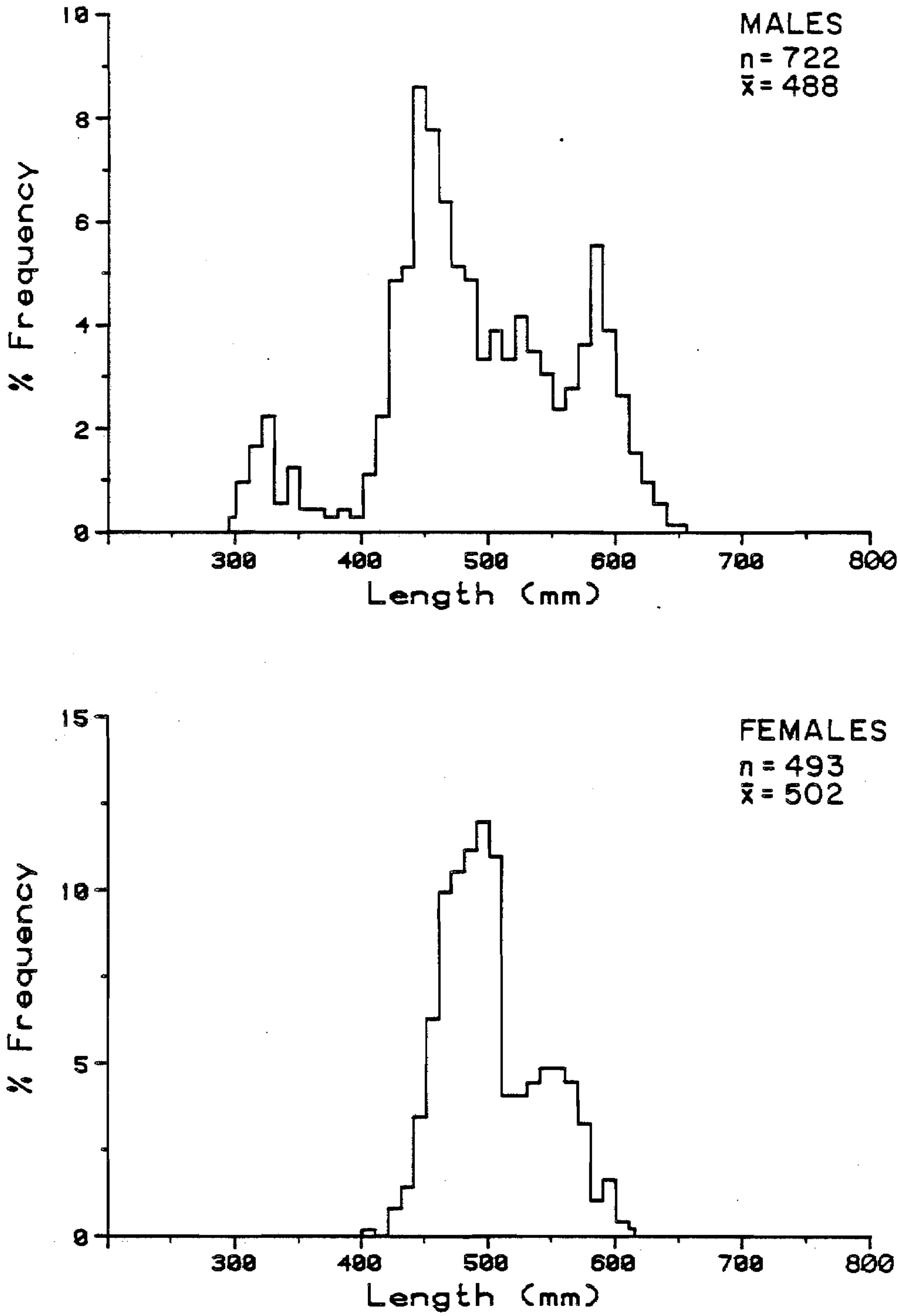




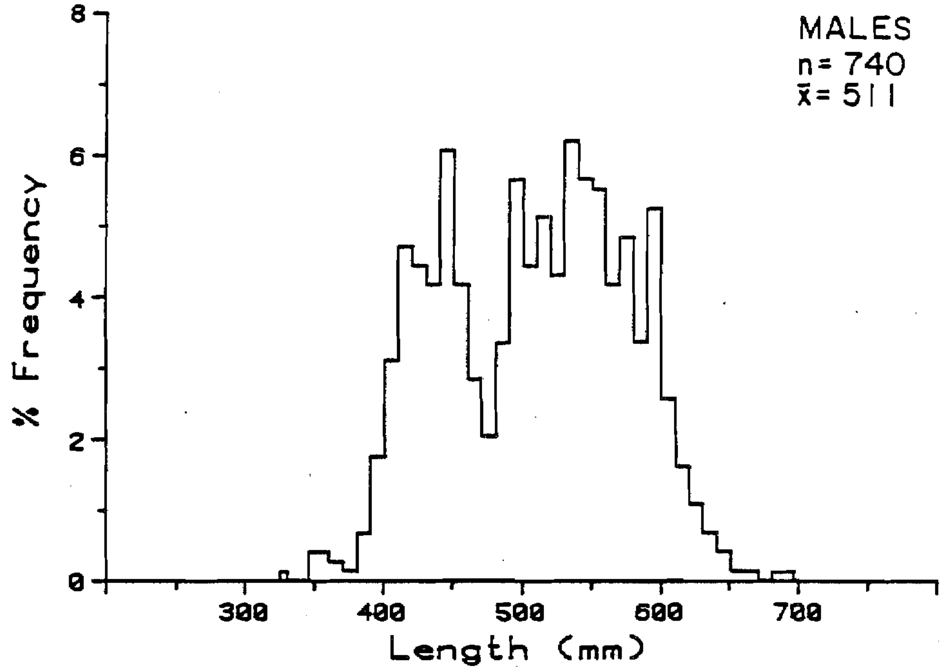
Appendix Figure 2-E-3. Length frequencies of chinook salmon by sex from fishwheel catches at Talkeetna Station, 1983.

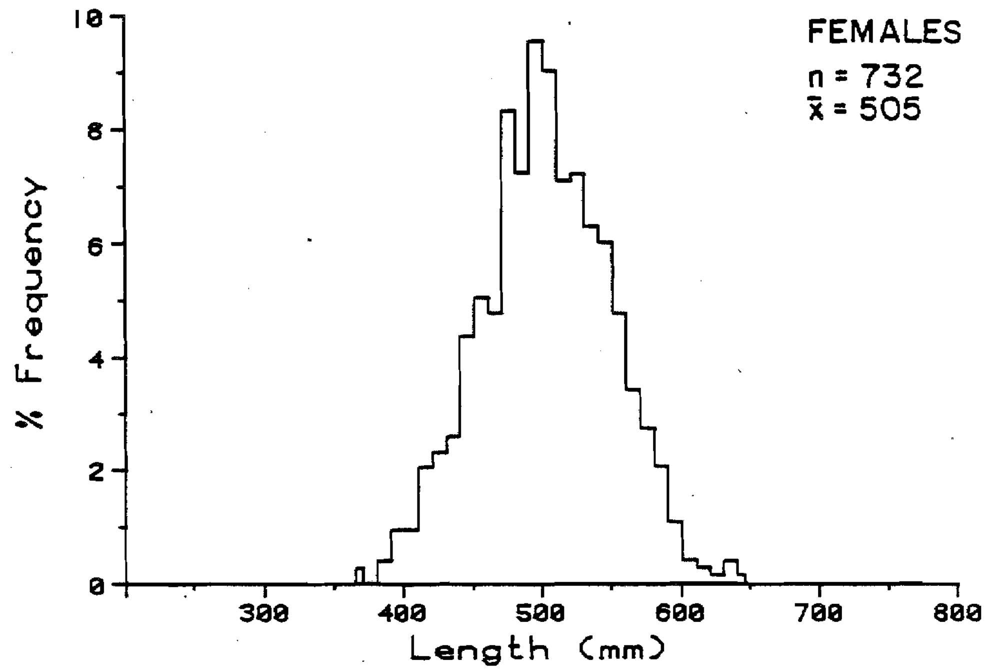


Appendix Figure 2-E-4. Length frequencies of chinook salmon by sex from fishwheel catches at Curry Station, 1983.

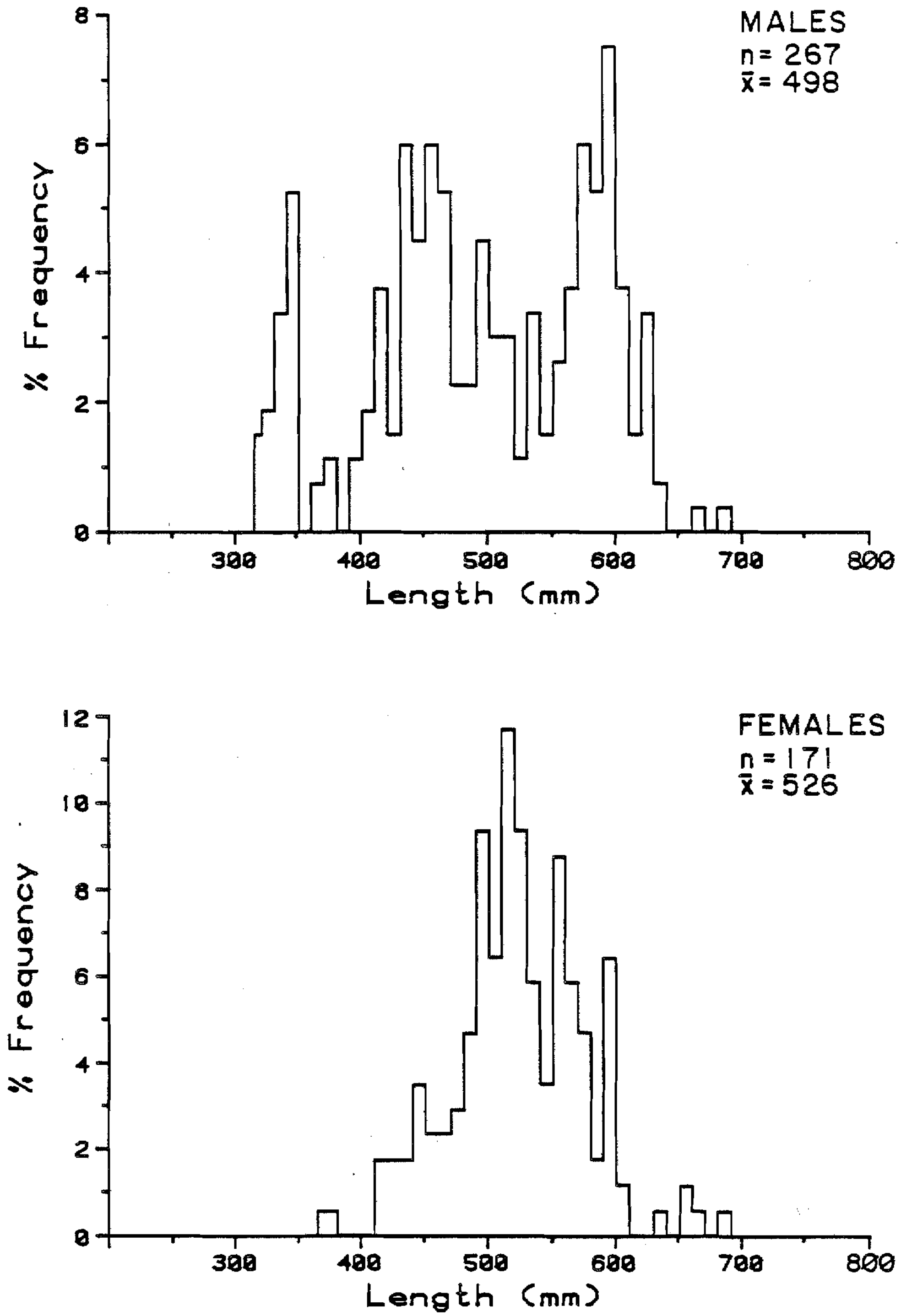


Appendix Figure 2-E-5. Length frequencies of sockeye salmon by sex from fishwheel catches at Yentna Station, 1983.

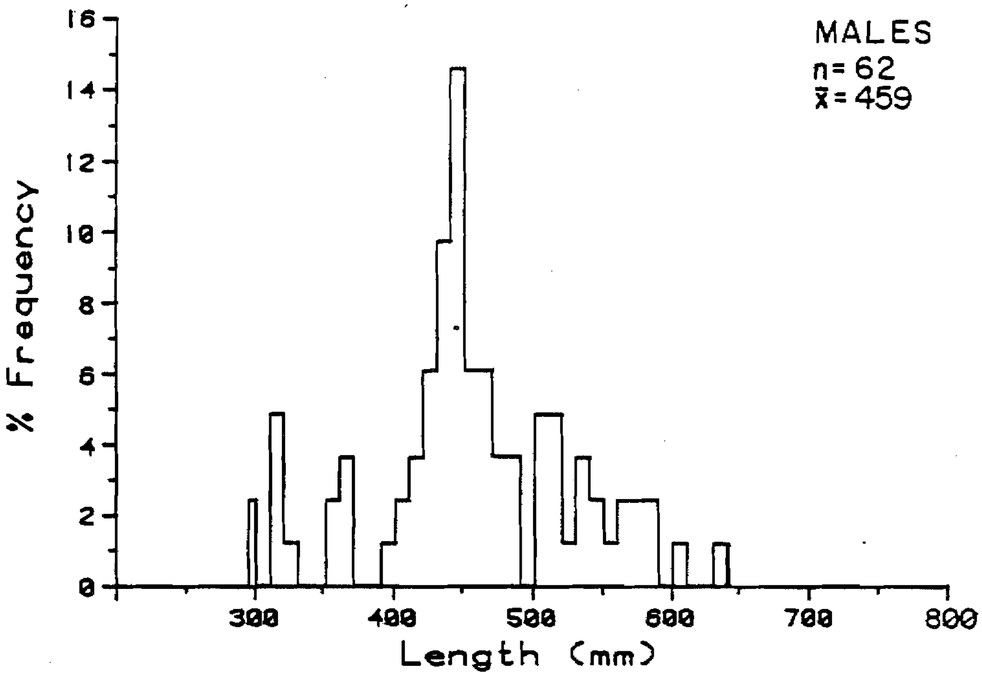


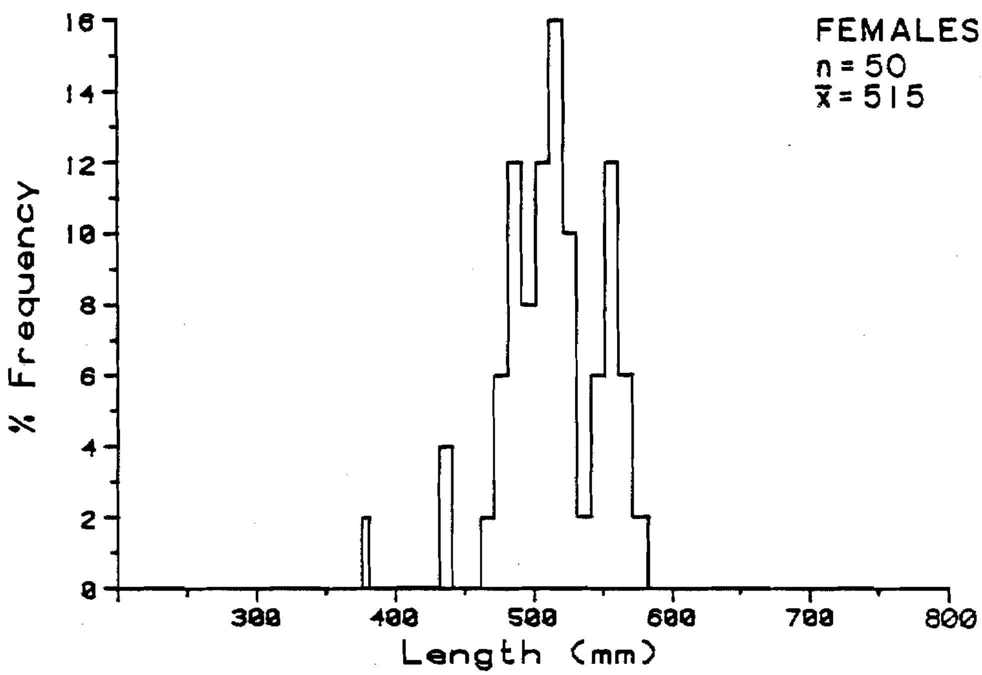


Appendix Figure 2-E-6. Length frequencies of sockeye salmon by sex from fishwheel catches at Sunshine Station,1983.

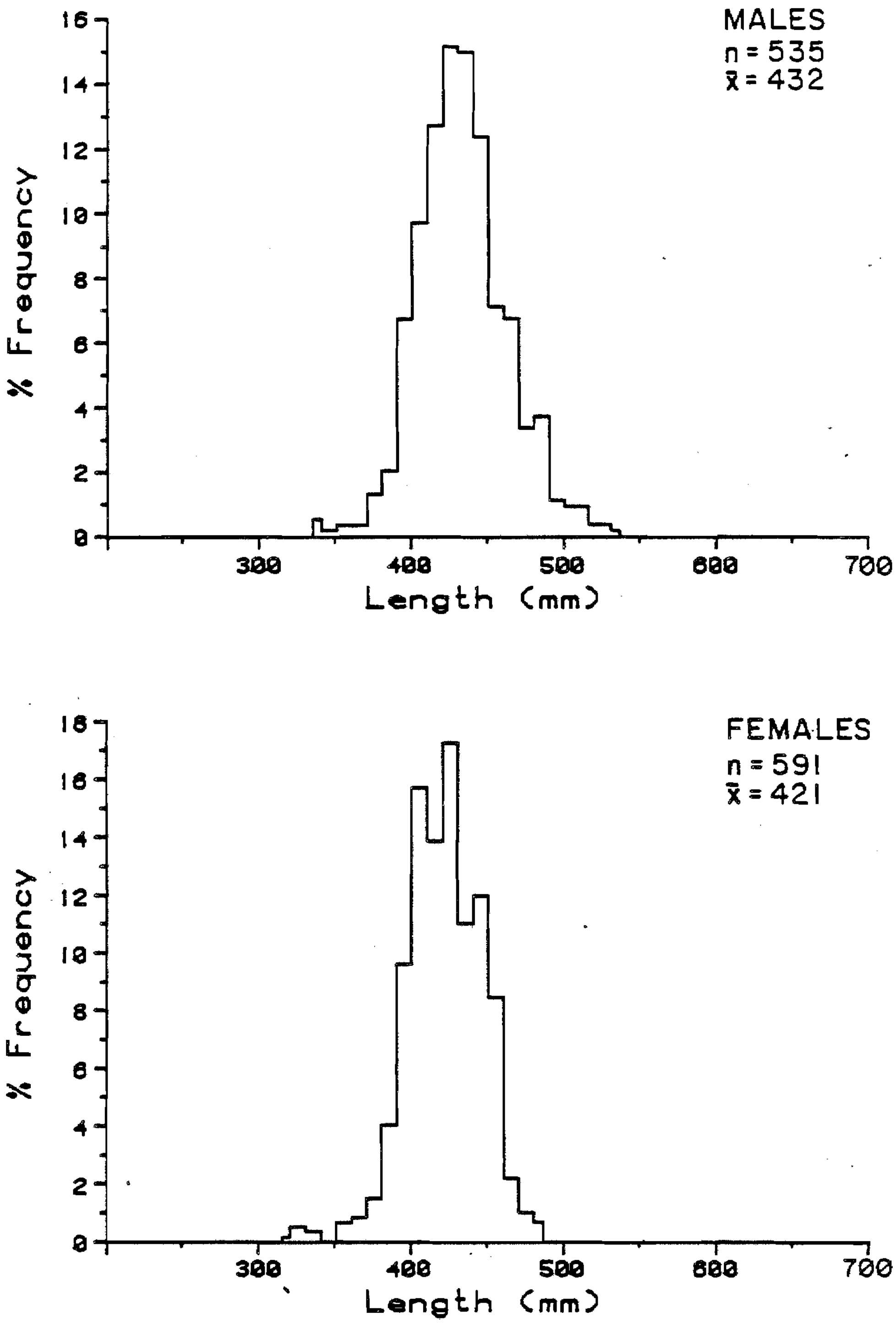


Appendix Figure 2-E-7. Length frequencies of sockeye salmon by sex from fishwheel catches at Talkeetna Station,1983.

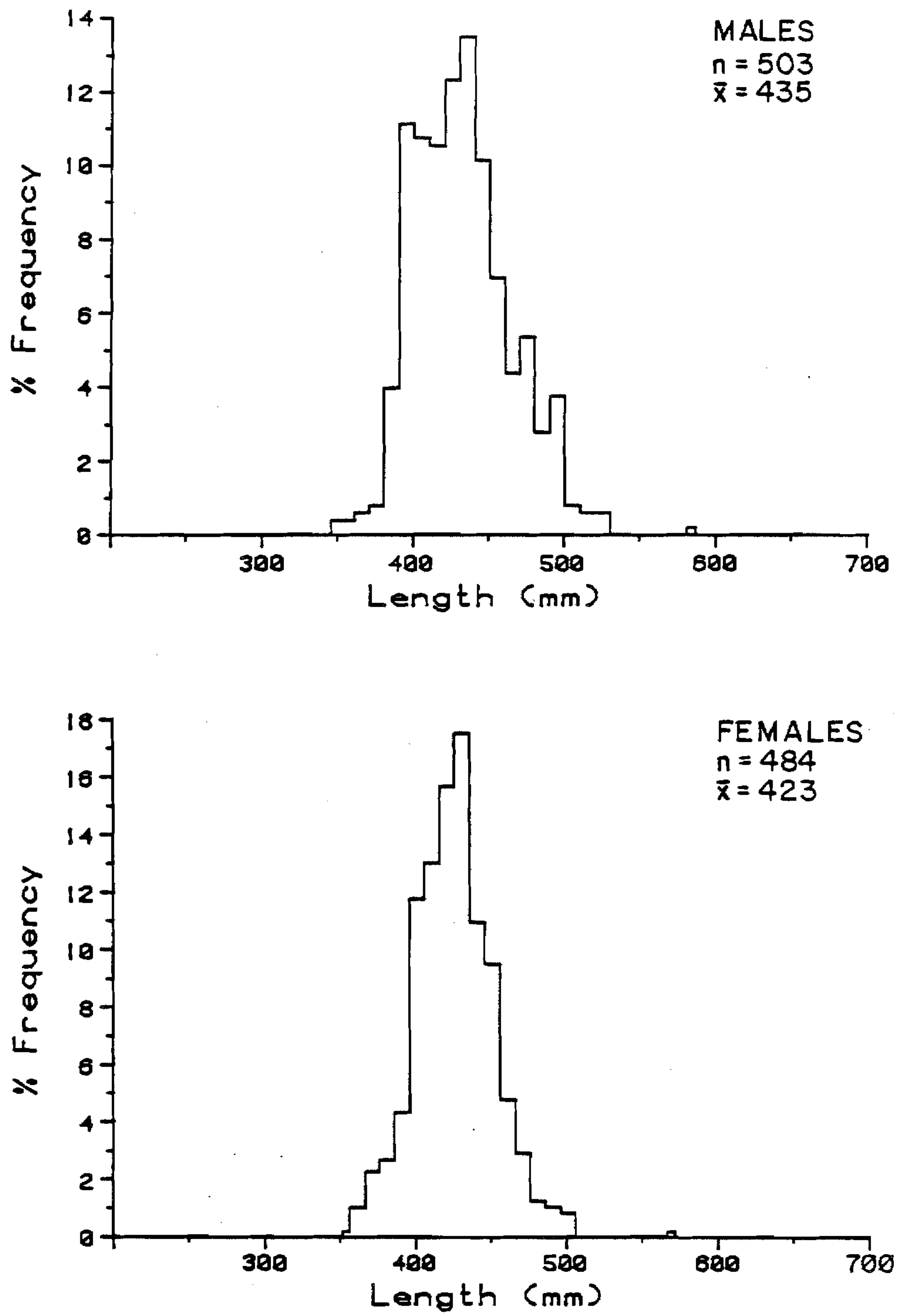




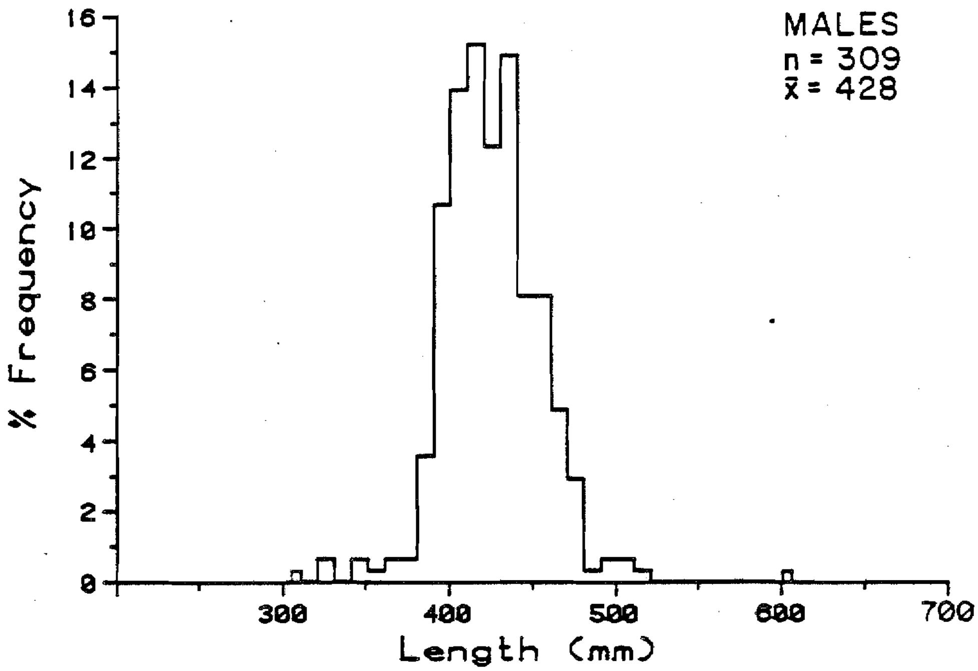
Appendix Figure 2-E-8. Length frequencies of sockeye salmon by sex from fishwheel catches at Curry Station, 1983.

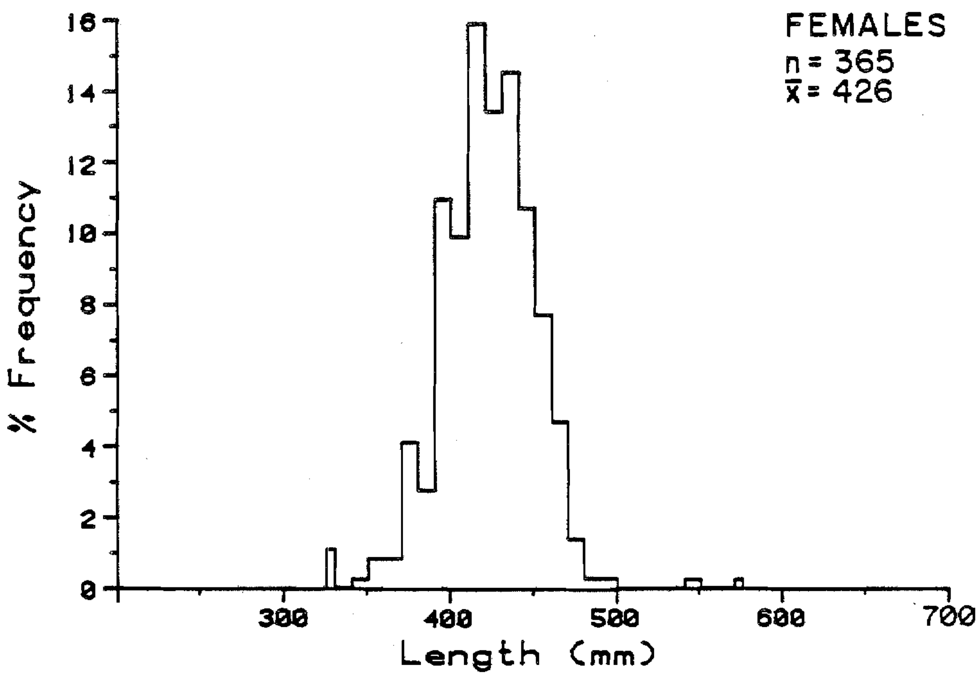


Appendix Figure 2-E-9. Length frequencies of pink salmon by sex from fishwheel catches at Yentna Station,1983.

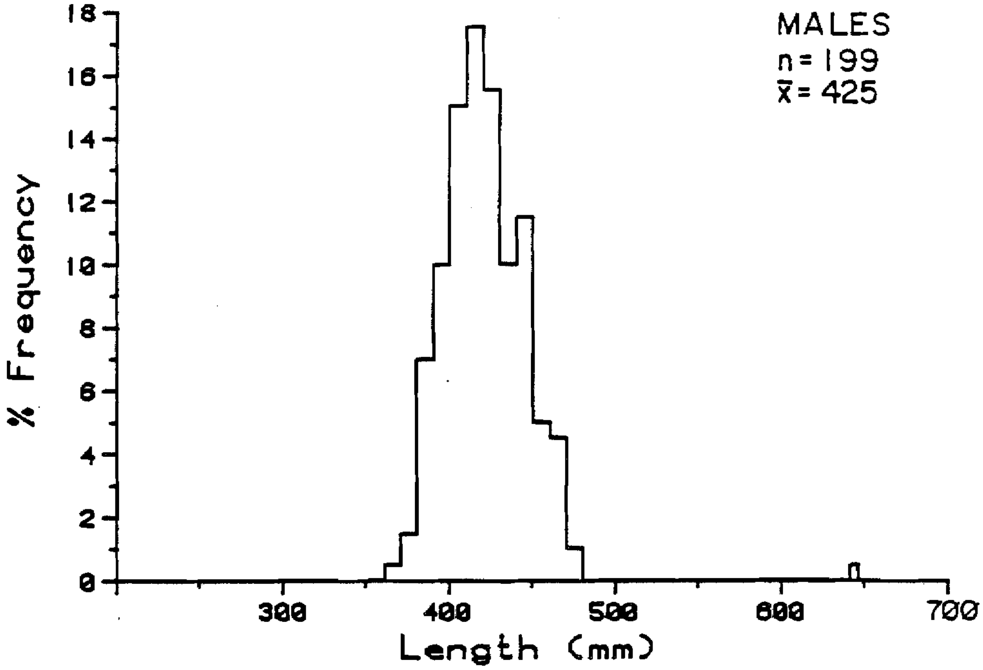


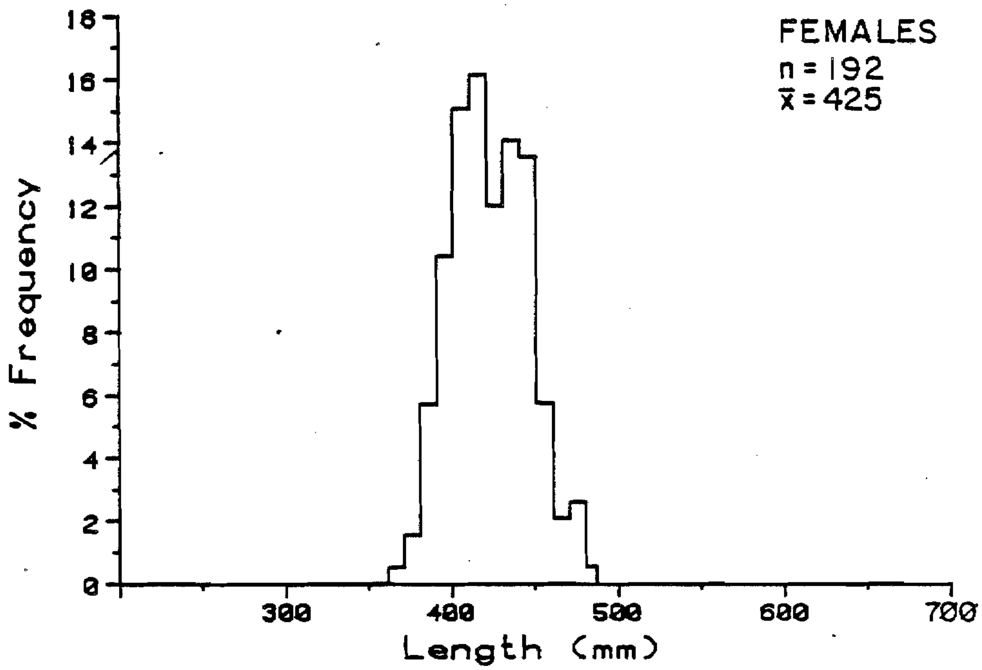
Appendix Figure 2-E-10. Length frequencies of pink salmon by sex from fishwheel catches at Sunshine Station, 1983.



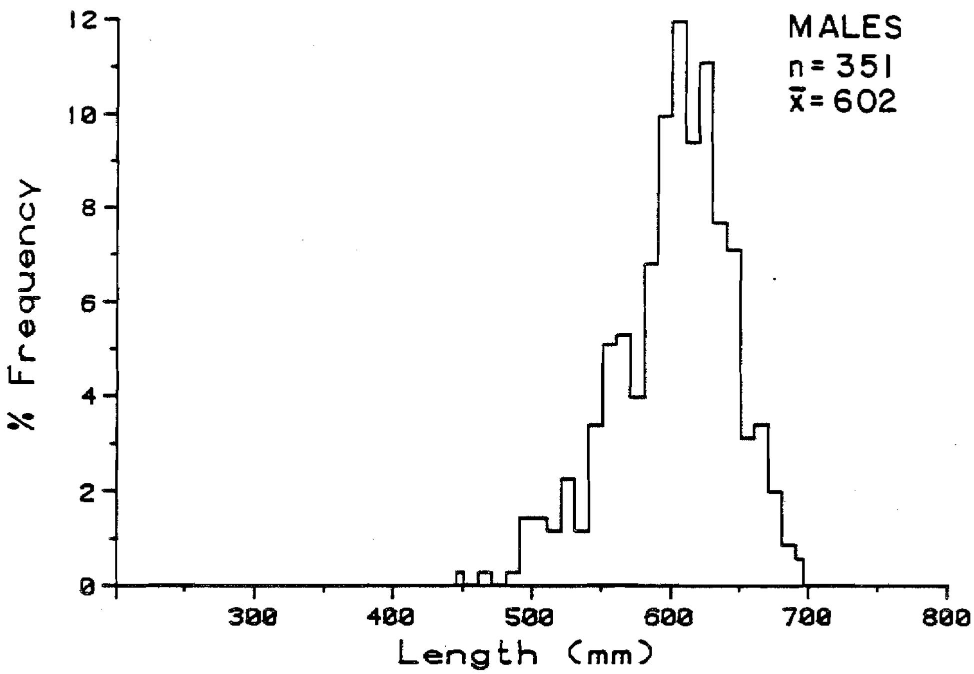


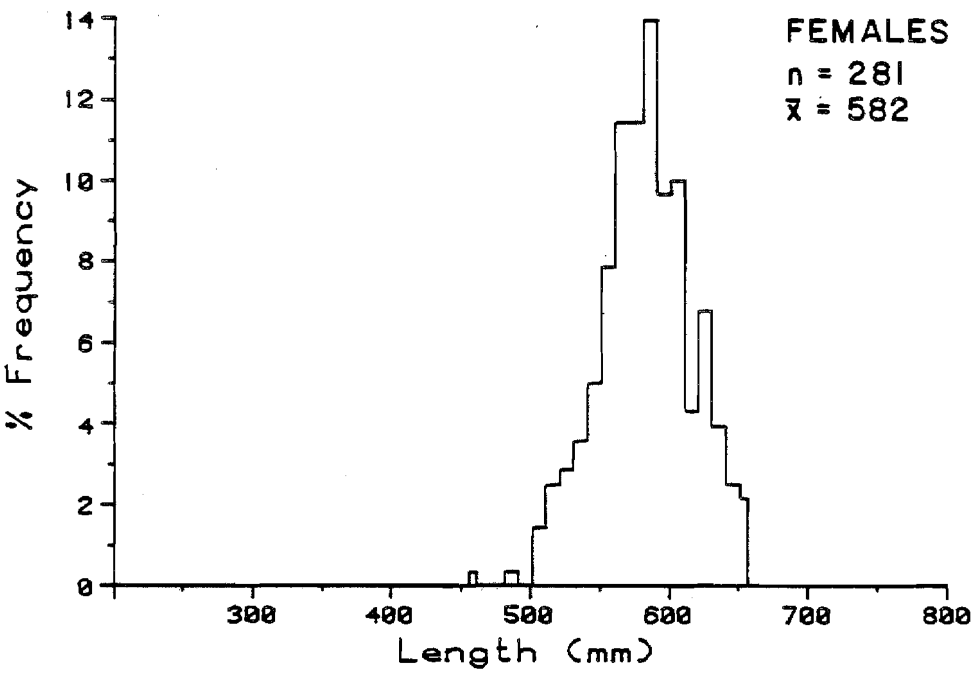
Appendix Figure 2-E-11. Length frequencies of pink salmon by sex from fishwheel catches at Talkeetna Station, 1983.



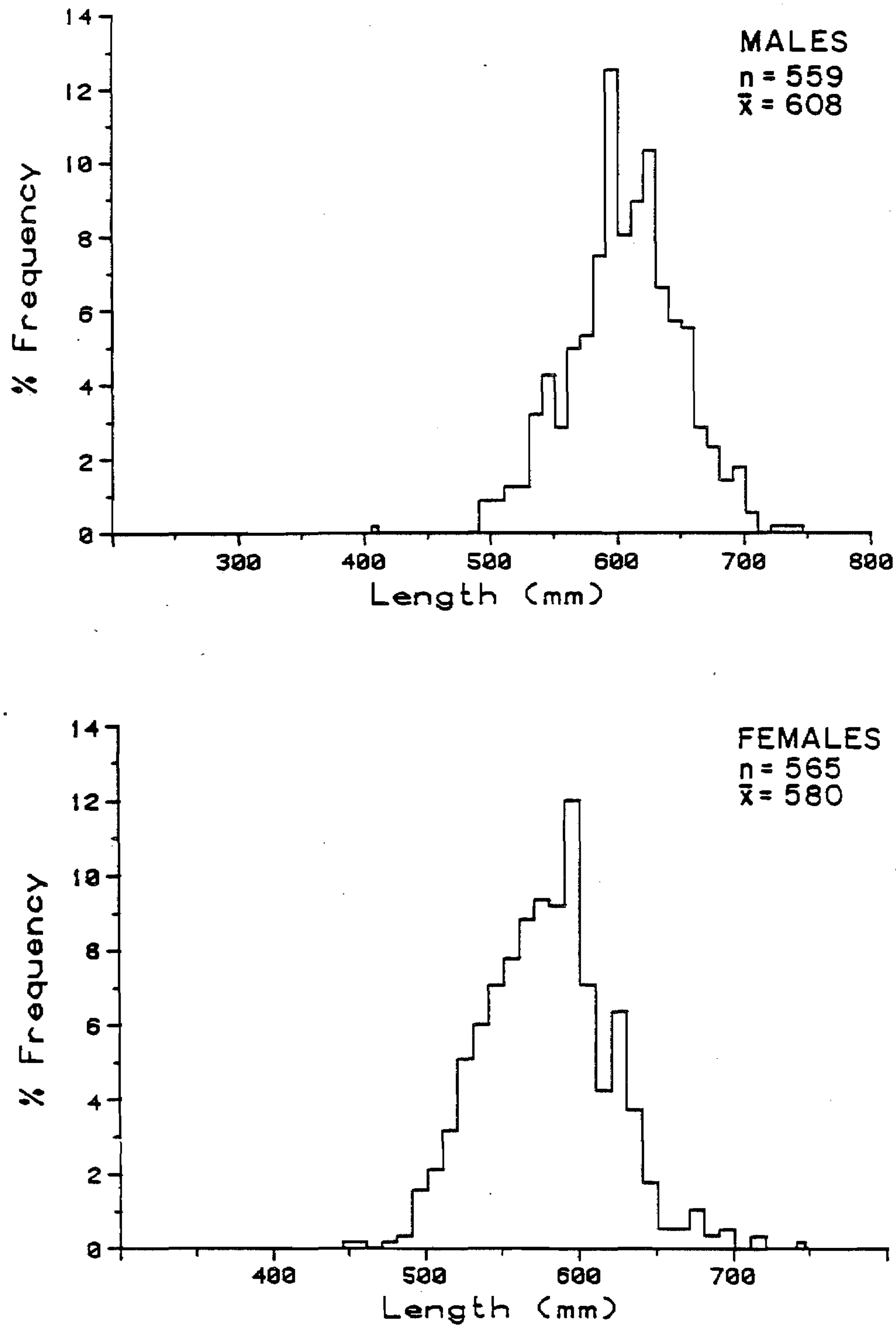


Appendix Figure 2-E-12. Length frequencies of pink salmon by sex from fishwheel catches at Curry Station, 1983.

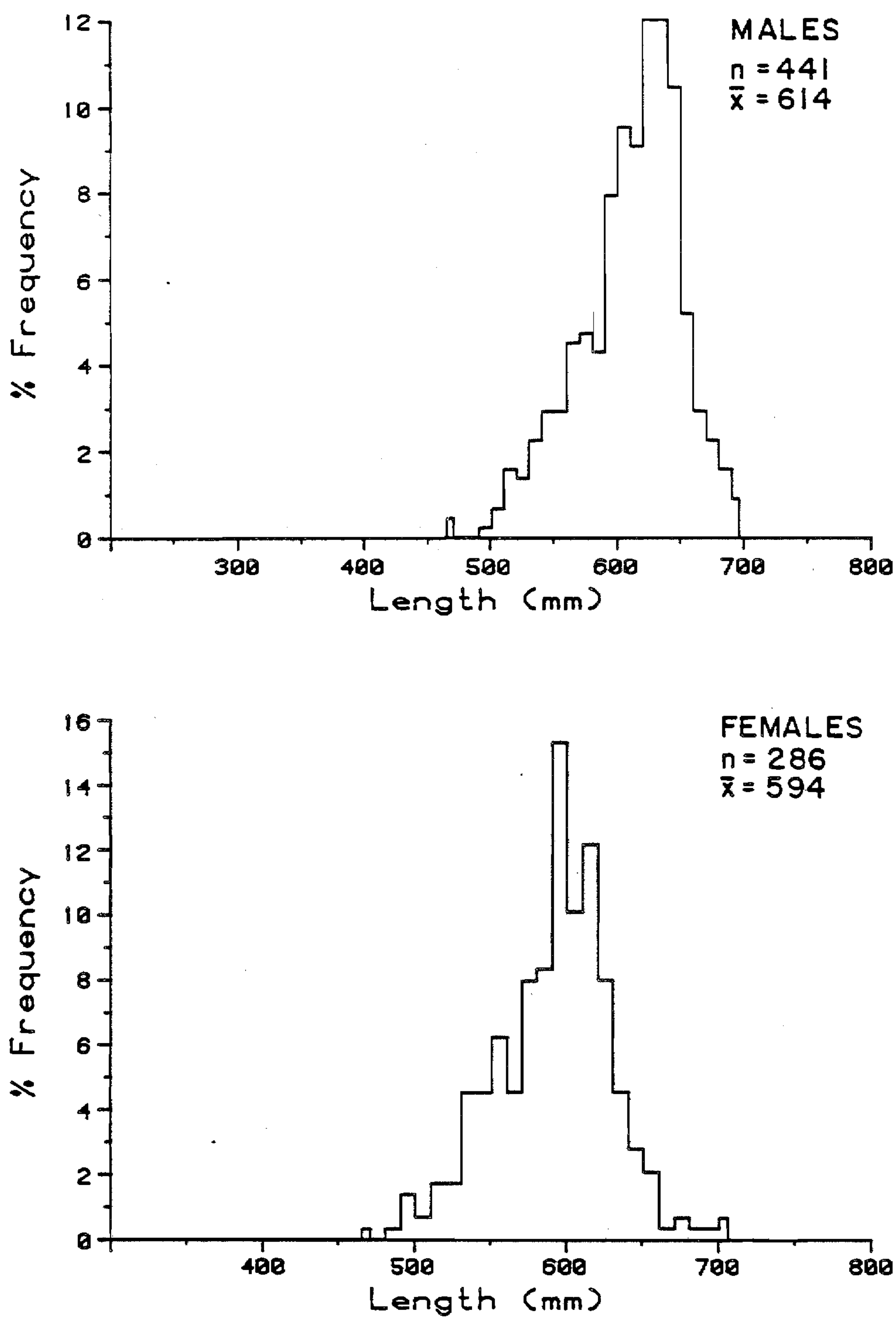




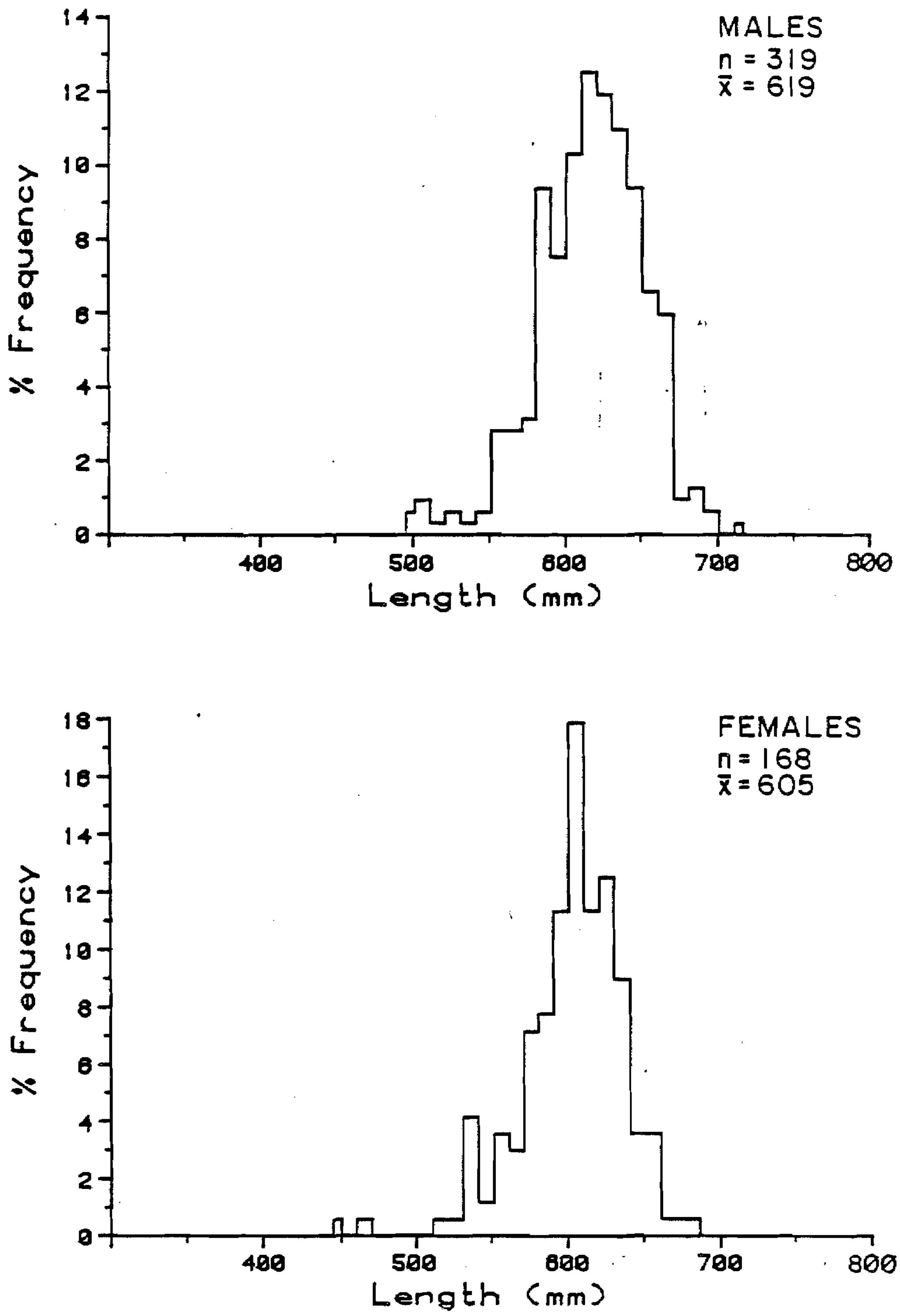
Appendix Figure 2-E-13. Length frequencies of chum salmon by sex from fishwheel catches at Yentna Station, 1983.



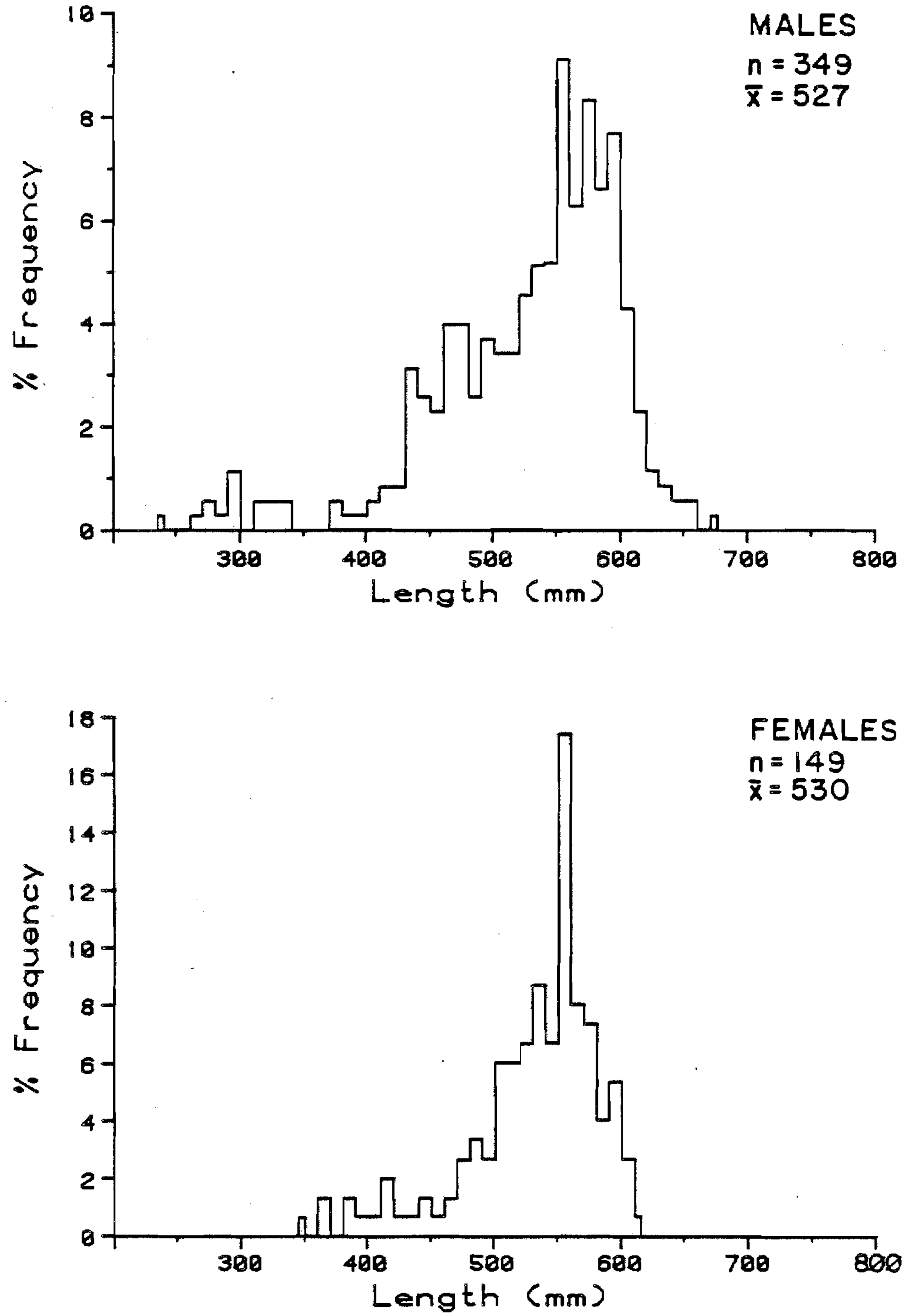
Appendix Figure 2-E-14. Length frequencies of chum salmon by sex from fishwheel catches at Sunshine Station, 1983.



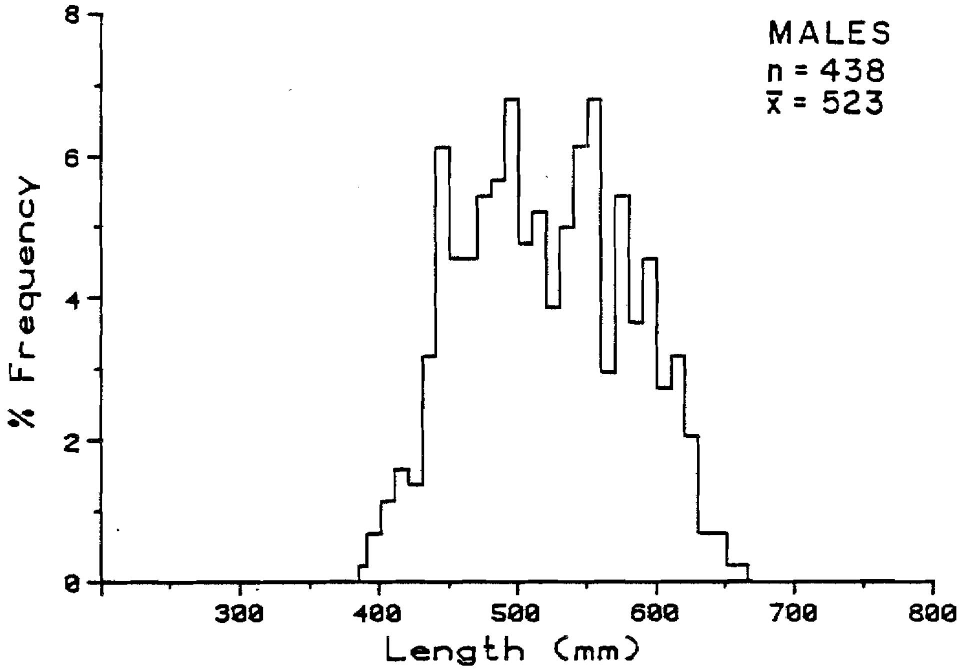
Appendix Figure 2-E-15. Length frequencies of chum salmon by sex from fishwheel catches at Talkeetna Station, 1983.

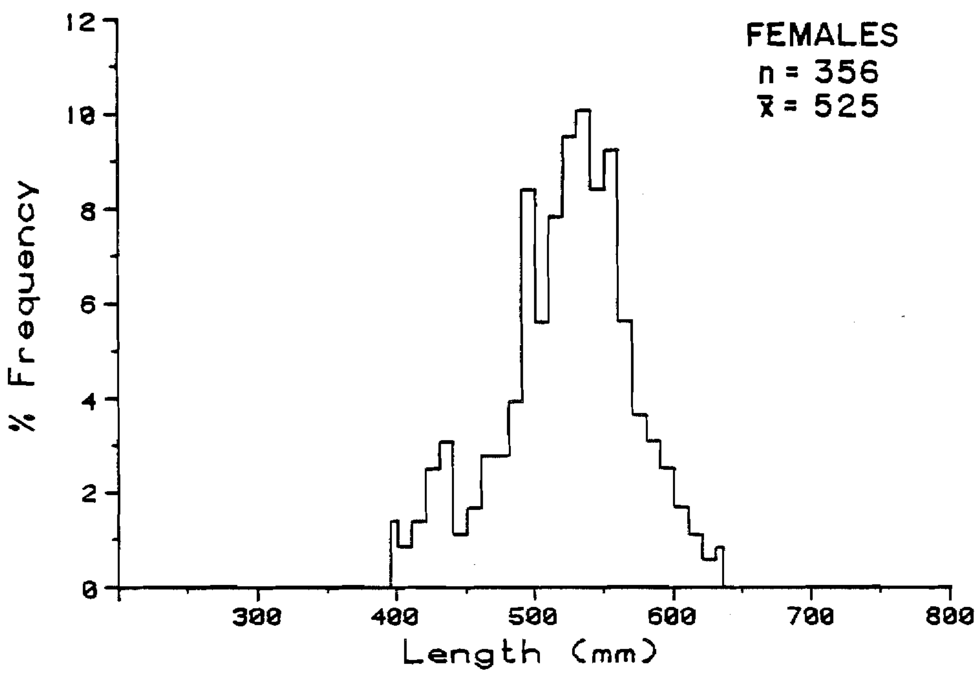


Appendix Figure 2-E-16. Length frequencies of chum salmon by sex from fishwheel catches at Curry Station,1983.

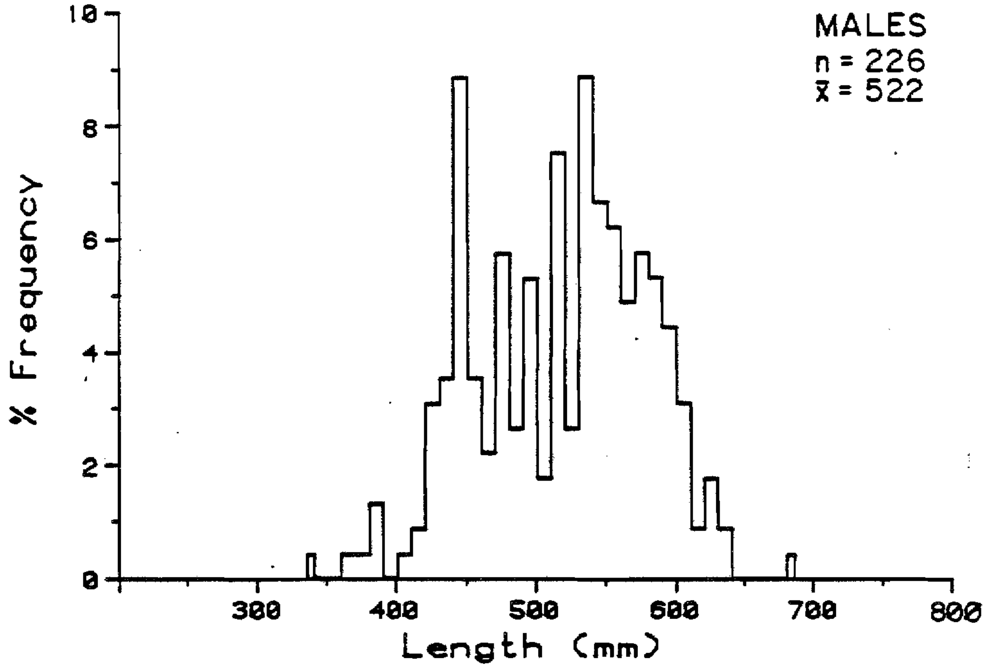


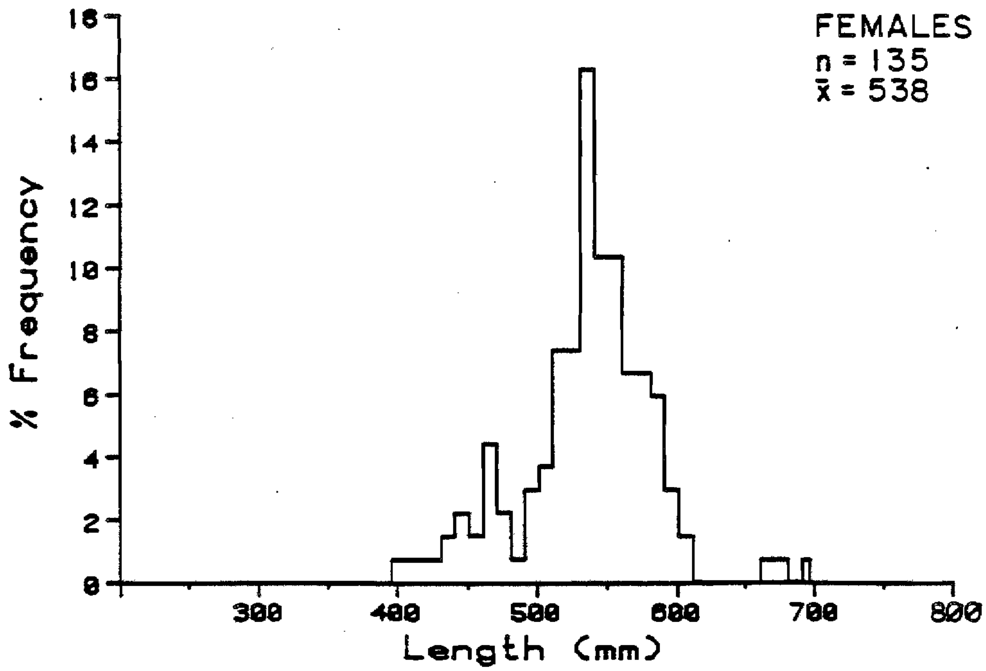
Appendix Figure 2-E-17. Length frequencies of coho salmon by sex from fishwheel catches at Yentna Station, 1983.



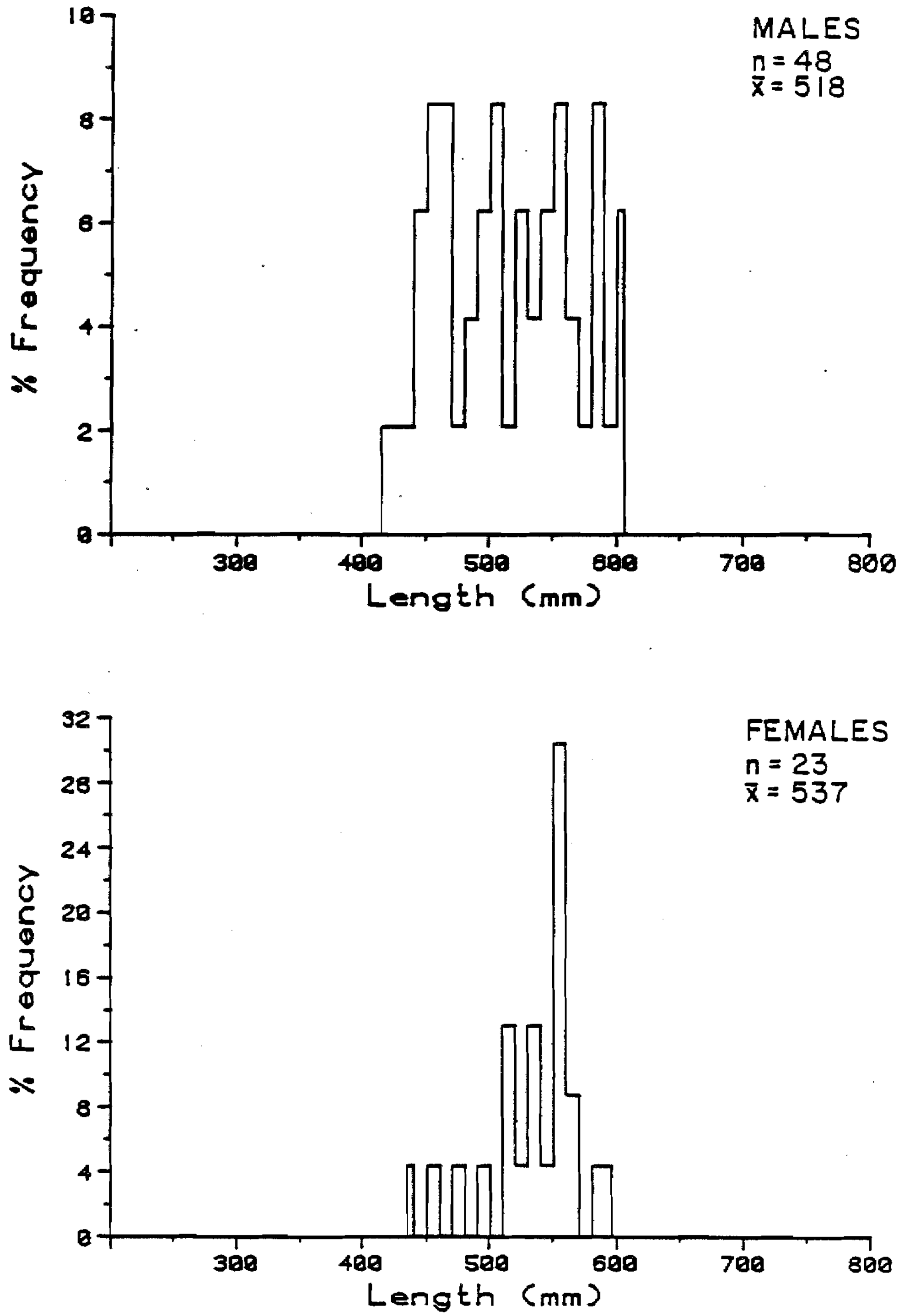


Appendix Figure 2-E-18. Length frequencies of coho salmon by sex from fishwheel catches at Sunshine Station, 1983.





Appendix Figure 2-E-19. Length frequencies of coho salmon by sex from fishwheel catches at Talkeetna Station, 1983.



Appendix Figure 2-E-20. Length frequencies of coho salmon by sex from fishwheel catches at Curry Station, 1983.

APPENDIX 2-F

REGRESSION ANALYSIS OF SOCKEYE AND CHUM SALMON FECUNDITIES

Appendix Table 2-F-1. Regression analysis of age class $^{4}2$ and $^{5}2$ sockeye salmon fecundities as a function of length and weight ,1983.

Age Class 4_2 Sockeye Salmon	
No. Eggs/Length	**No. Eggs/Weight**
$-1654.19 + 10.21(x) = y$	$1752.91 + 0.92(x) = y$
Standard error of estimate = 464.59	Standard error of estimate = 386.26
Coefficient of determination (r^2) = 0.32	Coefficient of determination (r^2) = 0.53
Correlation coefficient (r) = 0.57	Correlation coefficient (r) = 0.73
Sample size = 17	Sample size = 17

Age Class 5_2 Sockeye Salmon	
No. Eggs/Length	**No. Eggs/Weight**
$1344.94 + 4.94(x) = y$	$2295.06 + 2.51(x) = y$
Standard error of estimate = 572.49	Standard error of estimate = 295.16
Coefficient of determination (r^2) = 0.02	Coefficient of determination (r^2) = 0.74
Correlation coefficient (r) = 0.16	Correlation coefficient (r) = 0.86
Sample size = 8	Sample size = 8

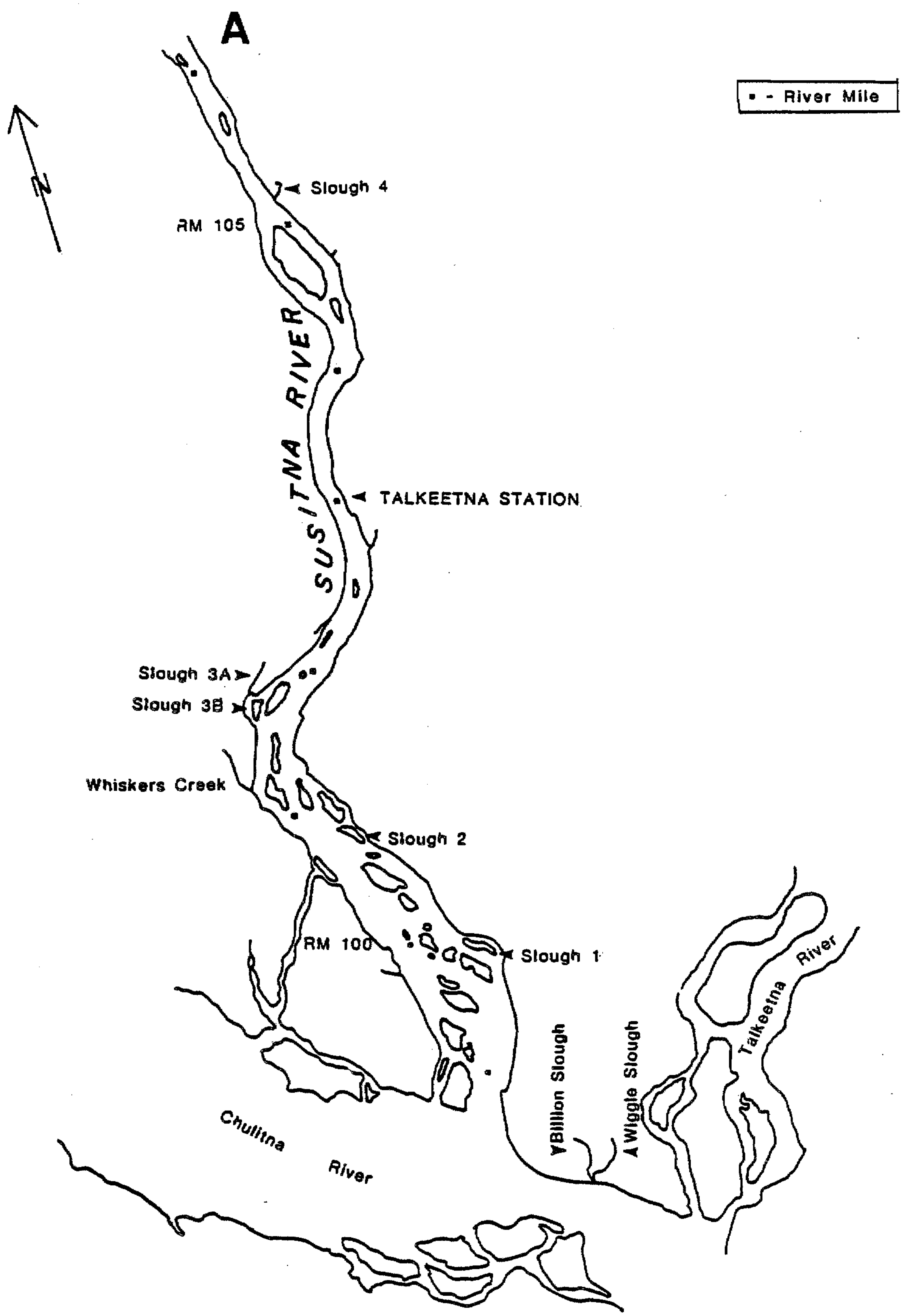
Appendix Table 2-F-2. Regression analysis of age class 4_1 and 5_1 chum salmon fecundities as a function of length and weight, 1983.

Age Class 4_1 Chum Salmon	
No. Eggs/Length	No. Eggs/Weight
3326.88 + 10.66 (x) = y	995.78 + 0.64 (x) = y
Standard error of estimate = 274.44	Standard error of estimate = 231.66
Coefficient of determination (r^2) = 0.74	Coefficient of determination (r^2) = 0.82
Correlation coefficient (r) = 0.86	Correlation coefficient (r) = 0.90
Sample size = 16	Sample size = 16

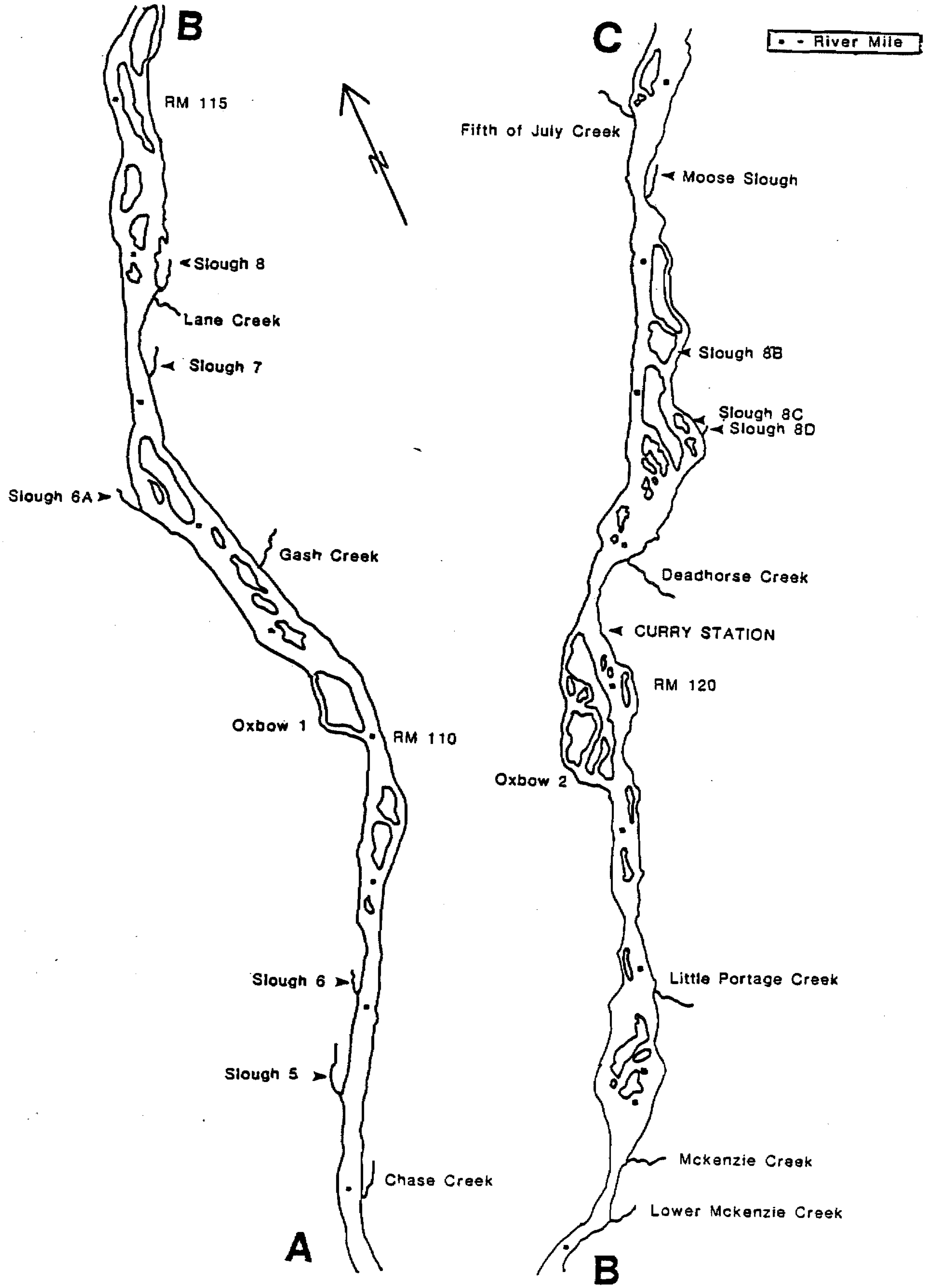
Age Class 5_1 Chum Salmon	
No. Eggs/Length	No. Eggs/Weight
1344.94 + 7.12 (x) = y	1766.14 + 0.38 (x) = y
Standard error of estimate = 210.05	Standard error of estimate = 213.36
Coefficient of determination (r^2) = 0.72	Coefficient of determination (r^2) = 0.71
Correlation coefficient (r) = 0.85	Correlation coefficient (r) = 0.84
Sample size = 11	Sample size = 11

APPENDIX 2-G

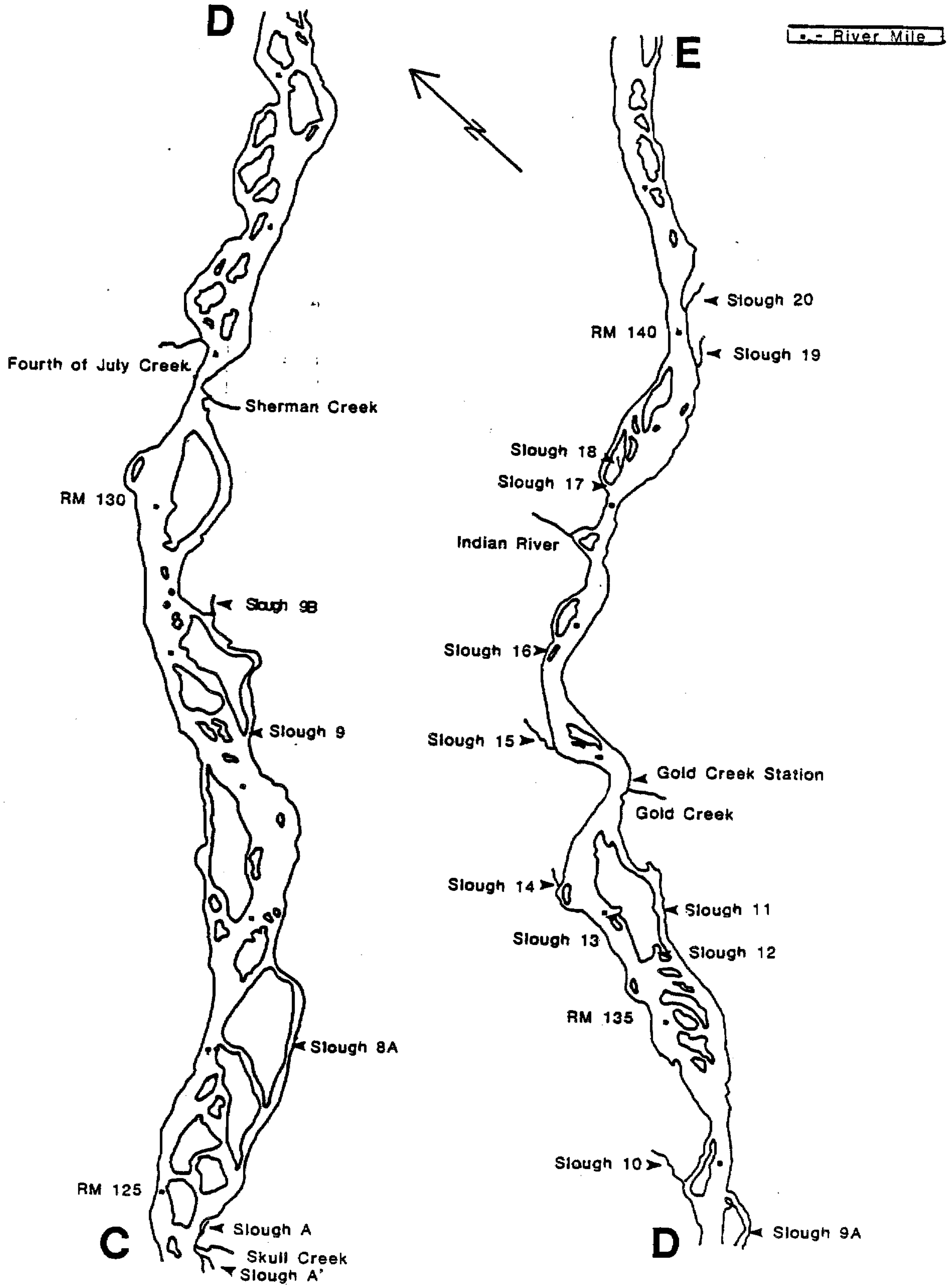
1. SLOUGH AND STREAM LOCATIONS FROM RM 98.6 TO 161.2
2. OBSERVATION LIFE SLOUGHS WITH HABITAT ZONES DEFINED
3. MAINSTEM SUSITNA RIVER SPAWNING SITE TABLE AND FIGURES
4. ESCAPEMENT SURVEYS OF SLOUGHS AND STREAMS
5. TAGGED/UNTAGGED RATIOS FROM SPAWNING GROUND SURVEYS



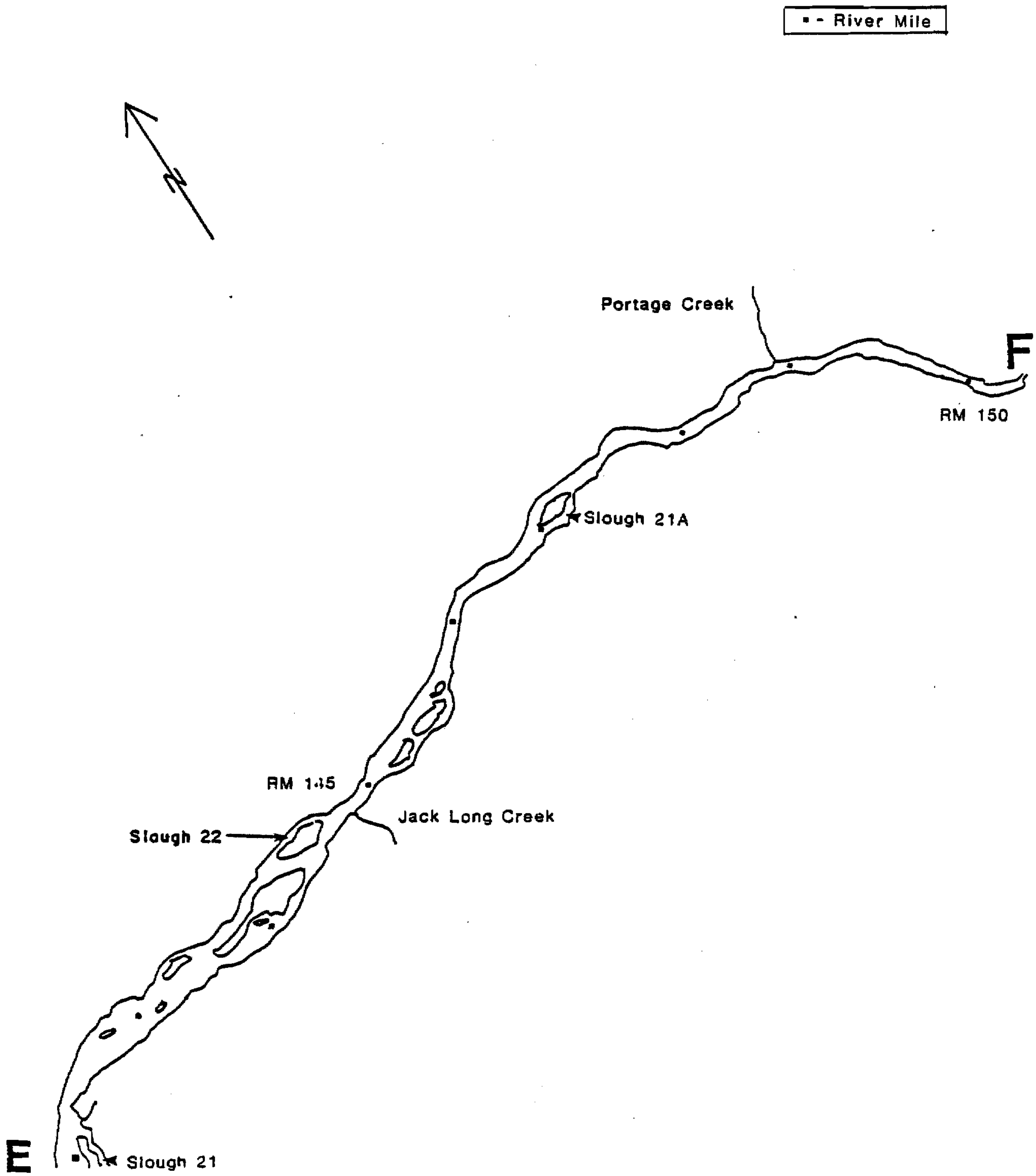
Appendix Figure 2-G-1. Slough locations and primary tributary streams of the Susitna River from the confluence of the Talkeetna and Chulitna rivers to Upper Devil Canyon,1983.



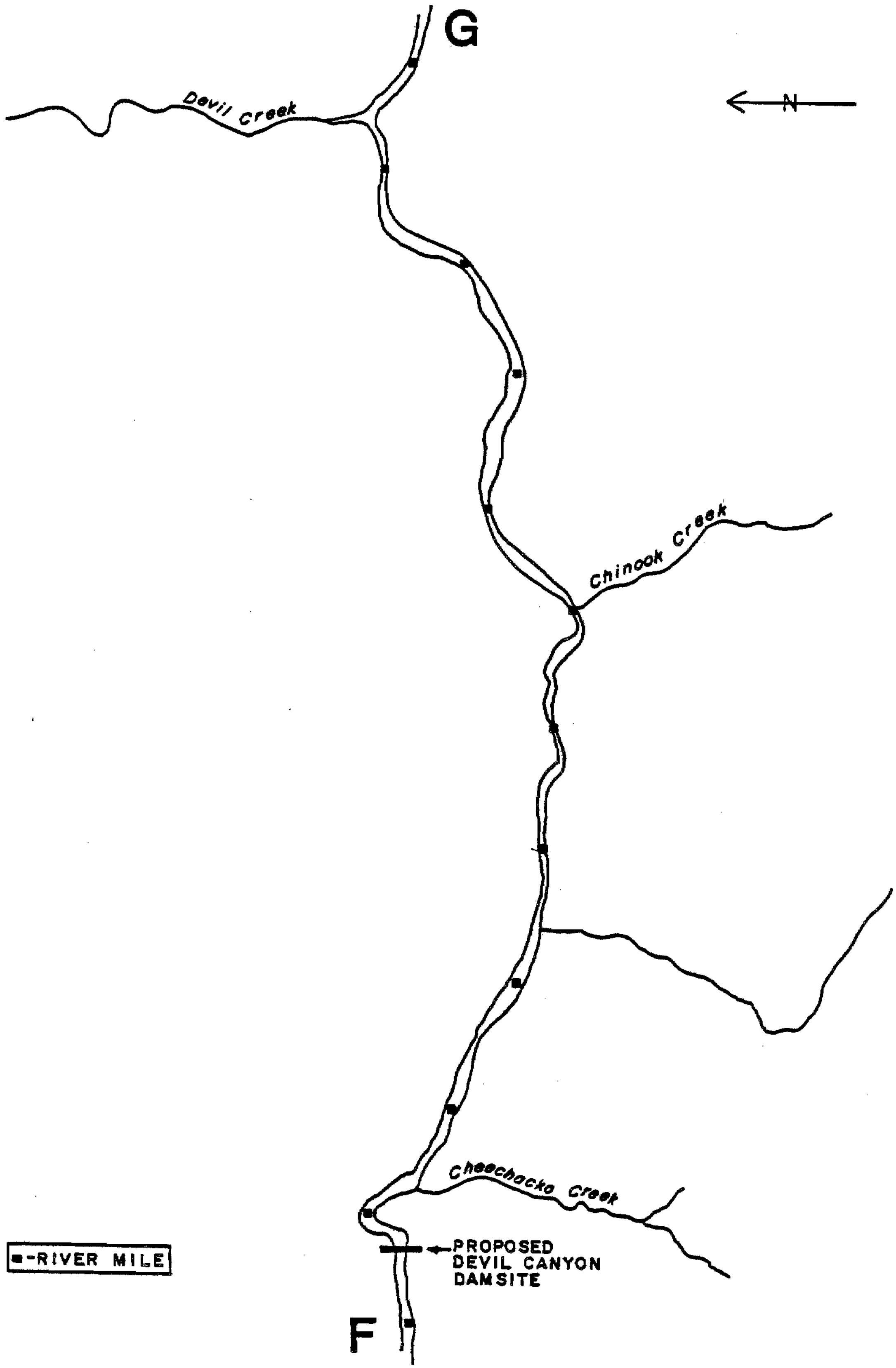
Appendix Figure 2-G-1. Continued.



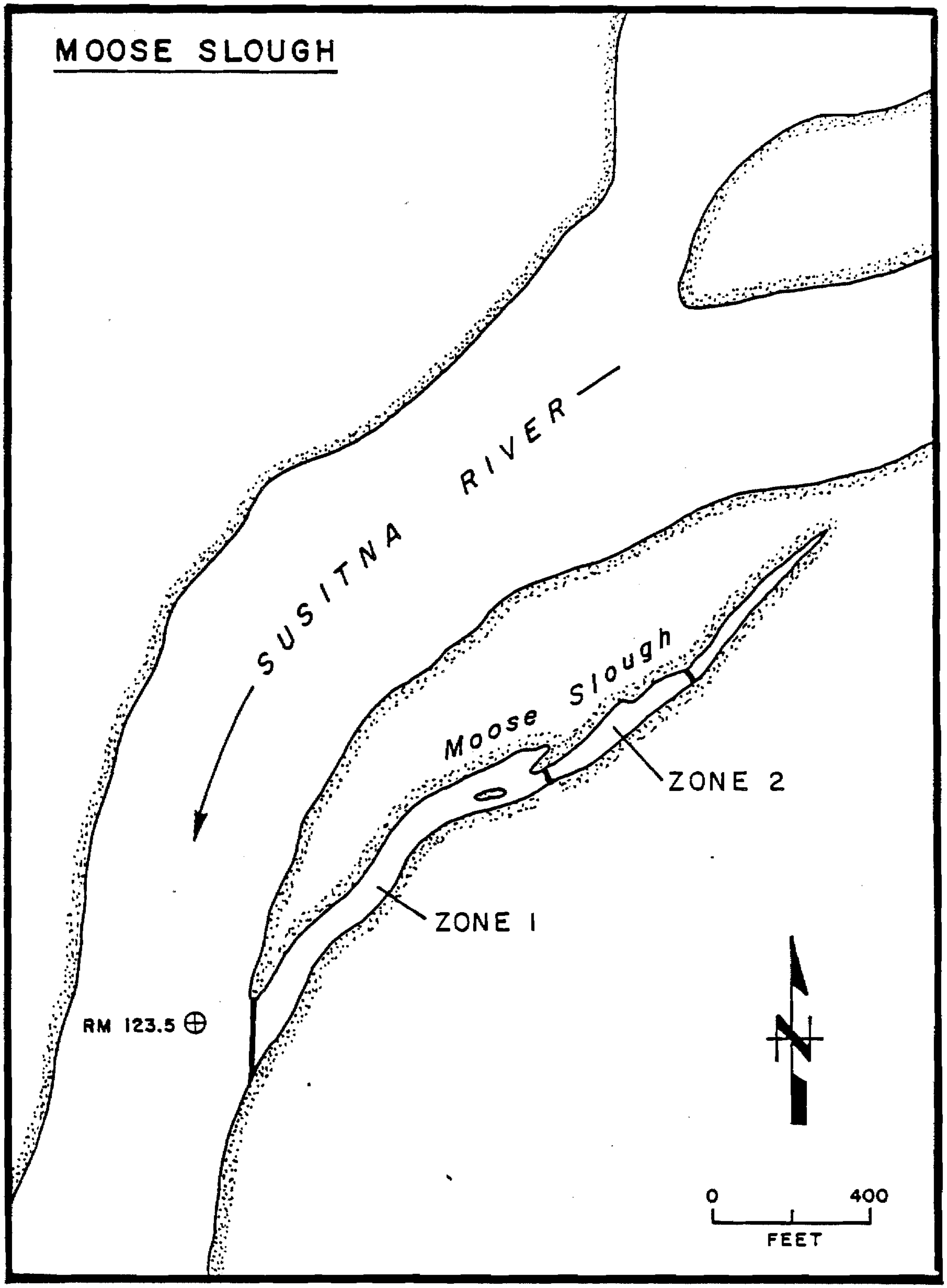
Appendix Figure 2-G-1. Continued.



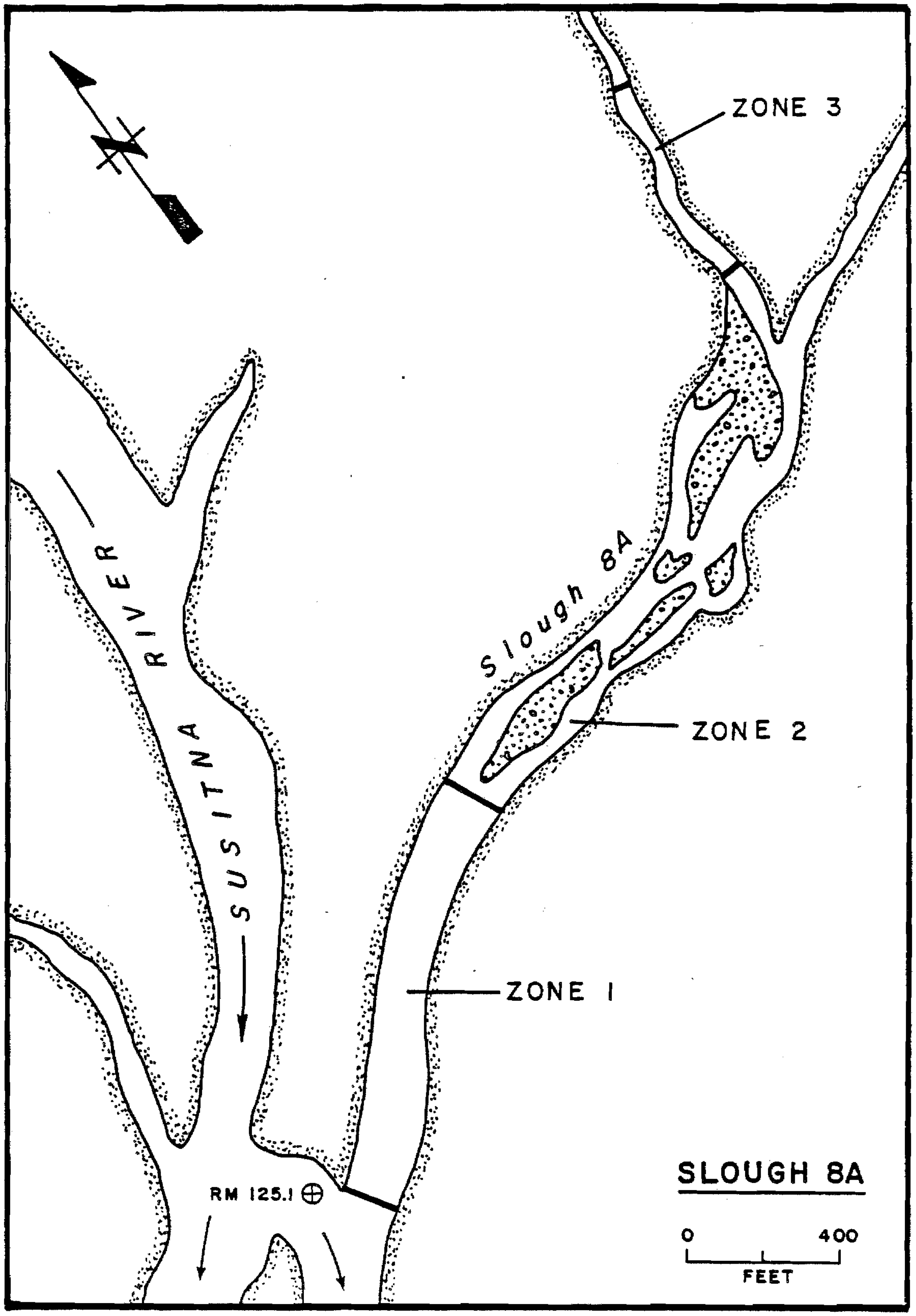
Appendix Figure 2-G-1. Continued.



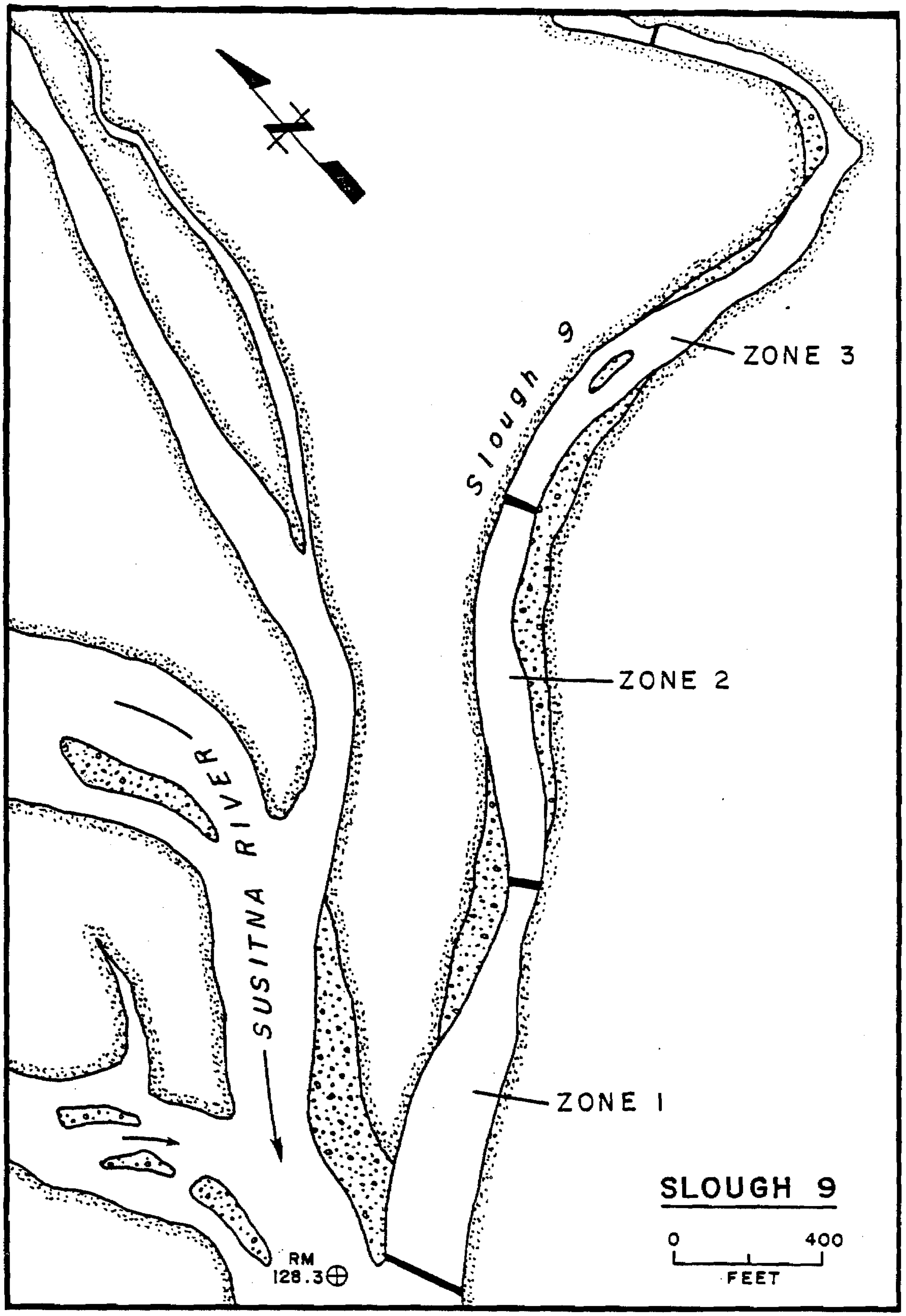
Appendix Figure 2-G-1. Continued.



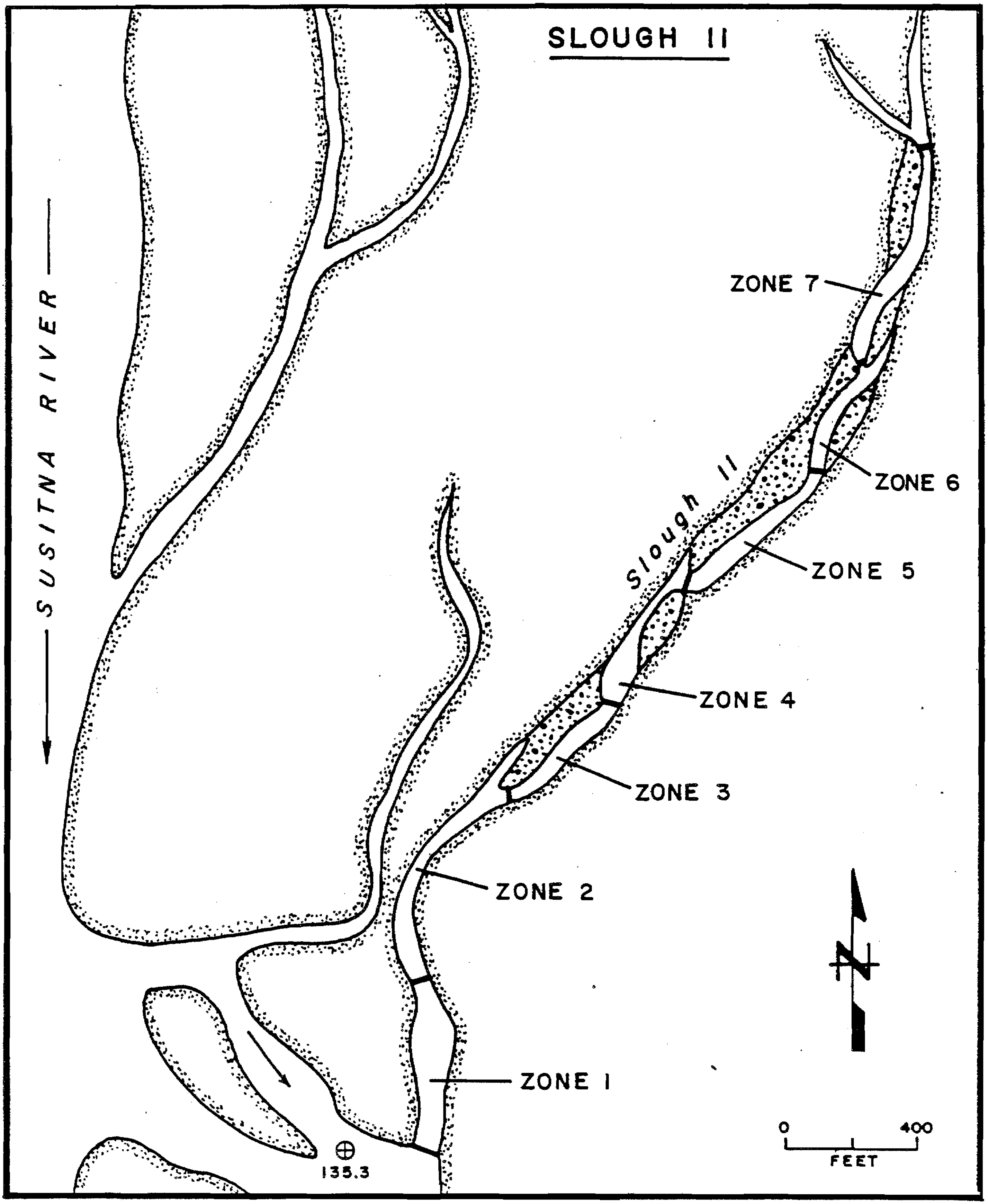
Appendix Figure 2-G-2. Moose Slough map with habitat locations defined,1983.



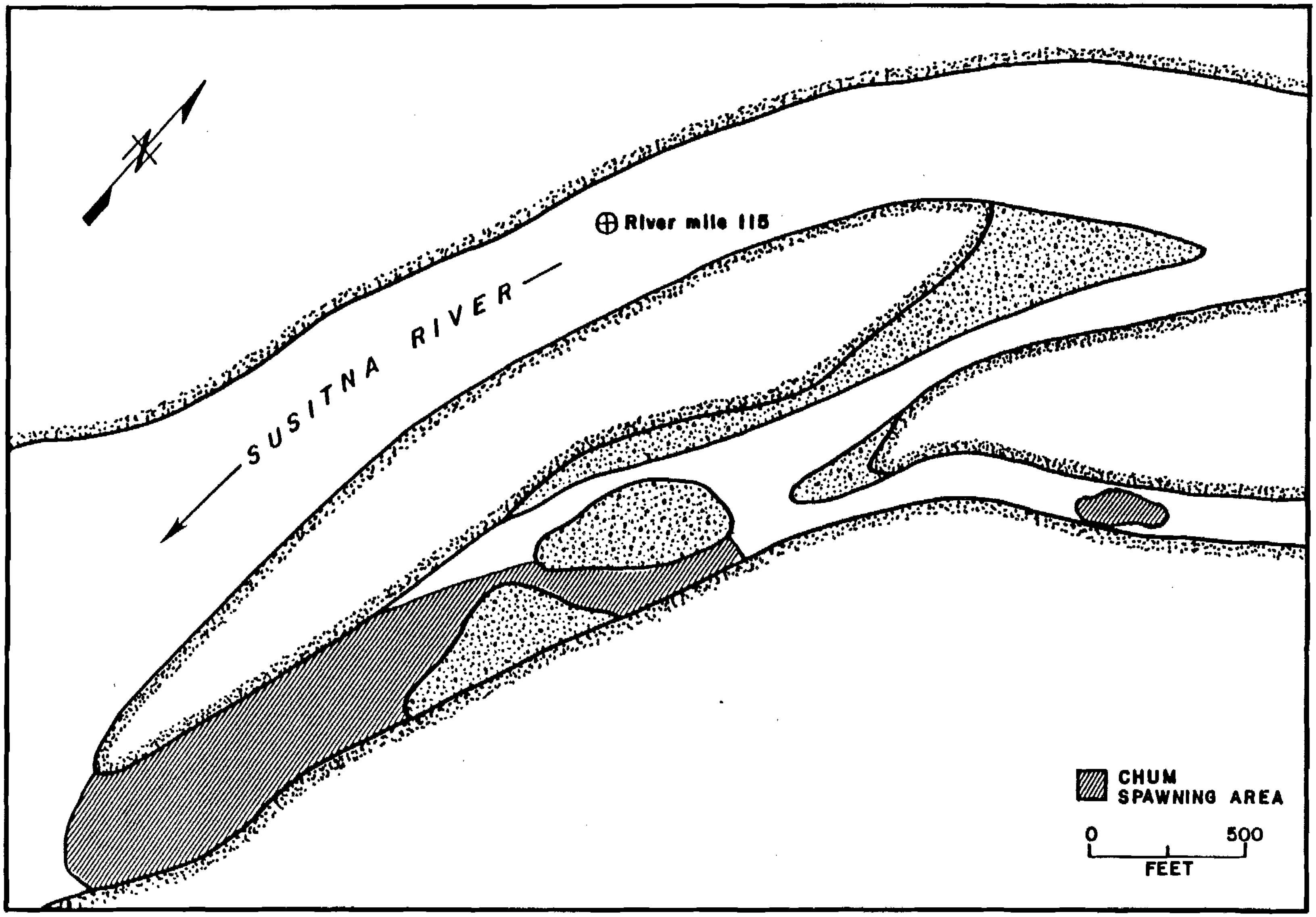
Appendix Figure 2-G-3. Slough 8A map with habitat locations defined, 1983.



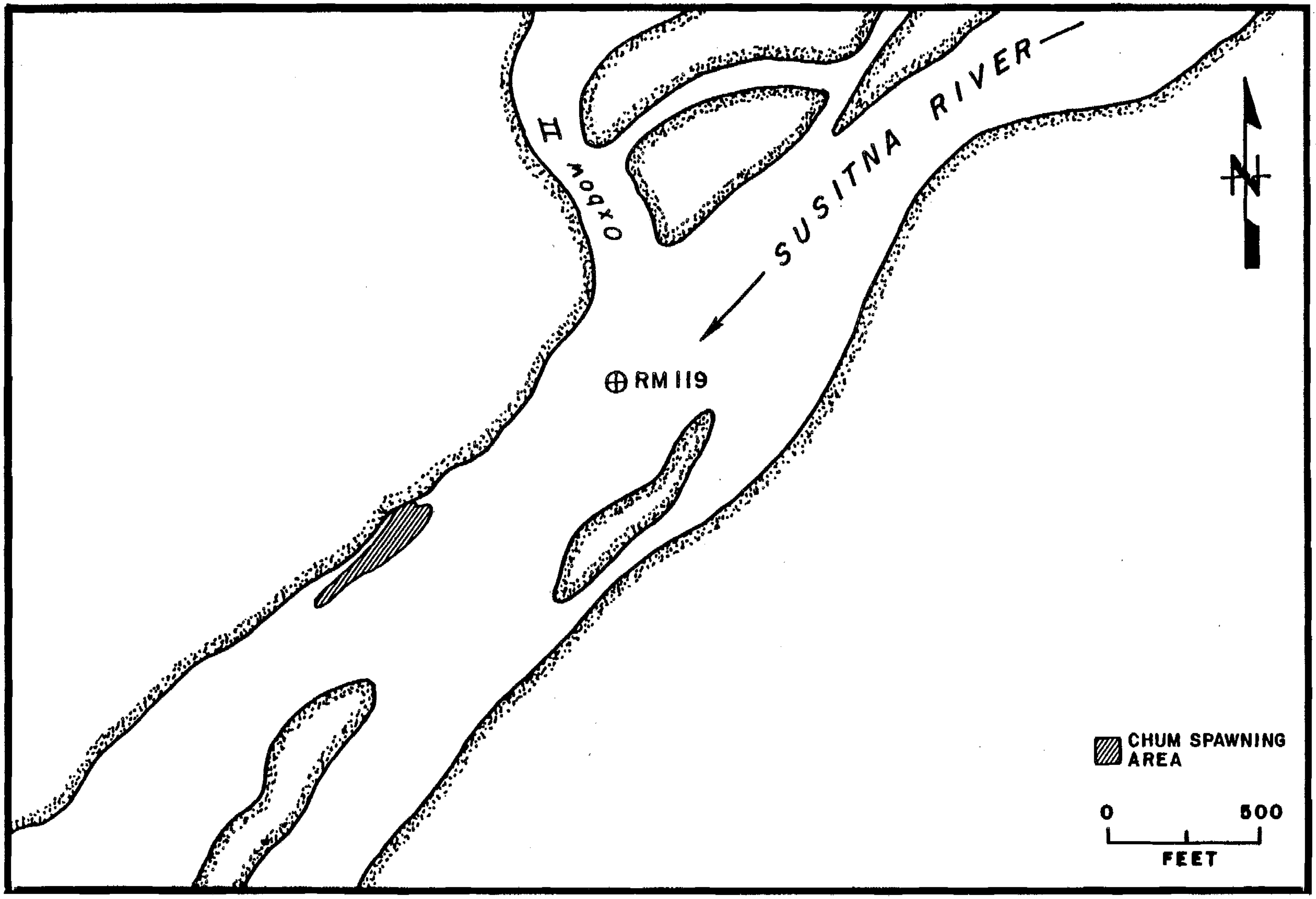
Appendix Figure 2-G-4. Slough 9 map with habitat locations defined,1983.



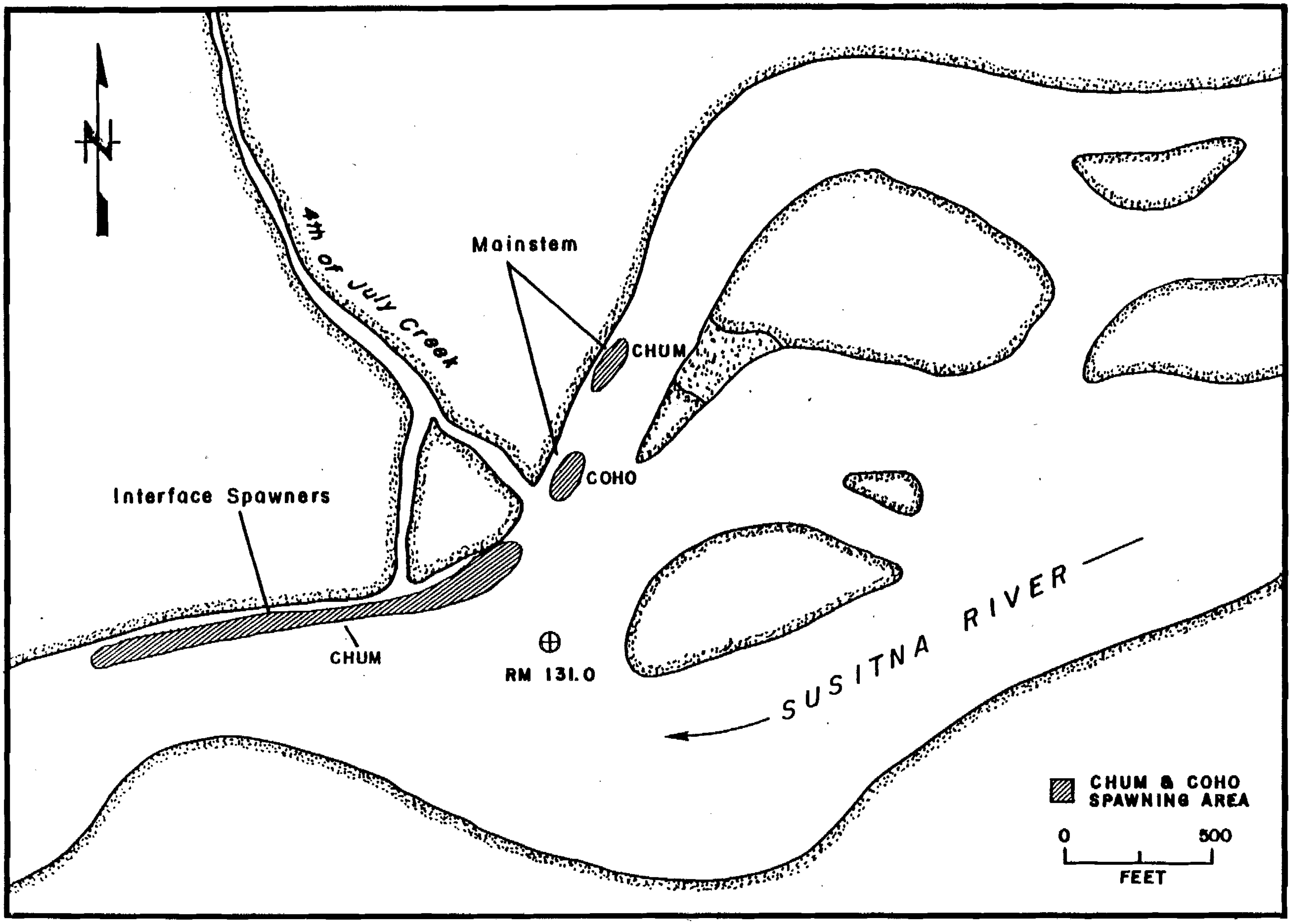
Appendix Figure 2-G-5. Slough 11 map with habitat locations defined,1983.



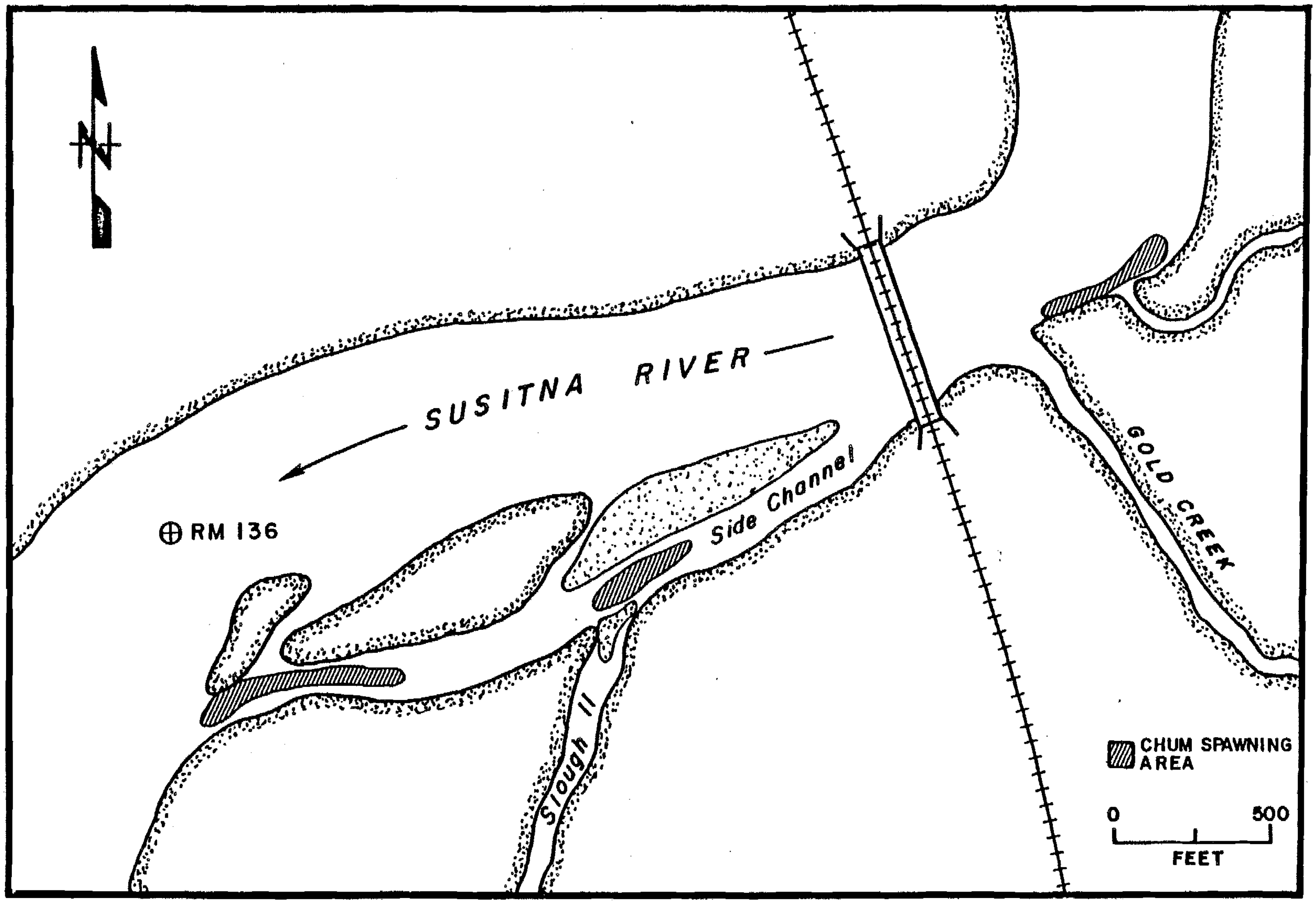
Appendix Figure 2-G-6. Mainstem Susitna River chum salmon spawning areas at RM 115.0 approximately,1983.



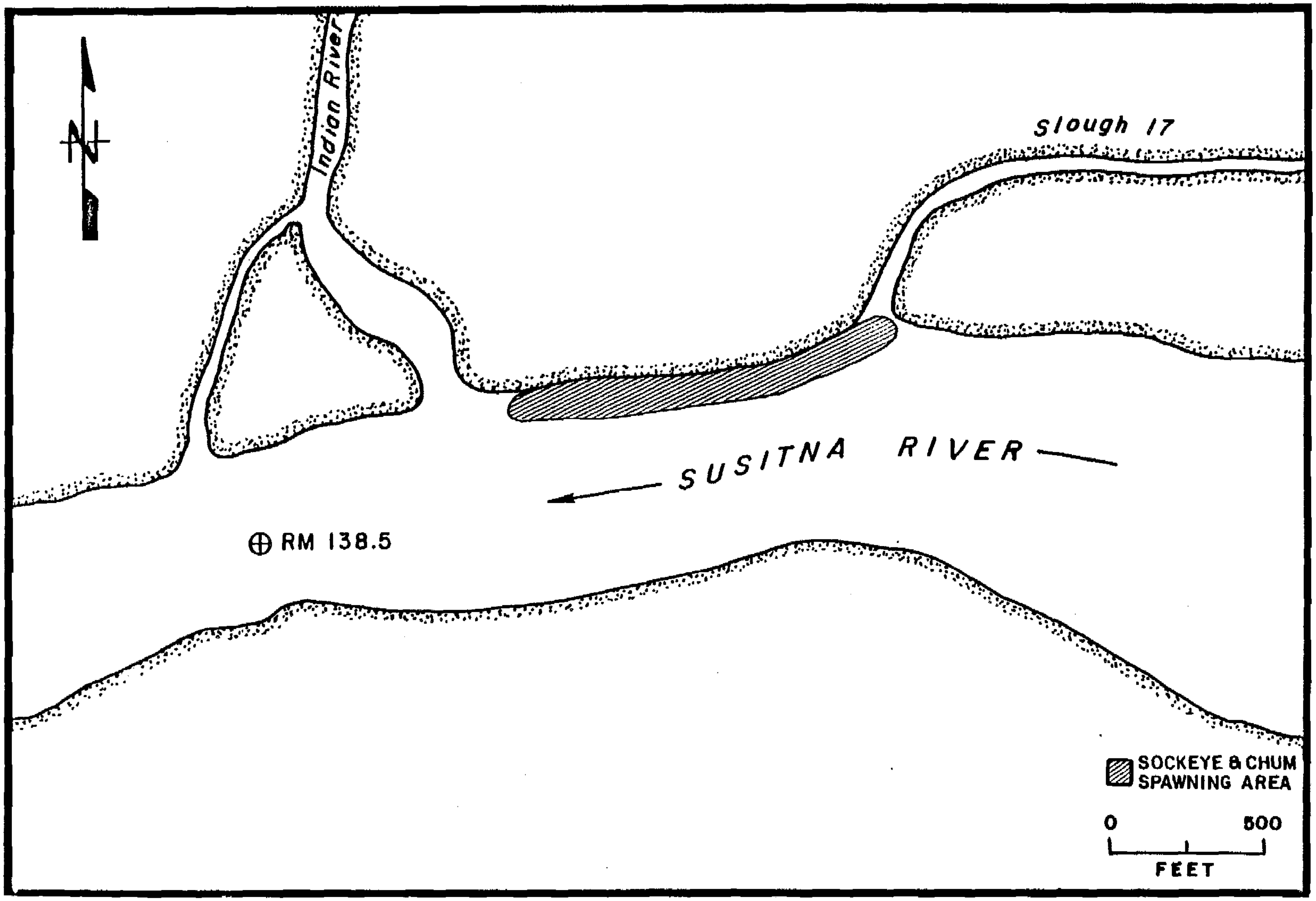
Appendix Figure 2-G-7. Mainstem Susitna River chum salmon spawning area at RM 119.0 approximately,1983.



Appendix Figure 2-G-8. Mainstem Susitna River chum and coho salmon spawning areas at RM 131.1 approximately, 1983.



Appendix Figure 2-G-9. Mainstem Susitna River chum salmon spawning areas at RM 136.1 and 136.8 approximately,1983.



Appendix Figure 2-G-10. Mainstem Susitna River sockeye and chum salmon spawning areas at RM 138.6 to 138.9 approximately, 1983.

Appendix Table 2-G-1. Mainstem Susitna River salmon spawning locations and survey results,1983.

Location		Survey									
					No. Caught/Observed						
River Mile	Legal	Date	Method	Distance	Chinook	Sockeye	Pink	Chum	Coho	Remarks	
115.0	S07N28W04BCB	9/12	Visual	300 yards	0	0	0	20	0	Low mainstem flows exposed chum salmon.	
119.0	S16N29W04CDD	9/19	Visual	1/8 mile	0	0	0	17	0	Chum observed spawning over redds in mainstem water. Low turbidity and water flow allowed high visibility of mainstem water.	
131.1	S03N03W03DAB	10/1	Visual	200 yards	0	0	0	4	2	Spawning occurred 150 yards upstream of Fourth of July Creek. Fish holding over redds.	
136.1	S20N31W02BBD	9/9	Visual	50 yards	0	0	0	110	0	This mainstem side channel is described as mainstem side channel zone III of Slough 11.	
		9/17	Visual	50 yards	0	0	0	67	0	Spawning in a 50 yard long pool.	
136.8	S20N31W02BAA	9/9	Visual	100 yards	0	0	0	12	0	Chum were spawning along bank upstream from the mouth of Gold Creek - freshly morted chum salmon carcass found on the same bank.	
138.6 to 138.9	S09N31W02DCB	9/15	Visual	1/4 mile	0	11	0	56	0	Chum and sockeye observed spawning along river bank upstream of the mouth of Indian River and Slough 17. Low mainstem water flow and low turbidity allowed for high visibility at the time of sighting.	

Appendix Table 2-G-2. Escapement survey counts of Susitna River sloughs between Chulitna River and Lower Devil Canyon, 1983.

					Adult Salmon Enumerated														
					Chinook			Sockeye			Pink			Chum			Coho		
Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 1	99.6	7/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/07	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Excellent	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 2	100.2	7/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/07	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Excellent	20	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	21	2	23	0	0	0
		9/12	Excellent	100	0	0	0	0	0	0	0	0	0	37	12	49	0	0	0
		9/19	Good	80	0	0	0	0	0	0	0	0	0	19	2	21	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 3B	101.4	7/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Poor	100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
		8/12	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	Poor	100	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0
		9/05	Excellent	100	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Slough 3A	101.9	7/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/12	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-2. Continued.

					Adult Salmon Enumerated														
					Chinook			Sockeye			Pink			Chum			Coho		
Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 4	105.2	8/07	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 5	107.6	7/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/07	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Poor	100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
		8/22	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 6	108.2	7/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/07	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 6A	112.3	7/26	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/05	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
		8/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Good	100	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0

Appendix Table 2-G-2. Continued.

Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Adult Salmon Enumerated: Chinook Live	Chinook Dead	Chinook Total	Sockeye Live	Sockeye Dead	Sockeye Total	Pink Live	Pink Dead	Pink Total	Chum Live	Chum Dead	Chum Total	Coho Live	Coho Dead	Coho Total
Slough 6A (Continued)	112.3	9/12	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 7	113.2	8/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 8	113.7	8/05	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 8D	121.8	7/26	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/03	Poor	100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
		8/12	Fair	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/01	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/09	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/17	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 8C	121.9	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/03	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/12	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Fair	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-2. Continued.

Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Chinook Live	Chinook Dead	Chinook Total	Sockeye Live	Sockeye Dead	Sockeye Total	Pink Live	Pink Dead	Pink Total	Chum Live	Chum Dead	Chum Total	Coho Live	Coho Dead	Coho Total
					Adult Salmon Enumerated														
Slough 8C (Continued)	121.9	8/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/01	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/09	Good	100	0	0	0	0	0	0	0	0	0	2	2	4	0	0	0
		9/17	Good	100	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
		9/25	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 8B	122.2	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/03	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/12	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/01	Poor	100	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
		9/09	Good	100	0	0	0	0	0	0	0	0	0	104	0	104	0	0	0
		9/17	Good	100	0	0	0	0	0	0	0	0	0	93	0	93	0	0	0
		9/25	Good	100	0	0	0	0	0	0	0	0	0	19	0	19	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	15	5	20	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0
Moose Slough	123.5	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/05	Excellent	100	0	0	0	0	0	0	0	0	0	68	0	68	0	0	0
		8/13	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/14	Poor	20	0	0	0	3	0	3	0	0	0	7	0	7	0	0	0
		8/15	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/17	Poor	75	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0
		8/18	Good	100	0	0	0	4	0	4	0	0	0	13	2	15	0	0	0
		8/20	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/21	Good	100	0	0	0	2	0	2	0	0	0	17	0	17	0	0	0
		8/23	Good	100	0	0	0	6	0	6	0	0	0	32	1	33	0	0	0
		8/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/30	Poor	100	0	0	0	7	0	7	0	0	0	24	6	30	0	0	0
		9/01	Poor	100	0	0	0	1	0	1	0	0	0	6	12	18	0	0	0
		9/02	Poor	100	0	0	0	2	0	2	0	0	0	4	8	12	0	0	0
		9/03	Poor	100	0	0	0	1	0	1	0	0	0	4	13	17	0	0	0
		9/05	Fair	100	0	0	0	13	0	13	0	0	0	8	11	19	0	0	0
		9/07	Excellent	100	0	0	0	19	0	19	0	0	0	5	7	12	0	0	0
		9/09	Excellent	100	0	0	0	21	1	22	0	0	0	6	9	15	0	0	0
		9/11	Excellent	100	0	0	0	18	0	18	0	0	0	3	10	13	0	0	0
		9/18	Excellent	100	0	0	0	2	0	2	0	0	0	0	8	8	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-2. Continued.

Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Adult Salmon Enumerated: Chinook Live	Chinook Dead	Chinook Total	Sockeye Live	Sockeye Dead	Sockeye Total	Pink Live	Pink Dead	Pink Total	Chum Live	Chum Dead	Chum Total	Coho Live	Coho Dead	Coho Total
Slough A[1]	124.6	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/05	Good	100	0	0	0	0	0	0	0	0	0	3	1	4	0	0	0
		8/15	Excellent	100	0	0	0	0	0	0	0	0	0	76	1	77	0	0	0
		8/17	Excellent	100	0	0	0	0	0	0	0	0	0	67	2	69	0	0	0
		8/19	Good	100	0	0	0	0	0	0	0	0	0	49	7	56	0	0	0
		8/20	Excellent	100	0	0	0	0	0	0	0	0	0	47	5	52	0	0	0
		8/21	Excellent	100	0	0	0	0	0	0	0	0	0	48	7	55	0	0	0
		8/23	Excellent	100	0	0	0	0	0	0	0	0	0	47	8	55	0	0	0
		8/27	Excellent	20	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0
		8/28	Good	100	0	0	0	0	0	0	0	0	0	3	1	4	0	0	0
		8/30	Poor	100	0	0	0	0	0	0	0	0	0	8	5	13	0	0	0
		9/01	Good	100	0	0	0	0	0	0	0	0	0	5	12	17	0	0	0
		9/02	Excellent	100	0	0	0	0	0	0	0	0	0	8	14	22	0	0	0
		9/03	Good	100	0	0	0	0	0	0	0	0	0	6	5	11	0	0	0
		9/05	Excellent	100	0	0	0	0	0	0	0	0	0	3	13	16	0	0	0
		9/07	Excellent	100	0	0	0	0	0	0	0	0	0	0	21	21	0	0	0
		9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	43	43	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough A	124.7	7/26	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/05	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/20	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/27	Excellent	100	0	0	0	0	0	0	1	0	1	1	1	2	0	0	0
		9/02	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 8A	125.4	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/05	Good	100	0	0	0	1	0	1	3	0	3	2	0	2	0	0	0
		8/13	Excellent	100	0	0	0	0	0	0	0	0	0	16	0	16	0	0	0
		8/14	Excellent	50	0	0	0	0	0	0	0	0	0	25	0	25	0	0	0
		8/15	Excellent	50	0	0	0	0	0	0	1	0	1	29	0	29	0	0	0
		8/17	Excellent	50	0	0	0	0	0	0	0	0	0	31	0	31	0	0	0
		8/19	Excellent	50	0	0	0	30	0	30	0	0	0	16	1	17	0	0	0
		8/20	Good	100	0	0	0	0	0	0	0	0	0	21	5	26	0	0	0

Appendix Table 2-G-2. Continued.

Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Adult Salmon Enumerated: Chinook Live	Chinook Dead	Chinook Total	Sockeye Live	Sockeye Dead	Sockeye Total	Pink Live	Pink Dead	Pink Total	Chum Live	Chum Dead	Chum Total	Coho Live	Coho Dead	Coho Total
Slough 8A (Continued)	125.4	8/21	Good	50	0	0	0	0	0	0	0	0	0	29	0	29	0	0	0
		8/23	Excellent	50	0	0	0	0	0	0	0	0	0	24	1	25	0	0	0
		8/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/28	Fair	50	0	0	0	0	0	0	0	0	0	18	1	19	0	0	0
		8/30	Fair	100	0	0	0	32	0	32	0	0	0	34	3	37	0	0	0
		9/01	Good	50	0	0	0	30	0	30	0	0	0	28	6	34	0	0	0
		9/03	Excellent	100	0	0	0	36	0	36	0	0	0	32	4	36	0	0	0
		9/05	Excellent	50	0	0	0	53	1	54	0	0	0	16	3	19	0	0	0
		9/07	Excellent	100	0	0	0	41	1	42	0	0	0	14	7	21	0	0	0
		9/09	Excellent	50	0	0	0	56	1	57	0	0	0	8	10	18	0	0	0
		9/11	Excellent	100	0	0	0	63	3	66	0	0	0	7	4	11	0	0	0
		9/18	Excellent	100	0	0	0	53	3	56	0	0	0	1	1	2	0	0	0
		10/1	Excellent	100	0	0	0	25	3	28	0	0	0	1	0	1	0	0	0
		10/8	Excellent	100	0	0	0	6	2	8	0	0	0	1	0	1	0	0	0
Slough B	126.3	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/20	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	Excellent	100	0	0	0	2	0	2	0	0	0	3	4	7	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 9	128.3	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Poor	50	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0
		8/20	Excellent	100	0	0	0	0	0	0	0	0	0	49	2	51	0	0	0
		8/20	Good	100	0	0	0	0	0	0	0	0	0	50	0	50	0	0	0
		8/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/05	Good	100	0	0	0	0	0	0	0	0	0	121	31	152	0	0	0
		9/07	Excellent	100	0	0	0	2	0	2	0	0	0	116	46	162	0	0	0
		9/09	Excellent	100	0	0	0	0	0	0	0	0	0	120	36	156	0	0	0
		9/11	Excellent	100	0	0	0	1	0	1	0	0	0	105	64	169	0	0	0
		9/11	Excellent	100	0	0	0	1	0	1	0	0	0	91	76	167	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	40	125	165	0	0	0
		10/1	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-2. Continued.

Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Adult Salmon Enumerated: Chinook			Sockeye			Pink			Chum			Coho		
					Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 9B	129.2	7/26	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/20	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 9A	133.8	7/26	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/20	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	Excellent	100	0	0	0	1	0	1	0	0	0	93	4	97	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	88	17	105	0	0	0
		10/1	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	10	4	14	0	0	0
Slough 10	133.8	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/20	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/27	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	Excellent	100	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0
		10/11	Excellent	100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
11 Mainstem Zone 3	135.2	9/09	Excellent	100	0	0	0	0	0	0	0	0	0	110	18	128	0	0	0
		9/16	Excellent	100	0	0	0	0	0	0	0	0	0	67	57	124	0	0	0
		9/23	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 11	135.3	7/26	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/05	Good	100	0	0	0	68	0	68	0	0	0	70	1	71	0	0	0
		8/11	Excellent	50	0	0	0	48	0	48	7	0	7	12	0	12	0	0	0
		8/12	Excellent	100	0	0	0	52	0	52	0	0	0	32	1	33	0	0	0
		8/13	Good	100	0	0	0	36	0	36	0	0	0	54	1	55	0	0	0

Appendix Table 2-G-2. Continued.

					Adult Salmon Enumerated														
					Chinook			Sockeye			Pink			Chum			Coho		
Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 11 (Continued)	135.3	8/14	Excellent	100	0	0	0	40	0	40	0	0	0	51	1	52	0	0	0
		8/15	Excellent	100	0	0	0	27	0	27	0	0	0	91	0	91	0	0	0
		8/18	Excellent	100	0	0	0	4	0	4	0	0	0	71	0	71	0	0	0
		8/20	Excellent	100	0	0	0	34	0	34	0	0	0	70	5	75	0	0	0
		8/22	Good	100	0	0	0	64	0	64	0	0	0	106	2	108	0	0	0
		8/25	Good	100	0	0	0	56	0	56	0	0	0	76	2	78	0	0	0
		8/27	Good	100	0	0	0	98	0	98	0	0	0	119	6	125	0	0	0
		8/28	Good	100	0	0	0	92	0	92	0	0	0	125	13	138	0	0	0
		8/30	Good	100	0	0	0	105	0	105	0	0	0	132	19	151	0	0	0
		9/01	Good	100	0	0	0	109	0	109	0	0	0	114	24	138	0	0	0
		9/03	Excellent	100	0	0	0	128	2	130	0	0	0	135	48	183	0	0	0
		9/05	Excellent	100	0	0	0	133	5	138	0	0	0	105	60	165	0	0	0
		9/07	Excellent	100	0	0	0	192	5	197	0	0	0	128	72	200	0	0	0
		9/09	Excellent	100	0	0	0	236	5	241	0	0	0	104	83	187	0	0	0
		9/11	Excellent	100	0	0	0	237	11	248	0	0	0	77	73	150	0	0	0
		9/18	Excellent	100	0	0	0	229	9	238	0	0	0	94	144	238	0	0	0
		9/25	Excellent	100	0	0	0	180	21	201	0	0	0	53	108	161	0	0	0
		10/3	Excellent	100	0	0	0	111	13	124	0	0	0	17	63	80	0	0	0
		10/11	Excellent	100	0	0	0	60	13	73	0	0	0	10	65	75	0	0	0
Slough 12	135.4	9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 13	135.9	8/20	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/27	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/01	Excellent	100	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0
		9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 14	135.9	8/20	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/27	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/01	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-2. Continued.

					Adult Salmon Enumerated														
					Chinook			Sockeye			Pink			Chum			Coho		
Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 15	137.2	7/25	Fair	100	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/11	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/25	Good	100	0	0	0	0	0	0	1	0	1	1	1	2	0	0	0
		9/03	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14
		9/09	Excellent	100	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
		9/15	Good	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/24	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 16	137.3	7/25	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/11	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/09	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 17	138.9	7/25	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/11	Good	100	0	0	0	0	0	0	0	0	0	28	0	28	5	0	5
		8/18	Excellent	100	0	0	0	1	0	1	0	0	0	33	0	33	0	0	0
		8/25	Excellent	100	0	0	0	2	0	2	0	0	0	89	1	90	0	0	0
		9/03	Excellent	100	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0
		9/09	Excellent	100	0	0	0	3	0	3	0	0	0	2	4	6	0	0	0
		9/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0
		9/22	Excellent	100	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	Excellent	100	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0
Slough 18	139.1	9/09	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-2. Continued.

					Adult Salmon Enumerated														
	River		Survey	Percent	Chinook			Sockeye			Pink			Chum			Coho		
Slough	Mile	Date	Conditions	Surveyed	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 19	139.7	7/25	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/11	Good	100	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
		8/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/25	Excellent	100	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0
		9/03	Excellent	100	0	0	0	1	0	1	0	0	0	2	1	3	0	0	0
		9/09	Excellent	100	0	0	0	4	1	5	0	0	0	0	0	0	0	0	0
		9/15	Excellent	100	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0
		9/22	Excellent	100	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 20	140.0	7/25	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Excellent	100	0	0	0	0	0	0	7	0	7	7	0	7	0	0	0
		8/11	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/18	Excellent	100	0	0	0	0	0	0	0	0	0	57	5	62	0	0	0
		8/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/03	Good	100	0	0	0	0	0	0	0	0	0	33	30	63	0	0	0
		9/09	Excellent	100	0	0	0	0	0	0	0	0	0	5	34	39	0	0	0
		9/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	23	23	0	0	0
		9/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 21	141.1	7/25	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/04	Poor	100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
		8/11	Poor	100	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0
		8/18	Excellent	100	0	0	0	45	0	45	0	0	0	149	5	154	0	0	0
		8/20	Poor	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
		8/22	Poor	75	0	0	0	34	0	34	0	0	0	76	5	81	0	0	0
		8/23	Poor	100	0	0	0	53	0	53	1	0	1	99	19	118	0	0	0
		8/25	Poor	100	0	0	0	0	1	1	0	0	0	1	6	7	0	0	0
		9/02	Excellent	50	0	0	0	86	0	86	0	0	0	81	0	81	0	0	0
		9/09	Excellent	100	0	0	0	180	17	197	0	0	0	149	170	319	0	0	0
		9/15	Excellent	100	0	0	0	139	30	169	0	0	0	86	161	247	0	0	0
		9/22	Excellent	100	0	0	0	45	33	78	0	0	0	20	180	200	0	0	0
		10/3	Excellent	100	0	0	0	4	6	10	0	0	0	9	7	16	0	0	0
		10/8	Excellent	100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0

Appendix Table 2-G-2. Continued.

					Adult Salmon Enumerated														
					Chinook			Sockeye			Pink			Chum			Coho		
Slough	River Mile	Date	Survey Conditions	Percent Surveyed	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Slough 22	144.5	8/18	Excellent	100	0	0	0	0	0	0	0	0	0	109	5	114	0	0	0
		8/25	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/02	Poor	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/09	Excellent	100	0	0	0	0	0	0	0	0	0	25	73	98	0	0	0
		9/15	Excellent	100	0	0	0	0	0	0	0	0	0	12	39	51	0	0	0
		9/22	Excellent	100	0	0	0	0	0	0	0	0	0	1	10	11	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slough 21A	145.3	8/18	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/25	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/02	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/09	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/15	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/22	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	Excellent	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-3. Escapement survey counts of Susitna River tributary streams between Chulitna River and Upper Devil Canyon, 1983.

						Adult Salmon Enumerated														
					Survey	Chinook			Sockeye			Pink			Chum			Coho		
Stream	River Mile	Date	Survey Method	Survey Conditions	Distance Miles	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Whiskers Creek	101.4	7/15	F	Excellent	0.25	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0
		7/25	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/4	F	Poor	0.25	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
		8/12	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
		8/26	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
		9/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	55	0	55
		9/9	F	Fair	0.25	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50
		9/10	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	32	0	32
		9/24	A	Excellent	8.00	0	0	0	0	0	0	0	0	0	0	0	0	110	5	115
		10/1	A	Poor	8.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Good	8.00	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6
Chase Creek	106.9	7/21	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7/22	F	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/1	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/12	F	Good	0.75	0	0	0	0	0	0	5	1	6	0	0	0	0	0	0
		8/27	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/6	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/24	A	Excellent	1.20	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12
		10/1	A	Good	1.20	0	0	0	0	0	0	0	0	0	0	0	0	5	1	6
		10/1	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	1.20	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
		10/8	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Slash Creek	111.2	7/27	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/2	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Gash Creek	111.6	7/27	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/5	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-3. Continued.

Stream	River Mile	Date	Survey Method	Survey Conditions	Survey Distance Miles	Adult Salmon Enumerated: Chinook Live	Chinook Dead	Chinook Total	Sockeye Live	Sockeye Dead	Sockeye Total	Pink Live	Pink Dead	Pink Total	Chum Live	Chum Dead	Chum Total	Coho Live	Coho Dead	Coho Total
Gash Creek (Continued)	111.6	9/12	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	18	1	19
		10/2	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	15	1	16
Lane Creek	113.6	7/12	F	Excellent	1.50	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0
		7/21	F	Excellent	1.50	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0
		7/28	F	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/2	A	Excellent	1.50	10	2	12	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.25	6	0	6	0	0	0	5	0	5	0	0	0	0	0	0
		8/15	F	Excellent	0.25	0	0	0	0	0	0	28	0	28	6	0	6	0	0	0
		8/22	F	Excellent	0.25	0	0	0	0	0	0	28	0	28	2	1	3	0	0	0
		8/29	F	Excellent	0.25	0	0	0	0	0	0	12	2	14	1	0	1	0	0	0
		9/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
		9/24	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
		10/1	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower McKenzie Creek	116.2	7/27	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	F	Excellent	0.75	0	0	0	0	0	0	17	0	17	1	0	1	0	0	0
		8/22	F	Excellent	0.75	0	0	0	0	0	0	4	1	5	1	0	1	0	0	0
		8/29	F	Excellent	0.75	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
		9/5	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
		9/24	F	Fair	3.00	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5
		10/1	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	18	0	18
		10/8	A	Excellent	2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	F	Excellent	0.75	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
Upper McKenzie Creek	116.7	7/27	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-3. Continued.

Stream	River Mile	Date	Survey Method	Survey Conditions	Survey Distance Miles	Adult Salmon Enumerated														
						Chinook			Sockeye			Pink			Chum			Coho		
						Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Little Portage Creek	117.7	7/27	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/15	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	F	Fair	0.25	0	0	0	0	0	0	7	0	7	0	0	0	0	0	0
		8/29	F	Excellent	0.25	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0
		9/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/12	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/19	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deadhorse Creek	120.8	8/15	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/22	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/30	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/6	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/13	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/17	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/25	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5th of July Creek	123.7	7/21	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7/26	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0
		8/13	F	Good	0.25	0	0	0	0	0	0	9	0	9	0	0	0	0	0	0
		8/20	F	Excellent	0.25	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0
		8/27	F	Excellent	0.25	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0
		9/3	F	Good	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skull Creek	124.7	8/5	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/13	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/20	F	Excellent	0.25	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
		8/27	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/3	F	Good	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-3. Continued.

Stream	River Mile	Date	Survey Method	Survey Conditions	Survey Distance Miles	Adult Salmon Enumerated: Chinook Live	Chinook Dead	Chinook Total	Sockeye Live	Sockeye Dead	Sockeye Total	Pink Live	Pink Dead	Pink Total	Chum Live	Chum Dead	Chum Total	Coho Live	Coho Dead	Coho Total
Sherman Creek	130.8	8/7	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/14	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/21	F	Good	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/11	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4th of July Creek	131.0	7/10	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7/21	F	Excellent	1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7/26	F	Excellent	1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/2	F	Excellent	0.50	4	2	6	0	0	0	0	0	0	0	0	0	0	0	0
		8/5	F	Excellent	0.50	6	0	6	0	0	0	25	0	25	11	0	11	0	0	0
		8/13	F	Good	0.50	3	0	3	0	0	0	20	0	20	53	1	54	0	0	0
		8/20	F	Excellent	0.50	0	0	0	0	0	0	63	15	78	109	3	112	0	0	0
		8/27	F	Good	0.50	0	0	0	0	0	0	23	9	32	143	5	148	1	0	1
		9/3	F	Fair	0.50	0	0	0	0	0	0	2	9	11	16	14	30	0	0	0
		9/11	F	Excellent	0.50	0	0	0	0	0	0	0	0	0	18	6	24	2	0	2
		9/18	F	Excellent	0.50	0	0	0	0	0	0	0	0	0	48	6	54	2	1	3
		10/1	F	Poor	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	F	Excellent	0.50	0	0	0	0	0	0	0	0	0	9	5	14	2	0	2
Gold Creek	136.7	7/24	A	Excellent	7.00	19	4	23	0	0	0	0	0	0	0	0	0	0	0	0
		7/29	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/1	A	Excellent	7.00	13	2	15	0	0	0	0	0	0	0	0	0	0	0	0
		8/7	F	Excellent	0.25	5	1	6	0	0	0	7	0	7	0	0	0	0	0	0
		8/14	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/21	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/29	F	Good	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/10	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Good	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indian River	138.6	7/25	A	Excellent	16.00	1172	21	1193	0	0	0	0	0	0	0	0	0	0	0	0
		8/2	A	Excellent	16.00	366	40	406	0	0	0	0	0	0	0	0	0	0	0	0
		8/9	A	Poor	16.00	6	2	8	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	A	Good	16.00	0	0	0	0	0	0	47	104	151	174	187	361	16	0	16
		9/3	A	Good	16.00	0	0	0	0	0	0	0	0	0	68	50	118	33	0	33
		9/10	A	Excellent	16.00	0	0	0	0	0	0	0	0	0	55	65	120	53	0	53

Appendix Table 2-G-3. Continued.

Stream	River Mile	Date	Survey Method	Survey Conditions	Survey Distance Miles	Adult Salmon Enumerated														
						Chinook			Sockeye			Pink			Chum			Coho		
						Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Indian River (Continued)	138.6	9/24	A	Excellent	16.00	0	0	0	0	0	0	0	0	0	0	0	0	38	0	38
		10/1	A	Good	16.00	0	0	0	0	0	0	0	0	0	0	0	0	17	0	17
		10/8	A	Good	16.00	0	0	0	0	0	0	0	0	0	0	0	0	18	0	18
		7/27	F	Fair	1.00	22	18	40	0	0	0	36	0	36	76	0	76	0	0	0
		8/4	F	Good	1.00	3	1	4	0	0	0	692	4	696	314	0	314	0	0	0
		8/12	F	Good	1.00	0	0	0	0	0	0	667	8	675	455	39	494	0	0	0
		8/19	F	Excellent	1.00	0	0	0	1	0	1	837	49	886	673	138	811	27	0	27
		8/27	F	Fair	1.00	0	0	0	0	0	0	104	185	289	295	439	734	21	1	22
		9/3	F	Poor	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/10	F	Excellent	1.00	0	0	0	0	0	0	0	0	0	18	153	171	15	0	15
		9/16	F	Excellent	1.00	0	0	0	0	0	0	0	0	0	14	94	108	7	0	7
		9/22	F	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15
		10/3	F	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
Jack Long Creek	144.5	7/24	A	Excellent	8.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/1	F	Excellent	0.25	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0
		8/4	F	Excellent	0.25	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		8/12	F	Excellent	0.25	0	1	1	0	0	0	5	0	5	2	0	2	0	0	0
		8/18	F	Excellent	0.25	0	0	0	0	0	0	0	1	1	2	0	2	0	0	0
		8/25	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/2	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/10	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/15	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/22	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	F	Excellent	8.00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
		10/3	A	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portage Creek	148.9	7/25	A	Excellent	25.00	3123	17	3140	0	0	0	0	0	0	0	0	0	0	0	0
		8/9	A	Poor	25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	A	Excellent	25.00	3	2	5	0	0	0	15	20	35	424	102	526	0	0	0
		9/4	A	Good	25.00	0	0	0	0	0	0	0	0	0	86	55	141	0	0	0
		9/10	A	Excellent	25.00	0	0	0	0	0	0	0	0	0	3	5	8	0	1	1
		9/18	A	Excellent	25.00	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
		9/24	A	Excellent	25.00	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15
		10/1	A	Fair	25.00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
		10/8	A	Excellent	25.00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6
		9/9	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/4	F	Excellent	0.25	5	0	5	0	0	0	285	0	285	262	0	262	0	0	0
		8/12	F	Good	0.25	1	3	4	0	0	0	50	0	50	67	1	68	0	0	0
		8/18	F	Excellent	0.25	0	0	0	0	0	0	56	1	57	25	1	26	2	0	2
		8/25	F	Fair	0.25	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0

Appendix Table 2-G-3. Continued.

Stream	River Mile	Date	Survey Method	Survey Conditions	Survey Distance Miles	Adult Salmon Enumerated														
						Chinook			Sockeye			Pink			Chum			Coho		
						Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total
Portage Creek (Continued)	148.8	9/2	F	Poor	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/9	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/15	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
		9/22	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/3	F	Excellent	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheechako Creek	152.5	7/24	A	Excellent	1.25	16	0	16	0	0	0	0	0	0	0	0	0	0	0	0
		8/1	A	Excellent	1.25	25	0	25	0	0	0	0	0	0	0	0	0	0	0	0
		8/9	A	Good	1.25	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	A	Fair	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/4	A	Good	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/10	A	Excellent	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	A	Excellent	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/24	A	Excellent	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	A	Excellent	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinook Creek	156.8	7/24	A	Excellent	1.00	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
		8/1	A	Excellent	1.00	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0
		8/9	A	Poor	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	A	Fair	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/4	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/10	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/17	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/24	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Devil Creek	161.0	7/24	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/1	A	Excellent	0.50	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		8/2	A	Excellent	0.50	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		8/9	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8/26	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/4	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/10	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/18	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9/24	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/1	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10/8	A	Excellent	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Table 2-G-4. Chinook salmon spawning ground surveys of selected spawning areas and resultant tagged to untagged ratios,1983.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Montana Creek	77.0	7/14	Excellent	63	1578	1641	26.0	6	1635	1641	273.5	4	1637	1641	410.3
		7/16	Excellent	4	64	68	17.0	2	66	68	34.0				
Rabideaux Creek	83.1	8/4	Good	1	23	24	24.0								
Clear Creek	97.1	7/7	Excellent	33	461	494	15.0	7	487	494	70.6				
		8/1	Excellent	15	245	260	17.3	1	259	260	260.0	1	259	260	260.0
Prairie Creek	97.1	7/20	Excellent	57	814	871	15.3								
		8/10	Excellent	0	10	10	0.0								
Fish Creek	97.1	7/19	Excellent	1	6	7	7.0								
Chulitna River	97.8	7/19	Excellent	26	3816	3842	147.8								
Middle Fork		8/3	Excellent	4	879	883	220.8	1	882	883	883.0				
Bunco Creek	97.8	8/2	Excellent	8	483	491	61.4	3	488	491	163.7	1	490	491	491.0
Whiskers Creek	101.4	7/15	Excellent	0	1	1	0.0								
Lane Creek	113.6	7/21	Excellent	0	4	4	0.0	1	3	4	4.0	1	5	6	6.0
		8/5	Excellent	1	5	6	6.0	2	4	6	3.0	1	5	6	6.0
4th of July Creek	131.0	8/5	Excellent	0	6	6	0.0	0	6	6	0.0	0	6	6	0.0
		8/13	Good	1	2	3	3.0	1	2	3	3.0	0	3	3	0.0
Gold Creek	136.7	8/7	Excellent	0	5	5	0.0	0	5	5	0.0	3	2	5	1.7
Indian River	138.6	7/27	Fair	2	16	18	9.0	1	17	18	18.0	2	16	18	9.0
		8/2	Excellent	4	47	51	12.8	4	47	51	12.8	5	46	51	10.2
		8/3	Excellent	2	80	82	41.0	4	78	82	20.5	10	72	82	8.2
		8/4	Good	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
Jack Long Cr.	144.5	8/1	Excellent	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
Portage Creek	148.9	8/1	Excellent	3	95	98	32.7	7	91	98	14.0	3	95	98	32.7
		8/4	Excellent	0	5	5	0.0	0	5	5	0.0	0	5	5	0.0
		8/12	Good	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0

Appendix Table 2-G-5. Sockeye salmon spawning ground surveys of selected spawning areas and resultant tagged to untagged ratios,1983.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Prairie Creek	97.1	8/10	Good	12	27	39	3.3								
Fish Creek	97.1	8/16	Excellent	2	10	12	6.0								
		8/22	Good	0	1	1	0.0								
Larson Creek	97.1	8/4	Excellent	1	15	16	16.0								
Byers Creek	97.8	8/16	Excellent	3	55	58	19.3								
Unnamed Trib. to Tokositna R.	97.8	8/5	Excellent	17	220	237	13.9								
Slough 3B	101.4	9/5	Excellent	0	1	1	0.0								
		9/19	Excellent	0	5	5	0.0					1	4	5	5.0
		10/8	Excellent	0	1	1	0.0								
Moose Slough	123.5	8/14	Poor	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
		8/24	Good	0	2	2	0.0	1	1	2	2.0	1	1	2	2.0
		8/30	Poor	1	6	7	7.0	0	7	7	0.0	2	5	7	3.5
		9/7	Excellent	5	14	19	3.8	5	14	19	3.8	4	15	19	4.8
		9/13	Excellent	3	11	14	4.7	5	9	14	2.8	3	11	14	4.7
		9/19	Excellent	0	8	8	0.0	2	6	8	4.0	0	8	8	0.0
Slough 8A	125.1	8/5	Good	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
		8/19	Excellent	0	30	30	0.0	0	30	30	0.0	1	29	30	30.0
		9/3	Excellent	3	33	36	12.0	7	29	36	5.1	4	32	36	9.0
		9/11	Excellent	2	61	63	31.5	9	54	63	7.0	8	55	63	7.9
		9/18	Excellent	1	52	53	53.0	7	46	53	7.6	7	46	53	7.6
		10/1	Excellent	0	25	25	0.0	1	24	25	25.0	3	22	25	8.3
		10/8	Excellent	0	6	6	0.0	0	6	6	0.0	1	5	6	6.0

Appendix Table 2-G-5. Continued.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Slough 8	126.3	9/11	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		9/18	Excellent	1	4	5	5.0	1	4	5	5.0	0	5	5	0.0
Slough 9	128.3	9/7	Excellent	0	2	2	0.0	1	1	2	2.0	0	2	2	0.0
Slough 9A	133.8	9/11	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Slough 10	133.8	10/1	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Slough 11	135.3	8/5	Good	12	56	68	5.7	18	50	68	3.8	5	63	68	13.6
		8/13	Good	8	28	36	4.5	7	29	36	5.1	0	36	36	0.0
		8/20	Excellent	2	32	34	17.0	3	31	34	11.3	4	30	34	8.5
		8/27	Good	11	87	98	8.9	6	92	98	16.3	10	88	98	9.8
		9/3	Excellent	17	111	128	7.5	10	118	128	12.8	10	118	128	12.8
		9/11	Excellent	23	214	237	10.3	12	225	237	19.8	17	220	237	13.9
		9/18	Excellent	15	214	229	15.3	13	216	229	17.6	11	218	229	20.8
		9/25	Excellent	13	167	180	13.8	11	169	180	16.4	7	173	180	25.7
		10/3	Excellent	11	100	111	10.1	9	102	111	12.3	3	108	111	37.0
		10/11	Excellent	1	59	60	60.0	2	58	60	30.0	0	60	60	0.0
Slough 17	138.9	8/18	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
		8/25	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		9/3	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
		9/9	Excellent	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
		9/22	Excellent	0	6	6	0.0	0	6	6	0.0	1	5	6	6.0
		10/8	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0

Appendix Table 2-G-6. Pink salmon spawning ground surveys of selected spawning areas and resultant tagged to untagged ratios,1983.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Birch Creek	88.4	8/16	Excellent	62	440	502	8.1	2	500	502	251.0				
Fish Creek	97.1	8/16	Excellent	45	441	486	10.8	2	466	468	234.0	1	467	468	468.0
		8/22	Good	10	57	67	6.7								
Chase Creek	106.9	8/12	Good	0	5	5	0.0	2	3	5	2.5	2	5	7	3.5
Lane Creek	113.6	8/5	Excellent	0	5	5	0.0	0	5	5	0.0				
		8/15	Excellent	1	27	28	28.0	1	27	28	28.0				
		8/22	Excellent	4	24	28	7.0	3	25	28	9.3	1	27	28	28.0
		8/29	Excellent	0	12	12	0.0	2	10	12	6.0				
Lower McKenzie Creek	116.2	8/15	Excellent	1	16	17	17.0	4	13	17	4.3	4	13	17	4.3
		8/22	Excellent	1	3	4	4.0	2	2	4	2.0				
		8/29	Excellent	0	1	1	0.0	0	1	1	0.0				
Little Portage Creek	117.7	8/22	Excellent	0	6	6	0.0	0	6	6	0.0	1	5	6	6.0
		8/29	Excellent	1	1	2	2.0	1	1	2	2.0	1	1	2	2.0
5th of July Creek	123.7	8/13	Good	3	6	9	3.0	4	5	9	2.3	0	9	9	0.0
		8/20	Excellent	0	6	6	0.0	3	3	6	2.0	0	6	6	0.0
		8/27	Excellent	0	3	3	0.0	2	1	3	1.5	0	3	3	0.0
Skull Creek	124.7	8/20	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Slough A	124.7	8/27	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Slough 8A	125.1	8/5	Good	0	3	3	0.0	0	3	3	0.0	1	2	3	3.0
		8/15	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
4th of July Creek	131.0	8/5	Excellent	2	23	25	12.5	7	18	25	3.6	5	20	25	5.0
		8/13	Excellent	2	18	20	10.0	6	14	20	3.3	4	16	20	5.0
		8/20	Excellent	7	56	63	9.0	16	47	63	3.9	3	60	63	21.0
		8/27	Good	3	20	23	7.7	4	19	23	5.8	2	21	23	11.5
Slough 11	135.3	8/11	Excellent	0	7	7	0.0	1	6	7	7.0	0	7	7	0.0
Gold Creek	136.7	8/7	Excellent	0	7	7	0.0	2	5	7	3.5	3	4	7	2.3

Appendix Table 2-G-6. Continued.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Slough 15	137.2	8/25	Good	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Indian River	138.6	7/27	Fair	0	36	36	0.0	22	14	36	1.6	7	29	36	5.1
		8/4	Good	75	616	691	9.2	172	519	691	4.0	55	636	691	12.6
		8/12	Good	62	605	667	10.8	146	521	667	4.6	56	611	667	11.9
		8/19	Excellent	38	798	836	22.0	120	716	836	7.0	49	787	836	17.1
		8/27	Excellent	3	101	104	34.7	1	103	104	104.0	7	97	104	14.9
Jack Long Creek	144.5	8/12	Excellent	0	5	5	0.0	2	3	5	2.5	1	4	5	5.0
Portage Creek	148.9	8/4	Excellent	32	214	246	7.7	77	169	246	3.2	27	219	246	9.1
		8/12	Good	5	35	40	8.0	15	25	40	2.7	6	34	40	6.7
		8/18	Excellent	2	54	56	28.0	15	41	56	3.7	6	50	56	9.3

Appendix Table 2-G-7. Chum salmon spawning ground surveys of selected spawning areas and resultant tagged to untagged ratios, 1983.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Prairie Creek	97.1	8/10	Excellent	0	1	1	0.0								
Clear Creek	97.1	8/1	Excellent	165	1551	1716	10.4	1	1715	1716	1716.0				
Fish Creek	97.1	8/16	Excellent	1	7	8	8.0								
		8/22	Excellent	1	6	7	7.0								
Troublesome Creek	97.8	8/23	Excellent	0	79	79	0.0	1	78	79	79.0				
Byers Creek	97.8	8/16	Excellent	0	27	27	0.0								
Slough 2	100.4	8/29	Excellent	1	9	10	10.0	2	8	10	5.0				
		9/5	Excellent	2	19	21	10.5					2	19	21	10.5
		9/12	Excellent	3	34	37	12.3	2	35	37	18.5	1	36	37	37.0
		9/19	Good	2	19	21	10.5								
Slough 6A	112.3	9/5	Good	0	6	6	0.0	0	6	6	0.0	1	5	6	6.0
Lane Creek	113.6	8/15	Excellent	0	6	6	0.0	0	6	6	0.0				
		8/22	Excellent	0	3	3	0.0	0	3	3	0.0				
		8/29	Excellent	0	1	1	0.0	0	1	1	0.0				
Lower McKenzie Creek	116.2	8/15	Excellent	0	1	1	0.0	0	1	1	0.0				
		8/22	Excellent	0	1	1	0.0	0	1	1	0.0				
Mainstem	119.0	9/19	Excellent	0	17	17	0.0	0	17	17	0.0				
Slough 8C	121.9	9/9	Good	1	3	4	4.0	0	4	4	0.0				
		9/17	Good	0	1	1	0.0	0	1	1	0.0				
Slough 8B	122.2	9/9	Good	0	104	104	0.0	0	104	104	0.0	0	104	104	0.0
		9/17	Good	0	93	93	0.0	0	93	93	0.0	0	93	93	0.0
		9/25	Good	0	19	19	0.0	0	19	19	0.0	0	19	19	0.0
		10/1	Excellent	0	20	20	0.0	0	20	20	0.0	0	20	20	0.0
		10/8	Excellent	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
Moose Slough	123.5	8/5	Excellent	11	57	68	6.2	16	52	68	4.3	4	64	68	17.0
		8/18	Good	0	15	15	0.0	0	15	15	0.0	1	14	15	15.0

Appendix Table 2-G-7. Continued.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Moose Slough (Continued)	123.5	8/21	Good	1	16	17	17.0	0	17	17	0.0	0	17	17	0.0
		8/23	Good	2	31	33	16.5	0	33	33	0.0	0	33	33	0.0
		9/5	Fair	0	19	19	0.0	0	19	19	0.0	0	19	19	0.0
		9/7	Excellent	0	12	12	0.0	0	12	12	0.0	0	12	12	0.0
		9/9	Excellent	1	14	15	15.0	0	15	15	0.0	0	15	15	0.0
		9/11	Excellent	0	17	17	0.0	1	16	17	17.0	0	17	17	0.0
		9/18	Excellent	0	8	8	0.0	0	8	8	0.0	0	8	8	0.0
5th of July Cr.	123.7	8/5	Good	0	4	4	0.0	0	4	4	0.0	1	3	4	4.0
Slough A'	124.6	8/5	Good	0	4	4	0.0	0	4	4	0.0	0	4	4	0.0
		8/15	Excellent	6	71	77	12.8	4	73	77	19.3	5	72	77	15.4
		8/17	Excellent	7	62	69	9.9	6	63	69	11.5	5	64	69	13.8
		8/19	Good	5	51	56	11.2	4	52	56	14.0	5	51	56	11.2
		8/20	Excellent	1	51	52	52.0	8	44	52	6.5	5	47	52	10.4
		8/21	Excellent	0	55	55	0.0	5	50	55	11.0	4	51	55	13.8
		8/23	Excellent	2	53	55	27.5	4	51	55	13.8	7	48	55	7.9
		8/27	Excellent	1	9	10	10.0	0	10	10	0.0	0	10	10	0.0
		8/28	Good	0	4	4	0.0	0	4	4	0.0	0	4	4	0.0
		9/1	Good	0	17	17	0.0	0	17	17	0.0	0	17	17	0.0
		9/2	Excellent	1	21	22	22.0	0	22	22	0.0	0	22	22	0.0
		9/3	Good	0	11	11	0.0	0	11	11	0.0	0	11	11	0.0
		9/5	Excellent	0	16	16	0.0	0	16	16	0.0	0	16	16	0.0
		9/7	Excellent	0	21	21	0.0	0	21	21	0.0	0	21	21	0.0
		9/11	Excellent	0	43	43	0.0	0	43	43	0.0	0	43	43	0.0
Slough A	124.7	8/27	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
Slough 8A	125.1	8/5	Good	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		8/13	Excellent	1	15	16	16.0	0	16	16	0.0	0	16	16	0.0
		8/15	Excellent	2	23	25	12.5	0	25	25	0.0	0	25	25	0.0
		8/17	Excellent	2	29	31	15.5	2	29	31	15.5	1	30	31	31.0
		8/19	Excellent	3	14	17	5.7	0	17	17	0.0	1	16	17	17.0
		8/20	Good	3	23	26	8.7	0	26	26	0.0	1	25	26	26.0
		8/21	Good	2	27	29	14.5	4	25	29	7.3	3	26	29	9.7
		8/23	Excellent	1	24	25	25.0	1	24	25	25.0	1	24	25	25.0
		8/28	Fair	2	17	19	9.5	1	18	19	19.0	1	18	19	19.0
		8/30	Fair	3	34	37	12.3	2	35	37	18.5	2	35	37	18.5
		9/1	Good	0	34	34	0.0	1	33	34	34.0	2	32	34	17.0

Appendix Table 2-G-7. Continued.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Slough 8A (Continued)	125.1	9/3	Excellent	3	33	36	12.0	0	36	36	0.0	2	34	36	18.0
		9/5	Excellent	4	15	19	4.8	0	19	19	0.0	2	17	19	9.5
		9/7	Excellent	1	20	21	21.0	0	21	21	0.0	1	20	21	21.0
		9/9	Excellent	0	18	18	0.0	0	18	18	0.0	0	18	18	0.0
		9/11	Excellent	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
		9/18	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		10/1	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
		10/8	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Slough 8	126.3	9/11	Excellent	0	7	7	0.0	0	7	7	0.0	1	6	7	7.0
Slough 9	128.3	8/20	Good	2	48	50	25.0	3	47	50	16.7	2	48	50	25.0
		9/5	Good	5	147	152	30.4	4	148	152	38.0	5	147	152	30.4
		9/7	Excellent	5	157	162	32.4	6	156	162	27.0	6	156	162	27.0
		9/9	Excellent	9	147	156	17.3	7	149	156	22.3	5	151	156	31.2
		9/11	Excellent	10	157	167	16.7	6	161	167	27.8	3	164	167	55.7
		9/18	Excellent	0	165	165	0.0	2	163	165	82.5	3	162	165	55.0
4th of July Creek	131.0	8/5	Excellent	2	9	11	5.5	1	10	11	11.0	2	9	11	5.5
		8/13	Good	10	44	54	5.4	3	51	54	18.0	3	51	54	18.0
		8/20	Excellent	10	102	112	11.2	10	102	112	11.2	8	104	112	14.0
		8/27	Good	10	190	200	20.0	6	194	200	33.3	3	197	200	66.7
		9/3	Fair	2	28	30	15.0	0	30	30	0.0	0	30	30	0.0
		9/10	Excellent	2	22	24	12.0	0	24	24	0.0	0	24	24	0.0
		9/18	Excellent	4	50	54	13.5	4	50	54	13.5	2	52	54	27.0
		10/8	Excellent	0	14	14	0.0	0	14	14	0.0	0	14	14	0.0
Slough 9A	133.8	9/11	Excellent	7	90	97	13.9	6	91	97	16.2	2	95	97	48.5
		9/18	Excellent	5	100	105	21.0	6	99	105	17.5	2	103	105	52.5
		10/8	Excellent	0	14	14	0.0	0	14	14	0.0	0	14	14	0.0
Slough 10	133.8	10/1	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
		10/11	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Mainstem	135.2	9/9	Excellent	3	125	128	42.7	4	124	128	32.0	6	122	128	21.3
		9/16	Excellent	4	120	124	31.0	0	124	124	0.0	1	123	124	124.0
Slough 11	135.3	8/5	Good	9	62	71	7.9	12	59	71	5.9	9	62	71	7.9
		8/11	Excellent	1	11	12	12.0	0	12	12	0.0	0	12	12	0.0
		8/12	Excellent	3	30	33	11.0	2	31	33	16.5	0	33	33	0.0

Appendix Table 2-G-7. Continued.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Slough 11 (Continued)	135.3	8/13	Good	8	47	55	6.9	6	49	55	9.2	6	49	55	9.2
		8/14	Excellent	5	47	52	10.4	7	45	52	7.4	2	50	52	26.0
		8/15	Excellent	7	84	91	13.0	3	88	91	30.3	4	87	91	22.8
		8/18	Excellent	1	70	71	71.0	5	66	71	14.2	1	70	71	71.0
		8/20	Excellent	3	72	75	25.0	5	70	75	15.0	7	68	75	10.7
		8/22	Good	5	103	108	21.6	5	103	108	21.6	5	103	108	21.6
		8/25	Good	2	76	78	39.0	1	77	78	78.0	4	74	78	19.5
		8/27	Good	7	118	125	17.9	1	124	125	125.0	8	117	125	15.6
		8/28	Good	11	127	138	12.5	3	135	138	46.0	8	130	138	17.3
		8/30	Good	8	143	151	18.9	5	146	151	30.2	5	146	151	30.2
		9/1	Good	7	131	138	19.7	2	136	138	69.0	4	134	138	34.5
		9/3	Excellent	10	173	183	18.3	3	180	183	61.0	6	177	183	30.5
		9/5	Excellent	8	157	165	20.6	3	162	165	55.0	3	162	165	55.0
		9/7	Excellent	13	187	200	15.4	4	196	200	50.0	5	195	200	40.0
		9/9	Excellent	4	183	187	46.8	12	175	187	15.6	4	183	187	46.8
		9/11	Excellent	23	127	150	6.5	12	138	150	12.5	17	133	150	8.9
		9/18	Excellent	4	234	238	59.5	6	232	238	39.7	1	237	238	238.0
		9/25	Excellent	6	155	161	26.8	5	156	161	32.2	0	161	161	0.0
		10/3	Excellent	0	80	80	0.0	0	80	80	0.0	0	80	80	0.0
		10/11	Excellent	1	74	75	75.0	2	73	75	37.5	0	75	75	0.0
Mainstem	136.7	9/9	Excellent	0	4	4	0.0	0	4	4	0.0	0	4	4	0.0
Slough 13	135.9	9/1	Excellent	0	4	4	0.0	0	4	4	0.0	0	4	4	0.0
Slough 15	137.2	8/25	Good	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		9/9	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Indian River	138.6	7/27	Fair	7	66	73	10.4	13	60	73	5.6	13	60	73	5.6
		8/4	Good	29	272	301	10.4	43	258	301	7.0	15	286	301	20.1
		8/12	Good	20	479	499	25.0	24	475	499	20.8	35	464	499	14.3
		8/19	Excellent	23	594	617	26.8	27	590	617	22.9	22	595	617	28.0
		8/26	Excellent	0	361	361	0.0	0	361	361	0.0	0	361	361	0.0
		8/27	Excellent	12	710	722	60.2	8	714	722	90.3	12	710	722	60.2
		9/3	Excellent	0	118	118	0.0	0	118	118	0.0	0	118	118	0.0
		9/10	Excellent	4	161	165	41.3	0	165	165	0.0	0	165	165	0.0
		9/16	Excellent	1	106	107	107.0	0	107	107	0.0	0	107	107	0.0

Appendix Table 2-G-7. Continued.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Mainstem	138.9	9/15	Excellent	1	55	56	56.0	1	55	56	56.0	2	54	56	28.0
Slough 17	138.4	8/11	Good	1	27	28	28.0	1	27	28	28.0	1	27	28	28.0
		8/18	Excellent	4	29	33	8.3	0	33	33	0.0	2	31	33	16.5
		8/25	Excellent	3	87	90	30.0	1	89	90	90.0	1	89	90	90.0
		9/3	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		9/9	Excellent	0	6	6	0.0	0	6	6	0.0	0	6	6	0.0
		9/15	Excellent	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
Slough 19	139.7	8/25	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		9/3	Excellent	0	3	3	0.0	0	3	3	0.0	0	3	3	0.0
Slough 20	140.0	8/4	Excellent	1	6	7	7.0	0	7	7	0.0	1	6	7	7.0
		8/18	Excellent	2	60	62	31.0	2	60	62	31.0	6	56	62	10.3
		9/3	Good	1	62	63	63.0	0	63	63	0.0	1	62	63	63.0
		9/9	Excellent	1	38	39	39.0	0	39	39	0.0	0	39	39	0.0
		9/15	Excellent	0	23	23	0.0	0	23	23	0.0	0	23	23	0.0
Slough 21	141.1	8/18	Excellent	7	147	154	22.0	6	148	154	25.7	2	152	154	77.0
		9/2	Excellent	4	77	81	20.3	3	78	81	27.0	1	80	81	81.0
		9/9	Excellent	17	302	319	18.8	8	311	319	39.9	6	313	319	53.2
		9/15	Excellent	8	239	247	30.9	3	244	247	82.3	1	246	247	247.0
		9/22	Excellent	1	199	200	200.0	0	200	200	0.0	0	200	200	0.0
		10/3	Excellent	0	16	16	0.0	0	16	16	0.0	1	15	16	16.0
		10/8	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Slough 22	144.3	8/18	Excellent	1	113	114	114.0	1	113	114	114.0	4	110	114	28.5
		9/9	Excellent	1	97	98	98.0	0	98	98	0.0	0	98	98	0.0
		9/15	Excellent	1	50	51	51.0	0	51	51	0.0	0	51	51	0.0
		9/22	Excellent	0	11	11	0.0	0	11	11	0.0	0	11	11	0.0
Jack Long Creek	144.5	8/12	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
		8/18	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
Portage Creek	148.9	8/4	Excellent	22	218	240	10.9	24	216	240	10.0	14	226	240	17.1
		8/12	Good	11	35	46	4.2	1	45	46	46.0	2	44	46	23.0
		8/18	Excellent	4	22	26	6.5	1	25	26	26.0	0	26	26	0.0
		8/26	Excellent	1	222	223	223.0	1	222	223	223.0	5	218	223	44.6
		9/4	Good	0	220	220	0.0	1	219	220	220.0	1	219	220	220.0
		9/10	Excellent	0	8	8	0.0	0	8	8	0.0	0	8	8	0.0
		9/15	Excellent	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0

Appendix Table 2-G-8. Coho salmon spawning ground surveys of selected spawning areas and resultant tagged to untagged ratios,1983.

LOCATION				SUNSHINE TAGS				TALKEETNA TAGS				CURRY TAGS			
Spawning Area	River Mile	Date	Survey Conditions	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)	Tagged (r)	Untagged	Total (c)	Ratio (c/r)
Question Creek	84.1	9/11	Fair	45	105	150	3.3	8	142	150	18.8				
Birch Creek	88.4	8/16	Excellent	42	218	260	6.2					1	259	260	260.0
Fish Creek	97.1	8/16	Excellent	6	29	35	5.8	1	34	35	35.0				
		8/22	Good	1	9	10	10.0								
Byers Creek	97.8	8/16	Good	0	3	3	0.0								
Whiskers Creek	101.4	8/26	Excellent	1	0	1	1.0								
		9/5	Excellent	8	47	55	6.9	5	50	55	11.0				
		9/19	Excellent	6	26	32	5.3					2	30	32	16.0
Slash Creek	111.2	10/2	Excellent	0	2	2	0.0	1	1	2	2.0				
Gash Creek	111.6	9/19	Excellent	3	15	18	6.0	4	14	18	4.5	3	15	18	6.0
		10/2	Excellent	0	14	14	0.0	0	14	14	0.0	1	13	14	14.0
Lane Creek	113.6	9/19	Excellent	0	2	2	0.0	1	1	2	2.0	1	1	2	2.0
		9/24	Excellent	0	1	1	0.0	0	1	1	0.0				
Lower McKenzie Creek	116.2	9/19	Excellent	2	2	4	2.0	0	4	4	0.0				
		9/24	Fair	0	4	4	0.0	0	4	4	0.0				
		10/1	Excellent	2	16	18	9.0	1	17	18	18.0	1	17	18	18.0
		10/8	Excellent	0	2	2	0.0	0	2	2	0.0				
4th of July Creek	131.0	8/27	Good	0	1	1	0.0	0	1	1	0.0	0	1	1	0.0
		9/11	Excellent	0	2	2	0.0	0	2	2	0.0	1	1	2	2.0
		9/18	Excellent	1	1	2	2.0	0	2	2	0.0	0	2	2	0.0
		10/8	Excellent	0	2	2	0.0	0	2	2	0.0	0	2	2	0.0
Slough 15	137.2	9/3	Excellent	3	11	14	4.7	1	13	14	14.0	2	12	14	7.0
		9/24	Excellent	1	1	2	2.0	0	2	2	0.0	0	2	2	0.0
Indian River	138.6	8/19	Excellent	6	21	27	4.5	10	17	27	2.7	3	24	27	9.0
		8/27	Excellent	4	17	21	5.3	1	20	21	21.0	1	20	21	21.0
		9/10	Excellent	2	11	13	6.5	0	13	13	0.0	2	11	13	6.5
		9/16	Excellent	0	6	6	0.0	0	6	6	0.0	1	5	6	6.0
		9/22	Excellent	5	10	15	3.0	2	13	15	7.5	0	15	15	0.0
		10/3	Excellent	1	4	5	5.0	2	3	5	2.5	0	5	5	0.0
Portage Creek	144.5	8/18	Excellent	1	1	2	2.0	0	2	2	0.0	0	2	2	0.0

Appendix Table 2-G-9. Total 1981 sockeye salmon slough escapements between RM 98.6 and 161.0.

Slough	River Mile	Total Fish Days 1/	Peak Live-Dead Survey Count	Mean Observation Life in Days 2/	Slough Escapement	% of Total Slough Escapement	% of Curry Station Escapement 4/
3A	101.9		7		13 3/	0.6	0.5
8A	125.1	2,302.5	177	11.8	195	9.0	7.0
9	128.3		10		18 3/	0.8	0.6
9B	129.2	2,506.0	81	11.8	212	9.7	7.6
9A	133.		2		4 3/	0.2	0.1
11	135.3	19,116.0	893	11.8	1,620	74.4	57.9
17	138.9		6		11 3/	0.5	0.4
19	139.7	494.1	23	11.8	42	1.9	1.5
21	141.1	739.1	38	11.8	63	2.9	2.3
TOTAL		25,157.7	1,237	-	2,178	100.0	77.9

1/ Number of fish days were calculated for sloughs that had peak survey counts > 15 fish. Refer to Section 2.4 for detailed data analysis procedures.

2/ Mean observation life values were computed from 1983 composite observation data.

3/ Total slough escapement into sloughs having peak live-dead survey counts of ≤ 15 fish were computed by multiplying the peak live-dead survey count by 1.8. This value represents the summation of the estimated slough escapement divided by the summation of the peak live-dead survey counts for all sloughs with peak survey counts ≥ 50 fish.

4/ 1981 Curry Station sockeye salmon escapement was approximately 2,800 fish.

Appendix Table 2-G-10. Total 1982 sockeye salmon slough escapements between RM 98.6 and 161.0.

Slough	River Mile	Total Fish Days 1/	Peak Live-Dead Survey Count	Mean Observation Life in Days 2/	Slough Escapement	% of Total Slough Escapement	% of Curry Station Escapement 4/
8C	121.9		2		5 3/	0.3	0.4
8B	122.2		5		13 3/	0.9	1.0
Moose	123.5		8		20 3/	1.3	1.5
8A	125.1	1,551.4	68	11.8	131	8.8	10.1
B	126.3		8		20 3/	1.3	1.5
9	128.3		5		13 3/	0.9	1.0
11	135.3	14,149.0	456	11.8	1,199	80.6	92.2
21	141.1	1,022.7	53	11.8	87	5.9	6.7
TOTAL		16,723.1	605	-	1,488	100.0	114.4

1/ Number of fish days were calculated for sloughs that had peak survey counts > 15 fish. Refer to Section 2.4 for detailed data analysis procedures.

2/ Mean observation life values were computed from 1983 composite observation data.

3/ Total slough escapement into sloughs having peak live-dead survey counts of ≤ 15 fish were computed by multiplying the peak live-dead survey count by 2.5. This value represents the summation of the estimated slough escapement divided by the summation of the peak live-dead survey counts for all sloughs with peak survey counts ≥ 50 fish.

4/ 1982 Curry Station sockeye salmon escapement was approximately 1,300 fish.

Appendix Table 2-G-11. Estimated pink salmon slough escapements for 1981, 1982 and 1983.

Year	Slough	River Mile	Peak Live-Dead Survey Count 1/	Slough Escapement 2/	% of Total Slough Escapement	% of Curry Station Escapement 3/
1981	8	113.7	25	38	100.0	3.8
TOTAL			25	38	100.0	3.8
1982	Moose	123.5	1	2	0.7	< 0.1
	8A	125.1	3	5	1.7	< 0.1
	B	126.3	12	18	6.1	< 0.1
	9	128.3	12	18	6.1	< 0.1
	11	135.3	113	170	57.2	0.3
	20	140.0	50	75	25.2	0.1
	21	141.1	6	9	3.0	< 0.1
TOTAL			197	297	100.0	0.4
1983	-	-	0	0	-	0

1/ Peak live-dead survey counts represent counts of spawning fish only. Milling fish were not considered in the analysis.

2/ Slough escapement was calculated by multiplying peak live-dead counts by 1.2.

3/ Curry Station pink salmon escapements for 1981, 1982 and 1983 were 1,000, 58,800 and 5,500 fish respectively.

Appendix Table 2-G-12. Total 1981 chum salmon slough escapements between RM 98.6 and 161.0.

Slough	River Mile	Total Fish Days 1/	Peak Live-Dead Survey Count	Mean Observation Life in Days 2/	Slough Escapement	% of Total Slough Escapement	% of Curry Station Escapement 4/
1	99.6		6		10 3/	0.2	0.1
2	100.2	296.1	27	6.9	43	0.9	0.3
6A	112.3		11		19 3/	0.4	0.2
8	113.7	4,797.5	302	6.9	695	15.4	5.3
Moose	123.5	1,531.8	167	6.9	222	4.9	1.7
A'	124.6	1,382.4	140	6.9	200	4.4	1.5
A	124.7	558.2	34	6.9	81	1.8	0.6
8A	125.1	3,314.0	620	6.9	480	10.6	3.7
9	128.3	2,541.0	260	6.9	368	8.2	2.8
9B	129.2	1,907.6	90	6.9	277	6.1	2.1
9A	133.8	963.0	182	6.9	140	3.1	1.1
11	135.3	7,719.0	411	6.9	1,119	24.8	8.5
13	135.9		4		7 3/	0.2	0.1
16	137.3		3		5 3/	0.5	<0.1
17	138.9	931.8	38	6.9	135	3.0	1.0
19	139.7		3		5 3/	0.1	<0.1
20	140.0		14		24 3/	0.5	0.2
21	141.1	4,535.0	274	6.9	657	14.6	5.0
21A	144.3		8		14 3/	0.3	0.1
TOTAL		30,477.4	2,594	-	4,501	100.0	34.3

1/ Number of fish days were calculated for sloughs that had peak survey counts > 15 fish. Refer to Section 2.4 for detailed data analysis procedures.

2/ Mean observation life values were computed from 1983 composite observation life data.

3/ Total slough escapement into sloughs having peak live-dead survey counts of ≤ 15 fish were computed by multiplying the peak live-dead survey count by 1.7. This value represents the summation of the estimated slough escapement divided by the summation of the peak live-dead survey counts for all sloughs with peak survey counts ≥ 50 fish.

4/ 1981 Curry Station chum salmon escapement was approximately 13,100 fish.

Appendix Table 2-G-13. Total 1982 chum salmon slough escapements between RM 98.6 and 161.0.

Slough	River Mile	Total Fish Days 1/	Peak Live-Dead Survey Count	Mean Observation Life in Days 2/	Slough Escapement	% of Total Slough Escapement	% of Curry Station Escapement 4/
6A	112.3		2		5 3/	0.1	0.1
8D	121.8		23		53 3/	1.1	0.2
8C	121.9	744.0	48	6.9	108	2.1	0.4
8B	122.2	683.4	80	6.9	99	2.0	0.3
Moose	123.5	409.3	23	6.9	59	1.2	0.2
8A	125.1	7,328.5	336	6.9	1,062	21.0	3.6
B	126.3	717.6	58	6.9	104	2.1	0.4
9	128.3	4,163.5	300	6.9	603	11.9	2.1
9B	129.2		5		12 3/	0.2	0.1
9A	133.8	596.0	118	6.9	86	1.7	0.3
11	135.3	7,437.0	459	6.9	1,078	21.3	3.7
17	138.9	158.1	21	6.9	23	0.4	0.1
20	140.0	194.9	30	6.9	28	0.5	0.1
21	141.1	11,982.0	736	6.9	1,737	34.4	5.9
TOTAL		34,414.3	2,239	-	5,057	100.0	17.3

1/ Number of fish days were calculated for sloughs that had peak survey counts $>$ 15 fish. Refer to Section 2.4 for detailed data analysis procedures.

2/ Mean observation life values were computed from 1983 composite observation data.

3/ Total slough escapement into sloughs having peak live-dead survey counts of $\leq$ 15 fish were computed by multiplying the peak live-dead survey count by 2.3. This value represents the summation of the estimated slough escapement divided by the summation of the peak live-dead survey counts for all sloughs with peak survey counts $\geq$ 50 fish.

4/ 1982 Curry Station chum salmon escapement was approximately 29,400 fish.

Appendix Table 2-G-14. Evaluation of chinook salmon Petersen disc tag loss based on fishwheel recaptures and spawning ground surveys conducted between Sunshine Station and Devil Canyon, 1983.

No. Tagged Fish Examined		No. Shed Tags		Total No. Tags		Overall Percent Tag Retention
Fishwheel	Survey	Fishwheel	Survey	Fishwheel	Survey	
181	387	5	76	186	463	87.4

Appendix Table 2-G-15. Evaluation of adult salmon tag loss for all species except chinook salmon based on spawning surveys conducted between Sunshine Station and Devil Canyon, 1983.

Tagging Station	Tag Type	No. of Tagged Fish Examined	No. Shed Tags	Total No. Tags	Percent Tag Retention
Sunshine	FT-4/Spaghetti	1508	33	1541	97.9
Talkeetna	FT-4/Spaghetti	1508	30	1538	98.0
Curry	Petersen Disc	486	0	486	100.0