Southeast Alaska Sockeye Salmon Studies, 1987-88

Technical Report for the period July 1, 1987 to June 30,1988

By

Fred E. Bergander
Scott A. McPherson
Jeff P. Koenings

Regional Information Report [1] No. 1J88-44

Alaska Department of Fish and Game
Commercial Fisheries Division
Juneau, Alaska

December 1988

---

[1] The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or Division of Commercial Fisheries.

AUTHORS

Fred Bergander is a Project Leader for the Southeast Alaska sockeye salmon research project of the Alaska Department of Fish and Game, Division of Commercial Fisheries, PO Box 20, Douglas, Ak 99824.

Scott McPherson is a Fisheries Biologist II with the Region I Stock Biology Group, Alaska Department of Fish and Game, Commercial Fisheries Division, P.O. Box 20, Douglas, Ak. 99824. Scott was responsible for the scale analysis of Lynn Canal sockeye scales collected from the commercial catch and escapements.

Jeff Koenings is a Limnologist with the Alaska Department of Fish and Game, F.R.E.D. Division, P.O. Box 3150, Soldotna, Ak. 99669.

ACKNOWLEDGEMENTS

Data presented in this report were collected through the efforts of numerous seasonal field personnel employed by the Commercial Fisheries and Fisheries Rehabilitation Enhancement and Development Divisions. Special thanks are due to Jerry Koerner, Margaret Cartwright, Robert Larson, and Ray Staska for providing supervisory assistance for many of the Commercial Fishery Division field crews, Dave Barto of the F.R.E.D. Division for collecting the limnological data, and members of the Stock Biology Group for analyzing the scale samples that were so essential in developing the brood year return analysis for Chilkoot and Chikat Lakes.

Thanks are due to Jim Edmunds of the F.R.E.D. Division Limnology Laboratory for conducting the Chilkoot and Chilkat Lake water chemistry and plankton analysis.

PROJECT SPONSORSHIP

This investigation was financed by Anadromous Fish Conservation Act research funds under Federal Aid Grant Number NA-87-ABD-00301.

TABLE OF CONTENTS

	Page
LIST OF TABLES	i
LIST OF FIGURES	i
LIST OF APPENDICES	ii
ABSTRACT	iv
INTRODUCTION	1
LYNN CANAL ESCAPEMENT ESTIMATION	6
Methods and Procedures	6
Results and Discussion	6
Escapement Goals for Chilkoot and Chilkat Lakes	11
Methods and Procedures	11
Results and Discussion	11
OTHER MONITORED SOCKEYE SYSTEMS	15
Methods and Procedures	15
Results and Discussion	15
LITERATURE CITED	17
APPENDICES	20

LIST OF TABLES

Table		Page
1.	Annual salmon escapements through Chilkat and Chilkoot Weirs, 1967-87	8
2.	Sockeye salmon escapements to select spawning systems in Southeast Alaska, 1987	16

LIST OF FIGURES

Figures		Page
1.	Lynn Canal Fishery areas and supporting sockeye salmon spawning systems, Chilkoot and Chilkat Lakes	2
2.	The Taku River and Port Snettisham sockeye salmon spawning systems	3
3.	The Situk River and Yakutat salmon spawning systems	4
4.	Sockeye salmon systems between Petersburg and Dixon Entrance	5
5.	Chilkat Lake daily sockeye salmon escapement expressed as a moving 3-day average, 1987	9
6.	Chilkoot Lake daily sockeye salmon escapement expressed as a moving 3-day average, 1987	10
7.	Chilkoot Lake sockeye salmon returns per spawner, 1976-82	12
8.	Chilkat Lake sockeye salmon return per spawner, 1976-82	13

LIST OF APPENDICES

Page

APPENDIX A: Chilkoot and Chilkat Lakes

A.1 Daily sockeye salmon counts and associated statistics from the Chilkat Weir, 1987..... 20

A.2 Daily sockeye salmon counts and associated statistics from the Chilkoot Lake Weir, 1987.... 24

A.3 Chilkat Lake Weir water level and temperatures, flow reversals, and sockeye salmon escapements, 1987..... 28

APPENDIX B: Limnological survey summaries for Chilkoot and Chilkat Lakes

B.1 Light penetration data obtained from Chilkat (A) and Chilkoot (B) Lakes showing the euphotic zone depth, verticle light extinction coefficient, and Secchi disk depth by sample date, 1987..... 32

B.2 Seasonal mean (May-October) values for general water-quality parameters, metals concentrations, nutrient concentrations/atom ratios, and algal pigment concentrations obtained from two depths sampled at two stations in Chilkoot and Chilkat Lakes during 1987..... 33

B.3 Seasonal changes in zooplankton densities (no./m2) with corresponding mean body sizes (mm) by taxa, sampling date, and station within Chilkat Lake during 1987..... 34

APPENDIX TABLES (Continued)

B.4 Seasonal changes in zooplankton densities (no./m2) with corresponding mean body sizes (mm) by taxa, sampling date,and station within Chilkoot Lake during 1987..... 35

B.5 Preliminary in-lake rearing fish population estimates for 1987 at Chilkat and Chilkoot Lakes based on hydroacoustic and townet surveys..... 36

APPENDIX C: Escapements to Other Monitored Southern S.E. sockeye systems..... 37

C.1 Daily sockeye salmon counts and associated statistics from the Situk River Weir, 1987..... 37

C.2 Daily sockeye salmon counts and associated statistics from the Speel Lake Weir, 1987..... 40

C.3 Daily sockeye salmon counts and associated statistics from the Crescent Lake Weir, 1987.... 42

C.4 Daily sockeye salmon counts and associated statistics from the Salmon Bay Weir, 1987..... 44

C.5 Daily sockeye salmon counts and associated statistics from the Karta River Weir, 1987..... 48

C.6 Daily sockeye salmon counts and associated statistics form the Naha River Weir, 1987..... 52

C.7 Daily sockeye salmon counts and associated statistics from the Klawock Lake Weir, 1987..... 55

C.8 Daily sockeye salmon counts and associated statistics from the Hugh Smith Lake Weir, 1987..... 61

ABSTRACT

Sockeye salmon escapements to the Lynn Canal spawning systems were monitored during the 1987 salmon season. Escapements to Chilkoot and Chilkat Lakes were 95,185 and 48,378 fish, respectively. Flow reversals occurred at the outlet of Chilkat Lake and led to the disruption of the migration of fish into the lake which precluded escapement data collected at this site from being used for in-season management purposes. Flow reversals at Chilkat Lake have been observed in the past and are considered a normal event Scale samples collected from the escapements to these systems and the 1987 Lynn Canal Harvest added to the brood year return data base for these stocks, which will contribute to the evaluation of the respective brood year escapements. Limnological data collected at Chilkoot and Chilkat Lakes in 1987 initiated a data base which will be used to establish escapement goals for these systems. Continued monitoring of sockeye salmon escapements to other spawning systems in Southeast Alaska in 1987 completed the seventh year of continuous escapement data collection for these systems.

Key Words: Salmon, sockeye, escapements, Chilkoot, and Chilkat

INTRODUCTION

In recent years sockeye salmon (Oncorhynchus nerka) harvests in Southeast Alaska have reached approximately 1.5 million fish. Maintaining a continuing record of the escapements to the major system contributing to these harvests is of primary concern to Fisheries Management and research. This report documents sockeye salmon escapements to Chilkoot and Chilkat Lakes (Figure 1); the Situk River (Figure 2); Speel and Crescent Lakes (Figure 3); Salmon Bay, Karta River, Naha River, Klawock and Hugh Smith Lakes (Figure 4).

The primary study area was encompassed Chilkoot and Chilkat Lakes which are the major contributors to the Lynn Canal drift gillnet fishery. Sockeye salmon catches in the Lynn Canal have ranged from a low of 18,338 (1975) to a record high of 415,791 (1987) fish. Escapement enumeration has been conducted at the outlets of Chilkat and Chilkoot Lakes since 1967 and 1976, respectively. Escapement Goals were first established for these lakes in 1976 and were 80 to 100 thousand for Chilkoot and 60 to 70 thousand for Chilkat. These goals were revised in 1981 to 60 to 80 thousand for Chilkoot and 70 to 90 thousand for Chilkat. Annual escapement monitoring for these systems revealed that the Chilkoot goals were met or exceeded 11 years since 1976 and Chilkat goals were met or exceeded 7 out the 11 years.

In an effort to further refine the escapement goals for Chilkoot and Chilkat Lakes returns from known brood year escapements were used to evaluate the production from the respective escapements. Limnological studies have been used by the F.R.E.D. Division to identify the rearing capacity of nursery lakes and in turn identify optimum escapements (Koenings 1987). This approach was selected to supplement the return per spawner as a means of identifying escapement goals.

Escapement studies funded under the U.S.\Canada Salmon Interception Treaty received technical, administrative, and logistic support from this project. The results of these activities were documented in this report.

LYNN CANAL ESCAPEMENT ESTIMATION

Methods

Escapement enumeration was conducted at Chilkat and Chilkat Lakes

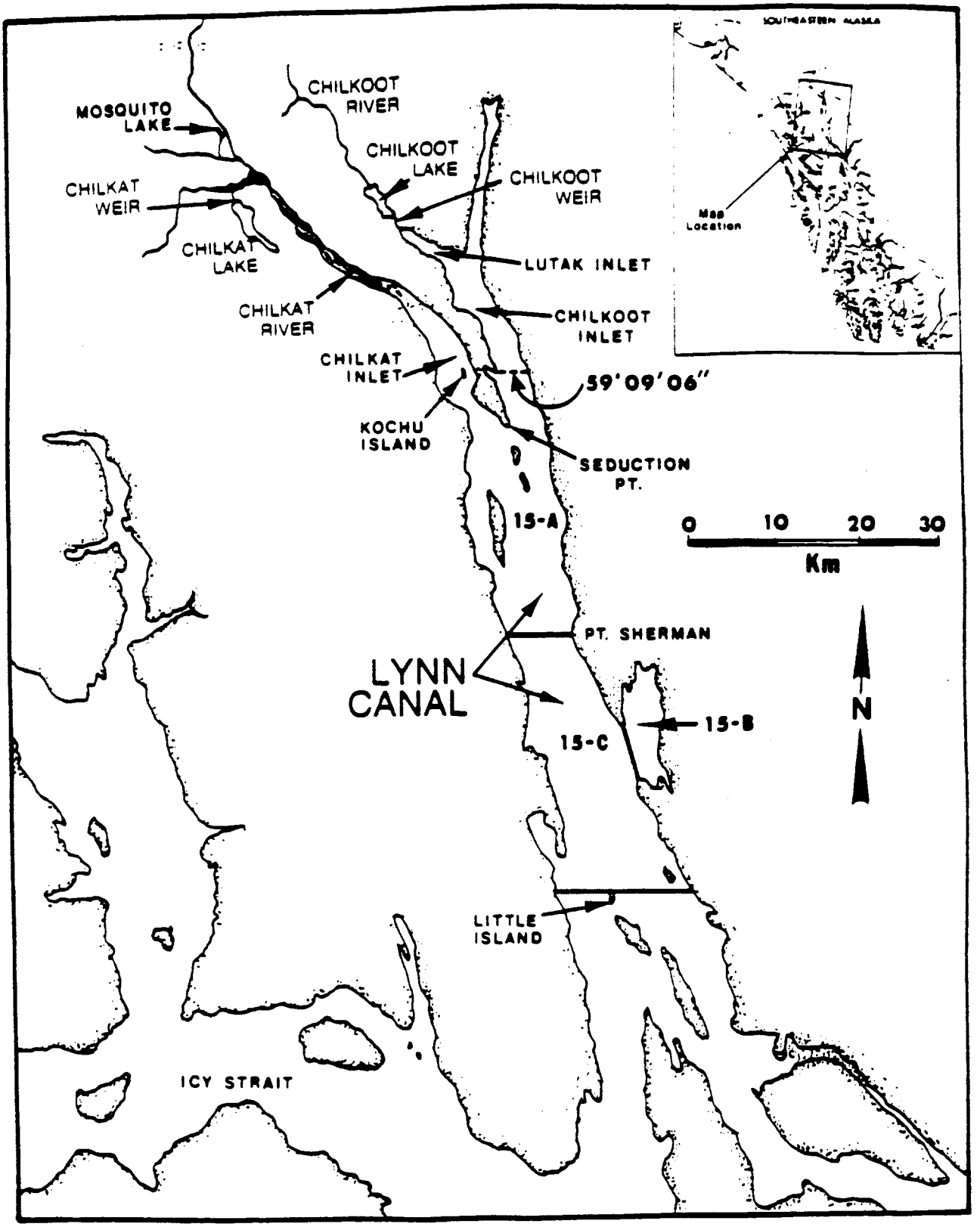

Figure 1. Lynn Canal Fishery areas and supporting sockeye salmon spawning systems, Chilkoot and Chilkat Lakes.

Figure 2. The Situk River and Yakutat salmon spawning systems.

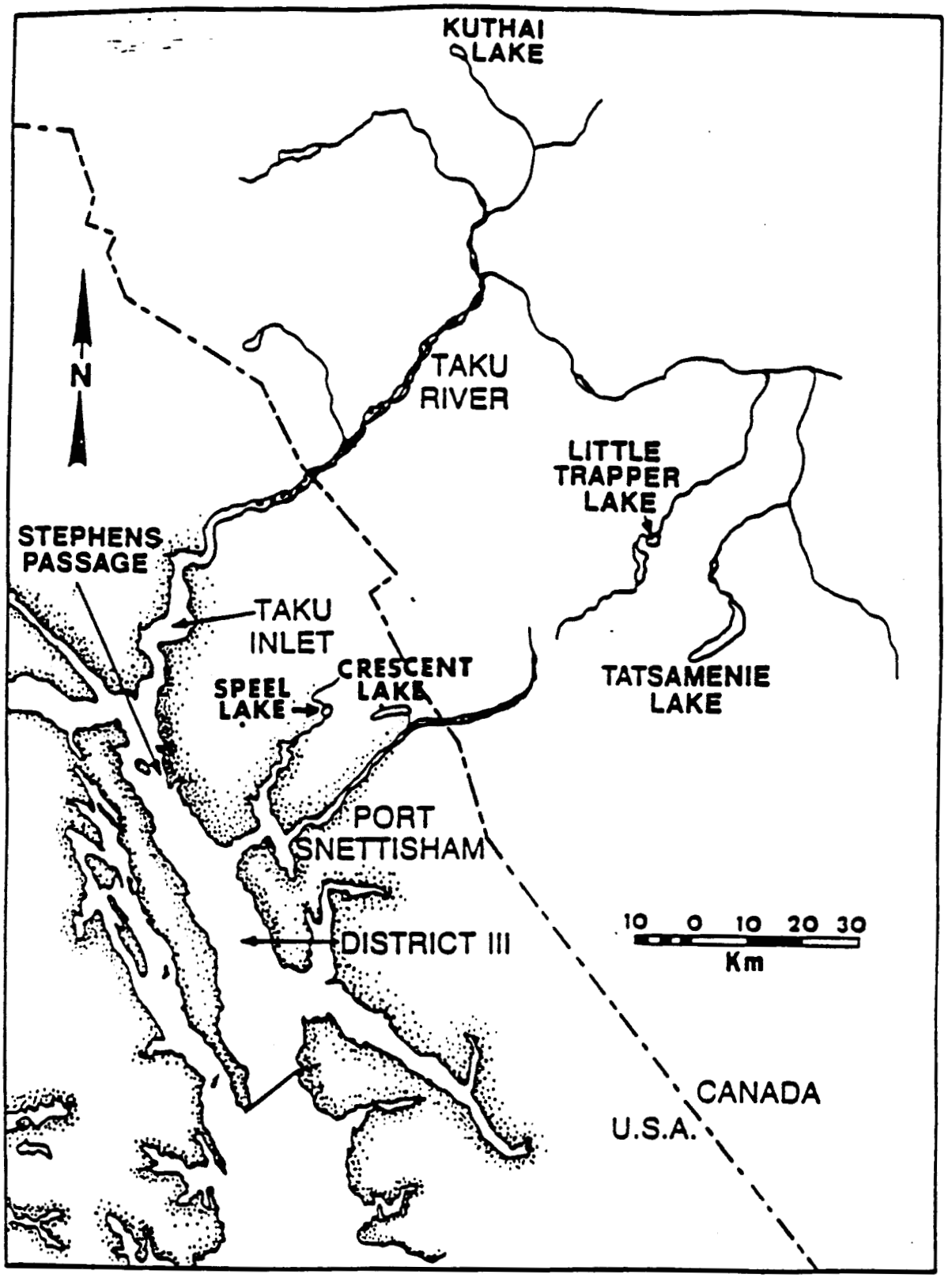

Figure 3. The Taku River and Port Snettisham sockeye salmon spawning systems.

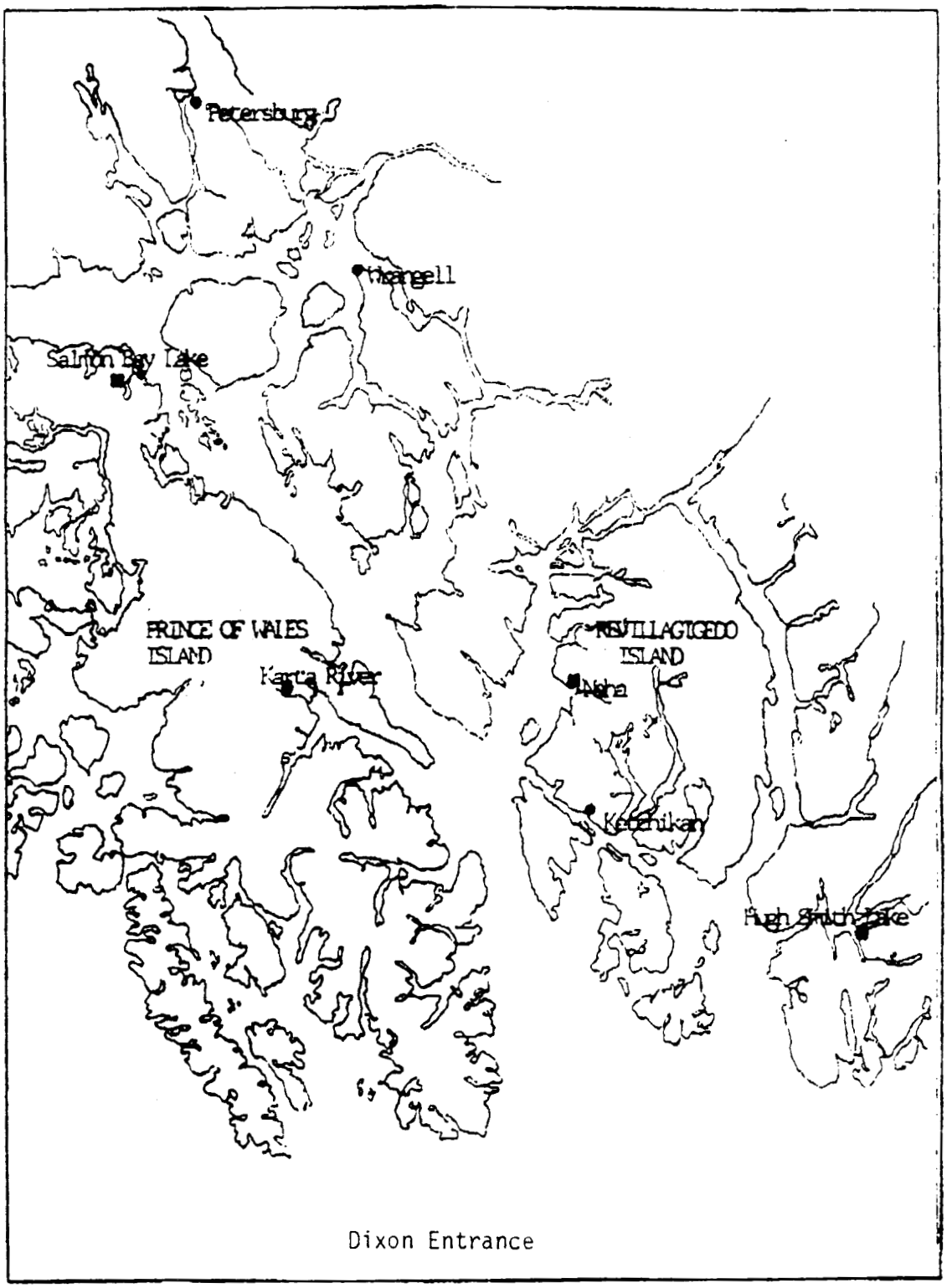

Figure 4. Sockeye salmon weir sites between Petersburg and Dixon Entrance, 1987.

using picket weirs located at their respective outlets. Chilkat Weir is a bipod supported structure approximately 80 feet long and incorporating a 12 ft. wide boat gate; water at the weir site reaches a maximum depth of approximately 10 feet. Chilkoot Weir is a 365 ft. long structure supported by 8 inch steel "H" beams driven 23 feet into the substrate; water at the Chilkoot Weir site reaches a maximum depth during high water of approximately 7 feet.

Fish were passed through the weirs by removing 2 or more pickets from the weir at the site of fish concentrations. Fish were counted as they passed through the opening. The daily totals were recorded on forms designed for that purpose along with daily water level measured at a staff gauge and water temperature measured at noon. Scale samples and length measurements were collected from the escapement at the weir for age analysis. Approximately 3% or 300 fish per week were sampled. Scales were taken from the preferred[2] area of the fish (Clutter,R and Whitesel. 1956) and mounted on gum cards possessing 40 sequentially numbered spaces; corresponding length and sex data were recorded on mark-sense forms. Scale analysis was performed by the Departments Stock Biology Group in Juneau. Detailed reports were published in the Departments Technical Data Report series (McPherson, et. al. 1987).

Results and Discussion

Annual sockeye escapements to Chilkoot Weir ranged from 102,973 (1982) to 35,450 (1978) ; the range in sockeye escapements to Chilkat Lake were 22,343 (1967) to 134,002 (1983) (Table 1). During the 1987 salmon season, sockeye salmon escapements to Chilkoot and Chilkat Lakes were 95,185 and 48,378 fish, respectively. Two minor peaks in the daily rate of escapement, which represented a total of 14% of the seasons escapement, occurred at Chilkat Weir 17-19 July and 24-26 August (Appendix Table A.1 and Figure 5). The largest peak period at Chilkat Weir occurred during the 21-30 September period and represented approximately 44% of the seasons total escapement.

---

[2] The preferred scale is defined as being found two rows above the lateral line on the row that runs diagonally from the posterior insertion of the dorsal fin.

Peak escapements to Chilkoot Lake were not so clearly defined as to Chilkat Lake (Appendix Table A.2 and Figure 6). An early peak occurred between 21-30 June and represented 22% of the seasons total escapement. The second peak period was more protracted and extended from 13 July through 31 August and represented 67% of the season total.

Water Level and Temperature Measurements: Flow reversals occur intermittently in the outlet stream of Chilkat Lake. During these flow reversals, the net flow is into the lake. The elevational difference between Chilkat Lake and the Tsirku River were so slight that from mid-season (July) when the runoff into Chilkat Lake were not sufficient to maintain the lake elevation at a higher level than the Tsirku River, the river began to flow back into the lake. During these flow reversal periods, the fish lost the homestream water and the migration into the lake ceased. This disruption of the entry of fish into the lake created voids in the in-season flow of escapement data for Chilkat Lake sockeye and precluded the in-season use of these data for management purposes.

Flow reversals occurred 21 days out of 155 days of weir operation, during the 1987 season. Water levels fluctuated over a range of 134 cm. High water level was not a prerequisite of reversal (Appendix Table A.3); reversals occurred when the lake level was low as well as when it was high. Reversals appeared to be more a function of elevational differential between the river and the lake than high flows in the Tsirku River.

Table 1. Annual salmon escapements through Chilkat and Chilkoot Weirs for the years, 1967-87.

Year	Sockeye	Coho	Pink	Chum	Total	Period Operated
Chilkat						
1967	22,343				22,343	6/13-9/15
1968	41,256	168	4		41,428	6/07-9/13
1969	44,555				44,555	5/27-9/16
1970	41,085				41,085	5/29-9/17
1971	49,342	1,063			50,405	5/25-10/28
1972	51,860	518			52,378	6/03-10/12
1973	50,554	167			50,721	6/07-10/15
1974	84,237	161			84,398	5/30-10/12
1975	41,508	644			42,152	6/04-11/06
1976	69,984	204			70,188	6/03-9/27
1977	40,334				40,334	6/03-9/27
1978	69,498	390			69,888	6/05-11/05
1979	80,588	965			81,553	6/09-11/11
1980	85,066				85,066	6/05-11/05
1981	84,125	1,150			85,275	6/08-10/23
1982	78,986	157			79,143	6/24-10/06
1983	134,002	1,027			135,029	6/22-11/12
1984	115,051	691			115,742	6/09-10/11
1985	57,724	409		2	58,135	6/03-10/28
1986	23,952	635		4	24,591	6/18-11/14
1987	48,378	957		116	49,451	6/18-11/20
Chilkoot						
1976	71,294	942		242	72,478	5/23-10/31
1977	97,217	1	5,368	165	102,751	5/28-9/12
1978	35,450	1,179		227	36,856	6/06-11/07
1979	95,948	899		253	97,100	6/05-11/06
1980	96,217	628		720	97,565	6/02-10/05
1981	85,072	1,479		269	86,820	6/04-10/12
1982	102,973	5		507	103,485	6/03-9/14
1983	80,087	1,740	11,227	501	93,555	6/04-11/13
1984	100,426	277	4,912	690	106,305	6/02-9/13
1985	69,026	2,184	32,743	1,019	104,972	6/02-10/28
1986	88,121	1,951	1,305	454	91,831	6/06-10/24
1987	95,185	548	6,689	430	102,852	6/4-11/1

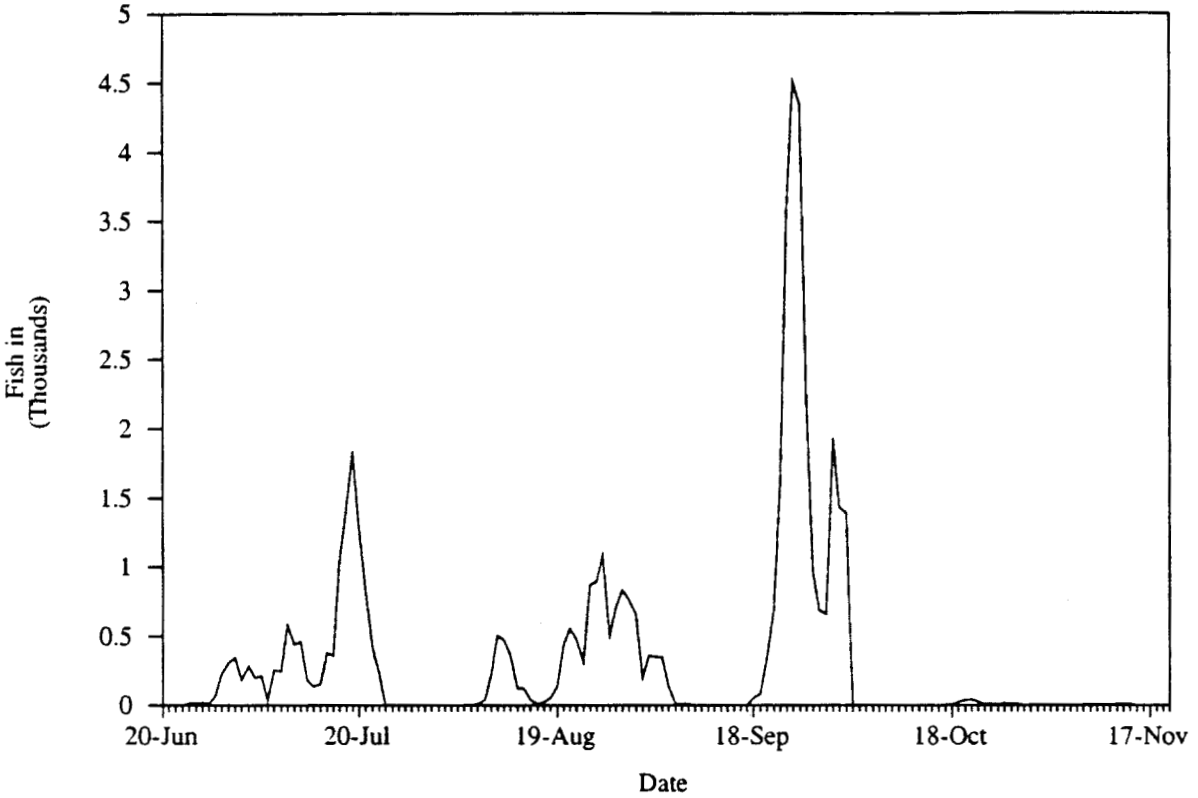

Figure 5. Chilkat Lake daily sockeye salmon

escapement expressed as a moving 3-day average, 1987.

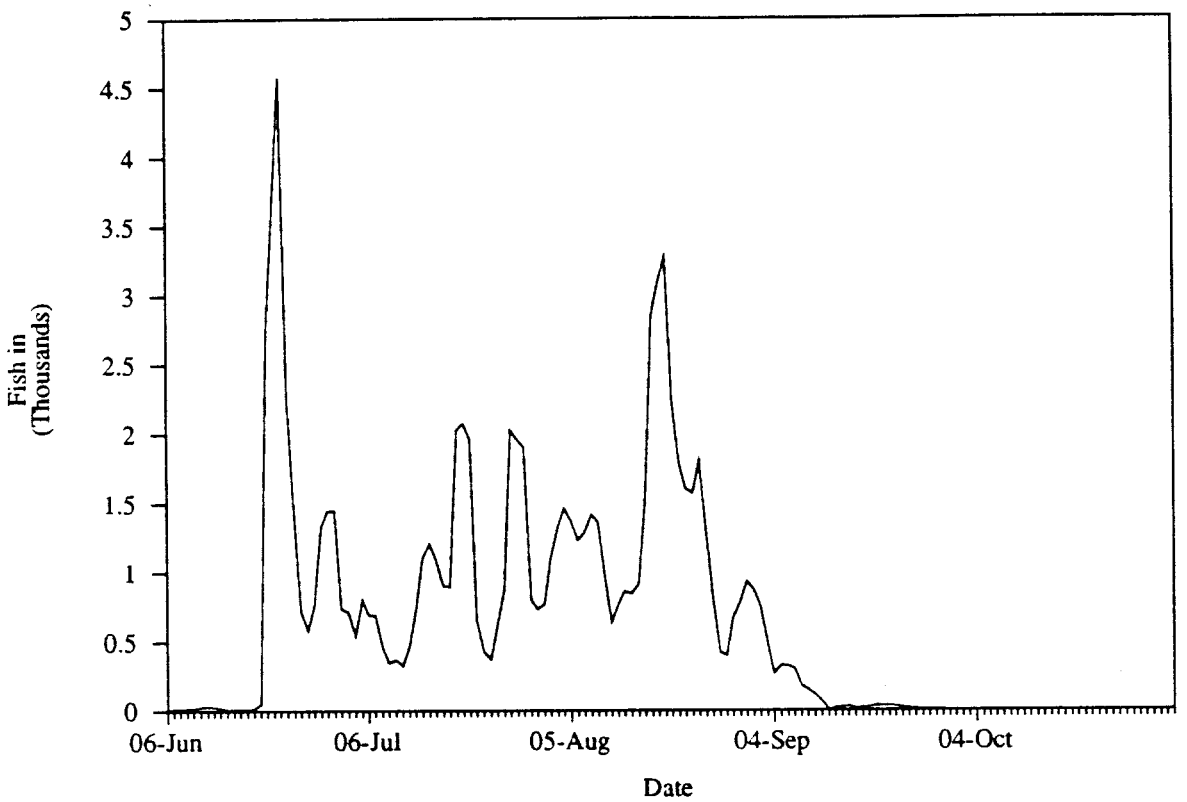

Figure 6. Chilkoot Lake sockeye salmon

escapement expressed as a moving 3-day average, 1987.

ESCAPEMENT GOALS

Methods

Two approaches were available from which to develop escapement goals.The first involved the evaluation of brood year escapements from the total returns realized; the other involves the calculation of rearing capacity of the nursery lake through the measurement of limnological parameters or more simply identifying the euphotic volume.

Spawner recruit relationships were determined by assigning a percentage of the run (catch plus escapement) to the appropriate brood year escapement. The brood year was determined by the Stock Biology Group during its age analysis and stock determination work on the Lynn Canal commercial catch and escapement (McPherson 1986-88). The contribution of sockeye salmon from Chilkoot and Chilkat Lakes to the Lynn Canal drift gillnet fishery was determined by scale pattern analysis. Detailed reporting is under separate cover (McPherson 1988).

Limnological data from Chilkat and Chilkoot Lakes were collected and analyzed by the Department of Fish and Game Fisheries Rehabilitation and Development Division. Water-quality and zooplankton samples were collected at two permanent sampling sites within each lake, and in conjunction with physical and water chemistry measurements. Samples were collected at 1-month intervals from May through November 1987. Juvenile sockeye fry population estimates within each lake were determined from three hydro acoustical and tow net surveys conducted during the spring, summer, and fall. All physical, chemical, and zooplankton samples were analyzed by the ADF&G laboratory in Soldotna according to procedures detailed in the limnology field and laboratory manual (Koenings et al. 1987).

Results and Discussion

Scale samples collected from the weekly Lynn Canal sockeye salmon harvest provided a means of determining the harvest level of the respective age groups by stock. This information was used in conjunction with the age analysis of
the escapement of the respective stocks to determine the return

per spawner from the respective brood year escapements. Returns of Chilkoot and Chilkat sockeye in 1987 completed returns from all classes through age 5 years which represented 90%+ of the expected return from the 1982 Chilkoot brood year and 60-70% of the return from the 1982 Chilkat brood year; returns from all previous brood year escapements to both systems were completed by 1987. Returns from 1976 to 1982 brood year escapements to Chilkoot Lake produced spawner recruit ratios of 1:1.72 (1976 brood year) to 1:6.27 (1978 brood year) (Figure 7). Chilkat Lake returns for this time period produced spawner recruit ratios ranging from 1:0.97 (1982) to 1:5.10 (1977) (Figure 8).

The results of the brood year returns to Chilkoot and Chilkat Lakes (Figures 7 and 8) indicate that factors other than escapement influenced the return per spawner to both systems. If escapement had been the sole controlling factor, it would have been reasonable to expect returns to increase in proportion to the respective brood year escapements, until the optimum escapement had been

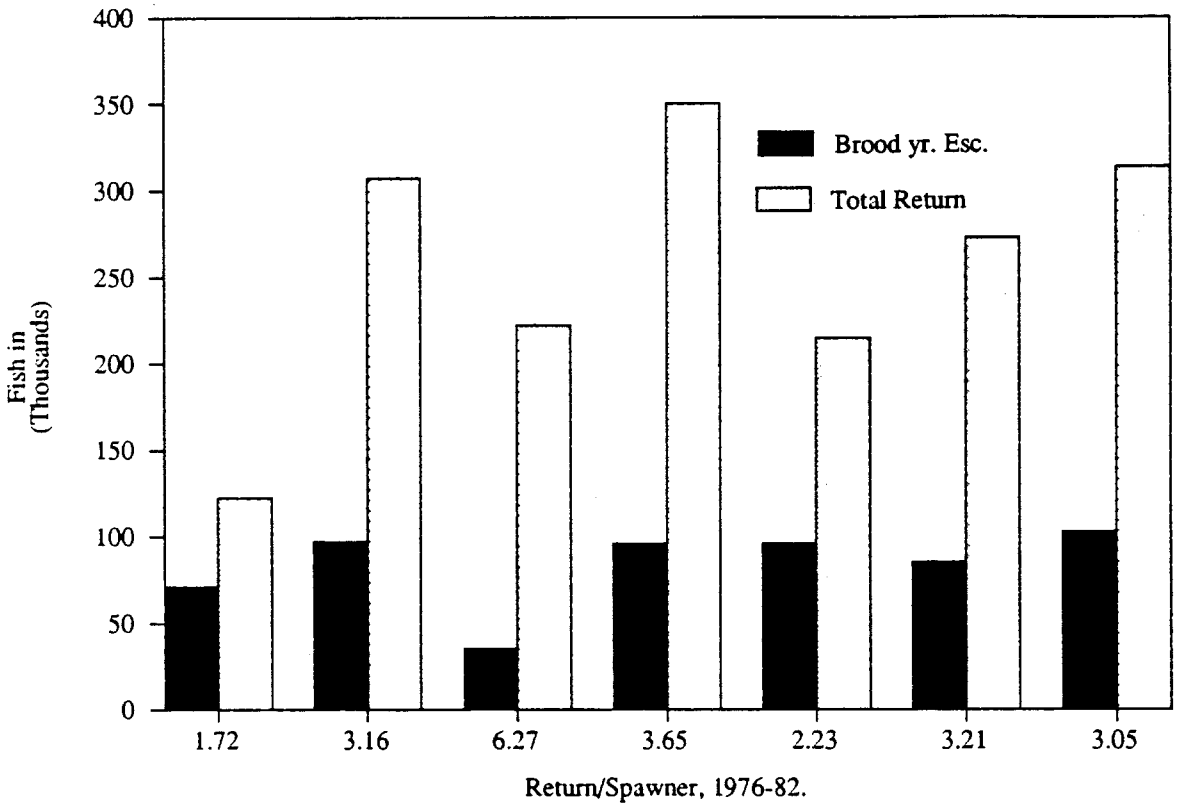

Figure 7. Chilkoot Lake sockeye salmon return per spawner, 1976-82.

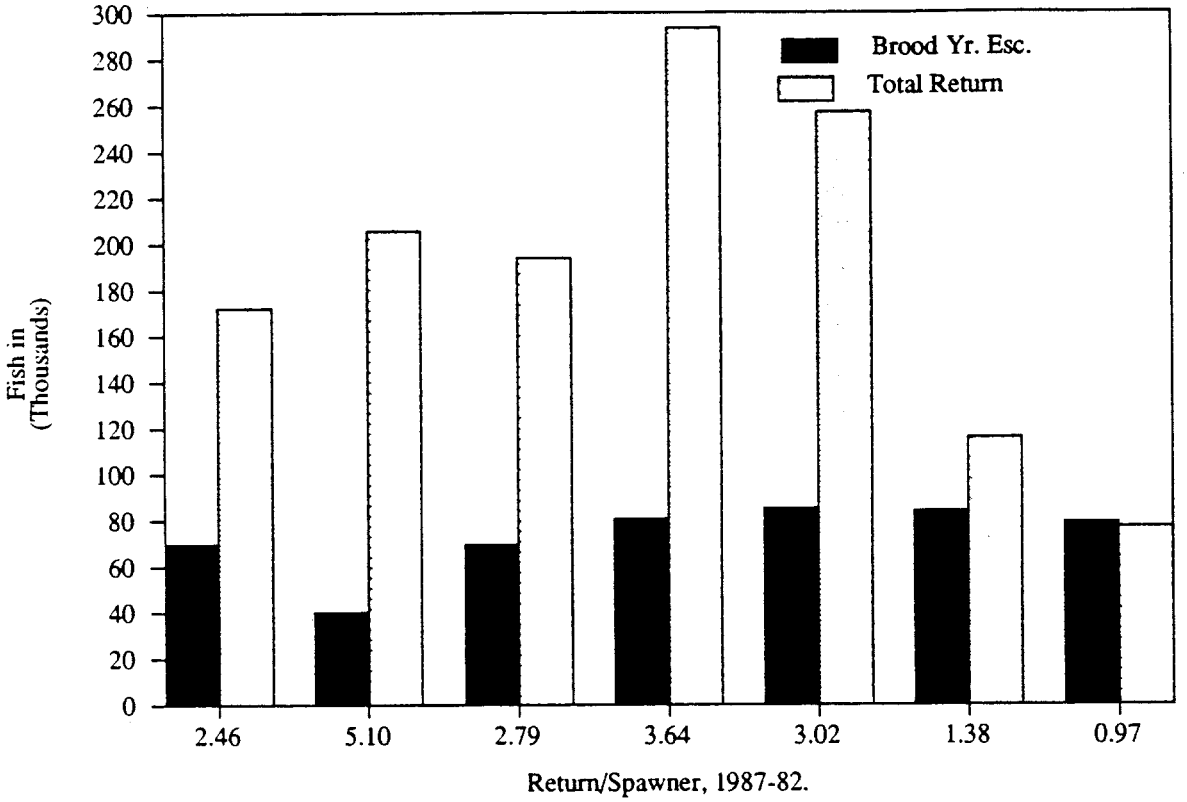

Figure 8. Chilkat Lake sockeye salmon return per spawner, 1976-82.

reached. Continued accumulation of spawner recruit data will be necessary before an acceptable evaluation of brood year escapements can be conducted.

Light penetration data collected during the course of the limnology studies revealed the average euphotic zone depths of station 1 and 2 at Chilkat Lake were 17.5m and 16.9m, respectively. Chilkoot Lake average euphotic zone depths for stations 1 and 2 were 6.4m and 6.2m. Sample were collected for both Chilkoot and Chilkat Lakes monthly from May through November. Water chemistry, seasonal zooplankton densities, and preliminary in-lake rearing fish population estimates are presented in Appendix Tables B.1 through B.5. No determination of rearing capacity or optimum escapements have been made due to the preliminary nature of these data.

ESCAPEMENTS TO OTHER MONITORED SOCKEYE SYSTEMS

Methods

Sockeye salmon escapements to Crescent and Speel Lakes(Figure 3), Salmon Bay, Naha River, Karta River, Klawock Lake, Hugh Smith Lake (Figure 4), and the Situk River (Figure 2) were monitored in 1987. Tripod and picket weirs were constructed on the outlet of these systems and fish were counted through openings created by removing 2 or more pickets. Scale samples were collected from the escapement for age and stock identification analysis by the Region I Stock Identification group.

Results and Discussion

Sockeye escapements ranged from 5,888 to the Karta River near Ketchikan and 72,720 fish to the Situk River near Yakutat. Escapements to the respective systems listed are presented in Table 2 and Appendix Tables C.1 through C.8. Escapements to these systems were monitored annually since 1983 as part of the U.S.\Canada Salmon Interceptions Studies. These activities received administrative, supervisory, and logistic support from the Southeast Alaska Sockeye Salmon Studies during the 1987 season.

Table 2. Sockeye salmon escapements to select spawning systems in Southeast Alaska, 1987.

Location	Escapement	Dates of Operation
Situk River	72,720	6/11-8/18
Speel Lake	9,167	7/15-8/27
Crescent Lake	7,459	7/12-8/27
Salmon Bay Lake	12,666	6/25-9/16
Karta River	5,888	6/23-9/16
Naha River	19,849	7/05-9/15
Hugh Smith Lake	33,204	6/08-9/16
Klawock Lake	7,763	6/27-11/13

LITERATURE CITED

Bergander, Fred E., Brood year return of sockeye salmon to the Chilkoot and Chilkat Lakes spawning systems, 1982. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data Report, Juneau.

Clutter, and L. Whitsel. 1956. Collection and interpretation of sockeye salmon scales. Bull. Int. Pac.Salmon Fish. Comm., No. 9. 15 pp.

Koenings, J.P., Limnological survey data for Chilkat and Chilkoot Lakes, 1987. Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement, and Development Division, Preliminary Data Report (unpublished), Soldotna.

Koenings, J. P., J. A. Edmundson, J. M. Edmundson, and G. B. Kyle, 1987. Limnology field and laboratory manual: methods for assessing aquatic production. Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement, and Development Division, FRED Report No. 71.

Marshall, Scott L., F.E. Bergander, S. Sharr, 1982. Origins of sockeye salmon (Oncorhynchus nerka) in the Lynn Canal drift gillnet fishery of 1981 based on scale pattern analysis. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data Report No. 75, Juneau.

McPherson, Scott A., and Scott L. Marshall, 1986. Contribution, exploitation, and migratory timing of Chilkat and Chilkoot River runs of sockeye salmon (Oncorhynchus nerka Walbaum) in the Lynn Canal drift gillnet fishery of 1983. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data Report No. 165, Juneau.

LITERATURE CITED (Continued)

McPherson, Scott A., 1987. Contribution, exploitation, and migratory timing of Chilkat and Chilkoot River runs of sockeye salmon (Oncorhynchus nerka Walbaum) in the Lynn Canal drift gillnet fishery of 1984. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data Report No. 198, Juneau.

McPherson, Scott A., 1987. Contribution, exploitation, and migratory timing of returns of sockeye salmon(Oncorhynchus nerka) stocks to Lynn Canal in 1985 based on analysis of scale patterns. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data Report No. 217, Juneau.

McPherson, Scott A., and E. L. Jones, 1987. Contribution, exploitation,and migratory timing of returns to Lynn Canal in 1986 based on analysis of scale patterns. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data Report No. 220, Juneau.

McPherson, Scott A., R. F. Staska, and M. C. Seibel, 1988. In-season management and post-season analysis of returns of sockeye salmon stocks to Lynn Canal in 1987 emphasizing analysis of scale patterns. Alaska Department of Fish and Game, Commercial Fisheries Division, Technical Data report , Juneau.

APPENDICES

Appendix TABLE A.1 . Daily sockeye salmon counts and associated statistics from the Chilkat Lake Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
June	18	0	0	0.0000	0.0000
June	19	0	0	0.0000	0.0000
June	20	0	0	0.0000	0.0000
June	21	0	0	0.0000	0.0000
June	22	0	0	0.0000	0.0000
June	23	0	0	0.0000	0.0000
June	24	38	38	0.0008	0.0008
June	25	0	38	0.0000	0.0008
June	26	33	71	0.0007	0.0015
June	27	17	88	0.0003	0.0018
June	28	153	241	0.0031	0.0050
June	29	501	742	0.0103	0.0153
June	30	262	1004	0.0054	0.0207
July	1	261	1265	0.0054	0.0260
July	2	18	1283	0.0004	0.0264
July	3	568	1851	0.0117	0.0381
July	4	14	1865	0.0003	0.0384
July	5	67	1932	0.0014	0.0398
July	6	24	1956	0.0005	0.0403
July	7	662	2618	0.0136	0.0539
July	8	56	2674	0.0012	0.0550
July	9	1026	3700	0.0211	0.0761
July	10	240	3940	0.0049	0.0811
July	11	122	4062	0.0025	0.0836
July	12	193	4255	0.0040	0.0876
July	13	101	4356	0.0021	0.0896
July	14	177	4533	0.0036	0.0933
July	15	851	5384	0.0175	0.1108
July	16	48	5432	0.0010	0.1118
July	17	2223	7655	0.0457	0.1575
July	18	2008	9663	0.0413	0.1989
July	19	1279	10942	0.0263	0.2252
July	20	560	11502	0.0115	0.2367
July	21	703	12205	0.0145	0.2512
July	22	0	12205	0.0000	0.2512
July	23	0	12205	0.0000	0.2512
July	24	0	12205	0.0000	0.2512
July	25	0	12205	0.0000	0.2512
July	26	0	12205	0.0000	0.2512
July	27	0	12205	0.0000	0.2512
July	28	1	12206	0.0000	0.2512
July	29	0	12206	0.0000	0.2512

Appendix Table A1. (cont.) Daily sockeye salmon counts and associated statistics from the Chilkat Weir, 1987.

July	30	0	12206	0.0000	0.2512
July	31	0	12206	0.0000	0.2512
Aug.	1	0	12206	0.0000	0.2512
Aug.	2	0	12206	0.0000	0.2512
Aug.	3	0	12206	0.0000	0.2512
Aug.	4	0	12206	0.0000	0.2512
Aug.	5	8	12214	0.0002	0.2514
Aug.	6	13	12227	0.0003	0.2516
Aug.	7	2	12229	0.0000	0.2517
Aug.	8	100	12329	0.0021	0.2537
Aug.	9	568	12897	0.0117	0.2654
Aug.	10	839	13736	0.0173	0.2827
Aug.	11	7	13743	0.0001	0.2828
Aug.	12	247	13990	0.0051	0.2879
Aug.	13	113	14103	0.0023	0.2902
Aug.	14	2	14105	0.0000	0.2903
Aug.	15	0	14105	0.0000	0.2903
Aug.	16	20	14125	0.0004	0.2907
Aug.	17	58	14183	0.0012	0.2919
Aug.	18	78	14261	0.0016	0.2935
Aug.	19	277	14538	0.0057	0.2992
Aug.	20	947	15485	0.0195	0.3187
Aug.	21	440	15925	0.0091	0.3277
Aug.	22	55	15980	0.0011	0.3289
Aug.	23	423	16403	0.0087	0.3376
Aug.	24	2130	18533	0.0438	0.3814
Aug.	25	121	18654	0.0025	0.3839
Aug.	26	1021	19675	0.0210	0.4049
Aug.	27	337	20012	0.0069	0.4118
Aug.	28	753	20765	0.0155	0.4273
Aug.	29	1408	22173	0.0290	0.4563
Aug.	30	135	22308	0.0028	0.4591
Aug.	31	435	22743	0.0090	0.4680
Sept.	1	23	22766	0.0005	0.4685
Sept.	2	610	23376	0.0126	0.4811
Sept.	3	413	23789	0.0085	0.4896
Sept.	4	2	23791	0.0000	0.4896
Sept.	5	0	23791	0.0000	0.4896
Sept.	6	26	23817	0.0005	0.4901
Sept.	7	0	23817	0.0000	0.4901
Sept.	8	0	23817	0.0000	0.4901
Sept.	9	0	23817	0.0000	0.4901
Sept.	10	0	23817	0.0000	0.4901
Sept.	11	0	23817	0.0000	0.4901
Sept.	12	1	23818	0.0000	0.4902

Appendix Table A.1. (cont.) Daily sockeye salmon counts and associated statistics from the Chilkat Weir, 1987.

Sept.	13	0	23818	0.0000	0.4902
Sept.	14	0	23818	0.0000	0.4902
Sept.	15	0	23818	0.0000	0.4902
Sept.	16	0	23818	0.0000	0.4902
Sept.	17	0	23818	0.0000	0.4902
Sept.	18	156	23974	0.0032	0.4934
Sept.	19	103	24077	0.0021	0.4955
Sept.	20	755	24832	0.0155	0.5110
Sept.	21	1213	26045	0.0250	0.5360
Sept.	22	2862	28907	0.0589	0.5949
Sept.	23	6621	35528	0.1363	0.7311
Sept.	24	4052	39580	0.0834	0.8145
Sept.	25	2352	41932	0.0484	0.8629
Sept.	26	178	42110	0.0037	0.8666
Sept.	27	378	42488	0.0078	0.8744
Sept.	28	1502	43990	0.0309	0.9053
Sept.	29	106	44096	0.0022	0.9075
Sept.	30	4179	48275	0.0860	0.9935
Oct.	1	0	48275	0.0000	0.9935
Oct.	2	0	48275	0.0000	0.9935
Oct.	3	0	48275	0.0000	0.9935
Oct.	4	0	48275	0.0000	0.9935
Oct.	5	0	48275	0.0000	0.9935
Oct.	6	0	48275	0.0000	0.9935
Oct.	7	0	48275	0.0000	0.9935
Oct.	8	0	48275	0.0000	0.9935
Oct.	9	0	48275	0.0000	0.9935
Oct.	10	0	48275	0.0000	0.9935
Oct.	11	0	48275	0.0000	0.9935
Oct.	12	0	48275	0.0000	0.9935
Oct.	13	0	48275	0.0000	0.9935
Oct.	14	0	48275	0.0000	0.9935
Oct.	15	0	48275	0.0000	0.9935
Oct.	16	2	48277	0.0000	0.9935
Oct.	17	17	48294	0.0003	0.9938
Oct.	18	1	48295	0.0000	0.9939
Oct.	19	61	48356	0.0013	0.9951
Oct.	20	60	48416	0.0012	0.9964
Oct.	21	7	48423	0.0001	0.9965
Oct.	22	11	48434	0.0002	0.9967
Oct.	23	4	48438	0.0001	0.9968
Oct.	24	11	48449	0.0002	0.9970
Oct.	25	7	48456	0.0001	0.9972
Oct.	26	25	48481	0.0005	0.9977
Oct.	27	3	48484	0.0001	0.9978
Oct.	28	3	48487	0.0001	0.9978

Appendix Table A.1. (cont.) Daily sockeye salmon counts and associated statistics from the Chilkat Weir, 1987.

Oct.	29	5	48492	0.0001	0.9979
Oct.	30	6	48498	0.0001	0.9980
Oct.	31	7	48505	0.0001	0.9982
Nov.	1	5	48510	0.0001	0.9983
Nov.	2	6	48516	0.0001	0.9984
Nov.	3	5	48521	0.0001	0.9985
Nov.	4	0	48521	0.0000	0.9985
Nov.	5	1	48522	0.0000	0.9985
Nov.	6	8	48530	0.0002	0.9987
Nov.	7	7	48537	0.0001	0.9988
Nov.	8	1	48538	0.0000	0.9989
Nov.	9	5	48543	0.0001	0.9990
Nov.	10	9	48552	0.0002	0.9992
Nov.	11	4	48556	0.0001	0.9992
Nov.	12	22	48578	0.0005	0.9997
Nov.	13	4	48582	0.0001	0.9998
Nov.	14	2	48584	0.0000	0.9998
Nov.	15	3	48587	0.0001	0.9999
Nov.	16	0	48587	0.0000	0.9999
Nov.	17	2	48589	0.0000	0.9999
Nov.	18	2	48591	0.0000	1.0000
Nov.	19	0	48591	0.0000	1.0000
Nov.	20	2	48593	0.0000	1.0000

Mean Day of Migration = Aug. 30 Variance = 960.9 Days squared

Appendix TABLE A.2. Daily sockeye salmon counts and associated statistics for the Chilkoot Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum Prop of Total
June	4	0	0	0.0000	0.0000
June	5	1	1	0.0000	0.0000
June	6	10	11	0.0001	0.0001
June	7	31	42	0.0003	0.0004
June	8	6	48	0.0001	0.0005
June	9	22	70	0.0002	0.0007
June	10	36	106	0.0004	0.0011
June	11	27	133	0.0003	0.0014
June	12	43	176	0.0005	0.0018
June	13	11	187	0.0001	0.0020
June	14	10	197	0.0001	0.0021
June	15	10	207	0.0001	0.0022
June	16	8	215	0.0001	0.0023
June	17	7	222	0.0001	0.0023
June	18	14	236	0.0001	0.0025
June	19	40	276	0.0004	0.0029
June	20	109	385	0.0011	0.0040
June	21	8083	8468	0.0849	0.0890
June	22	2927	11395	0.0308	0.1197
June	23	2717	14112	0.0285	0.1483
June	24	1120	15232	0.0118	0.1600
June	25	384	15616	0.0040	0.1641
June	26	654	16270	0.0069	0.1709
June	27	698	16968	0.0073	0.1783
June	28	926	17894	0.0097	0.1880
June	29	2350	20244	0.0247	0.2127
June	30	1048	21292	0.0110	0.2237
July	1	933	22225	0.0098	0.2335
July	2	224	22449	0.0024	0.2358
July	3	977	23426	0.0103	0.2461
July	4	421	23847	0.0044	0.2505
July	5	1012	24859	0.0106	0.2612
July	6	630	25489	0.0066	0.2678
July	7	425	25914	0.0045	0.2722
July	8	336	26250	0.0035	0.2758
July	9	263	26513	0.0028	0.2785
July	10	515	27028	0.0054	0.2840
July	11	184	27212	0.0019	0.2859
July	12	708	27920	0.0074	0.2933
July	13	1269	29189	0.0133	0.3067
July	14	1326	30515	0.0139	0.3206

Appendix Table A.2. (cont.) Daily sockeye salmon counts and associated statistics for Chilkoot Weir, 1987.

July	15	1025	31540	0.0108	0.3314
July	16	918	32458	0.0096	0.3410
July	17	756	33214	0.0079	0.3489
July	18	998	34212	0.0105	0.3594
July	19	4325	38537	0.0454	0.4049
July	20	908	39445	0.0095	0.4144
July	21	638	40083	0.0067	0.4211
July	22	424	40507	0.0045	0.4256
July	23	209	40716	0.0022	0.4278
July	24	468	41184	0.0049	0.4327
July	25	1162	42346	0.0122	0.4449
July	26	987	43333	0.0104	0.4553
July	27	3917	47250	0.0412	0.4964
July	28	958	48208	0.0101	0.5065
July	29	830	49038	0.0087	0.5152
July	30	616	49654	0.0065	0.5217
July	31	748	50402	0.0079	0.5295
Aug.	1	942	51344	0.0099	0.5394
Aug.	2	1606	52950	0.0169	0.5563
Aug.	3	1416	54366	0.0149	0.5712
Aug.	4	1364	55730	0.0143	0.5855
Aug.	5	1322	57052	0.0139	0.5994
Aug.	6	1003	58055	0.0105	0.6099
Aug.	7	1526	59581	0.0160	0.6259
Aug.	8	1707	61288	0.0179	0.6439
Aug.	9	849	62137	0.0089	0.6528
Aug.	10	326	62463	0.0034	0.6562
Aug.	11	729	63192	0.0077	0.6639
Aug.	12	1238	64430	0.0130	0.6769
Aug.	13	616	65046	0.0065	0.6834
Aug.	14	673	65719	0.0071	0.6904
Aug.	15	1468	67187	0.0154	0.7059
Aug.	16	2341	69528	0.0246	0.7305
Aug.	17	4762	74290	0.0500	0.7805
Aug.	18	2168	76458	0.0228	0.8033
Aug.	19	2908	79366	0.0306	0.8338
Aug.	20	1682	81048	0.0177	0.8515
Aug.	21	772	81820	0.0081	0.8596
Aug.	22	2345	84165	0.0246	0.8842
Aug.	23	1586	85751	0.0167	0.9009
Aug.	24	1482	87233	0.0156	0.9165
Aug.	25	721	87954	0.0076	0.9240
Aug.	26	224	88178	0.0024	0.9264
Aug.	27	309	88487	0.0032	0.9296
Aug.	28	665	89152	0.0070	0.9366

Appendix Table A.2. (cont.)Daily sockeye salmon counts and associated statistics for Chilkoot Weir, 1987.

Aug.	29	1031	90183	0.0108	0.9474
Aug.	30	658	90841	0.0069	0.9544
Aug.	31	1107	91948	0.0116	0.9660
Sept.	1	848	92796	0.0089	0.9749
Sept.	2	316	93112	0.0033	0.9782
Sept.	3	304	93416	0.0032	0.9814
Sept.	4	174	93590	0.0018	0.9832
Sept.	5	511	94101	0.0054	0.9886
Sept.	6	286	94387	0.0030	0.9916
Sept.	7	104	94491	0.0011	0.9927
Sept.	8	145	94636	0.0015	0.9942
Sept.	9	201	94837	0.0021	0.9963
Sept.	10	0	94837	0.0000	0.9963
Sept.	11	0	94837	0.0000	0.9963
Sept.	12	2	94839	0.0000	0.9964
Sept.	13	60	94899	0.0006	0.9970
Sept.	14	14	94913	0.0001	0.9971
Sept.	15	17	94930	0.0002	0.9973
Sept.	16	14	94944	0.0001	0.9975
Sept.	17	28	94972	0.0003	0.9978
Sept.	18	35	95007	0.0004	0.9981
Sept.	19	49	95056	0.0005	0.9986
Sept.	20	29	95085	0.0003	0.9989
Sept.	21	23	95108	0.0002	0.9992
Sept.	22	30	95138	0.0003	0.9995
Sept.	23	13	95151	0.0001	0.9996
Sept.	24	4	95155	0.0000	0.9997
Sept.	25	9	95164	0.0001	0.9998
Sept.	26	4	95168	0.0000	0.9998
Sept.	27	5	95173	0.0001	0.9999
Sept.	28	5	95178	0.0001	0.9999
Sept.	29	3	95181	0.0000	1.0000
Sept.	30	2	95183	0.0000	1.0000
Oct.	1	0	95183	0.0000	1.0000
Oct.	2	0	95183	0.0000	1.0000
Oct.	3	0	95183	0.0000	1.0000
Oct.	4	0	95183	0.0000	1.0000
Oct.	5	0	95183	0.0000	1.0000
Oct.	6	0	95183	0.0000	1.0000
Oct.	7	0	95183	0.0000	1.0000
Oct.	8	1	95184	0.0000	1.0000
Oct.	9	0	95184	0.0000	1.0000
Oct.	10	0	95184	0.0000	1.0000
Oct.	11	0	95184	0.0000	1.0000
Oct.	12	0	95184	0.0000	1.0000

Appendix TABLE A.2. (cont.) Daily sockeye salmon counts and associated statistics from the Chilkoot Weir, 1987.

Oct.	13	0	95184	0.0000	1.0000
Oct.	14	0	95184	0.0000	1.0000
Oct.	15	0	95184	0.0000	1.0000
Oct.	16	0	95184	0.0000	1.0000
Oct.	17	0	95184	0.0000	1.0000
Oct.	18	1	95185	0.0000	1.0000

Mean Day of Migration = July 27 Variance = 550.1 Days squared

Appendix Table A.3. Chilkat Lake Weir water level and temperature, flow reversals, and daily sockeye salmon escapements, 1987.

Date	Water Level (cm)	Water Temp (Farenheit)	Flow Reversal	Daily Sockeye Escapement
14-Jun				
15-Jun				
16-Jun				
17-Jun				
18-Jun				
19-Jun	12.5	44		0
20-Jun	14	44		0
21-Jun	20	46		0
22-Jun	28	47		0
23-Jun	30	48		0
24-Jun	29	49		38
25-Jun	25	49		0
26-Jun	24	49		33
27-Jun	20	50		17
28-Jun	20	52		153
29-Jun	24	54		501
30-Jun	27	54		262
01-Jul	37	54		261
02-Jul	41	54		18
03-Jul	41	54		568
04-Jul	43	56		14
05-Jul	44	56		67
06-Jul	44	53		24
07-Jul	45	55		662
08-Jul	50	56		56
09-Jul	53	57		1026
10-Jul	54	58		240
11-Jul	53	59		122
12-Jul	49	57		193
13-Jul	47	57		101
14-Jul	48	55		177
15-Jul	45	56		851
16-Jul	43	57		248
17-Jul	44	58		2223
18-Jul	46	58		2008
19-Jul	45	60		1279
20-Jul	50	59		560
21-Jul	60	65		703

Appendix Table A.3. (Cont.) Chilkat Lake Weir water level and temperature, sockeye flow reversals, and daily escapements, 1987.

22-Jul	72	55	Reversal	0
23-Jul	86	57	Reversal	0
24-Jul	94	65	Reversal	0
25-Jul	104	68	Reversal	0
26-Jul	100	63	Reversal	0
27-Jul	100	62	Reversal	0
28-Jul	106	61	Reversal	1
29-Jul	97	62	Reversal	0
30-Jul	83	60	Reversal	0
31-Jul	57	60	Reversal	0
01-Aug	51	60	Reversal	0
02-Aug	48	60	Reversal	0
03-Aug	44	60	Reversal	0
04-Aug	44	60	Reversal	0
05-Aug	29	59		8
06-Aug	24	62		13
07-Aug	22	59		2
08-Aug	29	60		100
09-Aug	34	60		568
10-Aug	33	60		839
11-Aug	25	59		7
12-Aug	18	60		247
13-Aug	9	61		113
14-Aug	2	61		2
15-Aug	-2	60		0
16-Aug	-3	60		20
17-Aug	-2	58		58
18-Aug	-6	57		78
19-Aug	-10	56		277
20-Aug	-12	57		947
21-Aug	-11	59		440
22-Aug	-10	56		55
23-Aug	-7	55		423
24-Aug	-5	56		2130
25-Aug	-7	56		121
26-Aug	-7	56		1021
27-Aug	-7	57		337
28-Aug	-7	56		753
29-Aug	-13	57		1408
30-Aug	-12	58		135
31-Aug	-15	57		435
01-Sep	-20	54		23
02-Sep	-25	54		610
03-Sep	-26	57		413

Appendix Table A.3. (Cont.) Chilkat Lake Weir water level and temperature, flow reversals, and daily sockeye salmon escapements, 1987.

04-Sep	-23	54	Reversal	2
05-Sep	-3	40	Reversal	26
06-Sep	-1	54	Reversal	0
07-Sep	-5	54	Reversal	1
08-Sep	-1	55	Reversal	0
09-Sep	5	46	Reversal	0
10-Sep	34	40	Reversal	0
11-Sep	54	53	Reversal	0
12-Sep	47	56		1
13-Sep	34	54		0
14-Sep	27	54		0
15-Sep	17	53		0
16-Sep	5	53		0
17-Sep	10	52		0
18-Sep	15	50		156
19-Sep	20	49		103
20-Sep	20	49		765
21-Sep	13	50		1213
22-Sep	9	50		2862
23-Sep	3	52		6621
24-Sep	-1	50		4052
25-Sep	-3	50		2352
26-Sep	-2	50		178
27-Sep	2	50		378
28-Sep	1	50		502
29-Sep	-1	49		106
30-Sep	23	47		4179
01-Oct	46	49	Reversal	0
02-Oct	71	44	Reversal	0
03-Oct	62	45	Reversal	0
04-Oct	44	51	Reversal	0
05-Oct	36	47		0
06-Oct	28	50		0
07-Oct	21	48		0
08-Oct	18	48		0
09-Oct	9	47		0
10-Oct	2	47		0
11-Oct	0	47		0
12-Oct	-3	47		22

Appendix Table A.3. (Cont.) Chilkat Lake Weir water level and temperature, flow reversals, and daily sockeye salmon escapements, 1987.

13-Oct	-8	47	0
14-Oct	-11	47	10
15-Oct	-15	47	0
16-Oct	-16	47	2
17-Oct	-20	46	17
18-Oct	-24	46	1
19-Oct	-24	47	61
20-Oct	-25	46	60
21-Oct	-25	45	7
22-Oct	-25	45	11
23-Oct	-25	45	4
24-Oct	-28	45	11
25-Oct	-28	48	7
26-Oct	-29	43	25
27-Oct	-26	45	3
28-Oct	-27	47	3
29-Oct	-29	43	5
30-Oct	-30	40	6
31-Oct	-32	40	7
01-Nov	-32	37	5
02-Nov	-31	41	6
03-Nov	-31	40	5
04-Nov	-31	40	0
05-Nov	-30	40	1
06-Nov	-30	40	8
07-Nov	-32	43	7
08-Nov	-33	39	1
09-Nov	-34	40	5
10-Nov	-33	40	9
11-Nov	-24	40	4
12-Nov	-26	40	22
13-Nov	-26	39	4
14-Nov	-27	38	2
15-Nov	-27	37	3
16-Nov	-30	37	0
17-Nov	-29	37	2
18-Nov	-30	37	2
19-Nov	-30	37	0

Appendix Table B.1. Light-penetration data obtained from Chilkat (A) and Chilkoot (B) Lakes showing the euphotic zone depth, vertical extinction coefficient, and Secchi disk depth by sample date during 1987.

	Euphotic Zone Depth (m)		Vertical Extinction Coefficient (m^{-1})		Secchi Disk Depth (m)	
Date/Station	1	2	1	2	1	2
			A. Chilkat Lake			
05/18	17.4	19.1	0.26	0.24	6.0	6.5
06/09	16.0	14.5	0.29	0.31	4.5	5.0
07/08	16.3	13.5	0.28	0.35	6.5	6.0
08/20	20.2	20.2	0.23	0.23	10.0	10.5
09/24	19.0	16.8	0.24	0.28	6.0	7.0
10/28	14.8	14.3	0.31	0.32	5.5	5.0
11/25	18.9	20.2	0.24	0.23	6.0	7.0
Mean	17.5	16.9	0.26	0.28	6.4	6.7
			B. Chilkoot Lake			
05/07	13.1	14.6	0.35	0.31	5.0	5.0
06/08	12.3	11.0	0.37	0.41	4.5	4.5
07/07	4.1	4.3	1.19	1.05	1.0	1.0
08/16	4.7	3.5	1.01	1.30	0.8	0.8
09/23	4.1	3.4	1.15	1.33	0.8	0.8
10/30	2.6	2.9	1.92	1.70	0.5	0.5
11/23	3.7	3.9	1.25	1.21	0.8	0.8
Mean	6.4	6.2	1.03	1.04	1.9	1.9

Appendix Table B.2. Seasonal mean (May-October) values (n=6) for general water-quality parameters, metals concentrations, nutrient concentrations/atom ratios, and algal pigment concentrations obtained from two depths sampled at two stations in Chilkoot and Chilkat Lakes during 1987.

	Chilkoot Lake				Chilkat Lake			
	Station 1		Station 2		Station 1		Station 2	
	1 m	Hypolimnion	1 m	Hypolimnion	1 m	Hypolimnion	1 m	Hypolimnion
Conductivity (umhos/cm)	33	41	33	41	152	157	154	158
Ph (units)	6.6	6.6	6.5	6.6	7.9	7.5	7.9	7.4
Alkalinity (mg/L)	8	9	7	8	58	62	62	63
Turbidity (NTU)	6.2	3.6	4.8	3.7	0.7	0.5	0.7	0.5
Color (Pt units)	4.8	5.5	8.4	5.7	8.1	8.5	8.5	7.2
Calcium (mg/L)	4.2	5.5	4.5	5.5	24.5	24.7	24.7	24.8
Magnesium (mg/L)	0.2	0.3	0.2	0.4	1.3	1.2	1.3	1.5
Iron (ug/L)	483	331	352	314	65	60	86	62
Reactive silicon (ug/L)	1,706	1,963	1,656	1,927	1,530	1,798	1,524	1,913
TP (ug/L)	13.8	10.9	16.7	10.8	9.6	6.5	7.1	7.1
TFP (ug/L)	3.6	2.4	4.1	3.2	2.3	2.6	4.1	3.4
FRP (ug/L)	1.7	1.3	1.2	1.5	0.6	0.8	0.9	1.5
TKN (ug/L)	54.6	44.7	55.8	36.3	117.0	90.6	99.4	89.3
Ammonia (ug/L)	2.0	2.8	2.9	3.6	3.2	4.2	3.4	4.1
Nitrate + Nitrite (ug/L)	61.2	94.8	59.2	92.9	133.0	218.0	141.3	219.8
TN (ug/L)	115.8	139.4	115.0	129.2	255.4	308.6	240.7	309.0
N:P (atom ratio)	19:1	28:1	15:1	27:1	52:1	105:1	75:1	97:1
Chl a (ug/L)	0.99	0.78*	1.19	0.85*	0.97	1.35*	1.07	1.31*
Phaeo a (ug/L)	0.35	1.02*	0.31	0.36*	0.28	0.38*	0.27	0.38*

* Average values for the mid-euphotic zone.

Appendix Table B.3. Seasonal changes in zooplankton densities (no./m^2) with corresponding mean body sizes (mm) by taxa, sampling date, and station within Chilkat Lake during 1987. Also shown are the seasonal average densities and body sizes. NA indicates not available.

Species/Date	05/18	06/09	07/08	08/20	09/24	10/28	11/25	Seasonal Mean
				Station 1				
Bosmina longirostris	2,972 (0.37)	1,486 (0.36)	1,062 (NA)	69,002 (0.36)	85,456 (0.38)	11,462 (0.42)	1,725 (0.43)	24,738 (0.34)
Daphnia longiremus	2,972 (0.45)	7,429 (0.74)	47,240 (0.74)	277,335 (0.81)	120,488 (0.91)	6,792 (0.92)	133 (0.89)	66,056 (0.78)
Cyclops sp.	1,653,719 (0.56)	1,343,182 (0.73)	396,497 (0.88)	253,450 (0.94)	121,550 (1.01)	74,291 (0.72)	72,054 (0.52)	559,249 (0.77)
				Station 2				
Bosmina longirostris	Present (NA)	1,486 (NA)	3,981 (0.42)	192,410 (0.39)	23,179 (0.40)	14,434 (0.41)	2,787 (0.41)	34,040 (0.41)
Daphnia longiremus	Present (0.61)	2,972 (0.76)	27,866 (0.91)	165,870 (0.83)	15,368 (0.90)	8,660 (0.94)	531 (0.90)	31,610 (0.84)
Cyclops sp.	1,102,479 (0.57)	1,096,536 (0.79)	932,856 (0.90)	283,970 (0.93)	35,235 (0.96)	122,432 (0.89)	78,025 (0.75)	521,648 (0.83)

Appendix Table B.4. Seasonal changes in zooplankton densities (no./m^2) with corresponding mean body sizes (mm) by taxa, sampling date, and station within Chilkoot Lake during 1987. Also shown are the seasonal average densities and body sizes.

Species/Date	05/07	06/08	07/07	08/16	09/23	10/30	11/23	Seasonal Average
				Station 1				
Cyclops sp.	79,513 (0.56)	195,619 (0.64)	117,847 (0.57)	132,790 (0.62)	261,929 (0.52)	182,331 (0.53)	131,389 (0.56)	157,345 (0.57)
				Station 2				
Cyclops sp.	69,069 (0.48)	137,969 (0.61)	377,399 (0.82)	130,328 (0.74)	231,788 (0.51)	150,959 (0.52)	116,828 (0.55)	173,477 (0.60)

Appendix Table B. 5. Preliminary in-lake rearing fish population estimtes for 1987 at Chilkat and Chilkoot Lakes based on hydroacoustic and tow net surveys.

Lake	Mean Fish Date	Hydroacoustic Sockeye Population Estimate	Population Species Composition: Dolly Varden (O. nerka)	Stickleback (S. malma)	Sculpin (G. aculeatus)	(Cottus sp.)
Chilkat	05/17	3,252,000	1,489,416	--	1,762,584	--
	08/21	10,949,000	76,643	--	10,844,985	21,898
	10/28	6,959,000	1,141,276	--	5,762,052	55,672
Chilkoot	05/13	1,425,500	1,425,500	--	--	--
	05/18	1,392,000	1,392,000	--	--	--
	10/30	1,998,000	1,530,468	9,990	337,662	119,880

Appendix Table C.1. Daily sockeye salmon counts and associated statistics from the Situk River Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
June	11	0	0	0.0000	0.0000
June	12	0	0	0.0000	0.0000
June	13	358	358	0.0049	0.0049
June	14	172	530	0.0024	0.0073
June	15	201	731	0.0028	0.0101
June	16	138	869	0.0019	0.0119
June	17	15	884	0.0002	0.0122
June	18	84	968	0.0012	0.0133
June	19	110	1078	0.0015	0.0148
June	20	88	1166	0.0012	0.0160
June	21	624	1790	0.0086	0.0246
June	22	666	2456	0.0092	0.0338
June	23	1333	3789	0.0183	0.0521
June	24	1322	5111	0.0182	0.0703
June	25	1258	6369	0.0173	0.0876
June	26	2852	9221	0.0392	0.1268
June	27	1626	10847	0.0224	0.1492
June	28	2063	12910	0.0284	0.1775
June	29	1509	14419	0.0208	0.1983
June	30	800	15219	0.0110	0.2093
July	1	1298	16517	0.0178	0.2271
July	2	1494	18011	0.0205	0.2477
July	3	2139	20150	0.0294	0.2771
July	4	5135	25285	0.0706	0.3477
July	5	2696	27981	0.0371	0.3848

Appendix Table C.1. (cont.) Daily sockeye salmon counts and associated statistics from the Situk River weir, 1987.

July	6	2989	30970	0.0411	0.4259
July	7	1819	32789	0.0250	0.4509
July	8	368	33157	0.0051	0.4560
July	9	407	33564	0.0056	0.4616
July	10	482	34046	0.0066	0.4682
July	11	1526	35572	0.0210	0.4892
July	12	1268	36840	0.0174	0.5066
July	13	1895	38735	0.0261	0.5327
July	14	2460	41195	0.0338	0.5665
July	15	2087	43282	0.0287	0.5952
July	16	1048	44330	0.0144	0.6096
July	17	1288	45618	0.0177	0.6273
July	18	2031	47649	0.0279	0.6552
July	19	2789	50438	0.0384	0.6936
July	20	2176	52614	0.0299	0.7235
July	21	1157	53771	0.0159	0.7394
July	22	2637	56408	0.0363	0.7757
July	23	1295	57703	0.0178	0.7935
July	24	1027	58730	0.0141	0.8076
July	25	1345	60075	0.0185	0.8261
July	26	718	60793	0.0099	0.8360
July	27	724	61517	0.0100	0.8459
July	28	910	62427	0.0125	0.8585
July	29	1288	63715	0.0177	0.8762
July	30	905	64620	0.0124	0.8886
July	31	947	65567	0.0130	0.9016
Aug.	1	683	66250	0.0094	0.9110
Aug.	2	472	66722	0.0065	0.9175
Aug.	3	1392	68114	0.0191	0.9367

Appenmdix TABLE C.1. (cont.) Daily saokeye salmon counts and associated statistics from the Situk Weir, 1987.

Aug.	4	679	68793	0.0093	0.9460
Aug.	5	1103	69896	0.0152	0.9612
Aug.	6	486	70382	0.0067	0.9678
Aug.	7	364	70746	0.0050	0.9729
Aug.	8	495	71241	0.0068	0.9797
Aug.	9	354	71595	0.0049	0.9845
Aug.	10	460	72055	0.0063	0.9909
Aug.	11	309	72364	0.0042	0.9951
Aug.	12	225	72589	0.0031	0.9982
Aug.	13	131	72720	0.0018	1.0000

Mean Day of Migration = July 12 Variance = 176.5 Days squared

Appendix TABLE C.2. Daily sockeye salmon counts and associated ststistics from the Speel Lake Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
July	15	0	0	0.0000	0.0000
July	16	0	0	0.0000	0.0000
July	17	0	0	0.0000	0.0000
July	18	0	0	0.0000	0.0000
July	19	0	0	0.0000	0.0000
July	20	0	0	0.0000	0.0000
July	21	0	0	0.0000	0.0000
July	22	0	0	0.0000	0.0000
July	23	0	0	0.0000	0.0000
July	24	36	36	0.0039	0.0039
July	25	268	304	0.0292	0.0332
July	26	26	330	0.0028	0.0360
July	27	23	353	0.0025	0.0385
July	28	613	966	0.0669	0.1054
July	29	228	1194	0.0249	0.1302
July	30	32	1226	0.0035	0.1337
July	31	279	1505	0.0304	0.1641
Aug.	1	33	1538	0.0036	0.1677
Aug.	2	148	1686	0.0161	0.1839
Aug.	3	533	2219	0.0581	0.2420
Aug.	4	143	2362	0.0156	0.2576
Aug.	5	117	2479	0.0128	0.2704
Aug.	6	49	2528	0.0053	0.2757
Aug.	7	103	2631	0.0112	0.2869
Aug.	8	28	2659	0.0031	0.2900

Appendix TABLE C.2. (cont.) Daily sockeye salmon counts and associated statistics from the Speel Lake Weir, 1987.

Aug.	9	8	2667	0.0009	0.2909
Aug.	10	994	3661	0.1084	0.3993
Aug.	11	44	3705	0.0048	0.4041
Aug.	12	1252	4957	0.1365	0.5406
Aug.	13	10	4967	0.0011	0.5417
Aug.	14	39	5006	0.0043	0.5460
Aug.	15	527	5533	0.0575	0.6034
Aug.	16	2950	8483	0.3217	0.9252
Aug.	17	277	8760	0.0302	0.9554
Aug.	18	70	8830	0.0076	0.9630
Aug.	19	23	8853	0.0025	0.9655
Aug.	20	42	8895	0.0046	0.9701
Aug.	21	16	8911	0.0017	0.9719
Aug.	22	218	9129	0.0238	0.9956
Aug.	23	0	9129	0.0000	0.9956
Aug.	24	38	9167	0.0041	0.9998
Aug.	25	2	9169	0.0002	1.0000
Aug.	26	0	9169	0.0000	1.0000
Aug.	27	0	9169	0.0000	1.0000

Mean Day of Migration = Aug. 10 Variance = 54.0 Days squared

Appendix TABLE C.3. Daily sockeye salmon counts and associated statistics from the Crescent Lake Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
July	12	1	1	0.0001	0.0001
July	13	0	1	0.0000	0.0001
July	14	21	22	0.0028	0.0029
July	15	2	24	0.0003	0.0032
July	16	5	29	0.0007	0.0039
July	17	107	136	0.0143	0.0182
July	18	69	205	0.0093	0.0275
July	19	144	349	0.0193	0.0468
July	20	212	561	0.0284	0.0752
July	21	167	728	0.0224	0.0976
July	22	160	888	0.0215	0.1191
July	23	280	1168	0.0375	0.1566
July	24	257	1425	0.0345	0.1910
July	25	155	1580	0.0208	0.2118
July	26	215	1795	0.0288	0.2406
July	27	255	2050	0.0342	0.2748
July	28	523	2573	0.0701	0.3450
July	29	219	2792	0.0294	0.3743
July	30	92	2884	0.0123	0.3866
July	31	23	2907	0.0031	0.3897
Aug.	1	354	3261	0.0475	0.4372
Aug.	2	666	3927	0.0893	0.5265
Aug.	3	172	4099	0.0231	0.5495
Aug.	4	49	4148	0.0066	0.5561
Aug.	5	112	4260	0.0150	0.5711
Aug.	6	380	4640	0.0509	0.6221

Appendix TABLE C.3. (cont.) Daily sockeye salmon counts and associated statistics from the Crescent Lake Weir, 1987.

Aug.	7	304	4944	0.0408	0.6628
Aug.	8	446	5390	0.0598	0.7226
Aug.	9	258	5648	0.0346	0.7572
Aug.	10	325	5973	0.0436	0.8008
Aug.	11	349	6322	0.0468	0.8476
Aug.	12	275	6597	0.0369	0.8844
Aug.	13	96	6693	0.0129	0.8973
Aug.	14	77	6770	0.0103	0.9076
Aug.	15	158	6928	0.0212	0.9288
Aug.	16	56	6984	0.0075	0.9363
Aug.	17	49	7033	0.0066	0.9429
Aug.	18	16	7049	0.0021	0.9450
Aug.	19	20	7069	0.0027	0.9477
Aug.	20	37	7106	0.0050	0.9527
Aug.	21	46	7152	0.0062	0.9588
Aug.	22	52	7204	0.0070	0.9658
Aug.	23	75	7279	0.0101	0.9759
Aug.	24	93	7372	0.0125	0.9883
Aug.	25	48	7420	0.0064	0.9948
Aug.	26	30	7450	0.0040	0.9988
Aug.	27	9	7459	0.0012	1.0000

Mean Day of Migration = Aug. 3 Variance = 84.5 Days squared

Appendix TABLE C.4. Daily sockeye salmon counts and associated statistics from the Salmon Bay Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
June	25	0	0	0.0000	0.0000
June	26	0	0	0.0000	0.0000
June	27	0	0	0.0000	0.0000
June	28	8	8	0.0006	0.0006
June	29	6	14	0.0005	0.0011
June	30	15	29	0.0012	0.0023
July	1	44	73	0.0035	0.0058
July	2	71	144	0.0056	0.0114
July	3	2	146	0.0002	0.0115
July	4	0	146	0.0000	0.0115
July	5	1	147	0.0001	0.0116
July	6	2	149	0.0002	0.0118
July	7	1	150	0.0001	0.0118
July	8	9	159	0.0007	0.0126
July	9	22	181	0.0017	0.0143
July	10	25	206	0.0020	0.0163
July	11	17	223	0.0013	0.0176
July	12	2	225	0.0002	0.0178
July	13	69	294	0.0054	0.0232
July	14	1	295	0.0001	0.0233
July	15	451	746	0.0356	0.0589
July	16	425	1171	0.0336	0.0925
July	17	68	1239	0.0054	0.0978
July	18	42	1281	0.0033	0.1011
July	19	681	1962	0.0538	0.1549

Appendix Table C.4. (cont.) Daily sockeye salmon counts and associated statistics from the Salmon Bay Weir, 1987.

July	20	433	2395	0.0342	0.1891
July	21	129	2524	0.0102	0.1993
July	22	611	3135	0.0482	0.2475
July	23	60	3195	0.0047	0.2523
July	24	14	3209	0.0011	0.2534
July	25	39	3248	0.0031	0.2564
July	26	66	3314	0.0052	0.2616
July	27	20	3334	0.0016	0.2632
July	28	33	3367	0.0026	0.2658
July	29	6	3373	0.0005	0.2663
July	30	28	3401	0.0022	0.2685
July	31	6	3407	0.0005	0.2690
Aug.	1	16	3423	0.0013	0.2703
Aug.	2	4	3427	0.0003	0.2706
Aug.	3	7	3434	0.0006	0.2711
Aug.	4	20	3454	0.0016	0.2727
Aug.	5	90	3544	0.0071	0.2798
Aug.	6	130	3674	0.0103	0.2901
Aug.	7	202	3876	0.0159	0.3060
Aug.	8	159	4035	0.0126	0.3186
Aug.	9	85	4120	0.0067	0.3253
Aug.	10	15	4135	0.0012	0.3265
Aug.	11	81	4216	0.0064	0.3329
Aug.	12	44	4260	0.0035	0.3363
Aug.	13	714	4974	0.0564	0.3927
Aug.	14	1	4975	0.0001	0.3928
Aug.	15	20	4995	0.0016	0.3944
Aug.	16	17	5012	0.0013	0.3957

Appendix TABLE C.4. (cont.) Daily sockeye salmon counts and associated statistics from Salmon Bay Weir, 1987.

Aug.	17	17	5029	0.0013	0.3970
Aug.	18	11	5040	0.0009	0.3979
Aug.	19	19	5059	0.0015	0.3994
Aug.	20	5	5064	0.0004	0.3998
Aug.	21	17	5081	0.0013	0.4012
Aug.	22	36	5117	0.0028	0.4040
Aug.	23	29	5146	0.0023	0.4063
Aug.	24	30	5176	0.0024	0.4087
Aug.	25	35	5211	0.0028	0.4114
Aug.	26	18	5229	0.0014	0.4128
Aug.	27	28	5257	0.0022	0.4150
Aug.	28	36	5293	0.0028	0.4179
Aug.	29	52	5345	0.0041	0.4220
Aug.	30	363	5708	0.0287	0.4507
Aug.	31	903	6611	0.0713	0.5219
Sept.	1	2919	9530	0.2305	0.7524
Sept.	2	594	10124	0.0469	0.7993
Sept.	3	566	10690	0.0447	0.8440
Sept.	4	396	11086	0.0313	0.8753
Sept.	5	242	11328	0.0191	0.8944
Sept.	6	153	11481	0.0121	0.9064
Sept.	7	90	11571	0.0071	0.9135
Sept.	8	82	11653	0.0065	0.9200
Sept.	9	103	11756	0.0081	0.9282
Sept.	10	406	12162	0.0321	0.9602
Sept.	11	419	12581	0.0331	0.9933
Sept.	12	28	12609	0.0022	0.9955

Appendix TABLE C.4. (cont.)Daily sockeye salmon counts and associated statistics from the Salmon Bay Weir, 1987.

Sept.	13	7	12616	0.0006	0.9961
Sept.	14	13	12629	0.0010	0.9971
Sept.	15	30	12659	0.0024	0.9994
Sept.	16	7	12666	0.0006	1.0000

Mean Day of Migration = Aug. 18 Variance = 425.4 Days squared

Appendix TABLE C.5. Daily sockeye salmon counts and associated statistics from the Karta River Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
June	23	0	0	0.0000	0.0000
June	24	27	27	0.0046	0.0046
June	25	19	46	0.0032	0.0078
June	26	30	76	0.0051	0.0129
June	27	172	248	0.0292	0.0421
June	28	145	393	0.0246	0.0667
June	29	207	600	0.0352	0.1019
June	30	150	750	0.0255	0.1274
July	1	102	852	0.0173	0.1447
July	2	78	930	0.0132	0.1579
July	3	156	1086	0.0265	0.1844
July	4	79	1165	0.0134	0.1979
July	5	242	1407	0.0411	0.2390
July	6	59	1466	0.0100	0.2490
July	7	112	1578	0.0190	0.2680
July	8	291	1869	0.0494	0.3174
July	9	267	2136	0.0453	0.3628
July	10	272	2408	0.0462	0.4090
July	11	293	2701	0.0498	0.4587
July	12	225	2926	0.0382	0.4969
July	13	73	2999	0.0124	0.5093
July	14	63	3062	0.0107	0.5200
July	15	71	3133	0.0121	0.5321
July	16	92	3225	0.0156	0.5477

Appendix Table C.5. (cont.) Daily sockeye salmon counts and associated statistics from the Karta River Weir, 1987.

July	17	222	3447	0.0377	0.5854
July	18	135	3582	0.0229	0.6084
July	19	107	3689	0.0182	0.6265
July	20	53	3742	0.0090	0.6355
July	21	89	3831	0.0151	0.6506
July	22	68	3899	0.0115	0.6622
July	23	40	3939	0.0068	0.6690
July	24	19	3958	0.0032	0.6722
July	25	25	3983	0.0042	0.6765
July	26	69	4052	0.0117	0.6882
July	27	25	4077	0.0042	0.6924
July	28	25	4102	0.0042	0.6967
July	29	28	4130	0.0048	0.7014
July	30	39	4169	0.0066	0.7081
July	31	50	4219	0.0085	0.7165
Aug.	1	8	4227	0.0014	0.7179
Aug.	2	18	4245	0.0031	0.7210
Aug.	3	40	4285	0.0068	0.7278
Aug.	4	11	4296	0.0019	0.7296
Aug.	5	49	4345	0.0083	0.7379
Aug.	6	37	4382	0.0063	0.7442
Aug.	7	34	4416	0.0058	0.7500
Aug.	8	25	4441	0.0042	0.7542
Aug.	9	31	4472	0.0053	0.7595
Aug.	10	32	4504	0.0054	0.7649
Aug.	11	29	4533	0.0049	0.7699
Aug.	12	5	4538	0.0008	0.7707
Aug.	13	38	4576	0.0065	0.7772
Aug.	14	25	4601	0.0042	0.7814

Appendix TABLE C.5. (cont.) Daily sockeye salmon count and associated statistics from the Karta River Weir, 1987.

Aug.	15	18	4619	0.0031	0.7845
Aug.	16	28	4647	0.0048	0.7892
Aug.	17	45	4692	0.0076	0.7969
Aug.	18	46	4738	0.0078	0.8047
Aug.	19	39	4777	0.0066	0.8113
Aug.	20	38	4815	0.0065	0.8178
Aug.	21	27	4842	0.0046	0.8224
Aug.	22	33	4875	0.0056	0.8280
Aug.	23	17	4892	0.0029	0.8308
Aug.	24	23	4915	0.0039	0.8347
Aug.	25	37	4952	0.0063	0.8410
Aug.	26	0	4952	0.0000	0.8410
Aug.	27	0	4952	0.0000	0.8410
Aug.	28	84	5036	0.0143	0.8553
Aug.	29	19	5055	0.0032	0.8585
Aug.	30	199	5254	0.0338	0.8923
Aug.	31	350	5604	0.0594	0.9518
Sept.	1	15	5619	0.0025	0.9543
Sept.	2	36	5655	0.0061	0.9604
Sept.	3	9	5664	0.0015	0.9620
Sept.	4	8	5672	0.0014	0.9633
Sept.	5	12	5684	0.0020	0.9654
Sept.	6	22	5706	0.0037	0.9691
Sept.	7	10	5716	0.0017	0.9708
Sept.	8	113	5829	0.0192	0.9900
Sept.	9	1	5830	0.0002	0.9901
Sept.	10	0	5830	0.0000	0.9901
Sept.	11	7	5837	0.0012	0.9913

Appendix TABLE C.5. (cont.)Daily sockeye salmon counts and associated statistics from the Karta River Weir, 1987.

Sept.	12	16	5853	0.0027	0.9941
Sept.	13	9	5862	0.0015	0.9956
Sept.	14	1	5863	0.0002	0.9958
Sept.	15	25	5888	0.0042	1.0000
Sept.	16	0	5888	0.0000	1.0000

Mean Day of Migration = July 23 Variance = 506.8 Days squared

Appendix TABLE C.6. Daily sockeye salmon counts and associated statistics from the Naha River Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
July	5	44	44	0.0022	0.0022
July	6	34	78	0.0017	0.0039
July	7	18	96	0.0009	0.0048
July	8	31	127	0.0016	0.0064
July	9	57	184	0.0029	0.0093
July	10	40	224	0.0020	0.0113
July	11	50	274	0.0025	0.0138
July	12	41	315	0.0021	0.0159
July	13	17	332	0.0009	0.0167
July	14	354	686	0.0178	0.0346
July	15	51	737	0.0026	0.0371
July	16	21	758	0.0011	0.0382
July	17	3	761	0.0002	0.0383
July	18	780	1541	0.0393	0.0776
July	19	702	2243	0.0354	0.1130
July	20	113	2356	0.0057	0.1187
July	21	137	2493	0.0069	0.1256
July	22	125	2618	0.0063	0.1319
July	23	916	3534	0.0461	0.1780
July	24	108	3642	0.0054	0.1835
July	25	76	3718	0.0038	0.1873
July	26	776	4494	0.0391	0.2264
July	27	68	4562	0.0034	0.2298
July	28	136	4698	0.0069	0.2367

Appendix Table C.6. (cont.) Daily sockeye salmon counts and associated statistics from the Naha River Weir, 1987.

July	29	882	5580	0.0444	0.2811
July	30	764	6344	0.0385	0.3196
July	31	699	7043	0.0352	0.3548
Aug.	1	306	7349	0.0154	0.3702
Aug.	2	164	7513	0.0083	0.3785
Aug.	3	254	7767	0.0128	0.3913
Aug.	4	1457	9224	0.0734	0.4647
Aug.	5	112	9336	0.0056	0.4704
Aug.	6	243	9579	0.0122	0.4826
Aug.	7	5	9584	0.0003	0.4828
Aug.	8	98	9682	0.0049	0.4878
Aug.	9	2	9684	0.0001	0.4879
Aug.	10	21	9705	0.0011	0.4889
Aug.	11	43	9748	0.0022	0.4911
Aug.	12	18	9766	0.0009	0.4920
Aug.	13	21	9787	0.0011	0.4931
Aug.	14	1	9788	0.0001	0.4931
Aug.	15	20	9808	0.0010	0.4941
Aug.	16	60	9868	0.0030	0.4972
Aug.	17	647	10515	0.0326	0.5297
Aug.	18	287	10802	0.0145	0.5442
Aug.	19	84	10886	0.0042	0.5484
Aug.	20	209	11095	0.0105	0.5590
Aug.	21	90	11185	0.0045	0.5635
Aug.	22	138	11323	0.0070	0.5705
Aug.	23	372	11695	0.0187	0.5892
Aug.	24	119	11814	0.0060	0.5952

Appendix TABLE C.6. (cont.)Daily sockeye salmon counts and associated statistics from the Naha River Weir, 1987.

Aug.	25	77	11891	0.0039	0.5991
Aug.	26	16	11907	0.0008	0.5999
Aug.	27	61	11968	0.0031	0.6030
Aug.	28	67	12035	0.0034	0.6063
Aug.	29	120	12155	0.0060	0.6124
Aug.	30	3498	15653	0.1762	0.7886
Aug.	31	631	16284	0.0318	0.8204
Sept.	1	1536	17820	0.0774	0.8978
Sept.	2	705	18525	0.0355	0.9333
Sept.	3	91	18616	0.0046	0.9379
Sept.	4	143	18759	0.0072	0.9451
Sept.	5	116	18875	0.0058	0.9509
Sept.	6	117	18992	0.0059	0.9568
Sept.	7	50	19042	0.0025	0.9593
Sept.	8	133	19175	0.0067	0.9660
Sept.	9	33	19208	0.0017	0.9677
Sept.	10	27	19235	0.0014	0.9691
Sept.	11	511	19746	0.0257	0.9948
Sept.	12	25	19771	0.0013	0.9961
Sept.	13	9	19780	0.0005	0.9965
Sept.	14	66	19846	0.0033	0.9998
Sept.	15	3	19849	0.0002	1.0000

Mean Day of Migration = Aug. 13 Variance = 332.0 Days squared

Appendix TABLE C.7. Daily sockeye salmon counts and associated statistics from the Klawock Lake weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
June	27	0	0	0.0000	0.0000
June	28	0	0	0.0000	0.0000
June	29	0	0	0.0000	0.0000
June	30	0	0	0.0000	0.0000
July	1	0	0	0.0000	0.0000
July	2	0	0	0.0000	0.0000
July	3	0	0	0.0000	0.0000
July	4	0	0	0.0000	0.0000
July	5	0	0	0.0000	0.0000
July	6	0	0	0.0000	0.0000
July	7	0	0	0.0000	0.0000
July	8	0	0	0.0000	0.0000
July	9	0	0	0.0000	0.0000
July	10	0	0	0.0000	0.0000
July	11	0	0	0.0000	0.0000
July	12	0	0	0.0000	0.0000
July	13	15	15	0.0019	0.0019
July	14	0	15	0.0000	0.0019
July	15	0	15	0.0000	0.0019
July	16	0	15	0.0000	0.0019
July	17	0	15	0.0000	0.0019
July	18	0	15	0.0000	0.0019
July	19	0	15	0.0000	0.0019
July	20	0	15	0.0000	0.0019

Appendix Table C.7. (cont.) Daily sockeye salmon counts and associated statistics from the Klawock Lake weir, 1987.

July	21	0	15	0.0000	0.0019
July	22	0	15	0.0000	0.0019
July	23	0	15	0.0000	0.0019
July	24	0	15	0.0000	0.0019
July	25	0	15	0.0000	0.0019
July	26	0	15	0.0000	0.0019
July	27	0	15	0.0000	0.0019
July	28	0	15	0.0000	0.0019
July	29	0	15	0.0000	0.0019
July	30	300	315	0.0386	0.0406
July	31	0	315	0.0000	0.0406
Aug.	1	0	315	0.0000	0.0406
Aug.	2	0	315	0.0000	0.0406
Aug.	3	0	315	0.0000	0.0406
Aug.	4	0	315	0.0000	0.0406
Aug.	5	0	315	0.0000	0.0406
Aug.	6	0	315	0.0000	0.0406
Aug.	7	0	315	0.0000	0.0406
Aug.	8	0	315	0.0000	0.0406
Aug.	9	0	315	0.0000	0.0406
Aug.	10	0	315	0.0000	0.0406
Aug.	11	0	315	0.0000	0.0406
Aug.	12	0	315	0.0000	0.0406
Aug.	13	0	315	0.0000	0.0406
Aug.	14	0	315	0.0000	0.0406
Aug.	15	0	315	0.0000	0.0406
Aug.	16	0	315	0.0000	0.0406

Appendix Table C.7. (cont.) Daily sockeye salmon counts and associated statistics
from the Klawock Lake weir, 1987.

Aug.	17	0	315	0.0000	0.0406
Aug.	18	0	315	0.0000	0.0406
Aug.	19	0	315	0.0000	0.0406
Aug.	20	0	315	0.0000	0.0406
Aug.	21	0	315	0.0000	0.0406
Aug.	22	0	315	0.0000	0.0406
Aug.	23	0	315	0.0000	0.0406
Aug.	24	0	315	0.0000	0.0406
Aug.	25	0	315	0.0000	0.0406
Aug.	26	0	315	0.0000	0.0406
Aug.	27	0	315	0.0000	0.0406
Aug.	28	400	715	0.0515	0.0921
Aug.	29	0	715	0.0000	0.0921
Aug.	30	0	715	0.0000	0.0921
Aug.	31	0	715	0.0000	0.0921
Sept.	1	0	715	0.0000	0.0921
Sept.	2	0	715	0.0000	0.0921
Sept.	3	0	715	0.0000	0.0921
Sept.	4	330	1045	0.0425	0.1346
Sept.	5	0	1045	0.0000	0.1346
Sept.	6	0	1045	0.0000	0.1346
Sept.	7	0	1045	0.0000	0.1346
Sept.	8	928	1973	0.1195	0.2542
Sept.	9	610	2583	0.0786	0.3327
Sept.	10	1108	3691	0.1427	0.4755
Sept.	11	936	4627	0.1206	0.5960
Sept.	12	659	5286	0.0849	0.6809
Sept.	13	424	5710	0.0546	0.7355

Appendix Table C.7. (cont.) Daily sockeye salmon counts and associated statistics from the Klawock Lake weir, 1987.

Sept.	14	452	6162	0.0582	0.7938
Sept.	15	340	6502	0.0438	0.8376
Sept.	16	326	6828	0.0420	0.8796
Sept.	17	67	6895	0.0086	0.8882
Sept.	18	78	6973	0.0100	0.8982
Sept.	19	64	7037	0.0082	0.9065
Sept.	20	142	7179	0.0183	0.9248
Sept.	21	53	7232	0.0068	0.9316
Sept.	22	77	7309	0.0099	0.9415
Sept.	23	86	7395	0.0111	0.9526
Sept.	24	37	7432	0.0048	0.9574
Sept.	25	32	7464	0.0041	0.9615
Sept.	26	42	7506	0.0054	0.9669
Sept.	27	167	7673	0.0215	0.9884
Sept.	28	12	7685	0.0015	0.9900
Sept.	29	36	7721	0.0046	0.9946
Sept.	30	21	7742	0.0027	0.9973
Oct.	1	2	7744	0.0003	0.9976
Oct.	2	0	7744	0.0000	0.9976
Oct.	3	0	7744	0.0000	0.9976
Oct.	4	10	7754	0.0013	0.9988
Oct.	5	7	7761	0.0009	0.9997
Oct.	6	0	7761	0.0000	0.9997
Oct.	7	1	7762	0.0001	0.9999
Oct.	8	0	7762	0.0000	0.9999
Oct.	9	0	7762	0.0000	0.9999
Oct.	10	0	7762	0.0000	0.9999
Oct.	11	0	7762	0.0000	0.9999

Appendix TABLE C.7. (cont.)Daily sockeye salmon counts and associated statistics from the Klawock Weir, 1987.

Oct.	12	0	7762	0.0000	0.9999
Oct.	13	0	7762	0.0000	0.9999
Oct.	14	0	7762	0.0000	0.9999
Oct.	15	0	7762	0.0000	0.9999
Oct.	16	0	7762	0.0000	0.9999
Oct.	17	0	7762	0.0000	0.9999
Oct.	18	0	7762	0.0000	0.9999
Oct.	19	0	7762	0.0000	0.9999
Oct.	20	0	7762	0.0000	0.9999
Oct.	21	0	7762	0.0000	0.9999
Oct.	22	0	7762	0.0000	0.9999
Oct.	23	0	7762	0.0000	0.9999
Oct.	24	0	7762	0.0000	0.9999
Oct.	25	0	7762	0.0000	0.9999
Oct.	26	0	7762	0.0000	0.9999
Oct.	27	0	7762	0.0000	0.9999
Oct.	28	0	7762	0.0000	0.9999
Oct.	29	0	7762	0.0000	0.9999
Oct.	30	0	7762	0.0000	0.9999
Oct.	31	0	7762	0.0000	0.9999
Nov.	1	0	7762	0.0000	0.9999
Nov.	2	0	7762	0.0000	0.9999
Nov.	3	0	7762	0.0000	0.9999
Nov.	4	0	7762	0.0000	0.9999
Nov.	5	0	7762	0.0000	0.9999
Nov.	6	0	7762	0.0000	0.9999
Nov.	7	0	7762	0.0000	0.9999
Nov.	8	0	7762	0.0000	0.9999

Appendix TABLE C.7. (cont.) Daily sockeye salmon counts and associated statistics from the Klawock Weir, 1987.

Nov.	9	0	7762	0.0000	0.9999
Nov.	10	0	7762	0.0000	0.9999
Nov.	11	0	7762	0.0000	0.9999
Nov.	12	1	7763	0.0001	1.0000
Nov.	13	0	7763	0.0000	1.0000

Mean Day of Migration = Sept. 10 Variance = 112.5 Days squared

Appendix TABLE C.8. Daily sockeye salmon counts and associated statistics from the Hugh Smith Lake Weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cum. Prop. of Total
June	8	2	2	0.0001	0.0001
June	9	0	2	0.0000	0.0001
June	10	0	2	0.0000	0.0001
June	11	0	2	0.0000	0.0001
June	12	0	2	0.0000	0.0001
June	13	0	2	0.0000	0.0001
June	14	0	2	0.0000	0.0001
June	15	0	2	0.0000	0.0001
June	16	9	11	0.0003	0.0003
June	17	0	11	0.0000	0.0003
June	18	6	17	0.0002	0.0005
June	19	25	42	0.0008	0.0013
June	20	16	58	0.0005	0.0017
June	21	21	79	0.0006	0.0024
June	22	54	133	0.0016	0.0040
June	23	14	147	0.0004	0.0044
June	24	5	152	0.0002	0.0046
June	25	51	203	0.0015	0.0061
June	26	23	226	0.0007	0.0068
June	27	0	226	0.0000	0.0068
June	28	0	226	0.0000	0.0068
June	29	0	226	0.0000	0.0068
June	30	0	226	0.0000	0.0068
July	1	8	234	0.0002	0.0070

Appendix Table C.8. (cont.) Daily sockeye salmon counts and associated statistics from the Hugh Smith Lake Weir, 1987.

July	2	100	334	0.0030	0.0101
July	3	81	415	0.0024	0.0125
July	4	80	495	0.0024	0.0149
July	5	80	575	0.0024	0.0173
July	6	100	675	0.0030	0.0203
July	7	180	855	0.0054	0.0257
July	8	128	983	0.0039	0.0296
July	9	40	1023	0.0012	0.0308
July	10	120	1143	0.0036	0.0344
July	11	100	1243	0.0030	0.0374
July	12	99	1342	0.0030	0.0404
July	13	100	1442	0.0030	0.0434
July	14	701	2143	0.0211	0.0645
July	15	405	2548	0.0122	0.0767
July	16	582	3130	0.0175	0.0943
July	17	411	3541	0.0124	0.1066
July	18	2878	6419	0.0867	0.1933
July	19	2225	8644	0.0670	0.2603
July	20	826	9470	0.0249	0.2852
July	21	550	10020	0.0166	0.3018
July	22	624	10644	0.0188	0.3206
July	23	501	11145	0.0151	0.3357
July	24	1603	12748	0.0483	0.3839
July	25	595	13343	0.0179	0.4018
July	26	500	13843	0.0151	0.4169
July	27	329	14172	0.0099	0.4268
July	28	185	14357	0.0056	0.4324

Appendix Table C.8. (cont.) Daily sockeye salmon counts and associated statistics from the Hugh Smith Lake Weir, 1987.

July	29	411	14768	0.0124	0.4448
July	30	822	15590	0.0248	0.4695
July	31	380	15970	0.0114	0.4810
Aug.	1	335	16305	0.0101	0.4911
Aug.	2	348	16653	0.0105	0.5015
Aug.	3	73	16726	0.0022	0.5037
Aug.	4	301	17027	0.0091	0.5128
Aug.	5	345	17372	0.0104	0.5232
Aug.	6	82	17454	0.0025	0.5257
Aug.	7	140	17594	0.0042	0.5299
Aug.	8	200	17794	0.0060	0.5359
Aug.	9	30	17824	0.0009	0.5368
Aug.	10	120	17944	0.0036	0.5404
Aug.	11	5	17949	0.0002	0.5406
Aug.	12	3383	21332	0.1019	0.6425
Aug.	13	369	21701	0.0111	0.6536
Aug.	14	18	21719	0.0005	0.6541
Aug.	15	19	21738	0.0006	0.6547
Aug.	16	12	21750	0.0004	0.6550
Aug.	17	5	21755	0.0002	0.6552
Aug.	18	3	21758	0.0001	0.6553
Aug.	19	9	21767	0.0003	0.6556
Aug.	20	5	21772	0.0002	0.6557
Aug.	21	9	21781	0.0003	0.6560
Aug.	22	6	21787	0.0002	0.6562
Aug.	23	33	21820	0.0010	0.6571
Aug.	24	6	21826	0.0002	0.6573
Aug.	25	44	21870	0.0013	0.6587

Appendix TABLE C.8. (cont.) Daily sockeye salmon counts and associated statistics from the Hugh Smith Weir, 1987.

Aug.	26	47	21917	0.0014	0.6601
Aug.	27	879	22796	0.0265	0.6865
Aug.	28	21	22817	0.0006	0.6872
Aug.	29	408	23225	0.0123	0.6995
Aug.	30	3309	26534	0.0997	0.7991
Aug.	31	4346	30880	0.1309	0.9300
Sept.	1	751	31631	0.0226	0.9526
Sept.	2	182	31813	0.0055	0.9581
Sept.	3	80	31893	0.0024	0.9605
Sept.	4	57	31950	0.0017	0.9622
Sept.	5	49	31999	0.0015	0.9637
Sept.	6	107	32106	0.0032	0.9669
Sept.	7	85	32191	0.0026	0.9695
Sept.	8	68	32259	0.0020	0.9715
Sept.	9	746	33005	0.0225	0.9940
Sept.	10	69	33074	0.0021	0.9961
Sept.	11	42	33116	0.0013	0.9973
Sept.	12	15	33131	0.0005	0.9978
Sept.	13	21	33152	0.0006	0.9984
Sept.	14	14	33166	0.0004	0.9989
Sept.	15	26	33192	0.0008	0.9996
Sept.	16	12	33204	0.0004	1.0000

Mean Day of Migration = Aug. 7 Variance = 392.8 Days squared