

PRINCE WILLIAM SOUND MANAGEMENT AREA
1990 ANNUAL FINFISH MANAGEMENT REPORT



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TABLE OF CONTENTS

	<u>Page</u>
PRINCE WILLIAM SOUND SALMON AND HERRING FISHERIES	1
Management Area Description	1
Overview of Area Wide Fisheries	1
Oil Spill Impacts on Management	2
SEASON SUMMARY BY DISTRICT	2
Copper River District	2
Pre-Season Outlook and Harvest Strategy	2
Sockeye and Chinook Salmon	3
Coho Salmon	4
Bering River District	5
Sockeye Salmon	5
Coho Salmon	5
Coghill and Unakwik Districts (early season, prior to July 20)	6
Eshamy District	7
General Purse Seine Districts	7
1990 PRINCE WILLIAM SOUND AND COPPER RIVER SUBSISTENCE FISHERIES	10
Upper Copper River Subsistence and Personal Use Fisheries	10
Subsistence Fishery	10
Batzulnetas Subsistence Fishery	10
Personal Use Fishery	11
Prince William Sound Area Subsistence Fisheries	11
Prince William Sound and Lower Copper River Fisheries	11
Tatitlek and Southwestern Prince William Sound Fisheries	11
1990 PRINCE WILLIAM SOUND HERRING FISHERIES	12
Introduction And Pre-Season Harvest Outlook	12
Sac Roe Seine Fishery	13
Gill Net Sac Roe Fishery	14
Wild Harvest Spawn-On-Kelp Fishery	14
Roe-On-Kelp In Pounds Fishery	15
1990 Food And Bait Fishery	16
1990 Stock Assessment	17
1991 Herring Season Outlook	18

SUMMARY OF APPENDICES

APPENDIX A: PRINCE WILLIAM SOUND AREA WIDE INFORMATION

APPENDIX B: COPPER AND BERING RIVER DISTRICTS

APPENDIX C: COGHILL AND UNAKWIK DISTRICTS

APPENDIX D: ESHAMY DISTRICT

APPENDIX E: PRINCE WILLIAM SOUND PURSE SEINE FISHERY

APPENDIX F: HATCHERY RETURNS

APPENDIX G: SUBSISTENCE AND PERSONAL USE FISHERIES

APPENDIX H: HERRING FISHERIES

LIST OF APPENDICES

	<u>Page</u>
APPENDIX A: PRINCE WILLIAM SOUND AREA WIDE INFORMATION	
A.1 - Map of the Prince William Sound Area showing commercial fishing districts, salmon hatcheries, weir locations and the Miles Lake sonar site (Figure)	20
A.2 - Commercial salmon harvest by species, gear type and district in the Prince William Sound Management Area, 1990 (Table)	21
A.3 - Commercial salmon harvest by species from all gear types, Prince William Sound, 1971 - 1990 (Table)	22
A.4 - Commercial salmon harvest by species for all gear types combined, Prince William Sound, 1971 - 1990 (Figure)	23
A.5 - Mean price and estimated exvessel value of the commercial salmon harvest by gear type, Prince William Sound, 1990 (Table)	24
A.6 - Commercial salmon harvest and estimated value by gear type and district, Prince William Sound, 1990 (Table)	25
A.7 - Average price paid to fishermen for salmon, Prince William Sound, 1981 - 1990 (Table)	26
A.8 - Harvest projections for the 1990 commercial salmon fishery by district and species, Prince William Sound (Table)	27
A.9 - A listing of finfish processors, location of operation, type of product processed, 1990 (Table)	28
A.10 - The 1990 memorandum of understanding between the Alaska Department of Fish and Game and the Alaska Department of Environmental Conservation	31
A.11 - Map of the Prince William Sound area commercial fishing districts and statistical reporting areas, 1990	36
A.12 - The Prince William Sound Salmon Harvest Task Force recommendations for the 1990 season	37
A.13 - Map of areas included in the Prince William Sound Salmon Harvest Task Force enlarged closed waters, 1990	41

LIST OF APPENDICES (con't)

	<u>Page</u>
APPENDIX B: COPPER AND BERING RIVER DISTRICTS	
B.1 - Anticipated and actual weekly catch and escapement of sockeye salmon in the Copper River District drift gill net fishery, 1990 (Table)	46
B.2 - Anticipated and actual weekly and cumulative catches of sockeye salmon in the Copper River District drift gill net fishery, 1990 (Figure)	47
B.3 - Commercial salmon harvest by period in the Copper River District drift gill net fishery, 1990 (Table)	48
B.4 - Anticipated and actual weekly and cumulative catches of chinook salmon in the Copper River District drift gill net fishery, 1990 (Figure)	49
B.5 - Anticipated and actual weekly and cumulative catches of coho salmon in the Copper River District drift gill net fishery, 1990 (Figure)	50
B.6 - Commercial salmon catch by species in the Copper River District, 1972 - 1990 (Table)	51
B.7 - Daily sockeye salmon escapement estimates at the Miles Lake sonar, 1990 (Table)	52
B.8 - Anticipated and actual daily and cumulative sockeye salmon escapement estimates at the Miles Lake sonar project, 1990 (Figure)	54
B.9 - Aerial escapement indices by date and location for sockeye salmon returning to the Copper River delta, 1990 (Table)	55
B.10 - Copper River and Bering River area sockeye salmon escapement estimates, 1981 - 1990 (Table)	59
B.11 - Aerial escapement indices by date and location for coho salmon returning to the Copper River delta, 1990 (Table)	60
B.12 - Copper River delta and Bering River coho salmon escapement estimates, 1981 - 1990 (Table)	63
B.13 - Aerial survey indices of sockeye salmon escapement to the Upper Copper River drainage, 1980 - 1990 (Table)	64

LIST OF APPENDICES (con't)

	<u>Page</u>
B.14 - Aerial survey indices of chinook salmon escapement to the Copper River drainage, 1980 - 1990 (Table)	65
B.15 - Chinook, sockeye, and coho salmon catch and escapement in the Copper River District, 1981 - 1990 (Figure)	66
B.16 - Estimated age and sex composition of sockeye salmon commercial harvest in the Copper River District drift gill net fishery, 1990 (Table)	67
B.17 - Estimated age and sex composition of the chinook salmon commercial harvest in the Copper River District drift gill net fishery, 1990 (Table)	68
B.18 - Temporally stratified age and sex composition of the coho salmon commercial harvest in the Copper River District drift gill net fishery, 1990	69
B.19 - Commercial salmon harvest by period in the Bering River District drift gill net fishery, 1990 (Table)	70
B.20 - Commercial salmon catch by species in the Bering River District, 1972 - 1990 (Table)	71
B.21 - Aerial escapement indices by date and location for sockeye salmon returning to the Bering River delta, 1990 (Table)	72
B.22 - Aerial escapement indices by date and location for coho salmon returning to the Bering River delta, 1990 (Table)	74
B.23 - Sockeye and coho salmon catch and escapement in the Bering River District, 1981 - 1990 (Figure)	75
B.24 - Estimated age and sex composition of sockeye salmon harvested in the Bering River District commercial drift gill net fishery, 1990 (Table)	76
B.25 - Estimated age and sex composition of coho salmon harvested in the Bering River District commercial drift gill net fishery, 1990 (Table)	77
B.26 - Summary of periods, dates, hours fished and emergency orders issued for the commercial salmon gill net fisheries in the Bering River and Copper River districts, 1990 (Table)	78

LIST OF APPENDICES (con't)

Page

APPENDIX C; COGHILL AND UNAKWIK DISTRICTS

C.1	- Commercial salmon harvest by period in the Coghill District commercial drift gill net and purse seine fisheries, Prince William Sound, 1990 (Table)	81
C.2	- Weekly and cumulative catches of sockeye salmon in the Coghill District, 1990 (Figure)	82
C.3	- Commercial salmon catch by species in the Coghill District, Prince William Sound, 1975 - 1990 (Table)	83
C.4	- Daily salmon escapement through the Coghill River weir, Prince William Sound, 1990 (Table)	84
C.5	- Anticipated and actual daily and cumulative sockeye salmon escapement at the Coghill weir, Prince William Sound, 1990 (Figure)	85
C.6	- Salmon escapement by species in the Coghill District, Prince William Sound, 1969 - 1990 (Table)	86
C.7	- Sockeye salmon catch and escapement in the Coghill District, Prince William Sound, 1978 - 1990 (Figure)	87
C.8	- Estimated age and sex composition of the sockeye salmon escapement past the Coghill River weir, 1990 (Table)	88
C.9	- Commercial salmon harvest by period in the Unakwik District drift gill net and purse seine fisheries, Prince William Sound, 1990 (Table)	89
C.10	- Commercial salmon catch by species in the Unakwik District, Prince William Sound, 1976 - 1990 (Table)	90
C.11	- Summary of periods, dates, hours fished, and emergency orders issued for the commercial salmon fisheries in the Coghill and Unakwik districts, Prince William Sound, 1990 (Table)	91

APPENDIX D: ESHAMY DISTRICT

D.1	- Commercial salmon catch by species in the Eshamy District, Prince William Sound, 1977 - 1990 (Table)	93
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LIST OF APPENDICES (con't)

	<u>Page</u>
D.2 - Daily salmon escapement at the Eshamy Lake weir, Prince William Sound, 1990 (Table)	94
D.3 - Anticipated and actual daily and cumulative sockeye salmon escapement at the Eshamy weir, Prince William Sound, 1990 (Figure)	95
D.4 - Salmon escapement by species at the Eshamy weir, Prince William Sound, 1967 - 1990 (Table)	96
D.5 - Sockeye salmon catch and escapement, Eshamy District, Prince William Sound, 1976 - 1990 (Figure)	97
D.6 - Estimated age and sex composition of sockeye salmon harvested in the Eshamy District commercial gill net fishery and to the lake at the head of Eshamy Lagoon, 1990 (Table)	98
D.7 - Summary of periods, dates, hours fished, and emergency orders issued for the commercial salmon fisheries in the Eshamy District, Prince William Sound, 1990 (Table)	99

APPENDIX E: PRINCE WILLIAM SOUND PURSE SEINE DISTRICTS

E.1 - Commercial purse seine catch of salmon by species by day, Prince William Sound, 1990 (Table)	101
E.2 - Commercial salmon harvest by all gear types, by species, Prince William Sound, 1971 - 1990 (Table)	103
E.3 - Commercial pink salmon harvest for all gear types, by district, Prince William Sound, 1969 - 1990 (Table)	104
E.4 - Aerial escapement indices for pink and chum salmon by district, Prince William Sound, 1990 (Table)	105
E.5 - Pink salmon harvests and escapement indices, including hatchery sales harvests and brood stock, Prince William Sound, 1965 - 1990 (Table)	106
E.6 - Weekly aerial estimates of pink salmon escapement by statistical area, Prince William Sound, 1990 (Table)	107
E.7 - Current year and historical weekly pink salmon escapement performance from index spawning streams, Prince William Sound, 1990 (Figure)	108

LIST OF APPENDICES (con't)

	<u>Page</u>
E.8 - Pink salmon catch and escapement, even years (1970-1990) and odd years (1969-1989), Prince William Sound (Figure)	109
E.9 - Chum salmon harvests and escapement indices, including hatchery sales harvests and brood stock, Prince William Sound, 1965 - 1990 (Table)	110
E.10 - Weekly aerial estimates of chum salmon escapement by statistical area, Prince William Sound, 1990 (Table)	111
E.11 - Current year and historical weekly chum salmon escapement performance from index spawning streams, Prince William Sound, 1990 (Figure)	112
E.12 - Chum salmon catch and escapement, Prince William Sound, 1980 - 1990 (Figure)	113
E.13 - Sockeye salmon escapement counts from selected systems, Prince William Sound, 1990 (Table)	114
E.14 - Estimated age and sex composition of Prince William Sound chum salmon commercial catches by district, 1990 (Table)	115
E.15 - Summary of periods, dates, hours fished, and emergency orders issued by district, for the commercial purse seine salmon fishery, Prince William Sound, 1990 (Table)	117

APPENDIX F: HATCHERY RETURNS

F.1 - Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Wally Noerenberg Hatchery, 1990 (Table)	120
F.2 - Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Armin F. Koernig Hatchery, 1990 (Table)	121
F.3 - Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Solomon Gulch Hatchery, 1990 (Table)	122
F.4 - Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Cannery Creek Hatchery, 1990 (Table)	123

LIST OF APPENDICES (con't)

	<u>Page</u>
F.5 - Sales harvests of salmon by species from private nonprofit hatcheries, Prince William Sound, 1978 - 1990 (Table)	124
F.6 - Summary of pink and chum salmon returns to Prince William Sound hatcheries, 1990 (Table)	125
F.7 - Estimated total hatchery and wild stock production of pink salmon, Prince William Sound, 1978 to 1990 (Table)	126
F.8 - Estimated total pink salmon returns to hatcheries and wild stock systems, Prince William Sound, 1978 -1990 (Figure)	127
 APPENDIX G: SUBSISTENCE AND PERSONAL USE FISHERIES	
G.1 - Subsistence salmon harvest by species and gear type, Prince William Sound, 1990 (Table)	129
G.2 - Salmon catch and effort in the Copper River District subsistence gill net fishery, 1960 - 1990 (Table)	130
G.3 - Salmon catch and effort in the Prince William Sound subsistence fishery, 1960 - 1990 (Table)	131
G.4 - Salmon catch by species and numbers of permits by gear type for the Upper Copper River subsistence and personal use fisheries, 1965 - 1990 (Table)	132
 APPENDIX H: HERRING FISHERIES	
H.1 - Miles and dates of herring spawn recorded by skiff and aerial surveys in Prince William Sound, 1990 (Figure)	134
H.2 - Commercial herring harvest summary with fishing locations and effort by gear type, Prince William Sound, 1990 (Table)	135
H.3 - Commercial herring harvest by fishery, Prince William Sound, 1969 - 1990 (Figure)	136
H.4 - Herring sac roe seine and gill net fishery effort, anticipated and actual harvest, Prince William Sound, 1969 -1990 (Table)	137

LIST OF APPENDICES (con't)

	<u>Page</u>
H.5 - Herring sac roe purse seine and gill net harvests, Prince William Sound, 1969 - 1990 (Figure)	138
H.6 - Herring eggs on kelp harvests from natural spawning, Prince William Sound, 1969 - 1990 (Table)	139
H.7 - Herring eggs on kelp produced in pounds, Prince William Sound, 1979 - 1990 (Table)	140
H.8 - Herring spawn on kelp harvest, Prince William Sound, 1969 - 1990 (Figure)	141
H.9 - Daily commercial herring food and bait harvest as reported on fish tickets, Prince William Sound, 1990 (Table)	142
H.10 - Commercial herring bait and food harvests in short tons, Prince William Sound, 1970 - 1990 (Table)	143
H.11 - Food and bait herring harvests, Prince William Sound, 1970 - 1990 (Figure)	144
H.12 - Peak aerial survey herring biomass, spawn deposition biomass estimate, and miles of spawn by area, Prince William Sound, 1990 (Table)	145
H.13 - Beach areas receiving herring spawn in the Hawkins Island (Southeast) area, Prince William Sound, April 14, 1990 (Figure)	146
H.14 - Beach areas receiving herring spawn in St. Matthews Bay, Prince William Sound, April 1 and April 7, 1990 (Figure)	147
H.15 - Beach areas receiving herring spawn in Two Moon Bay, Prince William Sound, April 15 to April 17, 1990 (Figure)	148
H.16 - Beach areas receiving herring spawn in Tatitlek Narrows, Prince William Sound, April 6 to April 20, 1990 (Figure)	149
H.17 - Beach areas receiving herring spawn in Valdez Arm, Prince William Sound, April 16 to April 21, 1990 (Figure)	150
H.18 - Beach areas receiving herring spawn on Glacier Island (North Shore area), Prince William Sound, April 13 to April 16, 1990 (Figure)	151

LIST OF APPENDICES (con't)

	<u>Page</u>
H.19 - Beach areas receiving herring spawn in the North Shore area, Prince William Sound, April 11 to April 21, 1990 (Figure)	152
H.20 - Beach areas receiving herring spawn in the Naked Island area, Prince William Sound, April 12 to April 17, 1990 (Figure)	153
H.21 - Beach areas receiving herring spawn on Smith Island (in the Naked Island area), Prince William Sound, April 24, 1990 (Figure)	154
H.22 - Beach areas receiving herring spawn in the northern Montague Island area, Prince William Sound, April 8 to April 22, 1990 (Figure)	155
H.23 - Annual herring biomass indices, Prince William Sound, 1978 - 1990 (Table)	156
H.24 - Annual herring biomass indices, Prince William Sound, 1978 - 1990 (Figure)	157
H.25 - Mean price and estimated exvessel value of the commercial herring harvest by gear type, Prince William Sound, 1978 - 1990 (Table)	158
H.26 - Annual exvessel value of commercial herring fisheries, Prince William Sound, 1978 - 1990 (Figure)	159
H.27 - Age, sex and size composition of Pacific herring sampled from the spring purse seine sac roe fishery, Prince William Sound, 1990 (Table)	160
H.28 - Age, sex and size composition of Pacific herring sampled from the spring gillnet sac roe fishery, Prince William Sound, 1990 (Table)	161
H.29 - Age, sex and size composition of Pacific herring sampled from the spring roe on kelp in pounds fishery, Prince William Sound, 1990 (Table)	162
H.30 - Age, sex and size composition of Pacific herring sampled from the fall food and bait fishery, Prince William Sound, 1990 (Table)	163
H.31 - Percent contribution by age class in the herring test fishery, Prince William Sound, 1990 (Figure)	166

LIST OF APPENDICES (con't)

	<u>Page</u>
H.32 - Percent contribution by age class in the purse seine herring sac roe fishery, Prince William Sound, 1986-1990 (Figure)	167

1990 PRINCE WILLIAM SOUND SALMON AND HERRING FISHERIES

Management Area Description

The Prince William Sound (PWS) commercial salmon management area encompasses all coastal waters and inland drainages entering the northcentral Gulf of Alaska between Cape Suckling and Cape Fairfield (Appendix A.1.). The area includes the Bering River, Copper River and all of Prince William Sound with a total adjacent land area of approximately 38,000 square miles.

The Prince William Sound salmon management area is divided into eleven management districts that correspond to the local geography and distribution of the five species of salmon harvested by the commercial fishery. The management objective for all districts is the achievement of desired escapement goals for the major species while allowing for the orderly harvest of all fish surplus to spawning requirements. In addition, the department follows regulatory management plans to manage fisheries to assist specific private non-profit (PNP) hatcheries in achieving cost recovery and brood stock objectives.

Legal gear for the salmon fishery includes purse seines and both drift and set gill nets. Drift gill net fishermen are the most numerous and are permitted to fish in the Bering River, Copper River, Coghill, Unakwik and Eshamy districts. During the 1990 season, 524 drift gill net permit holders participated at least some time during the season. Set gill net gear is legal only in the Eshamy district and 29 set gill net fishermen participated in the fishery this season. Purse seine gear is legal in the Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague and Southeastern districts. An estimated 266 permits were active during the 1990 season.

Overview of Area Wide Fisheries

The Prince William Sound Area commercial salmon harvest for 1990 was an all time record of 46.5 million fish, all species combined (Appendix A.2.). This catch exceeds the previous record harvest of the 1987 season by 13 million fish (Appendix A.3., Appendix A.4.). The record catch is attributed to the expanding hatchery program and excellent marine survival rates for both wild and hatchery produced pink salmon. Pink salmon comprised 95% of the season's harvest and were the only species to perform well in 1990. Wild stocks of sockeye and chum salmon in the Sound performed poorly. The Coghill Lake sockeye salmon return was the lowest on record. In the Copper River District, the sockeye salmon harvest was above average. Coho salmon returned below anticipated levels to the Sound's hatcheries. In the Copper River District, the coho salmon return was 70% of the forecast level.

The value of the combined commercial salmon harvest is estimated at \$66 million, including hatchery sales (Appendix A.5.). The drift gill net catch is valued at \$22.1 million, setting the average earnings for the 524 permit holders at

\$42,141. Seiners harvested \$31.8 million worth of fish setting the average earnings for the 266 permit fleet at \$119,670. The set gill net harvest is valued at \$1.1 million, making the average earnings for each of the 29 active permit holders approximately \$38,249.

Oil Spill Impacts on Management

Recognizing that the 1989 Exxon Valdez oil spill continued to have the potential to affect seafood quality within the Prince William Sound Management Area, the Department of Fish and Game and the Department of Environmental Conservation (D.E.C.) renewed the Memorandum of Understanding regarding seafood quality for the 1990 season (Appendix A.10.). The Department of Fish and Game conducted extensive beach surveys and collected fish that were provided to D.E.C. for inspection, prior to commercial openings in the affected areas of the Sound. Some minor beach areas continued to pose an appreciable likelihood for fouling of gear and adulterating of catch and were closed for the 1990 season. Two small beaches in the Eshamy District, 3.5 miles of shoreline on northern Latouche Island, and the shoreline of Eleanor, Ingot, and Knight Island north of 60°25.0 N. lat. were closed. These closures did not result in any reduction in the harvest of fish. Besides this, the lingering effects of the oil spill had little impact on the conduct of the 1990 salmon season.

SEASON SUMMARY BY DISTRICT

Copper River District

Pre-Season Outlook and Harvest Strategy

The 1990 harvest forecast for the Copper River District was 37,100 chinook, 658,100 sockeye, and 295,300 coho salmon. The harvest for the 1990 season was 844,778 sockeye, 200,000 or 28 percent above the anticipated. The chinook harvest was 21,702, almost 15,000 or 41 percent below the anticipated. Chum and pink salmon are also present with steelhead but comprise less than 1 percent of the catch. The Gulkana Hatchery was expected to contribute 139,226 in 1990. The actual hatchery contribution could not be verified as no smolt were tagged in 1987 and 88.

The early season management strategy in the Copper River District is based on the actual catch and effort compared to the anticipated catch and effort. This provides the most reliable method of evaluating early run strength. Two evenly spaced periods each week are optimum; however the fishing schedule is adjusted in-season as the situation dictates. Effort, tides and environmental conditions also enter into interpretation of the data. In late May, the upriver escapement data from Miles Lake sonar project becomes the primary factor governing the management of the fishery. By mid-June aerial estimates of sockeye escapement in the Copper River delta are available and are also considered when scheduling

fishing periods.

Coho management strategy was expected to be implemented on August 13. This strategy provides for a single fishing period per week but of longer duration than what is commonly used during the sockeye season. As in the sockeye salmon fishery, escapement estimates for the early portion of the coho salmon return lag behind the fishery and the fleet is managed using catch trends as indicators of run strength. However, in recent years the efficiency of the fleet has improved and early season estimates of run strengths have been too optimistic. Since 1986 early season coho catches have been average but by the third week of the fishery escapement indices have been poor and periods have been curtailed or the season has closed prematurely. To reduce over exploitation of coho returns early in the season, weekly fishing periods were reduced from 72 hours to 48 hours in 1989 lasting from 12:00 noon Monday to 12:00 noon Wednesday. This strategy was expected to continue for the 1990 season. Modifications of fishing times during the coho salmon season may occur based on escapement trends in the principal delta spawning streams. If reduced fishing times result in a reduction in the harvest rate, the season may be extended late into September or October.

Sockeye and Chinook Salmon

The Copper River District management strategy provides for two 24 hour periods per week beginning 7:00 a.m. on Mondays and 7:00 p.m. on Thursdays, with adjustments in-season by emergency order. The commercial season opened at 7:00 a.m. Monday, May 14 for a 24 hour period that yielded a catch of 19,646 sockeye and 2,984 chinook salmon. Based on the sockeye harvest, that was 19 percent above the projected, and chinook catches, that were only slightly under projected the fishery was opened for two subsequent 24 hour periods (Appendix B.1. and B.2.). The chinook harvest was still lagging behind the projected level by 4 percent after the second 24 hour period. In the absence of any indications of a stronger than anticipated return, a mesh size restriction of 6 inches or smaller, was implemented for the third period to minimize the harvest of large chinook salmon. The gear restriction was in place until August 1. (For specific period openings and species catches refer to Appendix B.3)

Future management alternatives, other than gear restrictions, to reduce the chinook salmon commercial harvest are: 1) delaying the first opening and/or 2) reducing the size of the commercial fishing district by closing areas inside the sandbars. The first option could result in a reduced chinook harvest and more aggressive fishing during the peak of the sockeye return. Since 1981, the chinook catch from the first period has averaged 5,000 fish. This is equivalent to one third of the chinook escapement goal of 15,000. In contrast, only 4.1 percent of the total sockeye harvest is taken during that same period. If the season opening was delayed, the increased early run sockeye escapement would result in a more aggressive fishing schedule during the peak of the sockeye return. In addition, by allowing a larger portion of the earlier run chinook salmon to escape up-river, the probability of reduced fishing time later in the sockeye season only to increase the chinook escapement would decrease. This in turn would reduce the possibility of sockeye over-escapement in the middle and later portions of the return. The second option, closing the inside to commercial fishing, would allow fishing time to harvest sockeye but decrease that

efficiency of the fleet on chinook salmon since most of the chinook harvest occurs inside of the sandbars.

The Bendix side-scanning sonar counter was deployed in the Copper River near Miles Lake from May 21 until August 2, 1990 (Appendix B.7). Species apportionment past the sonar is not an objective of this project. Sockeye make up an estimated 90 percent of the total run followed by chinook and in late July, coho salmon. It is estimated salmon require seven to nine days to travel from the Copper River District to the sonar site.

By May 23, the upriver escapement past the Miles Lake sonar was 50 percent below the anticipated escapement for that date (Appendix B.8). The anticipated cumulative count spanned six days, the actual count covered only 48 hours of continued monitoring. This lower than expected escapement was of some concern and to avoid falling behind early in the season the fishing schedule was reduced for the May 25 opening to a 12 hour period. This strategy allowed some fishing time but limited fleet efficiency by opening the fishery during a small high tide. Based on good catches during this 12 hour period and the anticipated increase in escapement due to the reduced fishing time, a 36 hour period was allowed on May 28 with two additional 24 hour periods following. By June 5, the upriver escapement was still three percent below expected and the escapement to the lower delta systems was also below anticipated levels (Appendix B.9). In response to these escapement levels the fishery was closed for one period on June 7. On June 11th the two 24 hour periods per week schedule resumed until June 28th when the second period was increased to 36 hours. This schedule continued for the remainder of the sockeye season.

Sockeye salmon escapement past the Miles Lake sonar to the upper Copper River exceeded the objective of 500,000 salmon, with a season total of 581,859 fish. The escapement for the lower delta stocks did not fare as well as the upriver stocks. This year's final escapement index of 74,445 sockeye falls below the 10 year average escapement index of 108,787 and the five year average of 77,399 (Appendix B.10). In recent years, the trend of declining abundance has been observed for the lower delta stocks. Past management strategies have called for total area closures. The response has been a significant increase in the upriver component as well as an increase in the lower delta stocks. Any increase in delta fish is over compensated by the surplus escapement up-river. Future strategies to increase the lower delta stocks may include subarea closures and shorter fishing periods to correspond with area and times of peak delta stock abundance.

Coho Salmon

Coho salmon become the predominate species in the Copper River District in early to mid August. The coho management strategy is a single 48 hour period per week beginning at 12:00 noon Monday. By August 30, the cumulative harvest of coho was 135,814, 26 percent below the projected harvest of 183,207 (Appendix B.5). An aerial escapement survey on August 29 was 77 percent below the anticipated escapement index for this date also indicating a weaker than projected run (Appendix B.11). During the week of September 3 the commercial season was delayed until further notice. A storm system passed through the area during the early part of that week and a substantial movement of coho into the freshwater

systems was anticipated. As a result, a 36 hour period beginning 8:00 p.m. Thursday, Sept. 6 was announced. Five subsequent one 48 hour periods per week followed until the season was closed on October 17th. The season's commercial coho salmon harvest of 246,797 was 21 percent below the 10 year average (Appendix B.12). During the last three weeks in September severe weather created poor fishing conditions and severely restricted the efficiency of the fleet. This poor weather created excellent conditions for coho movement, which was noted in several systems. The cumulative escapement index for the Copper River delta systems was 42,386 coho salmon, 12 percent below the historical average (Appendix B.15).

Coho escapement into the Copper River delta was monitored until the end of October. By then most of the systems were ice covered so no additional surveys were possible. This was the first year a coho weir was installed on 39 Mile Creek to assist in monitoring coho escapement when weather conditions made aerial surveys impossible. Flash flood conditions from heavy rains created continuous problems and the weir was inoperable for most of the season. The department will continue to investigate the possibilities of installing weirs on some river systems to enumerate coho escapement.

Bering River District

Sockeye Salmon

The Bering River District management strategy provides for a weekly commercial fishing schedule to coincide with the Copper River District. However, with no significant Bering River chinook salmon stocks and a later sockeye salmon run timing, the season usually opens a month later than the Copper River District. The Bering River District opened June 18 with 28 fisherman yielding a catch of 8 chinook, and 5,293 sockeye salmon. Effort after the first period was minimal with 32 deliveries reported by August 13 (Appendix B.19). The total 1990 catch of 8,332 sockeye was well below the preseason harvest forecast of 20,000 to 30,000 sockeye salmon (Appendix B.20).

The aerial escapement index for sockeye salmon was 19,741 for 1990 (Appendix B.21). Despite limited fishing effort the escapement was 35 percent below the historical 10 year average of 30,000 but was within the 5 year average of 20,000 (Appendix B.23).

Coho Salmon

Severe weather conditions limited coho fishing effort in the Bering River District for 1990. Effort peaked at 67 vessels during the September 6 opening, and dropped significantly during the successive periods. The commercial salmon season closed after the September 26 opening due to no fishing effort. The cumulative harvest of 42,952 coho was a disappointing 66 percent below the anticipated harvest of 127,000 coho salmon (Appendix B.20).

Aerial surveys were discontinued after October 16 due to severe freeze up on most of the coho spawning areas. The final 1990 escapement index was 24,800 coho salmon 16 percent above the historical average (Appendix 22). High turbid water in most streams limited survey conditions for most of the season.

Coghill and Unakwik Districts (early season, prior to July 20)

The outlook for the Coghill district called for an exceptionally poor return of sockeye salmon, which would not permit a targeted commercial harvest. The early chum return to the Wally Noerenberg Hatchery was forecast to be 340,000 fish, of which approximately 30% were needed for brood stock.

The Esther Subdistrict was opened on June 14 to a schedule of two 24 hour fishing periods per week, to target the hatchery return of chum salmon. The balance of the Coghill district remained closed to protect sockeye salmon returning to Coghill Lake. This schedule continued through July 3, when the subdistrict was closed to assist the hatchery in recovery of chum brood stock. Initially, the chum return appeared strong, with a good showing of five year old fish. This strength was not carried in the four year age class, which came in below expectations. At the close of the sixth 24 hour fishing period on July 3, the cumulative harvest in the subdistrict amounted to 222,000 chum salmon. The chum brood stock collected to that date was 57,500 fish, falling 5,400 fish below the expected amount for that date. Daily brood collection rates, which were initially strong, had declined to one third of the amount needed to meet the season goal of 103,000 fish. So, the Esther Subdistrict remained closed after July 3 and through the balance of the early chum return. The closure improved the brood collection rate and the goal was nearly attained by July 16.

The harvest of sockeye salmon during the six periods in the Esther Subdistrict was 6,900 fish (Appendix C.1). Escapements at the Coghill weir were extremely poor. When the weir was pulled on July 25, the cumulative sockeye salmon escapement was only 8,250 fish, falling drastically below the goal of 55,000 (Appendix C.4.). This year's Coghill Lake escapement is the weakest on record since statehood (Appendix C.6.).

The Esther Subdistrict reopened Monday, July 23, for the harvest of returning pink salmon to the Wally Noerenberg Hatchery. Further discussion of this portion of the fishing season is provided in the section pertaining to the *General Purse Seine Districts*.

Without quantitative assessment tools for the sockeye systems in the Unakwik district, this district is managed coincidentally to the Coghill District, as the two stocks cycle in a similar fashion. Consequently, the Unakwik District was not opened during the sockeye season, but did open later in July with the general sound wide openings for pink salmon.

Eshamy District

At the Main Bay Hatchery, a record return of 847,000 adult chum salmon was anticipated during June and July. In addition, 10,000 sockeye salmon were expected to return to the hatchery, the first return for that species to Main Bay. Also, a remote release of pink salmon was anticipated to yield a return of 500,000 pink salmon in August. Due to the weak anticipated return of sockeye to Coghill Lake, sockeye brood stock collection was planned for the Main Bay Hatchery. None of the pink or chum salmon returning to the facility were needed for brood and a total harvest was expected.

The Eshamy District opened to fishing on June 11. The Main Bay subdistrict was opened to continuous seven day per week fishing, and the Crafton Island subdistrict was opened to a schedule of five days per week (Appendix D.5.). The Alternating Gear Zone was managed to assist in the collection of sockeye salmon for brood stock. The chum salmon return was below expectations but still yielded a season catch of 359,000 chums to the set and drift gill netters in the district.

Continuous seven day per week fishing continued in the Main Bay subdistrict through August resulting in a harvest of 535,000 pink salmon from the remote release.

The Eshamy Lake sockeye return was projected to be weak and no targeted fishery on this stock was anticipated in the Crafton Island subdistrict of the Eshamy District in 1990. The Eshamy weir was installed on July 5. Escapement performance was weak as anticipated and the Crafton Island subdistrict was closed on July 13. At the end of the first three weeks of operation, the sockeye salmon escapement amounted to only 5% of the desired amount for that date (Appendix D. 2.). Consistent with discussions at the 1988 Board of Fisheries meeting in Cordova, the eastern shoreline of Chenega Island was closed to seining prior to the first opening of the Southwestern District, to provide additional protection to the Eshamy sockeye stock. The Crafton Island and Chenega closures benefitted the system even though the final escapement into Eshamy Lake was only 14,191 sockeye salmon, falling well below the desired goal of 40,000.

General Purse Seine Districts

The outlook for the general purse seine fishery was for a catch 19.8 million pink salmon and 1.4 million chum salmon. Hatchery production was anticipated to account for 87% of both the pink and chum salmon harvest.

Prior to the start of the 1990 season, the P.W.S. Salmon Harvest Task Force (SHTF) met numerous times to formulate a management plan focusing on improvement of the flesh quality of the pink salmon harvest in the Sound. After a great deal of public input, the SHTF agreed to a set of management recommendations which were signed off and presented to the Commissioner on June 13, 1990 (Appendix A.12 & A.13). Among other things, this document recommended the establishment of enlarged wild stock sanctuaries and a fishing schedule of two 12 hour periods per

week. Harvest pressure was to be exerted to a greater degree in mixed stock areas and on the early bright fish, recognizing that management risks were increased for wild stock escapement and hatchery cost recovery shortfalls.

Aerial surveillance of pink and chum spawning systems in the Sound began in late June. The early surveys revealed a surprisingly strong show of chum salmon in the Eastern and Northern districts. In response to this these districts were opened for a 12 hour period on June 28th. The SHTF enlarged closures were not employed so that the harvest could better target early chums. The chum catch was below expectations for this opening, only 51,029, and it was soon apparent that there was no strength behind the early showing.

On July 2nd, the SHTF enlarged sanctuaries were placed into effect and remained in effect for the balance of the salmon season. Commercial catches of the pink salmon return to the Solomon Gulch Hatchery were outstanding with a peak daily catch of 1.7 million pinks on July 5. The fishing schedule of two 12 hour periods per week was continued through the duration of the hatchery return, which continued into the third week of July. The closed waters boundaries in front of the hatchery were modified frequently to facilitate cost recovery harvesting and brood stock collection. The brood stock and cost recovery goals for the hatchery were both achieved.

Wild stock performance was quite weak during this early portion of the return, and escapement performance fell below expectations in the Eastern and Northern Districts (Appendices E.6. and E.7.). However, because of the outstanding return of hatchery fish to the Solomon Gulch hatchery, nearly all of the fishing effort was concentrated in Valdez Arm and Port, and little pressure was placed on the remaining wild stock systems in these districts. By the end of the third week of July, approximately 6.8 million pink salmon had been harvested by the common property fishery (CPF), the vast majority of which were returning to the hatchery. Due to the larger than anticipated return, the fishery was managed for the elevated sales goal of \$2.5 million, without fear of exceeding a 70% CPF contribution. A total of 2.2 million fish were harvested by the hatchery to achieve this goal (Appendix F.3.).

As the hatchery return to Solomon Gulch declined the weekly schedule of two 12 hour periods continued but the area opened was pulled back to the waters of Port Valdez, due to the weak performance of the early wild stocks in the Sound. The hatchery subdistricts in front of the Cannery Creek, Esther and AFK hatcheries were added to these openers on July 23 to provide CPF access to the front of the pink returns to these facilities.

The poor wild stock performance during the early portion of the pink return, was attributed to the weak escapement performance of the early run segment of the parent year, 1988. Parent year escapements during the August portion of the run were quite adequate, and based on the apparent high marine survival rate of the Solomon Gulch fish, it was anticipated that an improvement would be seen in the later wild production. This was indeed the case, and a dramatic improvement of wild stock pink escapements was observed during the fourth week of July. On the Monday opening of July 30, all districts of the Sound except the Eastern, were opened for a 12 hour period. The catch from this period was outstanding, totaling over 1.6 million pink salmon (Appendix E.1).

The enlarged sanctuaries provided protection to a buildup of fish in the important wild stock spawning area, which assured minimum escapements over the next week. A general opening of all seine districts for 48 hours was scheduled on August 2nd, in response to the rapid increase in the surplus production of both wild and enhanced pink salmon. The catch rate during this period was higher than ever observed in Prince William Sound resulting in a harvest of 3.9 million pink salmon.

At this point in the return it was apparent that a new record harvest was going to be established. While hatchery fish were dominating the catches, the wild stock component appeared sufficiently strong to continue fishing in the mixed stock areas of the general districts. Consequently a five day general opening of all seine districts was scheduled for the week of July 6. Cost recovery harvest rates at the PWSAC hatcheries were lagging behind expectations and consequently, the hatchery subdistricts were closed for the protection of hatchery returns. The harvests continued to be strong through the week, and totaled over 8.1 million pink salmon for the period.

During the five day fishery, the combined daily harvest at the three PWSAC hatcheries ranged from 100 - 200,000 pink salmon daily, which was insufficient to put the corporation back on track towards its cost recovery goal of \$9.3 million. By the end of the week their cumulative revenues totaled only \$2.6 million, approximately 36% below the anticipated revenue figure for that date.

Including sales harvests, the total daily harvest in the Sound for this week averaged approximately 2.0 million fish per day, which "red lined", if not exceeded the processing capacity in the management area. Although a significant volume of pink salmon moved into the special harvest areas (SHA) of the three PWSAC hatcheries over the weekend closure, PWSAC was unable to find a buyer for sales fish due to the backlog at the processing plants from the large CPF harvest. This created a critical situation at the peak of the run.

To prevent an excessive buildup of fish at the hatcheries, a 24 hour general opening was scheduled on Monday, August 13. During this period 2.8 million pinks were taken, which again added to the processing backlog. Although PWSAC had fish to sell, there was reluctance on the part of the processors to buy them due to their commitments to their fleets. It was estimated at that time that 1.0 to 2.0 million pinks had built up in the hatchery areas, exceeding the capacity that PWSAC's harvest boats could handle. The potential existed for these fish to not be harvested in a timely manner. If this were to occur, a decline in quality could result such that they could not be marketed.

In an effort to resolve this bottleneck in the fishery a plan was formulated that would accelerate the sales harvest of the fish built up in the hatchery areas. For a period of 36 hours, the SHA's at the three PWSAC hatcheries were expanded to include the hatchery subdistricts. With the seine fishery closed during this time period, PWSAC requested volunteers from the fleet to assist in the harvest of the fish built up in these areas. As a result of this "volunteer sales harvest", 1.6 million fish were harvested for PWSAC cost recovery by 74 commercial boats from the fleet which volunteered their time. This effort coupled with the normal sales by the PWSAC contract seiners resulted in a dramatic recovery in the sales revenue shortfall.

Commercial fishing in the general seine districts resumed on August 17 with a 56 hour period, yielding an additional harvest of 5.5 million. Continuous fishing was permitted in the Esther Subdistrict from the close of this period to the end of the season, October 3. Two additional general openings of 36 hour duration each were scheduled prior to the season's end. Due to escapement short falls in the northwestern portions of the Sound, the Northern, Coghill and Northwestern districts were closed.

At the close of the season, 35.4 million pink salmon were harvested by the common property fishery. An additional 8.7 million were taken by the PNP hatchery operators for cost recovery, setting the season's total take at 44.1 million, an all time record harvest.

1990 PRINCE WILLIAM SOUND AND COPPER RIVER SUBSISTENCE FISHERIES

Subsistence and personal use fisheries harvests continue to be minor by comparison to the commercial harvest in the Prince William Sound management area. The largest subsistence and personal use fisheries occur on the upper Copper River at and above Wood Canyon. In the commercial Prince William Sound and the Copper River delta commercial fishermen may withhold a portion of their catch for personal use. There is currently no mechanism to monitor this catch and it continues to go unreported. Subsistence fishing permits are issued from the Cordova office for the Copper River flats, Prince William Sound, and Chenega and Tatitlek residents. A breakdown of these catches are reported in Appendices G.1., G.2., G.3., and G.4.

Upper Copper River Subsistence and Personal Use Fisheries

Subsistence Fishery

The 1990 Copper River salmon return was anticipated to be ample to allow unrestricted fishing for the subsistence fish wheel and dip net fishery. Sonar counts in May indicated normal entry of salmon into the Copper River with sufficient strength to meet upriver escapement and subsistence fishery needs. The fish wheel and dip net fishery was open June 1 to seven day per week fishing. Throughout the subsistence fishing season, sonar counts at Miles Lake tracked along anticipated performance curves indicating that the minimum escapement goal of 500,00 would be reached. There were 95 dip net and 311 fish wheel permits issued and the harvest is estimated at 32,290 salmon (Appendix G.4.), composed primarily of sockeye (98%).

Batzulnetas Subsistence Fishery

In 1987 an interim subsistence fishery was provided for by emergency regulation at Batzulnetas to achieve settlement in the United States District Court case John v. Alaska. The fishery was conducted near the mouth of and within Tanada

Creek near the historical village site of Batzulnetus. Eight permits were issued to individuals or family groups from Mentasta or Dot Lake and the fishery was conducted during July and early August. A total of 22 sockeye salmon was reported in 1987. The Board of Fisheries reviewed the fishery prior to the 1988 season and set seasons, eliminated the quota, and provided for additional gear types. There has been no catch reported since 1987 and no permits were issued for the Batzulnetas fishery in 1988, 1989, or 1990.

Personal Use Fishery

The personal use fishery was conducted in 1990, as in the last two years, with periods of two to three days or less early in the season to comply with guideline harvest levels. An extensive public information effort was continued by the Department incorporating frequent news releases and dedicated phone lines with recorded messages in Glennallen, Fairbanks and Anchorage.

A total of 5,631 dip net and 58 fish wheel personal use permits were issued in 1990, representing a significant increase from the past for dip net permits. The estimated harvest for the season was 70,478 salmon (Appendix G.4.), primarily sockeye (94%). Harvest reports indicated that 99% of the catch was taken by dip net gear. The combined upper river personal use and subsistence estimated catch of 102,768 fish ranks as the largest since 1983.

Prince William Sound Area Subsistence Fisheries

Prince William Sound and Lower Copper River Fisheries

Permits issued at the Cordova office allow subsistence users to fish open commercial periods in Prince William Sound and the Copper River flats. In 1990, a total of 8 permits were issued for Prince William Sound, but only 2 actually fished. The reported catch was 7 coho and 4 pink salmon (Appendices G.1. and G.2.).

Only 38 of the 88 permits issued for the Copper River flats fished in 1990. A total catch of 611 fish was reported. Sockeye salmon comprised 77% of the harvest (Appendix G.2).

Tatitlek and Southwestern Prince William Sound Fisheries

Residents of both Chenega Bay and Tatitlek villages are issued special subsistence use permits; This was the third year for the program. The permit holders are allowed to fish in their respective areas from May 15 until the commercial fishery season opening and from the closure of the commercial fishery until October 31, for seven days a week. During the commercial salmon fishing season, they are allowed to fish whenever a commercial opening occurs.

In the Southwestern area, total permits issued dropped from 8 in 1989 to 7 in 1990, mainly to residents of Chenega Bay village; Only 2 permits were actually

fished. The total catch was 61 fish, mostly sockeye (Appendix G.1).

Tatitlek area residents are permitted to fish in the northeastern portion of Prince William Sound. Only 3 of the 13 permits issued actually fished in 1990. A total catch of 260 salmon, predominately coho, was reported in 1990. This is less than the 766 salmon captured in 1989 (Appendix G.1).

1990 PRINCE WILLIAM SOUND HERRING FISHERIES

Introduction And Pre-Season Harvest Outlook

There are five different herring fisheries in the PWS management area. All target on what is treated as a single major stock of herring. The PWS herring management plan calls for a maximum exploitation rate of 20% of the PWS herring biomass for all fisheries combined. The food and bait fishery is the only fishery that occurs in the fall and winter, traditionally in the Knowles Head area but more recently in the Montague Island area. This fishery is not limited, but generally has fewer than 10 boats participating annually. The four spring herring fisheries usually occur in April, coinciding with the spawn timing of the PWS herring stock. The spring fisheries include: (1) a purse seine sac roe fishery that accounts for a large portion of the harvest and is limited to approximately 108 permit holders, (2) a gill net sac roe fishery with 25 limited entry permit holders, (3) a roe on kelp produced in pounds fishery with 128 limited permit holders, and (4) the naturally occurring roe on kelp fishery that is not limited and has 100 to 200 participants annually.

Although there may be several small spawning stocks in Prince William Sound, the spring roe fisheries target on what is currently considered to be a single stock that spawns from mid-April to early May. All fisheries are managed for a sliding scale exploitation rate of 0 - 20% overall. In 1990, production was anticipated to be dominated by six year old fish from the 1984 brood year. Based on a stock recruitment model, the anticipated biomass for the 1990 season was 52,000 tons, which would allow an above average harvest for all fisheries.

A summary of the major spawning areas, timing of spawn, and areas utilized in the commercial fishery in 1990 are represented in Appendix H.1. A summary of the 1990 harvests for the four spring herring fisheries is presented in Appendix H.2. The purse seine sac roe harvest was 8,300 tons of herring and 505 tons was taken by the gill net fleet. Both the seine and gill net harvests exceeded expectations, with the highest catch rates ever recorded in Prince William Sound. The natural roe on kelp harvest of 119 tons was slightly above the guideline level while the pounded kelp harvest of 101 tons fell below the guideline harvest level. The estimated exvessel value for all four fisheries combined is \$8.2 million (Appendix H.25.). A detailed narrative of each fishery follows.

Sac Roe Seine Fishery

The purse seine fleet was placed on 48 hour advance notice on April 1 in accordance with previous practice. Aerial surveillance of the Sound began March 31, with the first sightings of herring occurring on that date in St. Matthews Bay. Adverse weather conditions hampered daily surveys through late March and early April. By April 6 conditions improved substantially, beginning a trend of excellent weather that continued through the spring herring season. Buildups of herring exceeding 2,500 tons were first sighted on April 8 in the Naked Island area, and April 9 at Fairmount Bay. This seemed consistent with the pattern over the past five years, when the fishery has been located in the Fairmount/Wells Bay area. In light of the apparent rapid buildup and favorable weather trend, the advanced notice status was reduced to 24 hours effective noon on April 10. On April 10, however, an unusual buildup of 16,000 to 24,000 tons was observed in Valdez Arm and through Tatitlek Narrows. At this time most of the commercial fishing fleet had arrived in Cordova from Sitka, but a large portion of the tendering and processing fleet was still at Sitka or in transit.

During aerial surveys on April 11, observers estimated 22,000 tons of herring in the Valdez Arm and Tatitlek Narrows area. Five test fishing boats gathered samples from various representative locations in the area. The results of the sampling program, based on pooled means of the samples, revealed an overall sex ratio of approximately 50% female, with roe recovery rates averaging better than 11% and the mean fish size was 144 grams. Only small numbers of immature or spawned out fish were observed. Based on the results of the day's activities, the advance notice period was reduced to 2 hours effective at 8:00 a.m. the following morning, Thursday, April 12.

On the morning of April 12, aerial surveys revealed little change in the distribution of fish in the area. Spawning had commenced in herring pounds in Galena Bay, but there was no apparent spawning activity elsewhere in the area. Although some of the freezer ships had not yet arrived, a canvass of the processors on site had shown sufficient tendering and processing capacity for a fishery. The decision was made to proceed with a fishery opening commencing at 1:00 p.m. that afternoon. Fish were well distributed through Galena Bay, Tatitlek Narrows, Boulder and Landlocked Bays. The decision was made to provide a large fishing area to minimize congestion of the fleet, and regulate the harvest by holding a short 20 minute opening.

The twenty minute opening, the shortest ever in Prince William Sound, proved to be more than sufficient to harvest the 6,000 ton guideline harvest level and yielded a final harvest of 8,362.1 tons (Appendix H.4.). Due to the shallow bottom of Tatitlek Narrows, some exceptionally large sets were made, and hundreds of tons of fish were observed spilling over the corks on a post fishery survey.

Roe recovery was estimated to average over 11% and the mean size of 135 to 145 grams was excellent for Prince William Sound. The age, sex, and size composition of the sac roe seine fishery catch is listed in Appendices H.27. and H.32. Fishermen received an advance price of \$640 per ton for 10% mature fish. Without accounting for future adjustments, the estimated exvessel value of the harvest is \$5.4 million (Appendices H.25 and H.26.).

Gill Net Sac Roe Fishery

The gill net sac roe fleet was placed on 24 hour advance notice on April 12 when the herring biomass in the Valdez Arm area was in excess of 23,000 tons. The notice period was reduced to 2 hours, effective at 10:00 A.M. April 13, the day following the seine opening. Light but widespread spawning was observed during a morning aerial survey April 13 and sufficient biomass remained in the area after the purse seine opening to prosecute a gill net fishery that day. The abundance of herring and the commencement of spawning produced optimum conditions for a gill net harvest. The Tatitlek Narrows area opened for four hours starting at noon April 13 and lasting until 4:00 p.m. Twenty-four boats participated and most of the effort was at Boulder and Landlocked bays. The harvest for this opening was 505.4 tons (Appendix H.2.), exceeding the guideline harvest allocation of 353 tons. Roe recovery averaged 10.6% and the mean weight was 163 grams. The age, sex, and size composition of the gill net sac roe fish are represented in Appendix H.28. The exvessel value of the gill net sac roe harvest was approximately \$323,456 (Appendix H.25.).

As with the seine fleet, the gill net fleet has shown a dramatic increase in efficiency over recent years. The mean catch per boat hour has shown an increase from 2.7 tons in 1988 to 5.3 tons in 1990 (Appendix H.4.).

Wild Harvest Spawn-On-Kelp Fishery

Heavy spawning began in the Tatitlek Narrows and the Boulder/Landlocked Bay area on April 13 and continued through April 16. A boat and dive survey in this area April 17 revealed variable amounts of spawn. Kelp quality appeared good with adequate coverage to produce a marketable product of the desired species (hair, ribbon and sieve) in a number of areas. The kelp was free of sand and grit. The first 8 hour opening was April 21 beginning at 8:00 a.m. and ending at 4:00 p.m. The open area included a portion of Valdez Arm as well as Tatitlek Narrows and Boulder and Landlocked bays; However, most effort was concentrated between Rocky and Black points. Preliminary verbal harvest information indicated that approximately 57 tons were harvested and an aerial survey estimated 70 divers participated. Marketable kelp was abundant and the quality was good. Based on the harvest rate of this opening, an additional opening in the same area and of the same duration was announced for the next day to harvest the remainder of the guideline allocation of 104 tons.

The harvest for the first opening, from fish ticket data, was actually 47.4 tons and the second opening yielded 69.4 tons for a total harvest of 118.8 tons (Appendix H.2.). A total of 128 divers actually participated in the fishery, 86 the first day and 97 the second day. Hair kelp comprised 57% of the total catch, 37% was ribbon, and 6% was sieve kelp. Seven buyers were represented on the grounds and paid an average price of \$.88/lb. for hair kelp, \$.99/lb. for ribbon and \$.52/lb for sieve, setting the estimated exvessel value at \$213,840 (Appendices H.25. and H.26.).

Roe-On-Kelp In Pounds Fishery

The roe-on-kelp in pounds fishery was limited by the Commercial Fisheries Entry Commission in December of 1986. A total of 129 permanent and interim use permits were granted as of January 1, 1990. In addition to the CFEC permit, a permit issued by the Department is also required for this fishery. There was a total of 128 permits issued for the 1990 roe-on-kelp in pounds fishery. New restrictions were imposed in the pound fishery this year whereby any individual permit holders must forfeit to the state any processed product which exceeds their individual production limit.

This fishery has developed quickly since its inception in 1980, when only two pounds produced product (Appendix H.7.). In 1990, 122 pounds produced product. Unfortunately, biological research programs have not kept pace with the evolution of the fishery. Many questions and misunderstandings have occurred in recent years due to the increased efficiency of the fishery. The department was directed by the Board of Fisheries in 1988 to design and implement a study to answer the many questions concerning harvest quotas, weight loss of product, and the quantity of herring utilized. This study was designed for the 1989 and 1990 seasons, but due to the Exxon Valdez oil spill it was implemented only during the 1990 season.

The 1990 fishery was restricted to the traditional areas of Valdez Arm and Port Fidalgo. Galena Bay was once again the center of the fishery with 15 of the 20 groups located there, two groups were located in Picnic Cove, one group in Virgin Bay, and the last two groups were located in Landlocked Bay and Two Moon Bay.

Herring were first observed in Galena Bay on April 6 and the biomass increased to 3,800 tons by April 10. Test samples from Galena Bay April 7 revealed age six to be the predominate age class. On April 9 at 12:00 noon, the pound seine fleet was put on 24 hour advance notice. By April 10, only a few of the pound operators had received Macrocystis, and were in the process of stringing kelp in their pounds. On April 10 at 12:00 noon, an opening for the seining of herring for the introduction into pounds was announced to begin at 12:00 noon on April 11, open until further notice. The open area included all waters of the Valdez Arm and Port Fidalgo north of a line extending from Porcupine Point to Point Freemantle.

On April 12, at 1:00 p.m. the seining of herring for the sac roe fishery opened within the same boundaries as the seining of herring for pounds. To prevent conflicts between the two fisheries and to assist in enforcement, a closure of seining for pounds occurred at 12:00 noon, April 12, and lasted until April 13, at 8:00 a.m.

The build-up of the herring biomass occurred suddenly. Most pound operators postponed harvesting Macrocystis, anticipating a slow buildup of herring and possibly a late fishery when only 150 tons were spotted on April 6 and still only 120 tons were estimated on April 9. On the morning of April 10, 860 tons were spotted in Galena Bay, by early afternoon 3,800 tons of herring were showing, and by the morning of the 11th, 8,400 tons were estimated in Galena Bay. On April 10, one group of 8 permit holders had their kelp on the grounds. By the opening of the fishery on April 11, only that group had kelp strung in their pounds and

were ready to fish. By the end of the day, another group of 6 permits had their kelp on the grounds and began setting it out. By the 12th, 70% of the permit holders had their kelp on grounds and by 8:00 a.m. April 13, when the seining of herring for the introduction into pounds reopened, only 15% of the pounders had kelp in place and were ready to fish. By noon on April 14 all permit holders had kelp strung in their pounds and were fishing.

The herring biomass dropped drastically from a high of 8,400 tons on April 11, to less than 300 tons on April 14. By the 14th, 70% of the permit holders had herring in their pounds and by the 18th all but four permit holders had fish. This group of four permits did not place any herring in their pounds or harvest for sale any pounded roe-on-kelp product. The age, sex, and size composition of the pound fishery catch is represented in Appendix 29.

The harvest of pounded roe on kelp began on April 19, and by noon April 26, all pounds producing product had completed harvesting. The total final product weight was 101.1 tons (Appendix H.7.). This is less than the 118 tons allocated to the roe-on-kelp in pounds fishery. This season's product quality was better than previous years. A little over 9% of the product harvested was graded as "Jumbo" quality, and just under 50% was grade 2 or superior. Approximately 7,400 lbs of product were "peelers" and were disposed of. "Peelers" occur when the egg layers separate from the Macrocystis blade and have little or no value. What caused this high incidence of "peelers"? One possibility is that mucus accumulated on the blades while in transit to Prince William Sound and it never washed off when placed in the pounds before the herring were introduced and spawning initiated.

The fishermen received an average estimated price of \$11.40 per pound for their kelp, placing the gross value of the harvest at \$2.3 million (Appendices H.25. and H.26.).

1990 Food And Bait Fishery

There was substantial interest in the 1990 herring food and bait fishery. Unlike recent years, processors requested an early opening to enable them to secure an additional bait market. The fishery opened by emergency order on September 21. Fishing started slowly, with the herring being scattered and not vulnerable to capture by purse seines in the traditional Knowles Head area. An additional area, the Montague area, opened on Sept. 25 and most of the effort shifted to that area. Poor weather hindered fishing in late October and early November but the guideline harvest level of 1,800 tons was easily exceeded by Nov. 24 when the fishery was closed by emergency order. The final harvest was 2015.9 tons (Appendix H.9.) from both areas combined. A total of 5 purse seine vessels and one trawler made deliveries to 7 different processors. Only the trawler and one purse seine vessel fished the Knowles Head area. Fishermen received between \$200 and \$300 per ton bringing the exvessel value of the catch to approximately \$605,000 (Appendices H.25. and H.26.).

There was a marked difference between the quality, size and age composition between the two areas. The Montague fish were larger, older and reportedly of higher quality. These fish had an average weight of 130 grams and length of 207

mm, and were mixed 5 yr olds (30.8%) and 6 yr olds (49.7%). The fish sampled from Knowles Head were mostly 2 yr old fish (67.9%) with an average weight of 74 grams and a length of 173 mm. Five samples of food and bait herring were taken with the age, sex, and size composition listed in Appendix H.30.

1990 Stock Assessment

The 1990 herring spawning population was dominated by the 1984 year class, as expected, which returned in force as six year olds. Six year olds represented 65% to 75% of the test fishery (Appendix H.31.) and of the commercial fisheries (Appendices H.27. - H.30.).

The aerial survey program was conducted as usual in 1990 from late March through late April. Herring schools were recorded and biomass estimated on a daily basis as well as extent of spawning activity, as summarized over the season in Appendix H.1. The peak aerial biomass estimate was 57,900 short tons (Appendix H.12.) in 1990 with a majority of the biomass as recorded by air occurring in the Northeast area (Tatitlek Narrows and Valdez Arm). In contrast, spawn deposition surveys revealed that half of the biomass, 53,889 tons, occurred in the Northeast area, with the majority of the remaining half, 42,906 tons, occurring in the northern Montague area (Appendix H.12.). Spawn was recorded on Smith Island in 1990 (the first observed in the past 20 years) and was included in the Naked Island area total biomass of only 3,171 tons. The North Shore area was the spawning site for over 14,000 tons of fish. The total spawning biomass was estimated from the diver survey at 114,998 short tons, plus or minus 23% of the true value 95% of the time, which is over double the forecasted amount of 52,000 tons (Appendices H.12. and H.24.). Historical biomass indices are listed in Appendices H.23. and H.24. for reference.

Shore mileage was recorded as 94.1 total linear miles as compared to 98.4 in 1989 (Appendix H.24.). Spawn mileage recorded by air was confirmed by skiff and diver surveys. Areas utilized for spawning did not change significantly from 1989 to 1990, however, a shift in biomass did occur with a decrease in the North Shore and Naked Island areas and a large increase in the Northeast and Montague Island areas. The mileage and biomass by area is listed in Appendix H.12., with 46.4%, for a total of 43.7 miles, of the 94.1 miles occurring in the Northeast area (46.9% of the total spawning biomass occurred there). Of the remaining areas, 25.7% or 24.2 miles of spawn occurred on Northern Montague Island, 19.3% or 18.2 miles of spawn occurred in the North Shore area mainly in Fairmount Bay and near Kiniklik and Pt. Pellew, 5.7% or 5.4 miles of spawn occurred in the Naked Island area mainly in Cabin and MacPherson Bays, on Peak Island, and including spawn on Smith Island, and finally, 2.8% or 2.6 miles of spawn occurred in the Southeast area in St. Matthews Bay, Port Gravina and on the North shore of Hawkins Island. Overall egg deposition was twice as dense in 1990 than in 1989, with a resulting 2.4 million pounds of spawners per mile compared to 1.2 million pounds of spawners per mile in 1989. Eggs were deposited off Montague Point covering that shallow reef area so thickly that overall spawner density on Montague was 3.5 million pounds of spawners per mile. Tatitlek Narrows exhibited extremely dense spawn, especially in Virgin Bay with an overall spawner density of 2.47 million pounds per mile. Densities were closer to normal on Naked Island and in the North Shore area at 1.2 and 1.6 million pounds per mile respectively (1 million

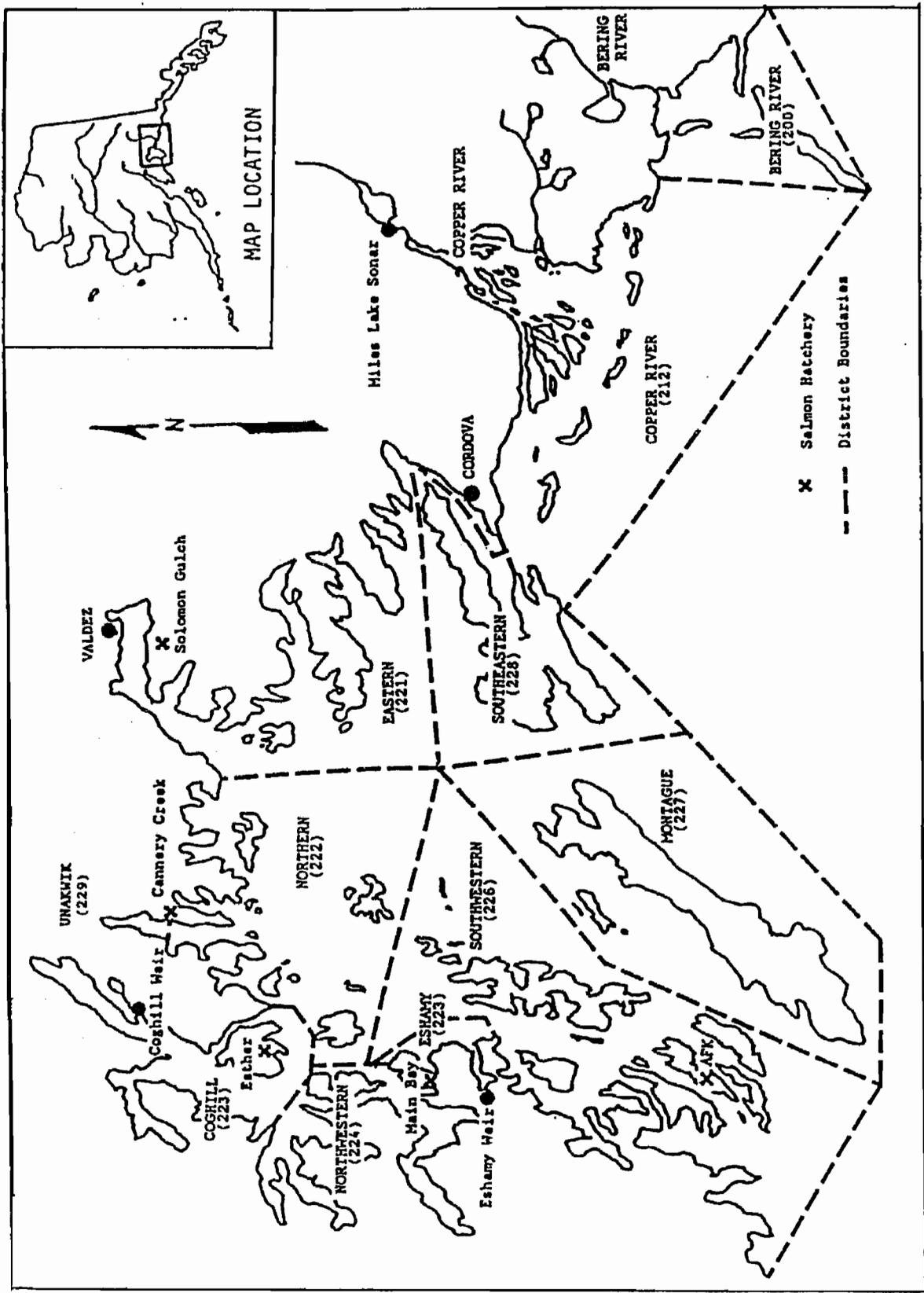
pounds per mile is considered the norm in Southeast Alaska). The 1990 herring stock is the most impressive return of spawners that has been observed in the last 13 years.

1991 Herring Season Outlook

From the estimated escapement of 114,998 tons of spawners, composed largely of 6 year olds, a returning Prince William Sound stock of 96,800 short tons of herring, of which 77.5% by weight will be 7 year olds, has been projected to return in 1991. The mean weight of the 7 year olds is projected to be 155 grams. The total projected returning biomass of 96,800 tons constitutes an extremely healthy stock which can be exploited at the maximal rate of 20%. The following allocations have been made to the five herring fisheries: 3100 tons for the 1990 food and bait (of which 2017 tons was harvested; the 1800 ton quota was set based on 1989 estimated return and harvest plan since the forecast was not complete), 1550 tons of herring or 195 tons of roe on kelp to be harvested by the wild spawn-on-kelp fishery, 2750 tons or 220 tons of roe on kelp to be harvested by the pound fishery, 11,300 tons of herring to be harvested by the sac roe seine fishery, and 660 tons to be harvested by the sac roe gill net fishery. The total guideline harvest for 1991 has been set at 19,360 tons of herring. If this is realized, the 1991 harvest will be the largest in 22 years in Prince William Sound.

APPENDIX A

PRINCE WILLIAM SOUND
AREA WIDE INFORMATION



Appendix A.1. Map of the Prince William Sound Area showing commercial fishing districts, salmon hatcheries, weir locations, and the Miles Lake sonar site.

Appendix A.2. Commercial salmon harvest by species, gear type and district in the Prince William Sound Management Area, 1990.

District	Effort	Chinook	Sockeye	Coho	Pink	Chum	Total
Eastern	259	59	1,445	18,212	7,970,364	153,344	8,143,424
Northern	220	36	3,721	12,387	5,482,585	75,443	5,574,172
Unakwik	0	0	0	0	0	0	0
Coghill	89	2	286	11,819	785,278	10,951	808,336
Northwestern	43	2	1,034	2,032	891,444	4,591	899,103
Southwestern	248	16	15,718	45,493	17,811,479	27,974	17,900,680
Montague	3	0	0	50	10,658	3	10,711
Southeastern	2	0	9	4	12,325	212	12,550
Purse Seine	266	115	22,213	89,997	32,964,133	272,518	33,348,976
Bering River	109	14	8,332	42,952	2	1	51,301
Copper River	514	21,702	844,778	246,797	1,596	7,545	1,122,418
Unakwik	5	3	247	127	9,986	23	10,386
Coghill	403	126	11,988	128,605	1,907,510	301,209	2,349,438
Eshamy	336	110	12,967	574	165,362	264,772	443,785
Drift Gill Net	524	21,955	878,312	419,055	2,084,456	573,550	3,977,328
Eshamy	29	56	10,204	532	369,589	94,494	474,875
Set Gill Net	29	56	10,204	532	369,589	94,494	474,875
Solomon Gulch	1	2	1	11,201	2,146,469	1,085	2,158,758
Cannery Creek	1	0	0	0	552,498	0	552,498
Wally Noernberg	1	0	40	2,682	3,364,172	23,024	3,389,918
Armin F Koernig	1	0	67	316	2,669,519	445	2,670,347
Main Bay	0	0	0	0	0	0	0
Hatchery ^a		2	108	14,199	8,732,658	24,554	8,771,521
Ed. Permit ^b	1	33	307	488	9,292	2,014	12,134
Confiscated	3	2	463	3	4,949	254	5,671
Misc. Gear		35	770	491	14,241	2,268	17,805
Prince William Sound Total		22,163	911,607	524,274	44,165,077	967,384	46,590,505

^aHatchery sales for hatchery operating costs.

^bCordova High School educational special use permits.

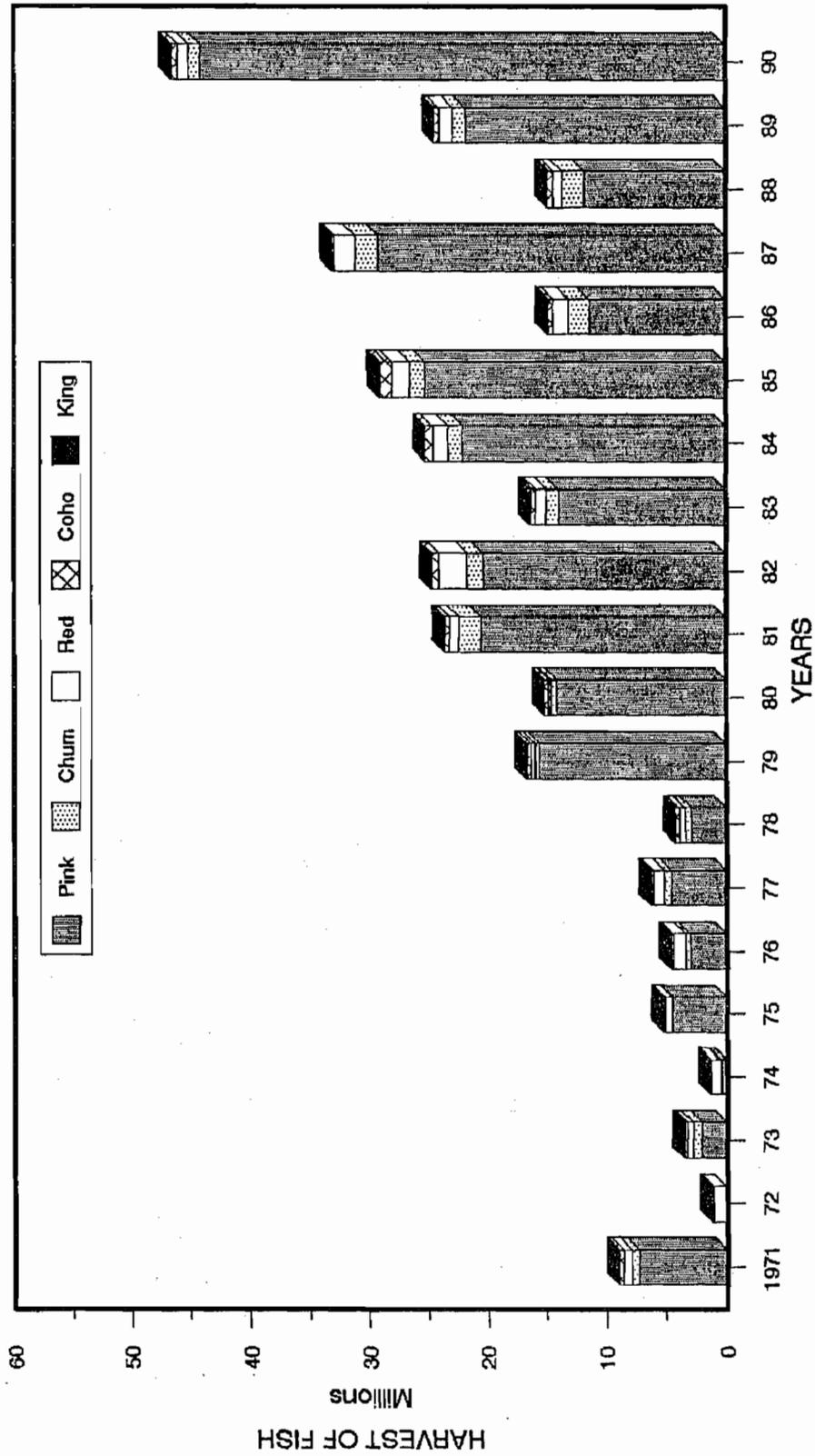
Appendix A.3. Commercial salmon harvest by species from all gear types, Prince William Sound, 1971 - 1990. ^a

Year	Catch by Species					
	Chinook	Sockeye	Coho	Pink	Chum	Total
1971	20,142	741,945	327,697	7,312,730	579,552	8,982,066
1972	23,003	976,115	124,670	57,090	46,088	1,226,966
1973	22,638	473,044	199,019	2,065,844	740,017	3,500,562
1974	20,602	741,340	76,041	458,619	89,210	1,385,812
1975	22,325	546,634	84,109	4,453,041	101,286	5,207,395
1976	32,751	1,008,912	160,494	3,022,426	370,657	4,595,240
1977	22,864	943,943	179,417	4,536,459	573,166	6,255,849
1978	30,435	505,509	312,930	2,917,499	489,771	4,256,144
1979	20,078	369,583	315,774	15,615,810	349,615	16,670,860
1980	8,643	208,724	337,123	14,161,023	482,214	15,197,727
1981	20,782	784,469	396,163	20,558,304	1,888,822	23,648,540
1982	47,871	2,362,328	623,877	20,403,423	1,336,878	24,774,377
1983	53,879	908,469	365,469	13,977,116	1,048,737	16,353,670
1984	39,774	1,303,515	609,484	22,119,309	1,229,185	25,301,267
1985	43,735	1,464,563	1,025,046	25,252,924	1,321,538	29,107,806
1986	42,128	1,288,712	426,240	11,410,302	1,700,906	14,868,288
1987	41,909	1,737,989	175,214	29,230,303	1,919,415	33,104,830
1988 ^b	31,797	767,674	477,816	11,820,121	1,843,317	14,940,725
1989 ^b	32,006	1,175,238	424,980	21,886,466	1,001,809	24,520,499
1990 ^b	22,163	911,607	524,274	44,165,077	967,384	46,590,505
Ten Year						
Average	36,252	1,200,168	486,141	19,081,929	1,377,282	22,181,773
(1980-89)						

^a Includes catches by all gear types and hatchery sales from the Eastern, Northern, Coghill, Unakwik, Northwestern, Eshamy, Southwestern, Montague, Southeastern, Copper River and Bering River Districts.

^b Includes confiscated and educational special use permits. Also includes hatchery sales harvests and carcass sales.

**ALL SPECIES SALMON CATCH
PRINCE WILLIAM SOUND**



Appendix A.4. Commercial salmon harvest by species for all gear types combined, Prince William Sound, 1971 - 1990.

Appendix A.5. Mean price and estimated exvessel value of the commercial salmon harvest by gear type, Prince William Sound, 1990. ^a

PURSE SEINE

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	115	1,452	12.6	1.50	2,178.00
Sockeye	22,213	146,502	6.6	1.50	219,753.00
Coho	89,997	777,032	8.6	0.50	388,516.00
Pink	32,964,133	98,096,289	3.0	0.30	29,428,886.70
Chum	272,518	2,561,144	9.4	0.70	1,792,800.80
	33,348,976	101,582,419			\$31,832,134.50

DRIFT GILL NET

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	21,955	566,896	25.8	2.24	1,269,847.04
Sockeye	878,312	5,376,765	6.1	2.13	11,452,509.45
Coho	419,055	3,831,726	9.1	0.97	3,716,774.22
Pink	2,084,456	6,664,420	3.2	0.30	1,999,326.00
Chum	573,550	5,204,981	9.1	0.70	3,643,486.70
	3,977,328	21,644,788			\$22,081,943.41

SET GILL NET

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	56	723	12.9	1.45	1,048.35
Sockeye	10,204	62,960	6.2	1.59	100,106.40
Coho	532	4,144	7.8	0.69	2,859.36
Pink	369,589	1,233,382	3.3	0.30	370,014.60
Chum	94,494	907,407	9.6	0.70	635,184.90
	474,875	2,208,616			\$1,109,213.61

HATCHERY SALES ^b

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook ^c	2	5	2.5		0.00
Sockeye	108	795	7.4	0.57	451.00
Coho	14,199	117,213	8.3	0.68	79,481.04
Pink	8,732,658	25,485,394	2.9	0.41	10,443,197.69
Chum	24,554	216,070	8.8	0.47	101,985.44
	8,771,521	25,819,477			\$10,625,115.17

OTHER GEAR ^d

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	35	925	26.4	2.23	2,062.00
Sockeye	770	4,744	6.2	2.13	10,095.00
Coho	491	4,609	9.4	0.76	3,513.00
Pink	14,241	42,488	3.0	0.30	12,746.00
Chum	2,268	22,095	9.7	0.70	15,467.00
	17,805	74,861			\$43,883.00

Gear Type	Value of Catch	No. of Permits	Average Earnings
Purse Seine	31,832,134.50	266	\$119,669.68
Drift Gill Net	22,081,943.41	524	\$42,141.11
Set Gill Net	1,109,213.61	29	\$38,248.75
Subtotal-			
Value of CPF Catch	\$55,023,291.52		
Hatchery	\$10,625,115.17		
Other Gear	\$43,883.00		
GRAND TOTAL	\$65,692,289.69		

^a Mean prices are estimated at the end of the season based on the average of cash buyers and the advance prices paid by the canneries on the grounds. They do not reflect the spring adjustments paid by some companies.

^b Prices are an average of sales harvest prices.

^c Incidental catch - value included in pink total.

^d Includes the Cordova High School special educational permit and confiscated fish sales.

Appendix A.6. Commercial salmon harvest and estimated value by gear type and district, Prince William Sound, 1990.

District	Permits	Landings	Numbers of Fish					Chum	Total	Estimated Value ^a
			Chinook	Sockeye	Coho	Pink				
221 Eastern	259	2,147	59	1,445	18,212	7,970,364	153,344	8,143,424	8,037,704 ^b	
222 Northern	220	1,136	36	3,721	12,387	5,482,585	75,443	5,574,172	5,471,868 ^b	
229 Unakwik	0	0	0	0	0	0	0	0	0 ^b	
223 Coghill	89	216	2	286	11,819	785,278	10,951	808,336	838,113 ^b	
224 Northwestern	43	123	2	1,034	2,032	891,444	4,591	899,103	850,791 ^b	
226 Southwestern	248	2,839	16	15,718	45,493	17,811,479	27,974	17,900,680	16,611,665 ^b	
227 Montague	-	4	0	0	50	10,658	3	10,711	9,789 ^b	
228 Southeastern	-	-	0	9	4	12,325	212	12,550	12,206 ^b	
PURSE SEINE TOTAL	266	6,465	115	22,213	89,997	32,964,133	272,518	33,348,976	\$31,832,135	
200 Bering River	109	464	14	8,332	42,952	2	1	51,301	491,121	
212 Copper River	514	11,691	21,702	844,778	246,797	1,596	7,545	1,122,418	14,519,590	
229 Unakwik	5	17	3	247	127	9,986	23	10,386	13,540 ^c	
223 Coghill	403	9,310	126	11,988	128,605	1,907,510	301,209	2,349,438	4,989,663	
225 Eshamy	336	3,961	110	12,967	574	165,362	264,772	443,785	2,068,029	
DRIFT GILL NET TOTAL	524	25,443	21,955	878,312	419,055	2,084,456	573,550	3,977,328	\$22,081,943	
225 Eshamy	29	1,873	56	10,204	532	369,589	94,494	474,875	1,109,214	
SET GILL NET TOTAL	29	1,873	56	10,204	532	369,589	94,494	474,875	\$1,109,214	
221 Solomon Gulch	-	75	2	1	11,201	2,146,469	1,085	2,158,758	2,615,488 ^d	
222 Cannery Creek	-	42	0	0	0	552,498	0	552,498	502,896 ^d	
223 Wally Noerenberg	-	129	0	40	2,682	3,364,172	23,024	3,389,918	4,036,139 ^d	
226 Armin F. Koernig	-	129	0	67	316	2,669,519	445	2,670,347	3,470,592 ^d	
225 Main Bay	NO SALES HARVEST								0 ^d	
HATCHERY SALES TOTAL		375	2	108	14,199	8,732,658	24,554	8,771,521	\$10,625,115	
200/212 Copper/Bering	-	12	32	294	111	0	0	437	6,935	
221 Eshamy	-	29	1	13	0	0	1,711	1,725	11,896 ^b	
223 Coghill	-	27	0	0	377	9,292	303	9,972	13,088 ^b	
Educational Permit ^e		68	33	307	488	9,292	2,014	12,134	\$31,918.60	
Confiscated	-	21	2	463	3	4,949	254	5,671	\$11,964.57 ^c	
OTHER GEAR TOTAL		89	35	770	491	14,241	2,268	17,805	\$43,883.17	
PRINCE WILLIAM SOUND										
GRAND TOTAL		34,245	22,163	911,607	524,274	44,165,077	967,384	46,590,505	\$65,692,290	

^a (Reported number of pounds delivered by species) x (estimated average price per pound for that species and district) = Estimated Value. Actual value may vary.

^b Used the general purse seine district average price paid by species in estimating value.

^c Used the Coghill District drift gill net average price paid by species in estimating value.

^d Hatchery sales for hatchery operating costs. Does not include hatchery carcass sales.

^e Cordova High School educational special use permit.

Appendix A.7. Average price paid to fishermen for salmon, Prince William Sound, 1981-1990. ^a

Species	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
King Salmon	1.65	1.40	1.05	1.30	1.65	1.45	1.75	2.23	2.25	2.24
Sockeye Salmon	1.40	1.01	0.95	1.15	1.50					
Copper River		0.80	0.95	1.00	1.55	1.65	1.90	3.20	2.30	2.13
Bering River		0.80	0.85	0.95	1.10	1.65	1.90	3.00	2.30	2.13
Coghill/Unakwik districts				0.90	1.20	1.37	1.75	2.68	2.00	1.50
Eshamy				0.85	1.10	1.34	1.60	2.77	--	1.45
General Purse Seine						1.35	1.45	2.68	2.00	1.50
Coho Salmon										
Copper/Bering rivers	0.95	0.86	0.75	1.10	0.85	0.94	0.93	2.35	0.60	0.97
Prince William Sound	0.39	0.40	0.30	1.10	0.40	0.46	0.55	1.86	0.70	0.97
Pink Salmon	0.44	0.23	0.24	0.26	0.22	0.23	0.40	0.79	0.35	0.30
Chum Salmon	0.50	0.38	0.24	0.26	0.29	0.33	0.39	0.73	0.35	0.70

^aBased on processor reports, fish tickets and other sources. Prices are monitored throughout the season and a weighted average is generally used. Prices generally do not reflect post season adjustments. Prices are an estimate only; Caution should be used if using these prices to estimate value.

Appendix A.8. Harvest projections for the 1990 commercial salmon fishery by district and species, Prince William Sound.^a

COMMERCIAL HARVEST (1,000's of fish)					
District	King	Sockeye	Coho	Pink	Chum
Copper River ^b	28.2 - 46.0	431.3 - 603.5	242.4 - 348.2		
Bering River ^c		0.0 - 46.7	83.0 - 170.5		
Coghill ^d		0.0 - 105.6			
Eshamy ^e					
General P.W.S. Districts		50.4 - 79.1	7.3 - 13.2	150 - 8,650	17.8 - 484.6
Total Wild	28.2 - 46.0	481.7 - 834.9	332.7 - 531.9	150 - 8,650	17.8 - 484.6
Solomon Gulch			55.7 - 85.1	1,130 - 5,640	15.9 - 37.6
Armin F. Koernig				4,780 - 7,490	5.6 - 8.9
Wally Noerenberg			342.5 - 404.8	4,610 - 7,310	223.3 - 465.5
Cannery Creek				1,020 - 2,300	
Main Bay		8.9 - 10.9			650.5 - 1044.1
Gulkana		112.6 - 168.8			
Total Hatchery	0.0 - 0.0	121.5 - 179.7	398.2 - 489.9	11,540 - 22,740	895.3 - 1556.1
Total Hatchery and Wild	28.2 - 46.0	603.2 - 1014.6	730.9 - 1021.8	11,690 - 31,390	913.1 - 2040.7

^aFormal forecast procedures are used for estimating wildstock returns for pink and chum salmon in Prince William Sound. Hatchery contributions are based on known fry releases and assumed marine survival rates. Sockeye production is based upon mean fishery performance. Harvest estimates are only made for those species which constitute a significant portion of the catch. The pink salmon harvest projection does not include 6.63 million fish projected for harvest by hatcheries for cost recovery.

^bFormalized forecast procedures are used for Copper River king and sockeye returns. Copper River coho catches are based on mean fishery performance adjusted by escapement levels and environmental conditions.

^cBering River sockeye and coho harvest estimates are based on mean fishery performance adjusted by escapement levels and environmental conditions.

^dCoghill sockeye returns are formally forecasted using a sibling relationship model for the major age class and spawner recruit relationships for other age classes. The pink and chum harvest is included in the 'General PWS Districts' projection.

^eNo formal forecast exists for Eshamy sockeye production. The pink and chum harvest is included in the 'General PWS Districts' projection.

Appendix A.9. A listing of finfish processors, location of operation,
type of product processed, 1990.

Executive Names, Address Location of Operations	Processor Code	Type of Product
Anderson Seafoods P.O. Box 87 Seward, AK 99664 Don Brindle	F0082	Herring
Anpac P.O. Box 92520 Anchorage, AK 99509 Jack Schultheis	F0800	Herring
Bragit-Fishing Co. P.O. Box 936 Cordova, AK 99574 Stan Samuelson	F0121	Herring
Bristol Monarch/Trident 7814 8th Ave S Seattle, WA 98108 Bob Morton	F0948 F0079 F1237	Herring Salmon
Chugach Fisheries Inc. P.O. Box 120 Cordova, AK 99574 Steve Meuter	F0830 F0213	Salmon
Coldwater Fish P.O. Box 2678 Valdez, AK 99686 Victor Young	F1276	Salmon
Copper River Fishermen's Coop P.O. Box 90 Cordova, AK 99574 Mike Schomer	F0146	Herring Salmon
Eyak Packing P.O. Box 1131 Cordova, AK 99574 Gerald Masolini	F0224	Salmon
Great Pacific Seafoods P.O. Box 710 Whittier, AK 99603 Ken Madsen	F1267	Salmon
Icicle Seafoods, Inc. P.O. Box 8 Seward, AK 99664 Jeff Poole/John Woodruff	F0133 F0135 F0138 F0137	Herring Salmon
Inlet Salmon P.O. Box 530 Kenai, AK 99611 Steve Sather	F1039 F1086 F0561	F1006 F1810 Salmon
John Cabot Company 1200 E. 70th Anchorage, AK 99518 Roy Jones/Bill Billingsley	F0932	Salmon

Executive Names, Address Location of Operations	Processor Code	Type of Product
Josef Kopecky 7865 Moose Run Circle Anchorage, AK 99507	F1191	Salmon
Lafayette Fisheries, Inc. 4259-22nd Ave. W. Seattle, WA 98199 John Garner	F0072 F0073	Herring
Nautilus Marine P.O. Box 727 Valdez, AK 99686 Tom Waterer	F0815	Salmon
New West Fisheries, Inc. 601 W. Chestnut St. Bellingham, WA 98225 Jerry Thon	F0602	Herring
North Coast Processors P.O. Box 17538 Seattle, WA 98107 Jim Nagai	F0084	Herring
North Pacific Processors P.O. Box 1040 Cordova, AK 99574 Ken Roemhildt	F0232	Salmon
Oceanic Seafoods, Co. 8221 44th Ave. W. Mukilteo, WA 98275 Allen Searle	F0051	Herring
Pan Pacific Seafoods, Inc. 150 Nickerson St. Suite 103 Seattle, WA 98109 Janet Dizard	F0923	Herring
Peter Pan Seafoods, Inc. P.O. Box 1027 Valdez, AK 99686 Jim Poor	F1041	Herring Salmon
Phoenix Seafoods, Inc. Anchorage, AK Joe Hale	F0597	Salmon
Clyde Pignolet P.O. Box 88496 Honolulu, HI 96830	F1173	Herring
Prime Alaska Seafoods 6135 Mike St. Anchorage, AK 99518 Jack McLean	F1113	Herring

Executive Names, Address Location of Operations	Processor Code	Type of Product
Royal Pacific Fisheries P.O. Box 4609 Kenai, AK 99611 Marvin Dragseth	F0409	Herring
Sagaya Corp. 3309 Spenard Rd. Anchorage, AK 99503 Paul Reid	F0803	Herring
Sea Hawk Seafoods, Inc. P.O. Box 151 Valdez, AK 99686 Ray Cesarini	F0223	Salmon
St. Elias Ocean Products, Inc. P.O. Box 548 Cordova, AK 99574 Bill Terhar	F0120 F0043	Herring Salmon
Taylor Aquatic Enterprises P.O. Box 112241 Anchorage, AK 99511 Gary Taylor	F0131	Herring
Virgin Bay Kelp Co. P.O. Box 1724 Cordova, AK 99574 Steve Smith/Jeannie Buller	F1261	Herring
Wards Cove Packing Company P.O. Box 1710 Seward, AK 99664 William E. Brindle	F0270 F0266	Salmon
Woodbine Alaska Fish Co. P.O. Box 218 Naknek, AK 99633 J.C. Hiles	F0214	Herring
Wrangell Fisheries, Inc. P.O. Box 908 Wrangell, AK 99929 Mike Miyagi	F0319	Salmon
Yak 500 Fairview N. Seattle, WA 98109 Al Chaffe	F0786	Herring
Yamaya Seafoods 704 W. 4th Ave. Anchorage, AK 99501 Sam Yamada	F1249	Herring

MEMORANDUM OF UNDERSTANDING
1990 COMMERCIAL FISHERY SEASON
Alaska Department of Fish and Game
and

Alaska Department of Environmental Conservation

I. PREAMBLE

On March 24, 1989, the oil tanker Exxon Valdez ran aground, spilling more than 10,500,000 gallons of crude oil into the waters of Prince William Sound. The spilled oil spread from Prince William Sound through the western Gulf of Alaska; it polluted and contaminated state waters and shoreline that support productive fisheries which are of immense economic and social value to the State of Alaska and its citizens.

The State of Alaska, through the Alaska Department of Fish and Game (ADF&G) is charged with managing fishery resources. Fisheries management directives and goals include: (1) to protect, maintain, improve and extend fishery resources; (2) to avoid depletion or waste of fishery resources; (3) to conduct fishing in state waters in an orderly fashion which promotes conservation, development, and utilization of fishery resources; and (4) to preserve the economic stability of the state's fishing industry.

The State of Alaska, through the Alaska Department of Environmental Conservation (ADEC) is charged with protecting the environment and the health, safety, and welfare of the public. Public protection directives and goals include: (1) to conserve, improve, and protect natural resources from oil pollution; and (2) to ensure that fish marketed from state waters are pure, safe, wholesome, and unadulterated.

Oil pollution [as defined in AS 46.03.900(19)] in waters or on shoreline in or adjacent to an area where a fishery is conducted poses a risk of adulterating fisheries resources. Oil contamination also poses a risk of disruption of fisheries, including alteration of traditional

fishing patterns and Board of Fisheries' adopted fisheries management plans, by causing fishermen who are unable to acquire uncontaminated gear or vessels to forego their livelihoods, and by causing waste of fishery resources that have become adulterated by oil pollution in the water or by contact with oil contaminated gear or vessels.

If oil adulterated fish are introduced into fish processing facilities, it could cause disruption of fisheries and waste of fish product because processing activities would have to be suspended while oil contaminated processing equipment was cleaned, maintained, and inspected. Additional waste and adulteration of fish product could occur if uncontaminated fish were exposed to oil contaminated fish or equipment.

Because of the affects of weathering on oil, the time that has passed since the 1989 Exxon Valdez spill, and other factors, it is expected that the location and effect of oil from the Exxon Valdez spill will be substantially different in 1990 compared to 1989. ADF&G and ADEC anticipate that there will not be large floating oil slicks and mousse in fishing areas as existed in 1989. However, some beaches are expected to remain impacted and to continue to leach oil to adjacent waters.

Due to the residual effects of the 1989 oil spill, continued vigilance is necessary in the harvest and inspection of seafood from areas affected by the spill to ensure that no contaminated seafood products enter the marketplace.

Therefore, in order to carry out the management and public protection directives and goals with which the ADF&G and the ADEC are charged, the respective departments agree to conduct the following activities during the 1990 commercial fishing season.

II. FISHERY MANAGEMENT ACTIVITIES

- A. Prior to the commercial season for each species or species group (e.g., herring, crab, shrimp, salmon), ADF&G will collect fish samples for analysis by ADEC.
- B. ADEC will evaluate these samples

- organoleptically, determine bile levels, and send selected samples to the Federal Food and Drug Administration (FDA) or the National Marine Fisheries Service (NMFS) or other approved laboratories for chemical assay.
- C. A potential fishing area will remain closed if samples of fish taken from the area are found by ADEC to be adulterated by oil.
 - D. Prior to the initial openings or subsequent fishing periods, ADF&G will survey areas for the presence of oil, and document the results of the surveys.
 - E. A fishing area will remain closed if there is an indication of oil in the area or the proximity of the area (including beaches), such that there is an appreciable likelihood that gear will be fouled, fish harvest adulterated, or such that the conduct of an orderly fishery could not take place.
 - F. If a fishing area contains some isolated pockets of oil but the oil does not pose an appreciable likelihood of contaminating fishing gear or product throughout the area, ADF&G will close only the specific portion of the area that is contaminated.
 - G. ADF&G will be available to inspect areas where oil is reported and assess whether the area should be closed.
 - H. After fishing areas are opened for commercial fishing, if ADEC inspection or evaluation indicates repeated oil adulteration of fish from a harvest area, designated representatives of ADEC and ADF&G will consult to determine whether a recurring contamination problem has developed. If so, ADF&G will close fishing in the area where the oil contamination occurred.
 - I. ADEC will implement regulations regarding inspections, monitoring, and record-keeping for fishing vessels, tender vessels, and processors. ADEC will establish a vessel inspection system for vessels that work on oil spill related activities.
 - J. ADEC will provide training for quality control personnel in processing facilities. ADEC will

daily inspect plants that receive fish from any areas affected in 1989-90 by the oil spill. ADEC will continuously sample and monitor seafood harvests throughout the season.

III. AGENCY STAFF

Each agency will designate key contact people to implement this Memorandum of Understanding (MOU) and to facilitate the decision-making process during the 1990 commercial fishery season. The following are specific agency representatives for all purposes under this MOU:

ADF&G designates: David Cantillon
Deputy Director
Division of Commercial Fisheries
(907) 465-4210

ADEC designates: Manny Soares
Supervisor
Seafood Inspection Program
Division of Environmental Health
(907) 563-0318

Because it may be necessary to make emergency closure decisions, in the event that either designated representative is unavailable, the alternative designated persons are:

ADF&G designates:

Prince William Sound
Region: James Brady
Area Biologist
(907) 424-4213

and

Dennis Haanpaa
Regional Management Biologist
(907) 267-2104

Cook Inlet Region: John Hilsinger
Regional Management Biologist
(907) 267-104

Upper Cook Inlet: Paul Ruesch

Area Biologist
(907) 262-9369

Lower Cook Inlet: Wesley Bucher
Area Biologist
(907) 235-8191

Westward Region: Larry Nicholson
Regional Supervisor
(907) 486-4791

and

Pete Probasco
Regional Management Biologist
(907) 486-4791

ADEC Region: Bill Krostek
Field Inspection Supervisor
(907) 563-0318

Agency staff will, to the maximum extent possible coordinate and channel all respective efforts through the designated staff member.

4.4.90
Date

Don W. Collinsworth
Don W. Collinsworth, Commissioner
Alaska Department of Fish and Game

April 4, 1990
Date

Dennis D. Kelso
Dennis D. Kelso, Commissioner
Alaska Department of Environmental
Conservation

Appendix A.12. The Prince William Sound Salmon Harvest Task Force recommendations for the 1990 season.

June 13, 1990

SALMON HARVEST TASK FORCE RECOMMENDATIONS TO ADF&G FOR THE 1990 SEASON

The Prince William Sound Salmon Harvest Task Force (SHTF) recommends that the Alaska Department of Fish and Game adopt the following guidelines for management of the 1990 purse seine salmon fishery in Prince William Sound in an effort to improve the intrinsic quality of the salmon harvested in this valuable fishery. The objectives of this program, in no particular order, are as follows:

- * To provide greater fishing opportunities outside of terminal areas.
- * To increase overall quality the Area E salmon products.
- * To maximize fishing time for all user groups.
- * To maximize utilization of the high quality harvestable surplus.
- * To provide adequate protection to natural salmon stocks.
- * To provide increased basis for a workable management system for Area E salmon stocks.
- * To learn and adjust this management system from the results obtained from the 1990 season.

I. ENLARGED CLOSURES IN FRONT OF MAJOR SPAWNING SYSTEMS

The SHTF recommends that the Department establish enlarged closures at the heads of bays (as laid out by a sub-committee of the SHTF and approved at the June 13th meeting of the SHTF) as a management tool to provide a greater assurance of meeting minimum wild stock pink and chum salmon escapement objectives while permitting as much fishing time as possible during a given season, and at the same time assuring a high quality product to be taken by fishermen. These enlarged closures are anticipated to improve the quality of the salmon harvest by eliminating the harvest of poor quality "back out" fish taken at the present marker system and targeting the harvest on "bright" fish taken at the bay entrances, outer points and migratory passages.

These new closures are to be established by E.O at the start of the season and are intended to remain in effect throughout the entire season. The enlarged closures will be subject to modification if the SHTF and/or the department see inadequacies that have developed and it is felt that adjustments are necessary during and/or post season.

II. SEINE SEASON FISHING PERIODS

The SHTF recommends that the Department establish a weekly fishing schedule for the seine season permitting two 12 hour fishing periods per week, on Mondays and Thursdays, commencing no later than Monday, July 2nd, and opening at 6:00 a.m. These openings would include as many districts as possible. However, openings will not occur prior to July 15 in the Southwestern district and portions of the Northern and Northwestern districts (Perry Passage) so as not to interfere with predetermined allocation structure of salmon stocks.

After the first 12 hour opener, the subsequent three openings will proceed unless wild stock pink and chum escapement levels fall below 50% of the desired levels for a given date. After the first four openings, if the wild stock pink and chum escapement levels falls below 75% of the minimum desired escapement levels for a given date, the openings will be reduced to 1 period per week and will continue at this rate until such time that the escapement rate recovers to 105% of the daily anticipated and 95% of the cumulative. If the escapement levels fail to improve above 75% of the minimum for that date, then all fishing will be curtailed until the above thresholds are reached.

After an opening, ADF&G will use catch information provided as expediently as possible by the processors, as well as survey results, to determine if additional fishing time is warranted per each general district opening during that week.

We also recommend that as many areas as possible be opened concurrently including any and all hatchery openings. The purpose of this is to spread the fleet and leave time for decisions of the fishermen.

The SHTF recommends that VFDA take as much of its cost recovery fish from Boulder Bay as possible, and continue to harvest cost recovery fish in Boulder Bay after the July 2nd opening. The Boulder Bay SHA will remain closed during the 12 hour openings to assist the hatchery in achieving its cost recovery goal.

III. IN SEASON MEETINGS

The SHTF will meet in season as needed. It is the responsibility of the members of the SHTF to relay the content of these meetings to their constituents.

IV. AERIAL SPOTTING PROGRAM

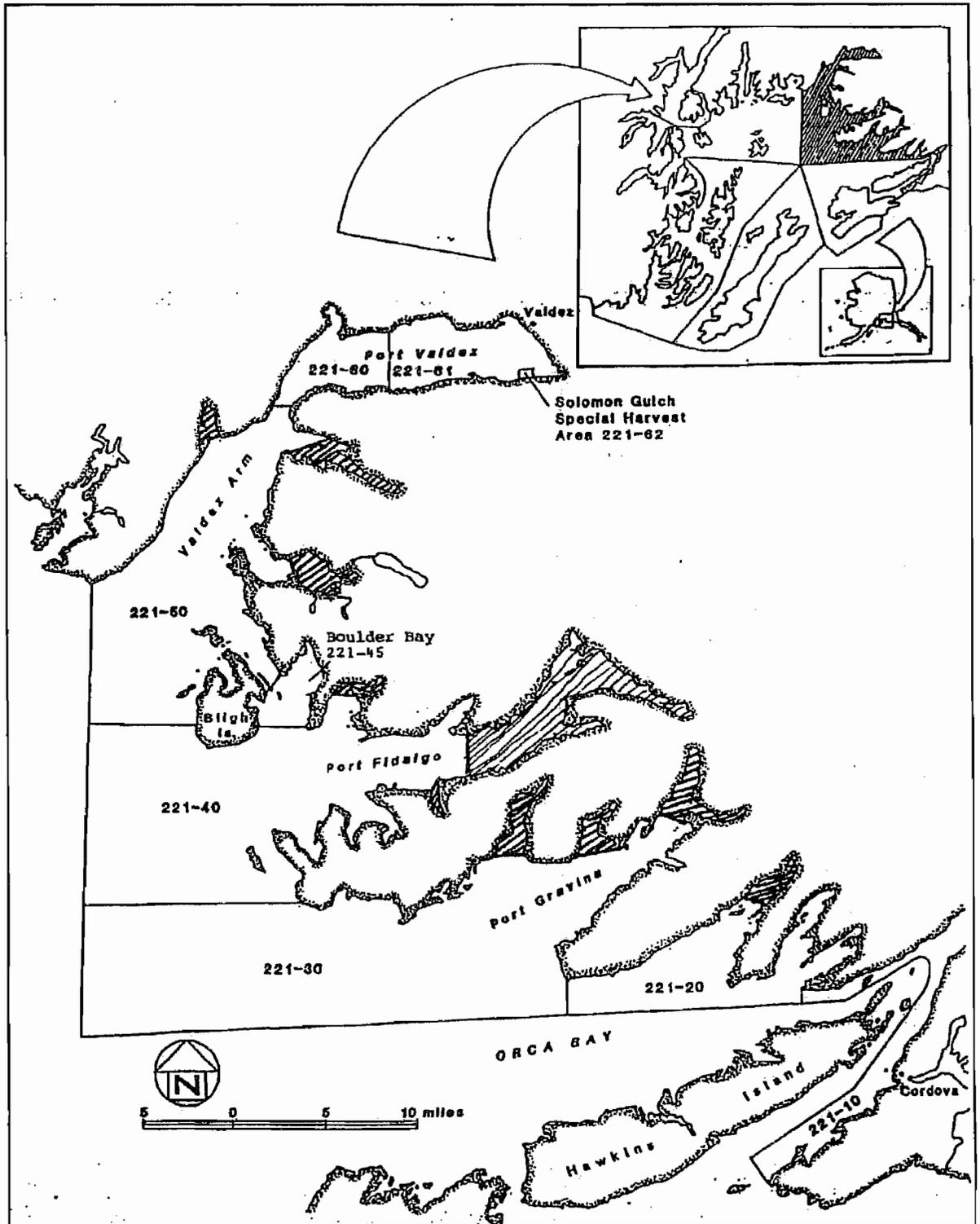
An additional airplane and personnel will be hired to supplement the present ADF&G aerial survey program and will be administrated by ADF&G. The SHTF recommends that PWSAC supply the funding for the airplane charter costs through additional sales harvests, not to exceed \$30,000 for the 1990 season. ADF&G will provide funding to cover personnel costs for the dedicated surveyor. The airplane spotter is to be hired by the Alaska Department of Fish and Game with potential candidates submitted by the SHTF.

This additional spotter will be expected to supplement the present pink and chum salmon escapement program that is in place (which is stream and bay surveys) by staggering surveys on opposite ends of the week from the normal department flights.

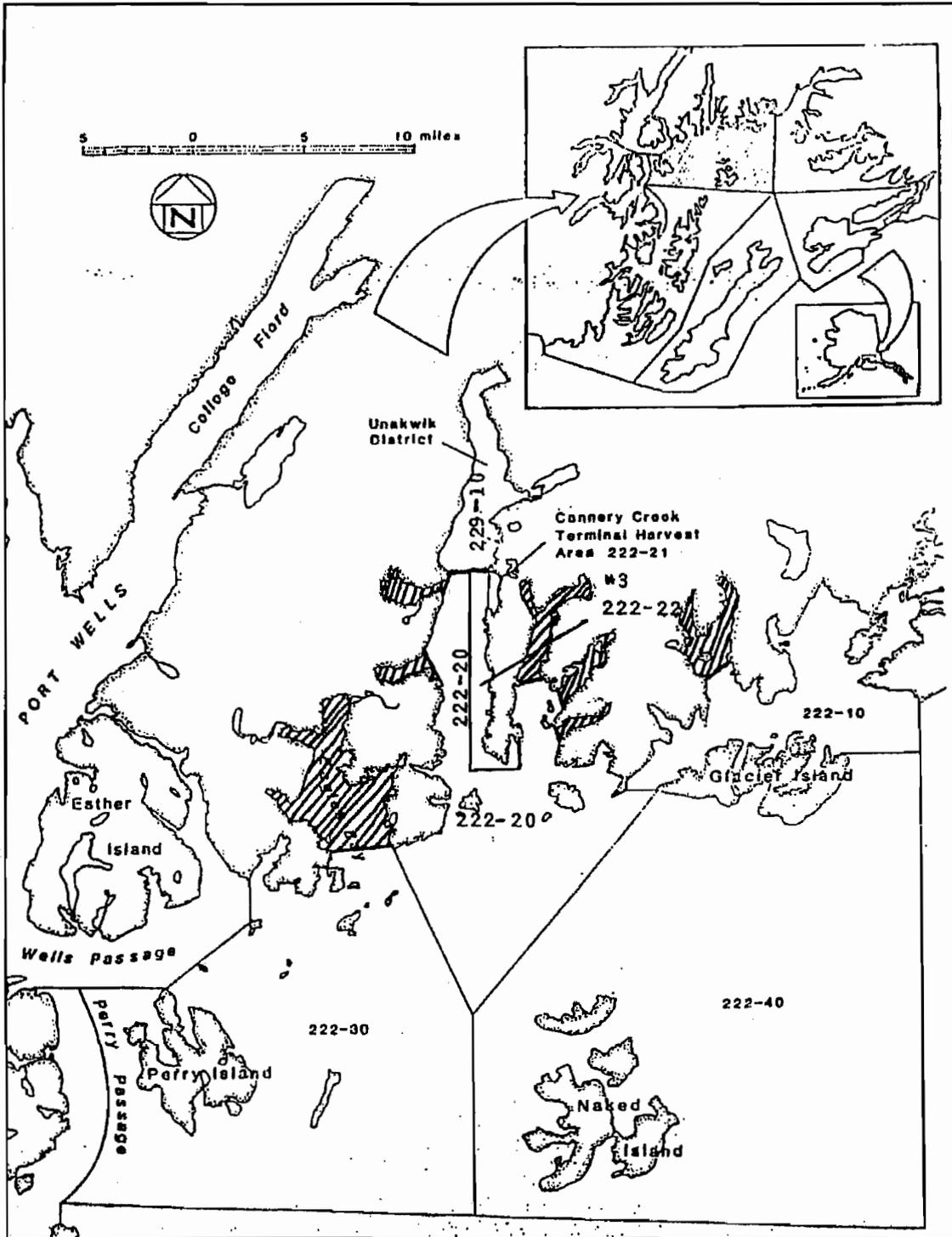
In addition, this spotter would spend one full day per week ascertaining the overall condition of the fishery in Prince William Sound and report subjectively to the Area Biologist trends observed during this flight.

P.W.S. SALMON HARVEST TASK FORCE RECOMMENDATIONS TO ADF&G

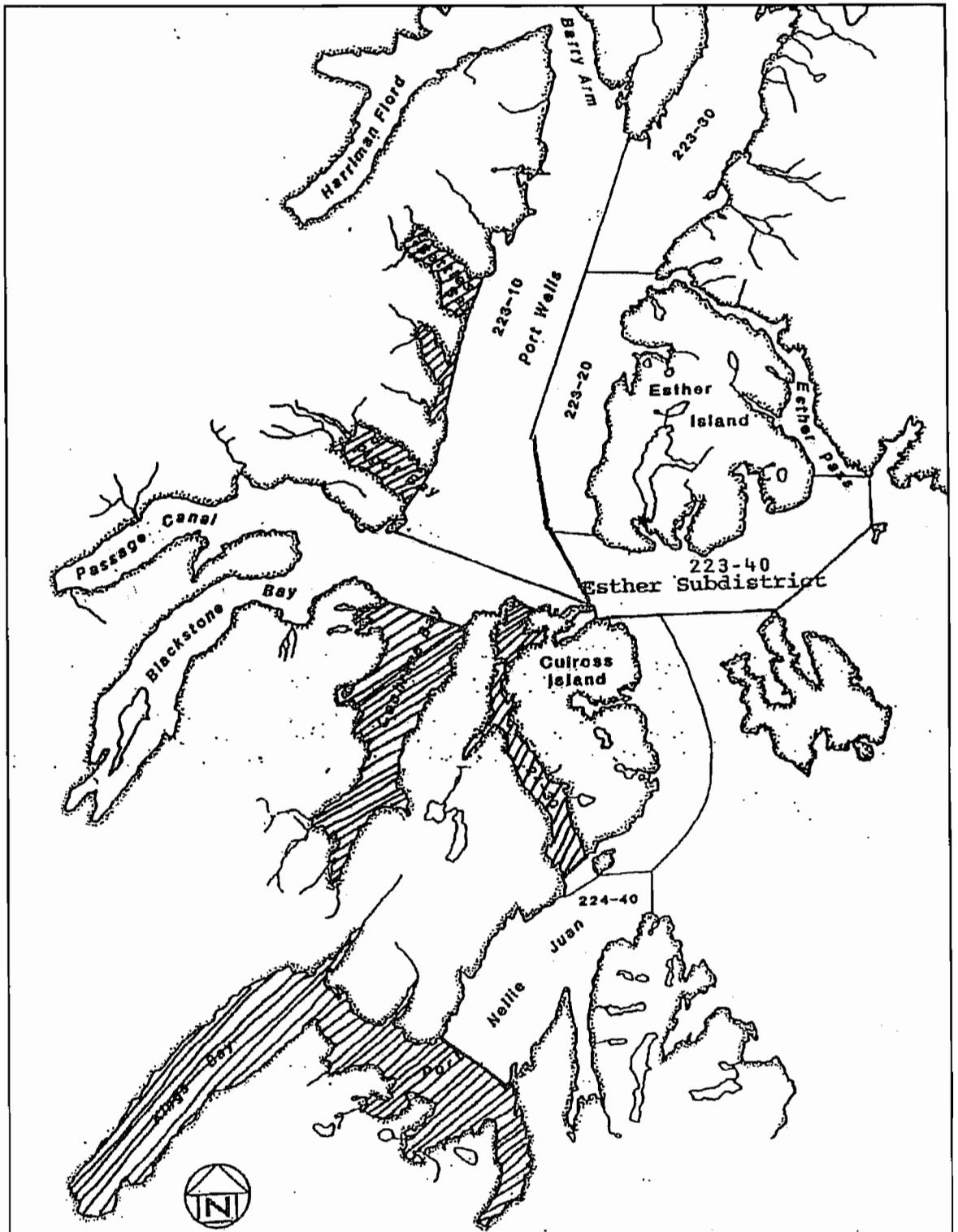
<u>Chris Nerison</u> Chris Nerison, CDFU (Seine Division)	<u>6/13/90</u> Date
<u>Thea Thomas</u> Thea Thomas, CDFU (Gill Net Division)	<u>6/13/90</u> Date
<u>Ross Mullins</u> Floyd Hutchens, PWS Seiners Association	<u>6/13/90</u> Date
<u>Tom Kohler</u> Tom Kohler, PWS Set Net Association	<u> </u> Date
<u>Mike Hiembuck</u> Mike Hiembuck, PWS Alliance	<u>6/13/90</u> Date
<u>Mike Glaser</u> Mike Glaser, PWS Fish and Game Advisory Committee	<u>6/13/90</u> Date
<u>Ray Cesarini</u> Ray Cesarini, SeaHawk Seafoods	<u>6/13/90</u> Date
<u>Jim Poor</u> Jim Poor, Peter Pan Seafoods	<u>6-13-90</u> Date
<u>Larry Cambronero</u> Larry Cambronero, Chugach Fisheries	<u>6/13/90</u> Date
<u>Bill Terhar</u> Bill Terhar, St. Elias Ocean Products	<u>6/13/90</u> Date
<u>Ken Roemhildt</u> Ken Roemhildt, North Pacific Processors	<u>6-13-90</u> Date
<u>John Woodruff</u> John Woodruff, Seward Fisheries	<u>6/16/90</u> Date
<u>Bruce K. Suzumoto</u> Bruce Suzumoto, PWS Aquaculture Corp.	<u>6/13/90</u> Date
<u>Paul McCollum</u> Paul McCollum, Valdez Fisheries Development Assn.	<u>6/13/90</u> Date
<u>Roy Jones</u> Roy Jones, John Cabot Fisheries	<u> </u> Date



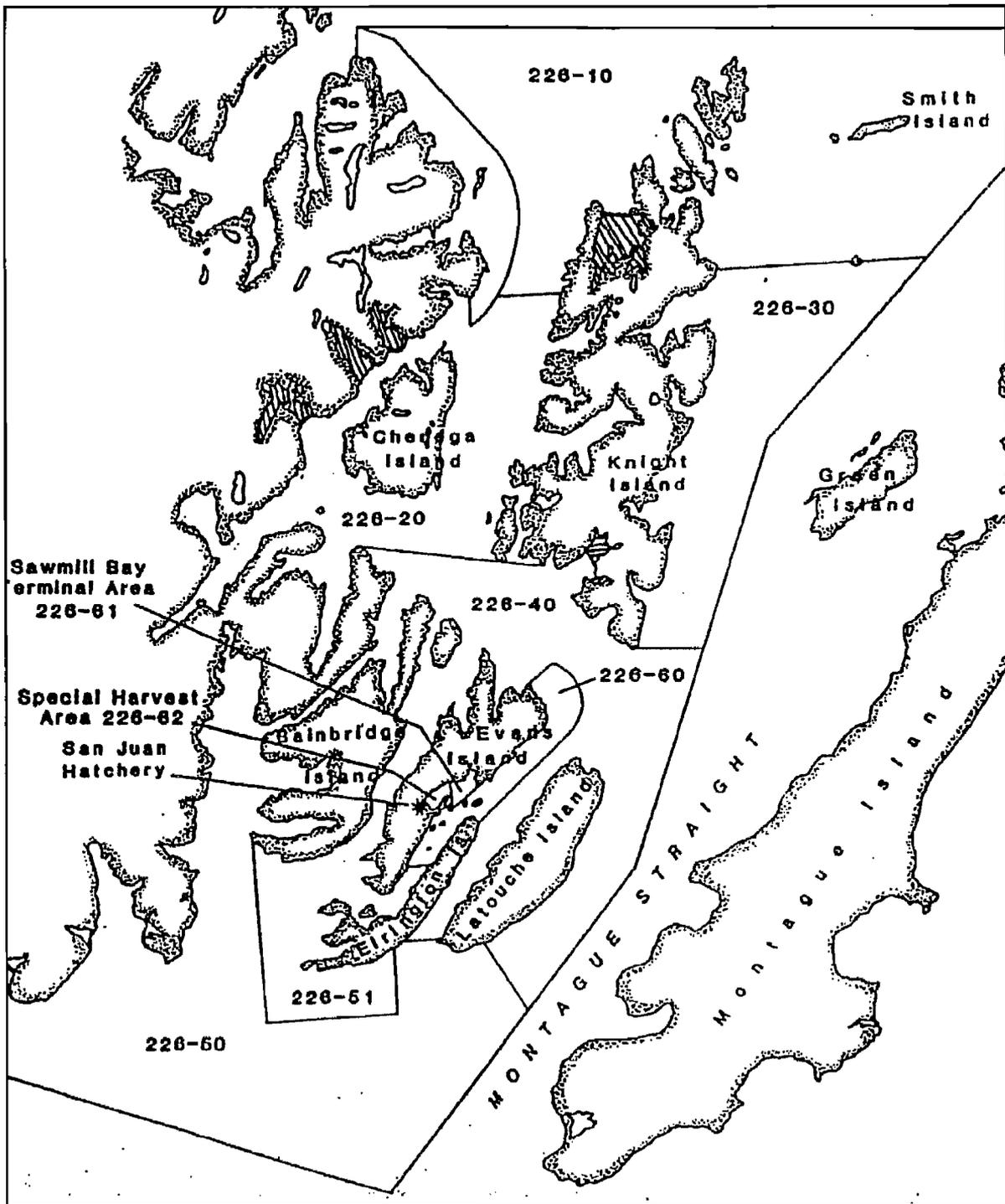
Appendix A.13. Map of areas included in the Prince William Sound Salmon Harvest Task Force enlarged closed waters, 1990.



Appendix A.13. (page 2 of 4)



Appendix A.13. (page 3 of 4)



Appendix A.13. (page 4 of 4)

APPENDIX B

COPPER AND BERING RIVER DISTRICTS

Appendix B.1. Anticipated and actual weekly catch and escapement of sockeye salmon in the Copper River District drift gill net fishery, 1990.

Week Ending Date	Stat. Week	Fishing Time (Hrs.)	Actual Catch	Anticipated Catch ^a	Anticipated Cumulative Escapement ^b	Actual Cumulative Escapement ^c
May 12	19	0	0	4,294	0	0
May 19	20	48	87,355	55,856	2,789	0
May 26	21	36	140,940	119,356	34,675	50,734
June 2	22	60	145,087	117,187	108,526	119,223
June 9	23	24	55,957	81,632	202,007	184,633
June 16	24	48	108,680	71,202	268,916	293,655
June 23	25	48	75,182	55,366	312,146	364,095
June 30	26	60	52,660	36,353	348,500	414,846
July 7	27	60	54,388	32,951	384,644	456,030
July 14	28	60	48,221	29,530	421,890	507,373
July 21	29	60	34,388	27,398	463,554	546,584
July 28	30	60	17,902	14,574	485,463	564,951
Aug 4	31	60	14,340	8,605	493,801	581,859
Aug 11	32	60	5,720	2,460		
Aug 18	33	48	2,621	855		
Aug 25	34	48	815	329		
Sept 1	35	48	451			
Sept 8	36	36	40			
Sept 15	37	48	24			
Sept 22	38	48	5			
Sept 29	39	48	2			
Oct 6	40	48	0			
Oct 13	41	48	0			
Season Total		1,104	844,778	657,948	493,801	581,859

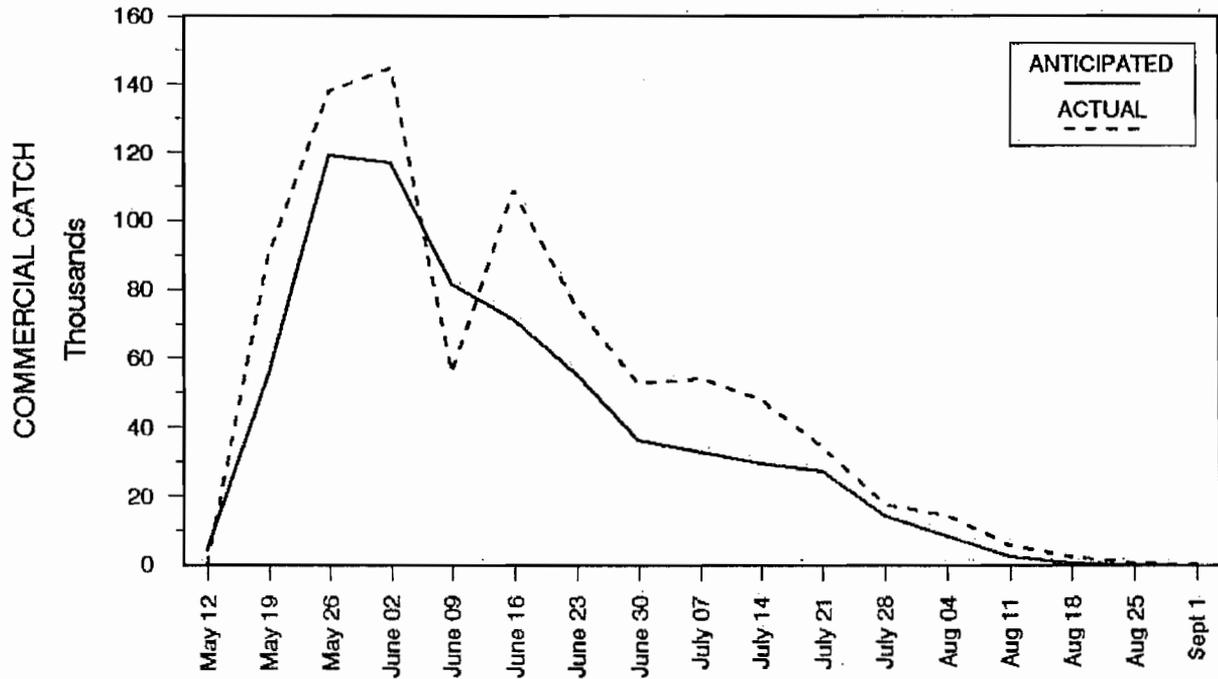
a Based on average historic catches for comparable dates (1969-1989).

b Based on historical escapements at Miles Lake sonar, includes upriver chinook escapement component and sockeye broodstock for the Gulkana hatchery. Does not include sockeye escapements for the Copper/Bering delta streams.

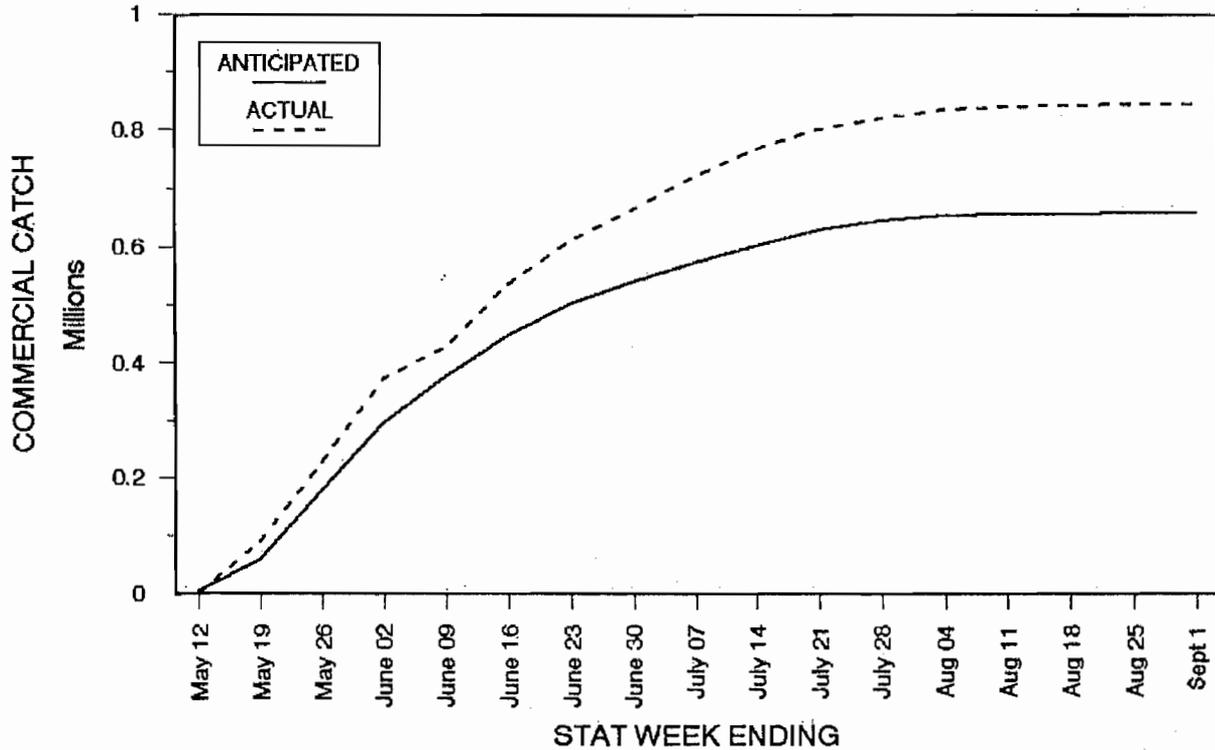
c Escapement estimate from sonar counters at Miles Lake.

COPPER RIVER COMMERCIAL SOCKEYE CATCH

WEEKLY



CUMULATIVE



Appendix B.2. Anticipated and actual weekly and cumulative catches of sockeye salmon in the Copper River District drift gill net fishery, 1990.

Appendix B.3. Commercial salmon harvest by period in the Copper River District drift gill net fishery, 1990.

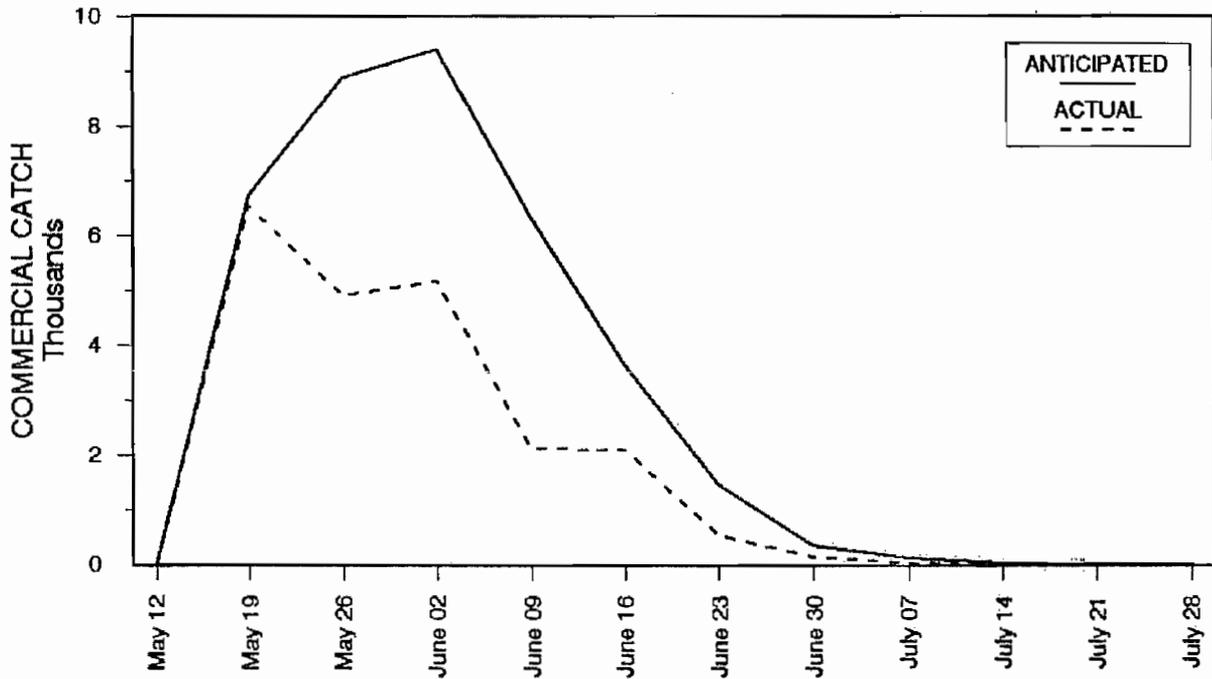
a b	Period	Date	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
						Numbers	Pound	Number	Pound	Number	Pound	Number	Pound	Number	Pound
01	5/14	24	447	547	2,984	78,196	19,646	120,616	2	13	0	0	262	2,330	
02	5/17	24	450	599	3,564	89,828	70,246	426,765	0	0	0	0	1,412	11,822	
03 ^c	5/21	24	465	701	2,899	74,553	81,316	487,792	0	0	0	0	819	7,351	
04	5/25	12	461	506	2,015	51,243	57,087	341,804	0	0	0	0	68	665	
05	5/28	36	498	874	3,068	77,947	97,206	583,377	71	562	0	0	1,444	13,163	
06	5/31	24	489	664	2,112	52,989	47,881	290,993	76	410	1	3	526	5,117	
07	6/04	24	434	619	2,138	57,073	55,957	341,672	69	576	0	0	237	1,996	
08	6/11	24	389	555	1,567	43,555	68,726	419,086	2	17	0	0	401	2,756	
09	6/14	24	281	353	536	14,927	40,159	244,142	4	33	1	4	576	4,430	
10	6/18	24	224	322	371	10,588	36,812	221,082	14	140	4	17	114	924	
11	6/21	24	218	292	188	5,186	38,196	230,379	9	76	1	3	401	3,007	
12	6/25	24	163	220	84	2,477	23,310	141,205	3	23	149	858	63	420	
13	6/28	36	182	275	69	1,823	29,319	180,650	22	165	99	343	221	1,600	
14	7/02	24	169	227	18	488	22,338	140,355	16	119	5	15	46	371	
15	7/05	36	208	339	31	810	32,050	204,695	374	2,727	165	889	104	859	
16	7/09	24	199	228	7	180	18,836	117,442	4	24	4	22	8	76	
17	7/12	36	218	319	19	567	29,385	180,754	91	749	8	26	24	177	
18	7/16	24	244	311	10	221	20,487	129,012	165	1,487	33	116	158	1,148	
19	7/19	36	223	292	7	153	13,901	89,156	536	4,602	124	424	61	516	
20	7/23	24	107	116	0	0	9,837	62,361	277	1,763	148	589	83	445	
21	7/26	36	101	110	0	0	8,065	51,386	400	2,623	63	224	21	100	
22	7/30	24	110	126	1	28	7,270	45,237	1,341	10,334	223	737	24	117	
23	8/02	36	89	105	2	30	7,070	44,804	2,896	23,011	38	119	127	842	
24	8/06	24	94	103	0	0	3,625	22,734	5,449	42,104	148	489	45	153	
25	8/09	36	88	104	2	52	2,095	13,535	9,737	77,351	79	560	15	45	
26	8/13	48	202	410	5	92	2,622	17,909	23,308	198,963	210	802	263	2,188	
27	8/20	48	225	501	2	45	814	5,669	42,416	384,116	28	94	8	42	
28	8/27	48	271	590	3	45	451	3,320	48,532	458,498	28	98	12	100	
29	9/06	36	276	544	0	0	40	265	53,818	514,839	28	83	0	0	
30	9/12	48	168	297	0	0	24	151	26,921	263,608	6	20	0	0	
31	9/19	48	140	214	0	0	5	29	18,160	180,891	3	10	0	0	
32	9/26	48	127	146	0	0	2	12	4,957	52,586	0	0	2	10	
33	10/03	48	58	78	0	0	0	0	7,044	70,540	0	0	0	0	
34	10/10	48	5	5	0	0	0	0	83	848	0	0	0	0	
Total		1,104	514	11,692	21,702	563,096	844,778	5,158,389	246,797	2,293,798	1,596	6,545	7,545	62,770	
Average Weight						25.95		6.11		9.29		4.10		8.32	

a Starting date of period.

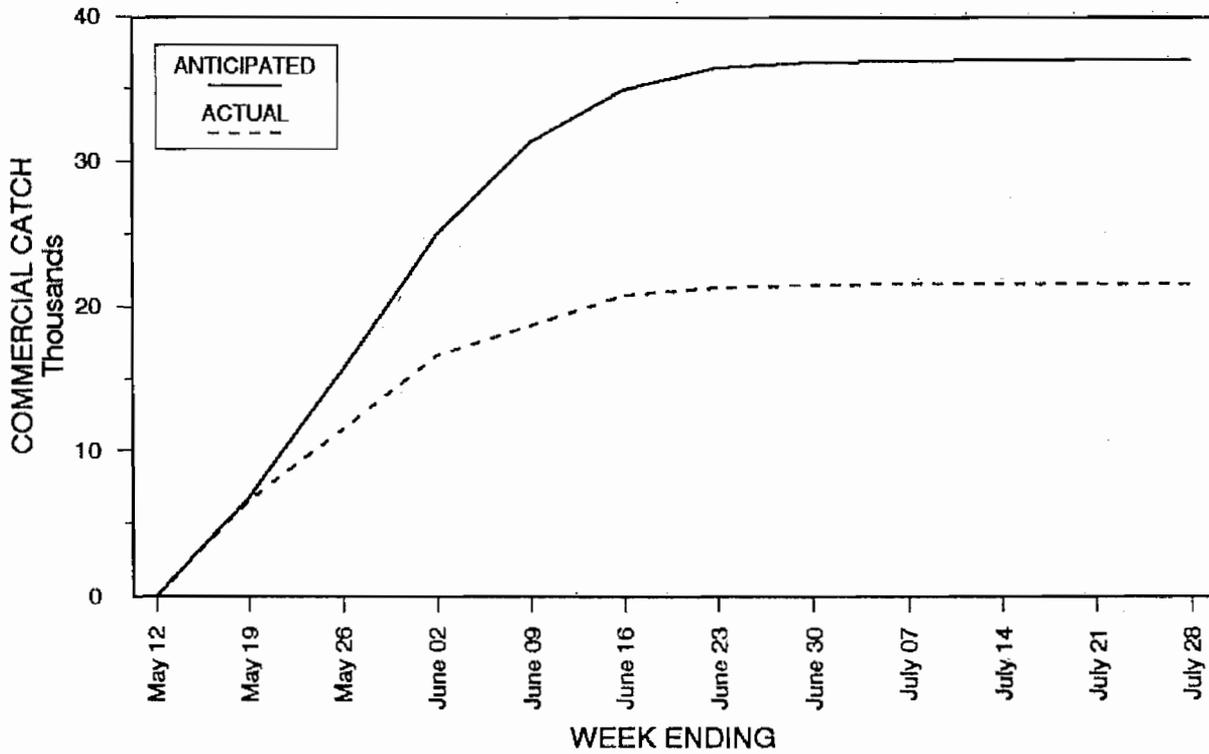
b From 5/15 - 8/09 all Monday openers started at 7:00 AM and Thursday openers started at 7:00 PM. Starting on 8/14, all openers started at 12:00 Noon.

c From 0700 May 21 until 0001 August 01 only mesh size smaller than six inches was allowed.

COPPER RIVER CHINOOK COMMERCIAL CATCH WEEKLY



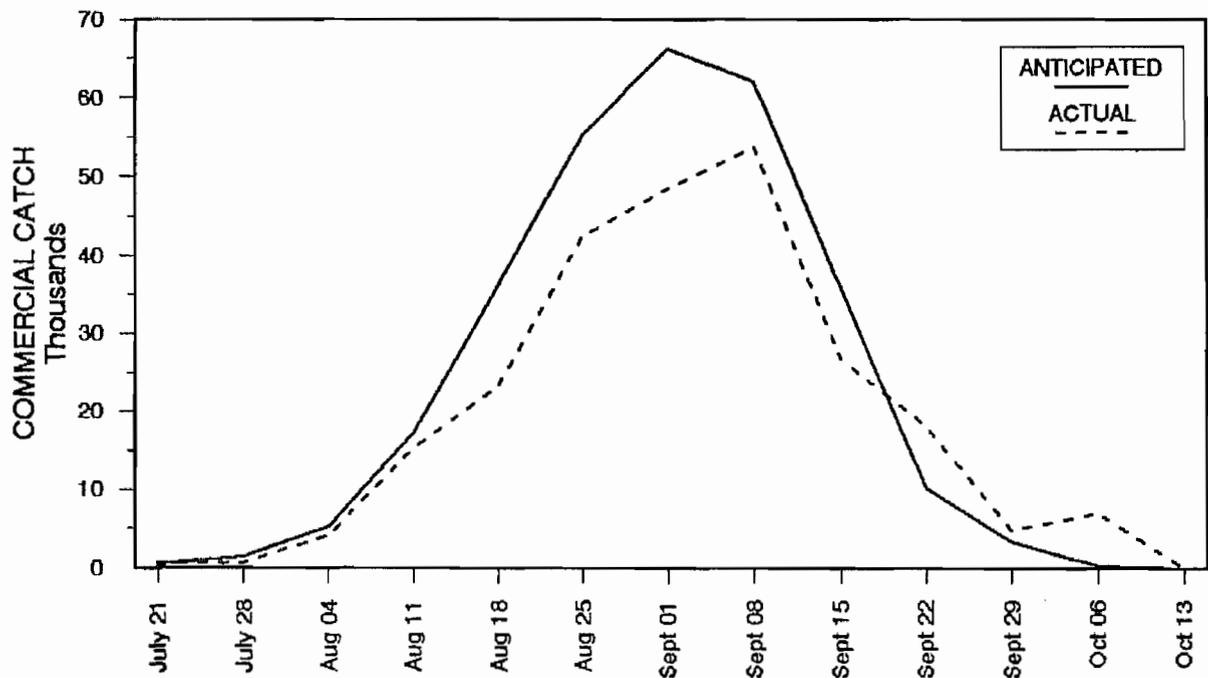
CUMULATIVE



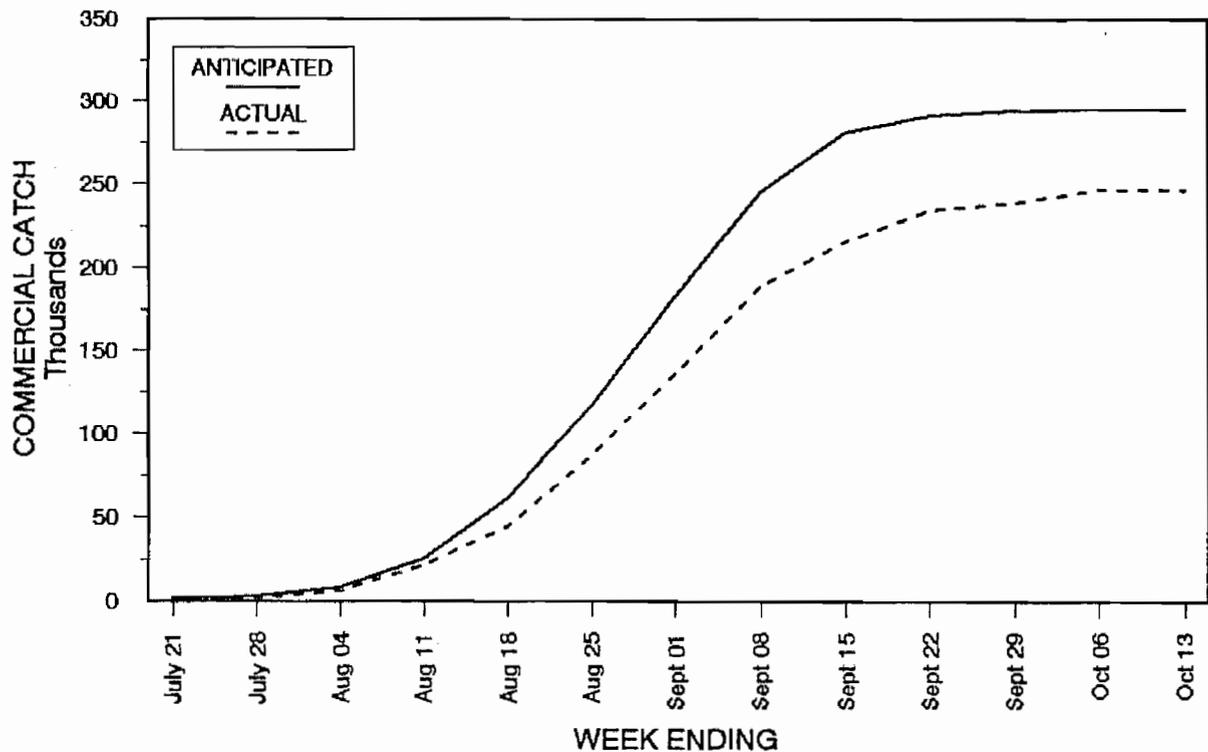
Appendix B.4. Anticipated and actual weekly and cumulative catches of chinook salmon in the Copper River District drift gill net fishery, 1990.

COPPER RIVER COHO COMMERCIAL CATCH

WEEKLY



CUMULATIVE



Appendix B.5. Anticipated and actual weekly and cumulative catches of coho salmon in the Copper River District drift gill net fishery, 1990.

Appendix B.6. Commercial salmon catch by species in the Copper
River District, 1972 - 1990.

Catch by Species						
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	22,349	727,144	103,211	2,304	717	855,725
1973	19,948	332,816	132,272	8,964	10,173	504,173
1974	18,890	607,766	46,625	9,839	664	683,784
1975	19,644	335,384	53,805	236	807	409,876
1976	31,483	865,254	111,900	3,392	178	1,012,207
1977	22,089	619,140	131,356	23,185	335	796,105
1978	29,062	249,872	220,338	3,512	2,233	505,017
1979	17,678	80,528	194,885	1,295	107	294,493
1980	8,454	18,908	225,299	3,966	198	256,825
1981	20,178	477,662	310,154	23,952	1,799	833,745
1982	47,362	1,177,632	454,763	7,154	1,177	1,688,088
1983	50,022	633,010	234,243	7,345	2,217	926,837
1984	38,955	899,776	382,432	32,194	6,935	1,360,292
1985	42,333	931,132	587,990	19,061	5,966	1,586,482
1986	40,670	780,808	295,980	3,016	17,614	1,138,088
1987	41,001	1,180,782	111,599	31,635	14,796	1,379,813
1988	30,741	576,950	315,568	2,775	11,022	937,056
1989	30,863	1,025,923	194,454	25,877	5,845	1,282,962
1990	21,702	844,778	246,797	1,596	7,545	1,122,418
Ten Year						
Average (1980-89)	35,058	770,258	311,248	15,698	6,757	1,139,019

Appendix B.7. Daily sockeye salmon escapement estimates at the Miles Lake sonar, 1990.

Date	Water Level ^a	Estimate				Escapement Objective		0700	Anticipated Daily
		North Bank	South Bank	Daily	Cumulative	Daily	Cumulative		
21-May	133.84		1,121	1,121	1,121	3,101	8,394		
22-May	134.26	809	4,034	4,843	5,964	3,468	11,862		
23-May	133.90	1,050	6,127	7,177	13,141	4,216	16,078	2,976	10,203
24-May	133.30	773	11,150	11,923	25,064	5,468	21,546	3,258	11,150
25-May	132.82	524	13,809	14,333	39,397	5,892	27,438	3,967	13,601
26-May	132.82	1,630	9,707	11,337	50,734	7,237	34,675	3,307	11,338
27-May	133.15	1,378	10,682	12,060	62,794	9,078	43,753	2,827	9,693
28-May	133.77	1,325	6,109	7,434	70,228	11,220	54,973	3,055	10,474
29-May	134.50	1,250	7,926	9,176	79,404	9,508	64,481	2,927	10,035
30-May	136.06	1,184	8,357	9,541	88,945	9,910	74,391	2,595	8,897
31-May	136.88	1,324	9,019	10,343	99,288	10,551	84,942	3,112	10,670
01-Jun	137.53	406	9,620	10,026	109,314	10,901	95,843	2,779	9,528
02-Jun	137.90	436	9,473	9,909	119,223	12,683	108,526	2,483	8,513
03-Jun	138.40	383	8,193	8,576	127,799	12,343	120,869	2,636	9,038
04-Jun	138.65	685	6,887	7,572	135,371	13,402	134,271	2,529	8,671
05-Jun	139.28	1,086	9,087	10,173	145,544	14,683	148,954	2,594	8,894
06-Jun	140.00	907	9,503	10,410	155,954	13,175	162,129	2,381	8,163
07-Jun	140.46	1,336	9,801	11,137	167,091	12,501	174,630	2,823	9,679
08-Jun	141.01	1,076	6,561	7,637	174,728	13,934	188,564	1,777	6,093
09-Jun	140.96	1,350	8,555	9,905	184,633	13,443	202,007	2,556	8,763
10-Jun	140.59	916	10,744	11,660	196,293	12,241	214,248	2,332	7,995
11-Jun	139.85	1,242	14,939	16,181	212,474	11,276	225,524	4,748	16,279
12-Jun	139.33	1,839	22,090	23,929	236,403	9,807	235,331	4,936	16,923
13-Jun	139.25	1,533	22,915	24,448	260,851	8,482	243,813	6,383	21,885
14-Jun	139.80	751	13,551	14,302	275,153	8,362	252,175	5,131	17,592
15-Jun	139.97	593	7,797	8,390	283,543	8,583	260,758	2,405	8,246
16-Jun	139.69	1,129	8,983	10,112	293,655	8,158	268,916	1,975	6,771
17-Jun	139.50	655	12,040	12,695	306,350	8,043	276,959	2,893	9,919
18-Jun	139.07	695	7,357	8,052	314,402	6,643	283,602	2,217	7,601
19-Jun	138.30	994	8,769	9,763	324,165	5,603	289,205	2,158	7,399
20-Jun	137.88	1,232	8,083	9,315	333,480	5,601	294,806	2,382	8,167
21-Jun	137.50	971	9,321	10,292	343,772	5,279	300,085	3,114	10,677
22-Jun	137.53	602	9,555	10,157	353,929	5,713	305,798	2,541	8,712
23-Jun	137.55	648	9,518	10,166	364,095	6,348	312,146	2,946	10,101
24-Jun	137.84	438	8,902	9,340	373,435	6,109	318,255	2,676	9,175
25-Jun	137.85	282	9,728	10,010	383,445	5,598	323,853	2,601	8,918
26-Jun	138.08	486	6,326	6,812	390,257	5,113	328,966	2,344	8,037
27-Jun	138.81	492	8,742	9,234	399,491	4,896	333,862	2,559	8,774
28-Jun	139.73	528	6,353	6,881	406,372	4,592	338,454	1,991	6,826
29-Jun	140.93	475	4,024	4,499	410,871	4,801	343,255	1,469	5,037
30-Jun	141.95	401	3,574	3,975	414,846	5,245	348,500	700	2,400
01-Jul	142.67 ^b	365	3,958	4,323	419,169	4,995	353,495	860	2,949
02-Jul	143.63	244	4,823	5,067	424,236	5,089	358,584	1,231	4,221
03-Jul	143.57	240	4,442	4,682	428,918	5,458	364,042	1,494	5,122
04-Jul	143.40	286	5,379	5,665	434,583	5,893	369,935	1,319	4,522
05-Jul	143.39	450	7,548	7,998	442,581	5,097	375,032	2,319	7,951

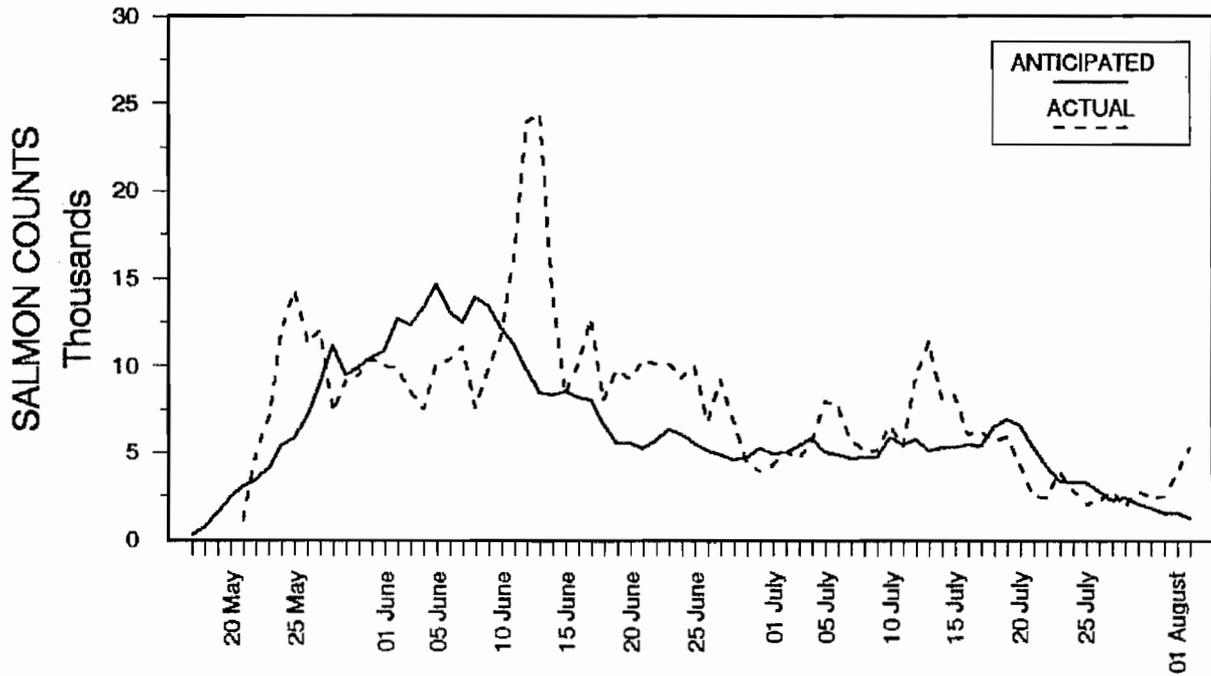
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Date	Water Level ^a	Estimate				Escapement Objective		0700	Anticipated Daily
		North Bank	South Bank	Daily	Cumulative	Daily	Cumulative		
06-Jul ^b	143.52	435	7,314	7,749	450,330	4,916	379,032	2,362	8,098
07-Jul	143.85	322	5,378	5,700	456,030	4,696	384,644	1,931	6,621
08-Jul	143.54	312	4,880	5,192	461,222	4,757	389,401	1,142	3,915
09-Jul	142.74	307	4,846	5,153	466,375	4,798	394,199	1,095	3,754
10-Jul	141.54	272	6,348	6,620	472,995	5,951	400,150	1,520	5,211
11-Jul	140.45	648	4,754	5,402	478,397	5,486	405,636	1,258	4,313
12-Jul	139.70	520	8,818	9,338	487,735	5,770	411,406	2,319	7,951
13-Jul	139.48	878	10,554	11,432	499,167	5,142	416,548	2,758	9,456
14-Jul	139.18	553	7,653	8,206	507,373	5,342	421,890	2,394	8,208
15-Jul	139.00	323	7,986	8,309	515,682	5,322	427,212	1,822	6,247
16-Jul	138.73	1,066	5,027	6,093	521,775	5,517	432,729	1,856	6,363
17-Jul	138.20	575	5,684	6,259	528,034	5,452	438,181	1,611	5,523
18-Jul	139.43	585	5,141	5,726	533,760	6,513	444,694	1,350	4,629
19-Jul	140.35	609	5,366	5,975	539,735	6,948	451,642	1,502	5,150
20-Jul	141.27	374	3,941	4,315	544,050	6,591	458,233	891	3,055
21-Jul	142.00	236	2,298	2,534	546,584	5,321	463,554	1,101	3,775
22-Jul	142.94	106	2,351	2,457	549,041	4,239	467,793	534	1,831
23-Jul	143.10	328	3,573	3,901	552,942	3,422	471,215	1,430	4,903
24-Jul	143.43	300	2,583	2,883	555,825	3,351	474,566	558	1,913
25-Jul	143.80	293	1,757	2,050	557,875	3,321	477,887	743	2,547
26-Jul	143.55	132	2,125	2,257	560,132	2,812	480,699	694	2,379
27-Jul	141.90	384	2,501	2,885	563,017	2,319	483,018	680	2,331
28-Jul	140.75		1,934	1,934	564,951	2,445	485,463	448	1,536
29-Jul	141.56		2,808	2,808	567,759	2,104	487,567	725	2,486
30-Jul	142.60		2,462	2,462	570,221	1,840	489,407	469	1,608
31-Jul	142.75		2,550	2,550	572,771	1,568	490,975	557	1,910
01-Aug	141.93		3,839	3,839	576,610	1,562	492,537	570	1,954
02-Aug	140.58		5,249	5,249	581,859	1,264	493,801	1,531	5,249
Total		46,957	534,902	581,859					

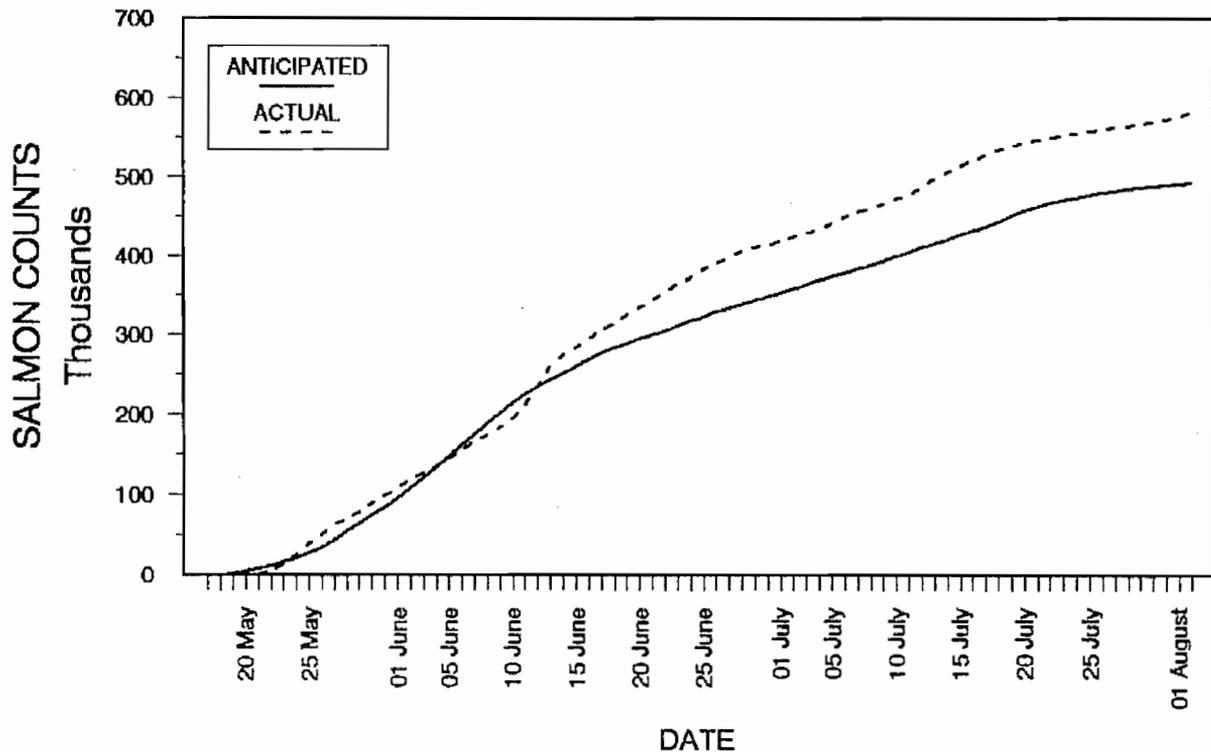
^a Feet above mean sea level.^b Water gauge off 6 inches when checked on July 1.

1990 MILES LAKE SONAR COUNTS

DAILY



CUMULATIVE



Appendix B.8. Anticipated and actual daily and cumulative sockeye salmon escapement estimates at Miles Lake sonar, 1990.

Appendix B.9. Aerial escapement indices by date and location for sockeye salmon returning to the Copper River delta, 1990.

Copper River delta* System and Drainage Survey System		Aerial Escapement Indices by Survey Date							
		20 May	05 June	08 June	12 June	22 June	24 June	26 June	03 July
Eyak River	Eyak River	75	0	0	0	NS	200	0	NS
	West Shore Beaches	0	0	20	152	NS	80	180	65
	Middle Arm Beaches ^b	20	20	80	90	NS	270 *	140	265
	North Shore Beaches	0	0	0	0	NS	0	50	20
	Hatchery Creek Delta	0	6	0	80	NS	400	500	13
	Hatchery Creek	NS	0	0	0	NS	80	120	75
	Power Creek Delta	NS	0	NS	NS	NS	0	NS	0
	Power Creek	NS	NS	NS	NS	NS	NS	NS	0
Ibek Creek	Ibek Creek	NS	NS	NS	NS	NS	NS	NS	0
Alganik Slough	Alganik Slough	NS	NS	NS	NS	0	NS	0	NS
	McKinley Lake	NS	0	NS	0	0	NS	0	2,450
	Salmon Creek West Fork	NS	0	0	0	0	NS	0	600
	Salmon Creek East Fork	NS	0	0	0	0	NS	0	30
26/27 Mile Creek	26/27 Mile Creek	0	0	0	0	600	NS	75 +	1,400
39 Mile Creek	39 Mile Creek	NS	0	0	0	0	NS	0	1,070
Goat Mountain Creek	Goat Mountain Creek	NS	NS	NS	NS	NS	NS	NS	0
Pleasant Creek	Pleasant Creek	NS	0	0	0	560 +	NS	1,350	3,190
Martin River	Martin River - Lower	0	1,140	1,140	560	575	NS	1,875	1,540
	Ragged Point River	NS	NS	NS	0	0	NS	0	1,000
	Ragged Point Lake Outlet	NS	NS	NS	0	0	NS	0	0
	Ragged Point Lake	NS	NS	NS	0	0	NS	0	0
	Martin River - Upper	NS	0	200	1,400	600	NS	1,800	1,900
	Martin Lake Outlet ^b	NS	0	0	1,200	1,700	NS	5,100	* 1,000
	Martin Lake ^b	NS	NS	0	1,900	3,100	NS	6,400 ^c	* 6,800
	Martin Lake Feeders	NS	NS	NS	0	1	NS	130	* 600
	Pothole River	NS	NS	NS	0	0	NS	0	155
	Pothole Lake Outlet	NS	NS	NS	0	0	NS	0	0
	Pothole Lake	NS	NS	NS	0	0	NS	0	1,200
	Little Martin Lake Outlet	NS	NS	0	0	120	NS	0	0
	Little Martin Lake	NS	NS	NS	0	0	NS	510	1,120
	Tokun Springs	NS	NS	0	100	0	NS	0	0
	Tokun River	NS	NS	0	90	140	NS	680	950
Tokun Lake Outlet	NS	NS	0	0	330	NS	300	640	
Tokun Lake	NS	NS	0	0	230	NS	200	1,300	
Martin River Slough	Martin River Slough	NS	0	0	310	7,300	NS	13,900	* 9,960
Copper River Aerial Survey Daily Total		95	1,166	1,440	5,882	15,256	1,030	33,310	37,343

-Continued-

Aerial Escapement Indices by Survey Date

Copper River delta ^a System and Drainage Survey System		14 July	19 July	01 Aug	16 Aug	24 Aug	29 Aug	08 Sept	25 Sept
Eyak River	Eyak River	NS	NS	NS	NS	NS	NS	NS	NS
	West Shore Beaches	900	1,550	3,400 *	600	1,800	2,500	1,700	NS
	Middle Arm Beaches ^b	1,000	2,100	1,800	2,100	4,000	4,300 *	3,200	NS
	North Shore Beaches	0	0	20	280	300	215	1,100 *	NS
	Hatchery Creek Delta	300	40	450	120	900	1,900	1,700 *	NS
	Hatchery Creek	900+*	350+	140 +	55	300	300	500 *	NS
	Power Creek Delta	75 *	NS	NS	NS	0	NS	NS	NS
	Power Creek	0 *	NS	NS	NS	0	NS	NS	NS
Ibek Creek	Ibek Creek	NS	NS	NS	NS	160 *	90	80	0
Alganik Slough	Alganik Slough	NS	NS	NS	NS	0 *	0	0	NS
	McKinley Lake	350	3,150 +	510	303	1,400 *	1,700	1,400	120
	Salmon Creek West Fork	0	200	1,700 +	1,600	1,600 *	1,000	1,400	0
	Salmon Creek East Fork	0	0	210	30	400 *	0	0	0
26/27 Mile Creek	26/27 Mile Creek	2,620	3,360 *	2,170	400	1,400	550	470	80
39 Mile Creek	39 Mile Creek	1,700	3,200	4,800	2,670	5,000 *	3,600	2,660	200
Goat Mountain Creek	Goat Mountain Creek	0	350	NC	NC	420 *	0	0	0
Pleasant Creek	Pleasant Creek	2,160	500	0	0	0	0	0	NC
Martin River	Martin River - Lower	200	460	NC	0	0	0	0	NS
	Ragged Point River	850	4,000	4,000 *	1,200	1,000	1,400	140	0
	Ragged Point Lake Outlet	0	0	1,100 *	300	1,800	800	0	300
	Ragged Point Lake	0	0	3,850 *	2,400	3,600	3,800	5,400	2,800
	Martin River - Upper	300	2,400	NC	30	200	400	800	NC
	Martin Lake Outlet ^b	0 +	2,000	NC	420	0	75	100	NC
	Martin Lake ^b	2,500 +	1,275	80 +	50	200	40	130	200
	Martin Lake Feeders	2,200 +	4,300	2,650	1	0	0	NC	0
	Pothole River	100	600	100 +	0	60 +	90 *	100	0
	Pothole Lake Outlet	0 +	400 +	NC	0	0	400 *	300	0
	Pothole Lake	0 +	500 +	NC	100 +	700 +	1,700 *	1,500	600
	Little Martin Lake Outlet	0	0	0	0	30	50	100 *	
	Little Martin Lake	1,470	1,300	1,700	620	2,650	2,180	5,600	*1,100
	Tokun Springs	0	100 *	60	0	80	0	0	0
	Tokun River	560	900	1,000	130	1,050	720 *	700	0
	Tokun Lake Outlet	NC	0	100	110	0	0 *	0	0
	Tokun Lake	NC	2,800	1,100	445 +	2,600	3,380 *	2,600	1,400
Martin River Slough	Martin River Slough	NS	6,300	3,110	155	13	40	0	0
Copper River Aerial Survey Daily Total		18,185	42,135	34,050	14,119	31,663	31,230	31,680	6,800

-Continued-

Copper River delta ^a System and Drainage Survey System		Aerial Escapement Indices by Survey Date			Estimated Escapement	
		03 Oct	16 Oct	30 Oct	Site ^d	System ^e
Eyak River	Eyak River	NS	NS	NS	0	12,375
	West Shore Beaches	0	0	0	3,400	
	Middle Arm Beaches ^b	100	0	0	4,570	
	North Shore Beaches	215	340	0	1,100	
	Hatchery Creek Delta	0	0	0	1,700	
	Hatchery Creek	150	110	0	1,400	
	Power Creek Delta	0	0	0	75	
	Power Creek	75	130 *	0	130	
Ibek Creek	Ibek Creek	0	0	0	160	160
Alganik Slough	Alganik Slough	NC	0	0	0	3,400
	McKinley Lake	100	50	0	1,400	
	Salmon Creek West Fork	0	0	0	1,600	
	Salmon Creek East Fork	0	0	0	400	
26/27 Mile Creek	26/27 Mile Creek	0	0	0	3,360	3,360
39 Mile Creek	39 Mile Creek	75	0	20	5,000	5,000
Goat Mountain Creek	Goat Mountain Creek	0	0	0	420	420
Pleasant Creek	Pleasant Creek	0	NS	NS	3,190	3,190
Martin River	Martin River - Lower	0	NC	0	0	0
	Ragged Point River	0	0	0	4,000	8,950
	Ragged Point Lake Outlet	0	0	0	1,100	
	Ragged Point Lake	1,500	300	10	3,850	
	Martin River - Upper	350 *	200	0	350	350
	Martin Lake Outlet ^b	10 *	0	0	5,110	11,250
	Martin Lake ^b	1,800 *	380	500	6,010	
	Martin Lake Feeders	0	0	0	130	
	Pothole River	0	0	0	90	2,190
	Pothole Lake Outlet	0	0	0	400	
	Pothole Lake	700	850	1,100	1,700	
	Little Martin Lake Outlet	0	0	0	100	5,700
	Little Martin Lake	800	100	NC	5,600	
Tokun Springs	0	0	0	100	4,200	
Tokun River	0	0	0	720		
Tokun Lake Outlet	50	0	0	0		
Tokun Lake	900	450	100	3,380		
Martin River Slough	Martin River Slough	0	0	0	13,900	13,900
Copper River Aerial Survey Daily Total		6,825	2,910	1,730		74,445

-Continued-

- a The survey sites represent most of the known sockeye salmon spawning locations in the Copper River Delta drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and the relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but they have been for the purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meanings: NS= no survey, NC= surveyed but no count due to poor conditions. The + sign after some counts indicate that the count is the minimum estimate of seen in less than ideal conditions. The * symbol indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote b).
- b The sites typically have very protracted run timing or two temporally segregated spawning populations at the same site. Aerial counts from more than one day may be restricted and used in the escapement estimate if the surveyor indicates that these counts represented different fish.
- c The Pothole Lake system escapement of 2,190 sockeye was subtracted from the peak Martin Lake estimate.
- d The escapement estimates for each site is in the restricted survey estimate. Where the survey site is a terminal spawning area the peak count is used however, if the site is a schooling area for migratory fish bound for sites further upstream the count which minimizes possible duplication counts across dates selected.
- e The sum of the estimates by site within a system.

Appendix B.10. Copper River and Bering River area sockeye salmon escapement estimates, 1981 - 1990. a

Stream/Lake b	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990		
Eyak Lake	11,300	11,700	8,900	11,690	11,025	2,960	7,420	6,775	4,110	10,245		
Hatchery Creek	4,750	1,800	2,000	3,700	850	650	1,975	1,225	1,150	900		
Power Creek	1,100	300	200	500	muddy	0	0	350	0	130		
Ibek Creek	0	0	0	0	25	0	0	0	120	160		
McKinley Lake	10,000	9,500	12,000	15,000	19,000	12,000	10,300	9,700	6,300	1,400		
Salmon Creek	10,800	13,500	8,500	11,000	8,000	900	2	100	630	2,000		
26/27 Mile Creek	9,500	5,500	8,000	7,500	6,500	2,030	4,100	2,105	3,020	3,360		
39 Mile Creek	11,000	13,000	13,000	17,000	27,000	9,500	6,100	3,620	7,420	5,000		
Goat Mountain	muddy	3,000	100	1,500	150	600	1,000	220	3,150	420		
Pleasant Creek	muddy	NS	muddy	NS	muddy	7,400	2,500	1,000	1	460	990	3,190
Martin River	5,350	1,000	3,650	5,000	0	2,875	1,480	0	0	350		
Ragged Pt. R./Lake	9,500	13,500	10,000	8,950	18,500	3,900	4,100	2,060	4,420	8,950		
Martin Lake	41,050	14,820	17,600	35,350	20,500	11,200	6,010	6,440	7,850	11,250		
Pothole Lake	8,000	1,230	6,500	6,000	1,500	2,200	910	2,785	1,550	2,190		
L. Martin Lake	2,500	6,020	6,400	10,500	11,000	1,500	3,320	2,200	3,030	5,700		
Tokon Lake/River c	1,700	450	500	27,553	11,393	16,000	8,080	12,160	4,950	4,200		
Martin River Slough	15,000	9,500	11,000	14,500	8,100	7,980	5,900	3,115	3,010	13,900		
Copper Delta Total	141,550	104,820	108,350	183,143	146,043	75,295	60,698	53,315	51,700	73,345		
Upper Copper R. d	535,263	467,306	545,724	536,806	436,313	509,275	483,478	488,398	607,869	581,859		
Copper R. Dist. Tot	676,813	572,126	654,074	719,949	582,356	584,570	544,176	541,713	659,569	655,204		
Bering River/Lake				29,000	15,700	13,200	19,200	11,450	14,330	16,325		
Shepherd Creek				14,500	8,000	3,600	4,100	950	340	1,260		
Clear Creek				3,500	100	1,350	2,000	100	250	700		
Kushtaka Lake				1,500	500	825	1,225	480	1,530	256		
Katalla River								350	6,850	1,200		
Bering R. Area Tot.				48,500	24,300	18,975	26,525	13,330	23,300	19,741		
Copper/Bering Total				768,449	606,656	603,545	570,701	555,043	682,869	674,945		

- a The escapement figures in this table are based on peak aerial survey estimates, sonar and weir counts from a majority of the known salmon spawning areas in the Copper and Bering River delta. These indices are not intended to provide a true estimate of total escapement for the coastal stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimate across years, however in years prior to 1984, different methodology was used and discrepancies may be found when cross referenced to the primary data.
- b The areas in this table represent combined survey sites corresponding to the "system" designations for the current year survey results presented elsewhere in this report.
- c Weir counts at Tokon Lake included in estimates for 1983, 1984 and 1985.
- d Upriver escapement estimate from Miles Lake sonar counts.

Appendix B.11. Aerial escapement indices by date and location for coho salmon returning to the Copper River delta, 1990.

Copper River delta* System and Drainage		Aerial Escapement Indices by Survey Date							
		16 Aug	24 Aug	29 Aug	08 Sept	25 Sept	03 Oct	16 Oct	30 Oct
Eyak River	Eyak River	NS	NS	NS	NS	NS	NS	NS	NS
	West Shore Beaches	0	0	1,158	4,100	165+	3,890+	3,975 *	810
	Middle Arm Beaches	0	0	0	0	NS	800	600	220
	North Shore Beaches	0	0	0	0	NS	460	1,000 *	250
	Hatchery Creek Delta	0	0	0	0	NS	500	900 *	1,410
	Hatchery Creek	0	0	0	0	NS	350	1,040 *	290
	Power Creek Delta	NS	NS	0	NS	NS	500	500 *	800
	Power Creek	NS	NS	0	NS	NS	160	150 *	720
Ibek Creek	Ibek Creek	NS	450	860	1,780	520+	3,280+	3,950 *	1,750
Scott River	Scott River	NS	0	0	0	200	NS	280	610*
	Elsner River	NS	0	0	0	NS	80	0	45*
	Scott Lake	NS	0	120	0	180	300	225	450*
Alganik Slough	Alganik Slough	NS	NS	NC	NC	NS	NC	NS	200*
	18/20 Mile Creek	NS	3	36	400	430+	430+*	300	320
	McKinley Lake	0	0	0	0	310+	375+*	350	100
	Salmon Creek West Fork	0	0	200	200	140+	170+*	200	100
	Salmon Creek East Fork	0	0	600	560	400	600+	1,510	1,800*
26/27 Mile Creek	26/27 Mile Creek	0	0	2	140	323+	180+	NS	860*
39 Mile Creek	39 Mile Creek	0	100	530	1,520	900+	2,230+*	2,200	1,100
Goat Mountain Creek	Goat Mountain Creek	NS	210	120	410	1,050	1,340 *	650	600
Pleasant Creek	Pleasant Creek	0	0	1 *	0	NC	0	NS	NS
Martin River	Martin River- Lower	0	150	260	2,500	NS	730+	NC	NS
	Ragged Point River	0	3	130	80	300	230	200	720*
	Ragged Point Lake Outlet	0	0	0	0	0	0	0	0
	Ragged Point Lake	0	0	0	0	100 *	0	0	0
	Martin River- Upper	0	135	1,700	1,800	NC	1,750+	1,800	400*
	Martin Lake Outlet	0	0	210	200	NC	50+	0*	0
	Martin Lake	0	0	0	0	280+	NC	100*	0
	Martin Lake Feeders	0	0	0	0	0	40	220*	170
	Pothole River	0	0	0	0	NC	320	510	500*
	Pothole Lake Outlet	0	0	0	0	NC	200+	450	1,550*
	Pothole Lake	0	0	0	0	500+	300+	340	620*
	Little Martin Lake Outlet	0	10	70	1,240	6,200	6,900 *	4,000	2,200
	Little Martin Lake	0	0	0	0	1,700SP	500 *	0	NC
	Tokun Springs	0	0	30	320	785	1,150 *	1,120	425
Tokun River	0	0	0	65	560	480	380	800*	
Tokun Lake Outlet	0	0	0	0	200	200 *	0	0	
Tokun Lake	0	0	0	0	300	100 *	0	0	
Martin River Slough	Martin River Slough	10	400	345	7,700 *	4,370+	4,700	5,970	1,870
Copper River Aerial Survey Daily Totals		10	1,511	6,372	23,015	19,913	33,295	39,753	21,690

-Continued-

Copper River delta ^a System and Drainage	Survey System	Estimated Escapement	
		Site ^b	System ^c
Eyak River	Eyak River	0	8,365
	West Shore Beaches	3,975	
	Middle Arm Beaches	800	
	North Shore Beaches	1,000	
	Hatchery Creek Delta	900	
	Hatchery Creek	1,040	
	Power Creek Delta	500	
	Power Creek	150	
Ibek Creek	Ibek Creek	3,950	3,950
Scott River	Scott River	610	1,105
	Elsner Lake	45	
	Scott Lake	450	
Alganik Slough	Alganik Slough	200	2,975
	18/20 Mile Creek	430	
	McKinley Lake	375	
	Salmon Creek West Fork	170	
	Salmon Creek East Fork	1,800	
26/27 Mile Creek	26/27 Mile Creek	860	860
39 Mile Creek	39 Mile Creek	2,230	2,230
Goat Mountain Creek	Goat Mountain Creek	1,340	1,340
Pleasant Creek	Pleasant Creek	1	1
Martin River	Martin River- Lower	0	0
	Ragged Point River	720	820
	Ragged Point Lake Outlet		
	Ragged Point Lake	100	
	Martin River- Upper	400	400
	Martin Lake Outlet	0	320
	Martin Lake	100	
	Martin Lake Feeders	220	
	Pothole River	500	2,670
	Pothole Lake Outlet	1,550	
	Pothole Lake	620	
	Little Martin Lake Outlet	6,900	7,400
	Little Martin Lake	500	
	Tokun Springs	1,150	2,250
Tokun River	800		
Tokun Lake Outlet	200		
Tokun Lake	100		
Martin River Slough	Martin River Slough	7,700	7,700
Copper River Aerial Survey Daily Totals			42,386

-Continued-

- a The survey sites represent most of the known coho salmon spawning locations in the Copper River Delta drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and the relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but they have been for the purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meanings: NS= no survey, NC= surveyed but no count due to poor conditions. The + sign after some counts indicate that the count is the minimum estimate of seen in less than ideal conditions. The * symbol indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote c).
- b The escapement estimates for each site is in the restricted survey estimate. Where the survey site is a terminal spawning area the peak count is used however, if the site is a schooling area for migratory fish bound for sites further upstream the count which minimizes possible duplication counts across dates selected.
- c The sum of the estimates by site within a system.

Appendix B.12. Copper River delta and Bering River coho salmon escapement estimates, 1981 - 1990.^a

Stream/Lake ^b	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Eyak Lake	2,750	7,000	14,600	6,500	1,400	2,550	2,800	3,250	1,925	5,775
Hatchery Creek	2,500	125	1,000	1,750	7,010	400	850	100	400	1,940
Power Creek	800	1,500	1,000	1,900	1,800	0	4,800	350	0	650
Ibek Creek	10,000	1,100	4,200	9,700	8,500	4,200	3,100	2,400	4,330	3,950
Scott River								1,060	510	1,105
Alganik Slough								1,075	1,000	630
McKinley Lake		500	5,000	500	4,300	1,600	10	170	800	375
Salmon Creek	1,700	4,650	6,500	850	7,000	200	0	1,925	1,990	1,970
26/27 Mile	250	50	0	350	300	60	350	105	810	860
39 Mile	1,900	2,000	6,500	8,000	8,000	5,800	2,800	1,390	2,150	2,230
Goat Mountain	500	50		600	4,000	100	520	1,500	2,500	1,340
Pleasant Cr.		400	350	1,100	1,500	0	250	110	961	1
Martin River	4,000	7,500	3,100	4,000	11,500	4,820	3,060	3,400	470	400
Ragged Pt. River/Lake	1,200	2,550	525	650	1,500	30	3,330	1,080	3,600	820
Martin Lake		9,000	6,100	4,700	9,100	275	70	145	590	320
Pothole Lake				900	8,500	640	70	350	1,300	2,670
Little Martin Lake	6,000	150	1,125	7,000	4,100	275	560	4,500	7,200	7,400
Tokun River/Lake	800	2,400	350	525	1,900	490	495	600	2,870	2,250
Martin River Slough	10,900	1,350	9,700	15,500	26,000	4,350	3,400	4,110	7,960	7,700
Copper Delta Total	43,300	40,325	60,050	64,525	106,410	25,790	26,465	27,620	41,366	42,386
Katalla R.	3,000	11,500	4,800	7,000	14,000	1,800	1,600	560	1,220	2,960
Bering Lake	0	8,000	4,000	2,000	18,000	1,350	900	2,350	1,000	2,040
Dick Creek	0	5,500	7,100	5,500	5,000	350	50	105	570	1,500
Shepard Cr.	600				1,500	10	45	70	70	100
Nichawak R.		5,000	800	1,000	3,500	1,700	250	3,670	2,550	2,900
Gandil R.					4,500				1,410	910
Controller Bay				4,500	34,000	4,210	2,740	4,660	9,000	14,390
Bering Area Total	3,600	30,000	16,700	20,000	80,500	9,420	5,585	11,415	15,835	24,800
Copper/Bering Total	46,900	70,325	76,750	84,525	186,910	35,210	32,050	39,345	57,201	67,186

a The escapement figures in this table are based on peak aerial survey estimates and weir counts from a majority of the known salmon spawning areas in the Copper and Bering River delta. These indices are not intended to provide a true estimate of total escapement for the coastal stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimate across years, however counts were obtained only as environmental conditions allow and may not necessarily correspond to periods of peak abundance. Missing counts are generally a result of bad weather, high water, turbulence or other factors that prevented surveys for that given year.

b The areas in this table represent combined survey sites corresponding to the "system" designations for the current year survey results presented elsewhere in this report.

Appendix B.13. Aerial survey indices of sockeye salmon escapement to the Upper Copper River drainage, 1980 to 1990.^a

Location	Yearly Survey Indices											10 Year Average 1980-89
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	
Fish Lake	3,175	8,800	22,560	5,500	10,950	3,750	8,750	9,530	6,800	6,700	3,600	8,652
Bad Crossing #1&2	75	15,000	4,550	2,000	760	1,125	5,300	2,575	2,075	3,025	6,050	3,649
Suslota Lake	1,700	300	1,800	5,600	700	2,200	1,300	970	550	525	750	1,565
Dickey Lake	250	20	410	135	105	290	43	360	57	28	28	170
Keg Creek	2,335	320	495	620	2,505	825	200	400	360	1,450	160	951
Mahlo Creek	1,000	1,800	3,300	2,400	4,300	575	1,750	2,350	3,900	4,600	2,600	2,598
St. Anne Creek	5,000	4,700	8,800	9,700	10,300	1,250	4,600	6,980	6,100	3,100	1,700	6,053
Fish Cr.-Mentasta	900	10,500	1,700	900	900	1,800	1,100	250	650	1,500	1,000	2,020
Swede Lake	400	450	1,400	550	2,400	250	385	113	230	275	120	645
Tana River	2,130	290	1,100	2,485	3,665	1,145	1,825	472	2,034	245	89	1,539
Mentasta Lake	3,200	7,400	3,250	6,800	4,850	3,850	2,850	1,800	4,300	3,270	2,900	4,157
Tanada Lake	4,200	5,300	3,880	4,300	9,100	5,900	3,960	4,950	2,100	2,550	1,650	4,624
Salmon Creek	1,500	250	850	1,550	1,350	575	300	1,150	700	425	350	865
Paxson Inlt-Mud Cr	8,200	2,200	1,150	7,500	15,700	7,500	7,000	4,250	6,350	3,200	2,850	6,305
Mud Creek and Lake	740	810	1,900	470	270	200	70	0	150	0	35	461
Mendeltna Creek	1,125	4,830	400	2,850	1,900	2,300	3,325	2,275	1,550	2,000	3,700	2,256
Paxson Lake Outlet	3,800	1,500	3,800	3,300	4,100	3,600	1,810	5,100	3,200	900	1,350	3,111
Mud Cr.- Summit L.	3,075	3,400	17,400	5,700	9,600	8,150	3,375	9,050	15,400	6,800	2,950	8,195
Long Lake	2,650	1,325	1,700	5,600	1,360	590	1,300	1,225	1,125	1,225	1,950	1,810
Tonsina Lake	650	1,725	1,700	2,850	975	290	350	740	650	2,450	1,450	1,238
Totals	46,105	70,920	82,145	70,810	85,790	46,165	49,593	54,540	58,281	44,268	35,282	60,862

^a The escapement figures in this table are based on peak aerial survey estimates and weir counts from a majority of the known salmon spawning areas in the upper Copper River drainage. These indices are not intended to provide a true estimate of total escapement for these stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimate across years, however counts were obtained only as environmental conditions allow and may not necessarily corresponded to periods of peak abundance. Missing counts are generally a result of bad weather, high water, turbulence or other factors that prevent surveys for that given year.

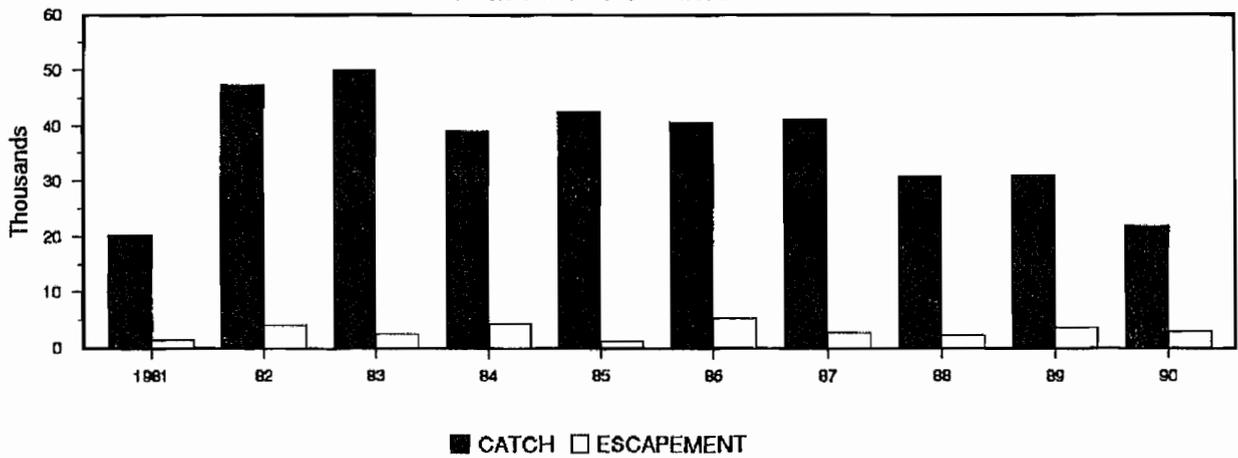
Appendix B.14. Aerial survey indices of chinook salmon escapement to the Copper River drainage, 1980 - 1990.*

Location	Yearly Survey Indices											10 Year
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Average 1980 - 1989
East Fork Chistochina	575	120	1,260	575	577	360	618	764	684	740	615	627
Gulkana River	718	754 ^b	1,656	931	2,189	321	3,182	1,228	967	1,993	1,356	1,394
Mendeltna Creek	3	51	70	12	26	26	76	10	17	185	320	48
Kiana Creek	247	191	200	166	382	91	328	80	249	344	411	228
St. Anne Creek	8	19	35	87	89	15	182	192	62	90	42	78
Manker Creek	35	23	49	141	264	22	251	141	115	165	41	121
Grayling Creek	66	107	127	287	279	58	224	112	161	72	49	149
Little Tonsina River	70	191	440	330	568	203	424	247	75	65	57	261
Indian River	24	20 ^b	179	41	17	14	29 ^b	33	0	3	15	36
Total	1,746	1,476	4,016	2,570	4,391	1,110	5,314	2,807	2,330	3,657	2,906	2,942

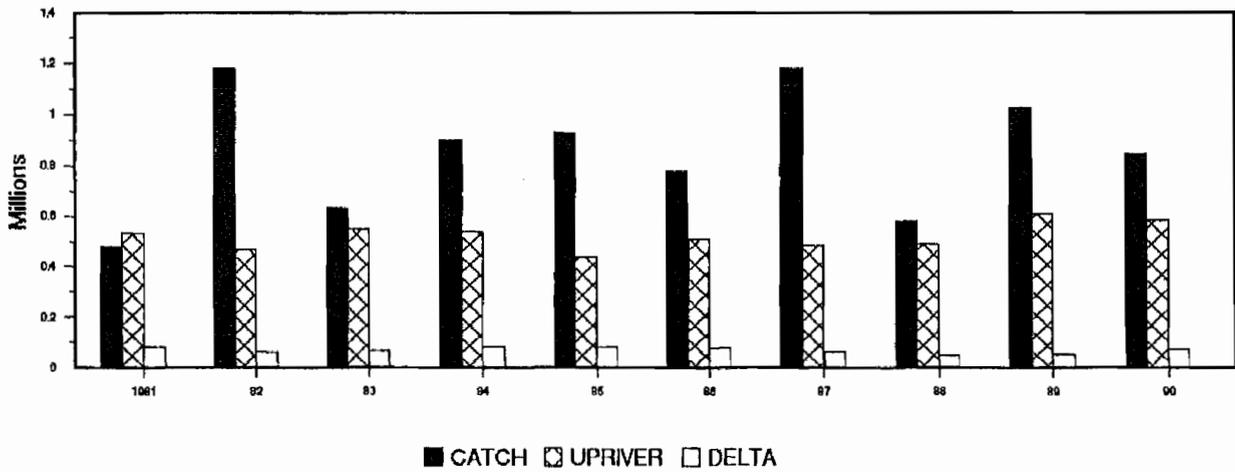
a The escapement figures in this table are based on peak aerial survey estimates and weir counts from a majority of the known salmon spawning areas in the upper Copper River drainage. These indices are not intended to provide a true estimate of total escapement for these stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimate across years, however counts were obtained only as environmental conditions allow and may not necessarily correspond to periods of peak abundance. Missing counts are generally a result of bad weather, high water, turbulence or other factors that prevented surveys for that given year.

b Interpolated counts.

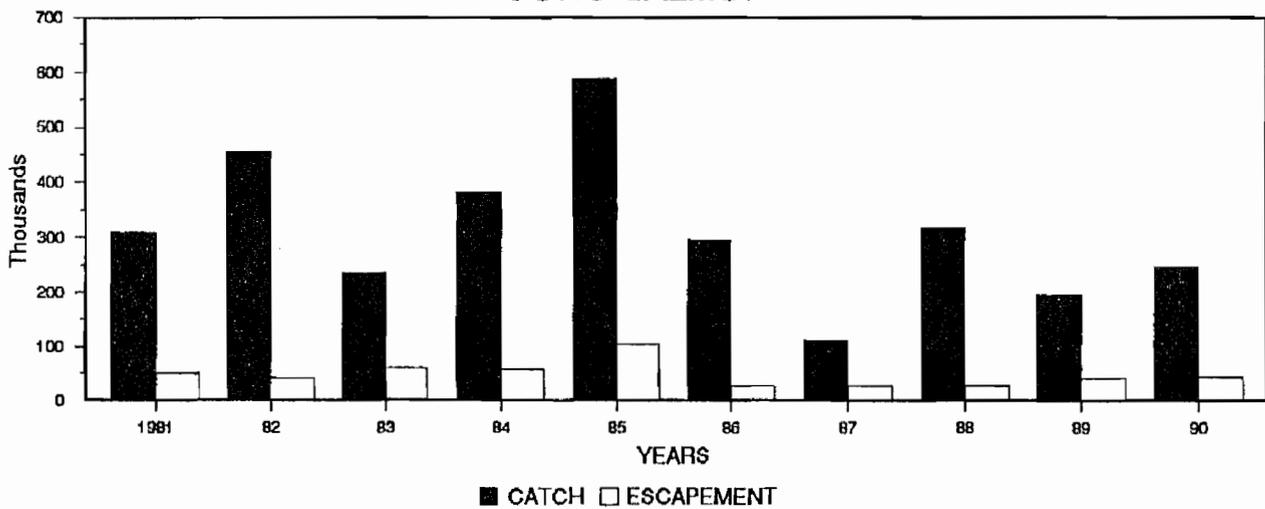
COPPER RIVER DISTRICT CATCH and ESCAPEMENT CHINOOK SALMON



SOCKEYE SALMON



COHO SALMON



Appendix B.15. Chinook, sockeye and coho salmon catch and escapement in the Copper River District, 1981 - 1990.

Appendix B.16. Estimated age and sex composition of the sockeye salmon commercial harvest in the Copper River District drift gill net fishery, 1990.

		Brood Year and Age Group										
		1987		1986		1985		1984		1983		
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3	2.4	Total
Strata Combined:	05/14 - 09/28											
Sampling Dates:	05/15 - 07/28											
Sample Size:	4,056											
Female	Percent of Sample	0.2	0.0	7.9	5.4	0.1	26.3	1.0	0.2	8.3	0.0	49.4
	Number in Catch	1,437	245	66,711	45,835	512	221,948	8,715	2,021	69,876	286	417,586
Male	Percent of Sample	0.4	0.1	8.3	7.1	0.1	27.2	1.2	0.3	5.9	0.0	50.5
	Number in Catch	3,208	740	69,993	59,610	590	229,567	10,200	2,695	49,899	419	426,919
Total	Percent of Sample	0.5	0.1	16.2	12.5	0.1	53.5	2.2	0.6	14.2	0.1	100.0
	Number in Catch	4,645	985	136,703	105,445	1,102	451,788	18,915	4,716	119,775	704	844,778
	Standard Error	1,002	492	5,171	4,435	523	7,012	2,053	1,022	4,902	365	

Appendix B.17. Estimated age and sex composition of the chinook salmon commercial harvest in the Copper River District drift gill net fishery, 1990.

		Brood Year and Age Group														
		1987		1986		1985		1984		1983		1982				
		0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	1.5	2.4	3.3	2.5	Total	
Female	Percent of Sample	0.0	0.1	0.0	0.9	0.0	14.3	0.2	29.0	1.2	0.1	0.4	4.9	0.1	0.1	51.3
	Number in Catch	0	18	0	194	0	3,095	69	6,300	270	23	93	1,064	18	18	11,129
Male	Percent of Sample	0.3	0.2	0.0	4.9	0.2	10.8	1.1	24.6	0.9	0.1	1.3	3.7	0.0	0.2	48.4
	Number in Catch	54	48	5	1,068	46	2,340	243	5,348	189	18	288	800	0	49	10,496
Total	Percent of Sample	0.3	0.3	0.0	5.8	0.2	25.0	1.3	54.0	2.1	0.2	1.8	8.6	0.1	0.3	100.0
	Number in Catch	54	66	5	1,262	46	5,435	279	11,713	459	41	381	1,875	18	68	21,702
	Standard Error	31	33	5	133	25	240	68	273	82	24	75	160	18	34	

Strata Combined: 5/14 - 8/29
 Sampling Dates: 5/15 - 6/19
 Sample Size: 1,594

Appendix B.18. Temporally stratified age and sex composition of the coho salmon commercial harvest in the Copper River District drift gill net fishery, 1990.

		Brood Year and Age Group				
		1988	1987	1986	1985	
		0.1	1.1	2.1	3.1	Total
Strata Combined:		05/14 - 09/21				
Sampling Dates:		08/15 - 09/08				
Sample Size:		1,607				
Female	Percent of Sample	0.0	14.2	22.7	1.9	38.8
	Number in Catch	89	34,077	54,466	4,469	93,101
Male	Percent of Sample	0.3	23.8	34.3	2.1	60.5
	Number in Catch	753	56,981	82,171	4,981	144,885
Total	Percent of Sample	0.4	38.5	57.2	3.9	100.0
	Number in Catch	842	92,208	137,171	9,450	239,670
	Standard Error	388	2,950	3,034	1,259	

Appendix B.19 Commercial salmon harvest by period in the Bering River District drift gill net fishery, 1990.

Period	Hours	Landings	Chinook		Sockeye		Coho		Pink		Chum			
			Date ^a	Permits	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
01 ^b	6/18	24	28	46	8	188	5,293	30,273	0	0	0	0	1	10
02	6/21	24	10	19	3	90	1,899	11,309	0	0	0	0	0	0
03	6/25	24	5	9	2	44	1,036	6,101	0	0	0	0	0	0
04	6/28	36	0	0	0	0	0	0	0	0	0	0	0	0
05	7/02	24	0	0	0	0	0	0	0	0	0	0	0	0
06	7/05	36	1	1	0	0	76	495	0	0	0	0	0	0
07	7/09	24	0	0	0	0	0	0	0	0	0	0	0	0
08	7/12	36	0	0	0	0	0	0	0	0	0	0	0	0
09	7/16	24	0	0	0	0	0	0	0	0	0	0	0	0
10	7/19	36	0	0	0	0	0	0	0	0	0	0	0	0
11	7/23	24	0	0	0	0	0	0	0	0	0	0	0	0
12	7/26	36	0	0	0	0	0	0	0	0	0	0	0	0
13	7/30	24	0	0	0	0	0	0	0	0	0	0	0	0
14	8/02	36	0	0	0	0	0	0	0	0	0	0	0	0
15	8/06	24	2	2	0	0	0	0	550	4,570	0	0	0	0
16	8/09	36	0	0	0	0	0	0	0	0	0	0	0	0
17	8/13	48	1	1	0	0	1	5	120	1,066	0	0	0	0
18	8/20	48	29	60	1	32	13	96	5,117	47,643	2	8	0	0
19	8/27	48	47	111	0	0	5	43	14,201	131,862	0	0	0	0
20	9/06	36	67	121	0	0	7	45	15,436	144,805	0	0	0	0
21	9/12	48	43	82	0	0	2	13	6,763	62,213	0	0	0	0
22	9/19	48	10	12	0	0	0	0	765	7,088	0	0	0	0
23	9/26	48	0	0	0	0	0	0	0	0	0	0	0	0
Total		792	109	464	14	354	8,332	48,380	42,952	399,247	2	8	1	10
Average Weight						25.29		5.81		9.30		4.00		10.00

a Starting times for specific openings refer to Appendix B.29

b From 7:00 a.m. May 21 until 0001 August 01 only drift gill nets with a mesh size smaller than six inches was allowed.

Appendix B.20. Commercial salmon catch by species in the Bering River District, 1972-1990.

Catch by Species						
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	107	51,445	19,825	3	1	71,381
1973	285	15,426	65,348	2	5	81,066
1974	32	4,208	28,615	7	2	32,864
1975	162	21,637	24,162	0	0	45,961
1976	228	30,908	42,423	43	1	73,603
1977	127	14,445	47,218	192	221	62,203
1978	331	33,554	91,097	266	2,391	127,639
1979	385	139,015	114,046	6,895	23,094	283,435
1980 ^a	0	0	108,872	0	0	108,872
1981	200	55,585	82,626	9,882	8,307	156,600
1982	254	129,667	144,752	47	333	275,053
1983	610	179,273	117,669	851	4,615	303,018
1984	330	91,784	214,632	309	20,408	327,463
1985	215	26,561	419,276	214	9,642	455,908
1986	128	19,038	115,809	15	243	135,233
1987	34	16,926	15,864	54	7	32,885
1988	19	7,152	86,539	23	181	93,914
1989	30	9,225	26,952	7	2	36,216
1990	14	8,332	42,952	2	1	51,301
Ten Year Average (1980-89)	182	53,521	133,299	1,140	4,374	192,516

a In 1980 no fishing was allowed prior to August 11.

Appendix B.21. Aerial escapement indices by date and location for sockeye salmon returning to the Bering River delta, 1990.

		Aerial Escapement Indices by Survey Date							
Bering River delta *	Survey System	08 June	12 June	22 June	26 June	03 July	19 July	01 Aug	16 Aug
Bering River	Bering River	0	560	940	1,200	180	0 *	NC	0
	Bering Lake	0	730+	120	690	14,400	11,775 *	820	220
	Dick Creek	0	0	0	0	0	4,550 *	13,100	1,900
	Shepherd Creek - Lagoon	0	0	0+	620	0	0	50+	0
	Shepherd Creek	NS	NS	NS	NS	0	240	200	460*
	Carbon Creek	NS	NS	NS	NS	NS	100	800	200
	Maxwell Creek	NS	NS	NS	NS	NS	0	NS	0*
	Trout Creek	NS	NS	NS	NS	NS	NC	0	0
	Clear Creek	NS	NS	NS	NS	NS	700	600	50
	Kushtaka Lake	NS	NS	NS	NS	NS	20	40	80
	Shockum Creek	NS	NS	NS	NS	NS	0	120	95
Katalla River	Katalla River	0	0	50	240	1,900SP	1,200	20	100
Bering River Aerial Survey Daily Total		0	1,290	1,110	2,750	16,480	18,585	15,750	3,105

		Aerial Escapement Indices by Survey Date						
Bering River delta *	Survey System	24 Aug	29 Aug	03 Sept	08 Sept	25 Sep	03 Oct	16 Oct
Bering River	Bering River	0	0	NC	0	0	NC	0
	Bering Lake	70	0	20+	100	0	0	0
	Dick Creek	360	80	30	30	0	0	0
	Shepherd Creek - Lagoon	0	0	NC	0	NS	NS	NS
	Shepherd Creek	NS	NS	NS	0	NS	NS	NS
	Carbon Creek	NS	NS	NS	NS	NS	NS	NS
	Maxwell Creek	NS	NS	NS	NS	NS	NS	NS
	Trout Creek	0	0	0	0	NS	0	NS
	Clear Creek	15	0	0	0	NS	0	NS
	Kushtaka Lake	136	30	0	0	NS	0	NS
	Shockum Creek	10	8	20	15	NS	0	NS
Katalla River	Katalla River	110	15	NC	40	0	0	0
Bering River Aerial Survey Daily Total		701	133	70	185	0	0	0

-Continued-

Bering River delta * System and Drainage	Survey System	Estimated Escapement	
		Site ^b	System ^c
Bering River	Bering River	0	16,325
	Bering Lake	11,775	
	Dick Creek	4,550	
	Shepherd Creek -Lagoon	0	1,260
	Shepherd Creek	460	
	Carbon Creek	800	
	Maxwell Creek	0	
	Trout Creek	0	0
	Clear Creek	700	700
	Kushtaka Lake	136	256
	Shockum Creek	120	
Katalla River	Katalla River	1,200	1,200
Bering River Aerial Survey Daily Total			19,741

- a The survey sites represent most of the known sockeye salmon spawning locations in the Bering River drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and the relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but they have been for the purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meanings: NS= no survey, NC= surveyed but no count due to poor conditions. The + sign after some counts indicate that the count is the minimum estimate of seen in less than ideal conditions. The * symbol indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote b).
- b The escapement estimates for each site is in the restricted survey estimate. Where the survey site is a terminal spawning area the peak count is used however, if the site is a schooling area for migratory fish bound for sites further upstream the count which minimizes possible duplication counts across dates selected.
- c The sum of the estimates by site within a system.

Appendix B.22. Aerial escapement indices by date and location for coho salmon returning to the Bering River delta, 1990.

Bering River delta ^a System and Drainage	Survey System	Aerial Escapement Indices by Survey Date						Estimated Escapement			
		16 Aug	24 Aug	29 Aug	08 Sep	25 Sept	03 Oct	16 Oct	Site ^a	System ^b	
Bering River	Bering River	0	1,400	2,090**	1,440	1,100+	500	120	1,440	3,540	
	Bering Lake	0	80	110	400 *	50+	325	160	400		
	Dick Creek	0	100	440	1,500 *	300+	1,160	1,560	1,500		
	Shepherd Creek - Lagoon	0	0	0	0	NS	NC	NS	0	100	
	Shepherd Creek	0	NS	NS	100 *	NS	NS	NS	100		
	Carbon Creek	0	NS	NS	0	NS	NS	NS	0		
	Maxwell Creek	0	NS	NS	NS	NS	NS	NS	0		
	Trout Creek	0	0	0	0	NS	0	NS	0		
	Clear Creek	0	0	0	0	NS	0	NS	0		
	Kushtaka Lake	0	0	0	0	NS	0	NS	0		
	Shockum Creek	0	0	0	0	NS	0	NS	0		
	Katalla River	Katalla River	350	1,000	1,060	2,960 *	200+	300+	20	2,960	2,960
	Gandil River	Gandil River	0	140	120	600	NS	910 *	240	910	3,810
Nichawak River	Nichawak River	0	100	280	1,550	NS	2,900 *	1,320	2,900		
Controller Bay Strms.	Campbell River	NS	150 *	6	NC	NS	0	NS	150	14,390	
	Edwards River	NS	1,200	3,030	12,100	NS	8,100	NS	12,100		
	Okalee River	NS	0	1	1,500+	NS	1,900+*	NS	1,900		
	Other Clear Streams	NS	90	115	240 *	NS	110	NS	240		
Bering River Aerial Survey Daily Total		350	4,260	7,252	22,390	1,650+	16,205	3,420		24,800	
Anticipated Escapement		1,014	891	7,731	13,105	18,089	15,020			21,450	

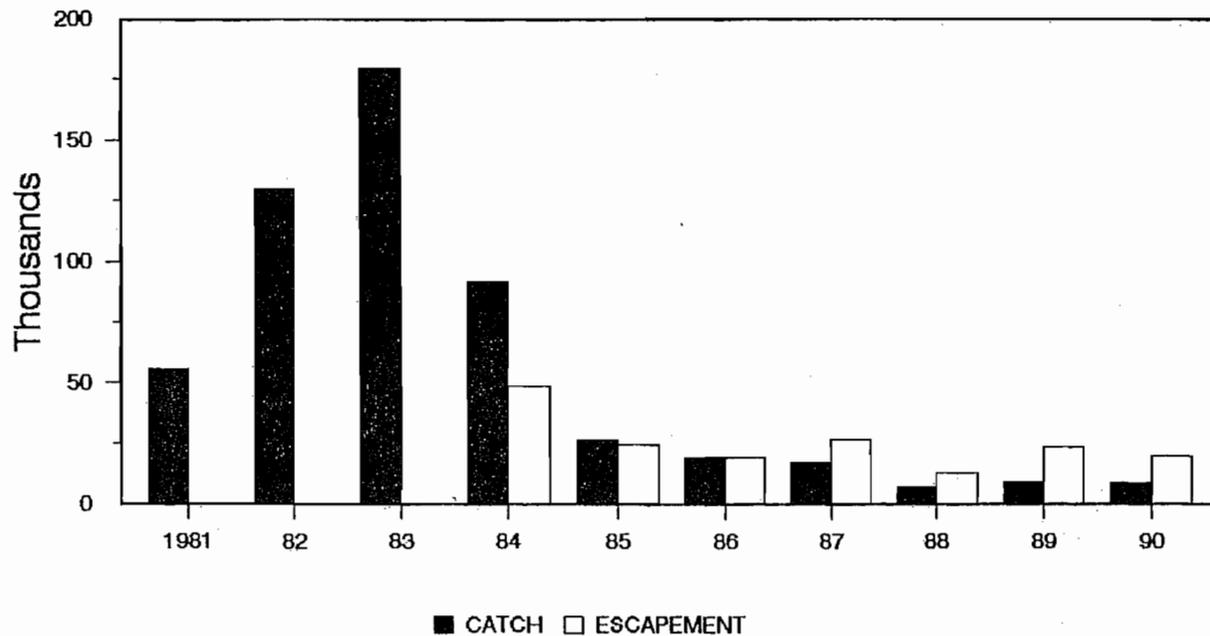
a The survey sites represent most of the known sockeye salmon spawning locations in the Bering River drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and the relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but they have been for the purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meanings: NS= no survey, NC= surveyed but no count due to poor conditions. The + sign after some counts indicate that the count is the minimum estimate of seen in less than ideal conditions. The * symbol indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote b).

b Bering River counts include 1,640 peak coho salmon observed in the Don Miller Hills tributaries.

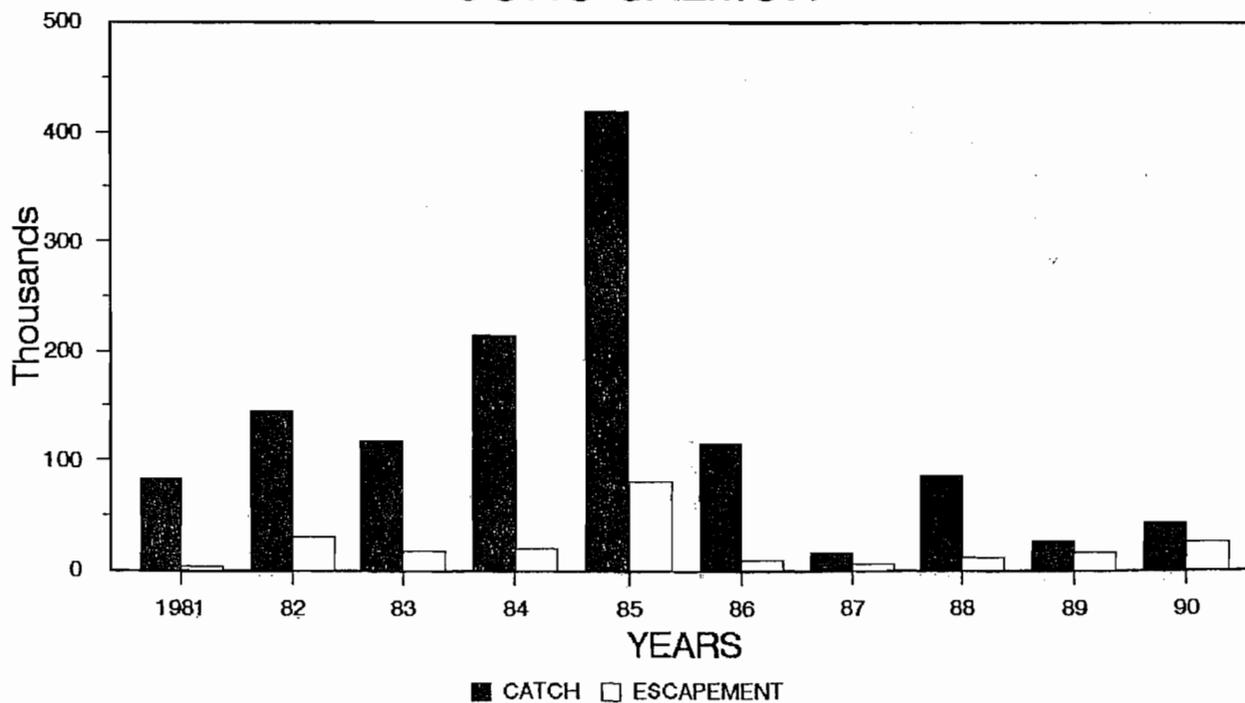
c The escapement estimates for each site is in the restricted survey estimate. Where the survey site is a terminal spawning area the peak count is used however, if the site is a schooling area for migratory fish bound for sites further upstream the count which minimizes possible duplication counts across dates selected.

d The sum of the estimates by site within a system.

BERING RIVER SALMON CATCH and ESCAPEMENT SOCKEYE SALMON



COHO SALMON



Appendix B.23. Sockeye and coho salmon catch and escapement in the Bering River District, 1981 - 1990.

Appendix B.24. Estimated age and sex composition of sockeye salmon harvested in the Bering River District commercial drift net fishery, 1990.

		Brood Year and Age Group							
		1987	1986		1985		1984		Total
		0.2	0.3	1.2	1.3	2.2	1.4	2.3	
Strata Combined: 6/18 - 9/21									
Sampling Dates: 6/19									
Sample Size: 537									
Female	Percent of Sample	0.2	6.0	18.1	22.0	0.4	0.6	1.3	48.4
	Number in Catch	16	497	1,505	1,831	31	47	109	4,034
Male	Percent of Sample	0.6	3.5	26.3	19.4	0.4	0.2	0.9	51.2
	Number in Catch	47	295	2,188	1,614	31	16	78	4,267
Total	Percent of Sample	0.7	9.5	44.5	41.5	0.7	0.7	2.2	100.0
	Number in Catch	62	791	3,708	3,460	62	62	186	8,332
	Standard Error	31	106	179	177	31	31	53	

Appendix B.25. Estimated age and sex composition of coho salmon harvested in the Bering River District commercial drift gill net fishery, 1990.

		Brood Year and Age Group				
		1988	1987	1986	1985	
		0.1	1.1	2.1	3.1	Total
Strata Combined 06/18 - 09/21						
Sampling Date 08/30 - 09/22						
Sample Size: 993						
Female	Percent of Sample	0.1	12.8	30.6	2.9	46.4
	Number in Catch	49	5,481	13,139	1,256	19,925
Male	Percent of Sample	0.0	15.6	34.7	3.4	53.6
	Number in Catch	0	6,681	14,889	1,457	23,027
Total	Percent of Sample	0.1	28.3	65.3	6.3	100.0
	Number in Catch	49	12,162	28,027	2,714	42,952
	Standard Error	49	618	649	321	

Appendix B.26. Summary of periods, dates, hours fished, and emergency orders issued for the commercial salmon gill net fisheries in the Bering River and Copper River districts, 1990.

Bering River (200)			Copper River (212)			Emergency Orders Issued
Periods	Dates	Hours Fished	Periods	Dates	Hours Fished	
			1	5/14 - 5/15	24	a 2-F-E-09-90
			2	5/17 - 5/18	24	a 2-F-E-10-90
			3	5/21 - 5/22	24	a 2-F-E-11-90
			4	5/25	12	b 2-F-E-12-90
			5	5/28 - 5/29	36	c 2-F-E-13-90
			6	5/31 - 6/01	24	b 2-F-E-14-90
			7	6/04 - 6/05	24	d 2-F-E-15-90
			8	6/11 - 6/12	24	a 2-F-E-17-90
			9	6/14 - 6/15	24	a 2-F-E-19-90
1	6/18 - 6/19	24	10	6/18 - 6/19	24	
2	6/21 - 6/22	24	11	6/21 - 6/22	24	
3	6/25 - 6/26	24	12	6/25 - 6/26	24	
4	6/28 - 6/30	36	13	6/28 - 6/30	36	e 2-F-E-22-90
5	7/02 - 7/03	24	14	7/02 - 7/03	24	
6	7/05 - 7/07	36	15	7/05 - 7/07	36	
7	7/09 - 7/10	24	16	7/09 - 7/10	24	
8	7/12 - 8/14	36	17	7/12 - 7/14	36	
9	7/16 - 7/17	24	18	7/16 - 7/17	24	
10	7/19 - 8/21	36	19	7/19 - 7/21	36	
11	7/23 - 7/24	24	20	7/23 - 7/24	24	
12	7/26 - 7/28	36	21	7/26 - 7/28	36	
13	7/30 - 7/31	24	22	7/30 - 7/31	24	
14	8/02 - 8/04	36	23	8/02 - 8/04	36	
15	8/06 - 8/07	24	24	8/06 - 8/07	24	
16	8/09 - 8/11	36	25	8/09 - 8/11	36	
17	8/13 - 8/15	48	26	8/13 - 8/15	48	f 2-F-E-40-91
18	8/20 - 9/22	48	27	8/20 - 8/22	48	
19	8/27 - 8/29	48	28	8/27 - 8/29	48	
20	9/06 - 9/08	36	29	9/06 - 9/08	36	g 2-F-E-47-90
21	9/12 - 9/14	48	30	9/12 - 9/14	48	h 2-F-E-48-90
22	9/19 - 9/21	48	31	9/19 - 9/21	48	i 2-F-E-49-90
23	9/26 - 9/28	48	32	9/26 - 9/28	48	2-F-E-50-90
			33	10/03 - 10/05	48	2-F-E-51-90
			34	10/10 - 10/12	48	2-F-E-53-90
						j 2-F-E-54-90
						k 2-F-E-55-90

a The Copper River Districts fishing season is officially opened for a first 24 hour period from 7:00 p.m. Thursday to 7:00 p.m. Friday. The Copper River fishing schedule is typically two 24 hour periods per week; the first is from 7:00 a.m. Monday to 7:00 a.m. Tuesday with the second weekly period beginning 7:00 p.m. Thursday to 7:00 p.m. Friday.

b Only gill nets with a mesh size of six inches or smaller will be allowed from 7:00 a.m. May 21 to 12:00 a.m. August 1

c The Copper River District is open to commercial fishing for 12 hours from 7:00 a.m. to 7:00 p.m. Friday, May 25.

d The Copper River District is open to commercial fishing for 36 hours from 7:00 a.m. Monday, May 28, to 7:00 p.m. Tuesday, May 29.

-Continued-

- e Until further notice, the Copper River and Bering River districts are on a 2 periods per week schedule. The schedule is one 24-hour period from 7:00 p.m. Thursday to 7:00 p.m. Friday and a 36 hour fishing period from 7:00 a.m. Monday to 7:00 p.m. Tuesday.
- f Until further notice, the Copper and Bering River districts will open for one 48-hour fishing period per week, from 12:00 noon Monday to 12:00 noon Wednesday.
- g Until further notice the Copper and Bering River districts will remain closed.
- h The Copper and Bering River districts is open for 36-hours from 8:00 p.m. Thursday, September 6 to 8:00 a.m. Saturday, September 8.
- i Copper and Bering River district is open for 48-hours from 12:00 noon Wednesday to 12:00 noon Friday.
- j This announcement offically closes the 1990 Bering River District season.
- k This announcement offically closes the 1990 Copper River District season.

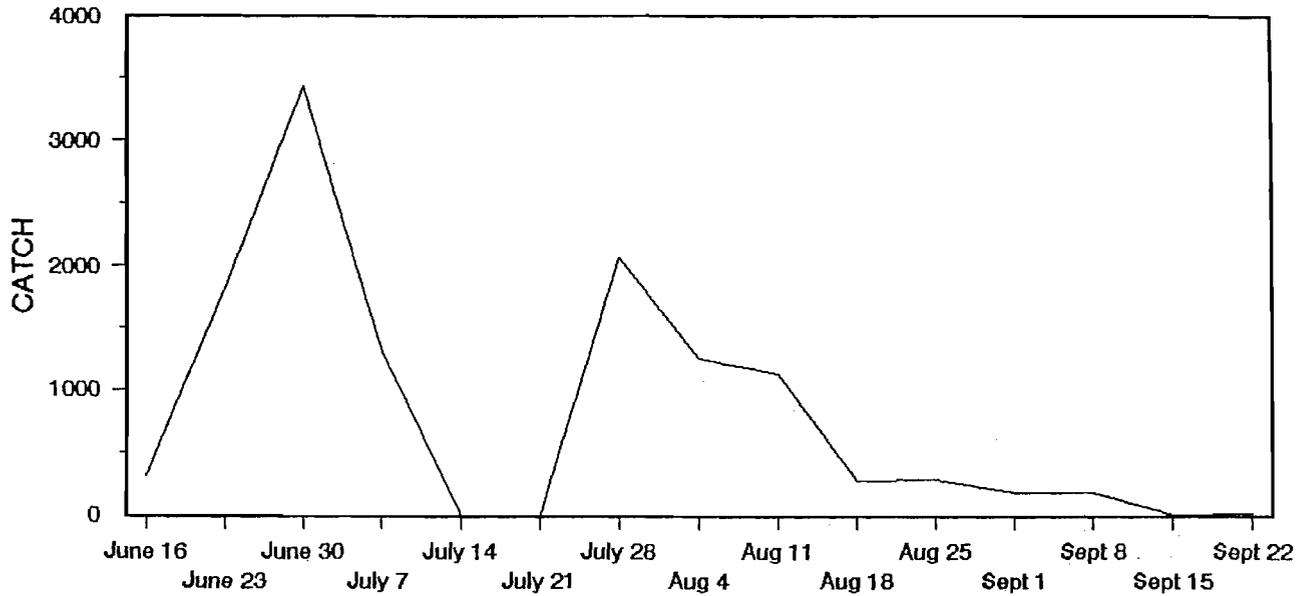
APPENDIX C

COGHILL AND UNAKWIK DISTRICTS

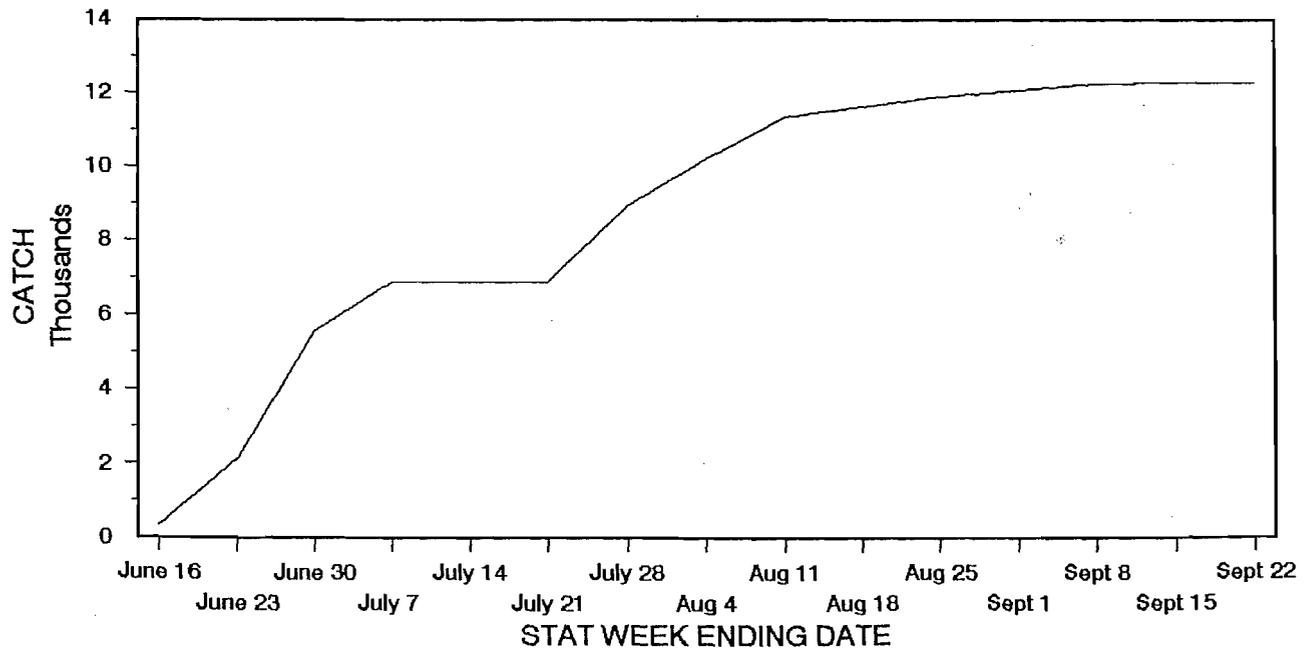
Appendix C.1. Commercial salmon harvest by period in the Coghill District commercial drift gill net and purse seine fisheries, Prince William Sound, 1990. The periods listed are those with active fishing participation. For a listing of all fishing periods see Appendix C.12.

Period Date	Hours	Permits	Chinook		Sockeye		Coho		Pink		Chum	
			Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
DRIFT GILL NET												
6/14-6/15	24	142	41	586	312	2,088	0	0	87	344	28,084	252,482
6/18-6/19	24	164	23	329	742	5,218	0	0	360	1,287	28,659	256,075
6/21-6/22	24	231	13	224	1,076	7,386	3	16	1,290	4,792	80,980	733,557
6/25-6/26	24	272	17	293	1,984	13,845	4	33	3,067	11,517	38,400	349,824
6/28-6/29	24	214	6	95	1,444	10,070	7	44	1,442	5,286	24,887	227,110
7/02-7/03	24	155	6	63	1,309	8,995	6	53	812	2,974	21,390	189,367
7/23-7/23	12	176	0	0	1,224	8,274	63	551	13,318	42,709	13,584	121,754
7/26-7/26	12	148	1	12	743	5,162	78	671	18,949	60,004	9,801	85,767
7/30-7/30	12	201	2	37	450	3,219	60	493	62,434	195,783	9,528	84,973
8/02-8/04	48	265	5	36	706	4,902	399	3,383	134,425	420,226	18,954	166,860
8/06-8/10	108	289	5	58	1,086	7,641	4,458	36,742	636,961	1,987,549	20,245	176,276
8/13-8/14	24	148	0	0	99	695	12,286	112,052	63,611	204,249	1,607	13,477
8/17-8/27	240	261	2	11	437	3,110	31,074	263,305	766,566	2,458,805	4,413	37,645
8/27-9/03	168	216	1	6	237	1,703	31,469	280,054	170,806	556,606	430	3,607
9/03-9/10	168	191	3	44	116	743	36,538	329,504	33,363	110,557	201	1,675
9/10-9/17	168	59	1	10	21	156	8,348	72,250	19	71	29	203
9/17-9/24	168	30	0	0	2	15	3,574	31,731	0	0	17	120
9/24-10/1	168	2	0	0	0	0	197	1,748	0	0	0	0
10/01-10/03	60	-	0	0	0	0	41	350	0	0	0	0
Totals		403	126	1,804	11,988	83,222	128,605	1,132,980	1,907,510	6,062,759	301,209	2,700,772
Average Weight				14.32		6.94		8.81		3.18		8.97
PURSE SEINE												
7/23-7/23	12	-	1	6	2	14	0	0	415	1,301	3,062	30,615
7/26-7/26	12	13	0	0	101	562	34	255	20,826	61,458	1,099	10,371
7/30-7/30	12	13	0	0	66	413	42	317	46,126	132,540	2,387	22,778
8/02-8/04	48	12	0	0	36	292	175	1,506	79,869	250,233	1,075	10,029
8/06-8/10	108	19	0	0	45	302	83	654	193,783	568,589	2,768	26,980
8/13-8/14	24	-	0	0	3	23	12	95	7,365	20,631	14	119
8/17-8/21	96	33	0	0	23	146	1,104	9,508	165,717	501,248	271	2,306
8/21-8/24	72	11	1	11	3	19	984	9,687	25,850	77,685	23	199
8/24-8/27	72	16	0	0	4	35	3,385	29,556	67,196	208,251	162	1,544
8/27-9/03	168	24	0	0	2	15	5,763	50,168	172,112	522,326	86	768
9/03-9/10	168	-	0	0	1	5	237	2,040	6,019	20,556	4	19
Total		89	2	17	286	1,826	11,819	103,786	785,278	2,364,818	10,951	105,728
Average Weight				8.50		6.38		8.78		3.01		9.65
Combined Total			128	1,821	12,274	85,048	140,424	1,236,766	2,692,788	8,427,577	312,160	2,806,500
Average Weight				14.23		6.93		8.81		3.13		8.99

COGHILL SOCKEYE SALMON CATCH WEEKLY



CUMULATIVE



Appendix C.2. Weekly and cumulative catches of sockeye salmon in the Coghill District, 1990. No commercial harvest was projected in 1990.

Appendix C.3. Commercial salmon catch by species in the Coghill District, Prince William Sound, 1975 - 1990.

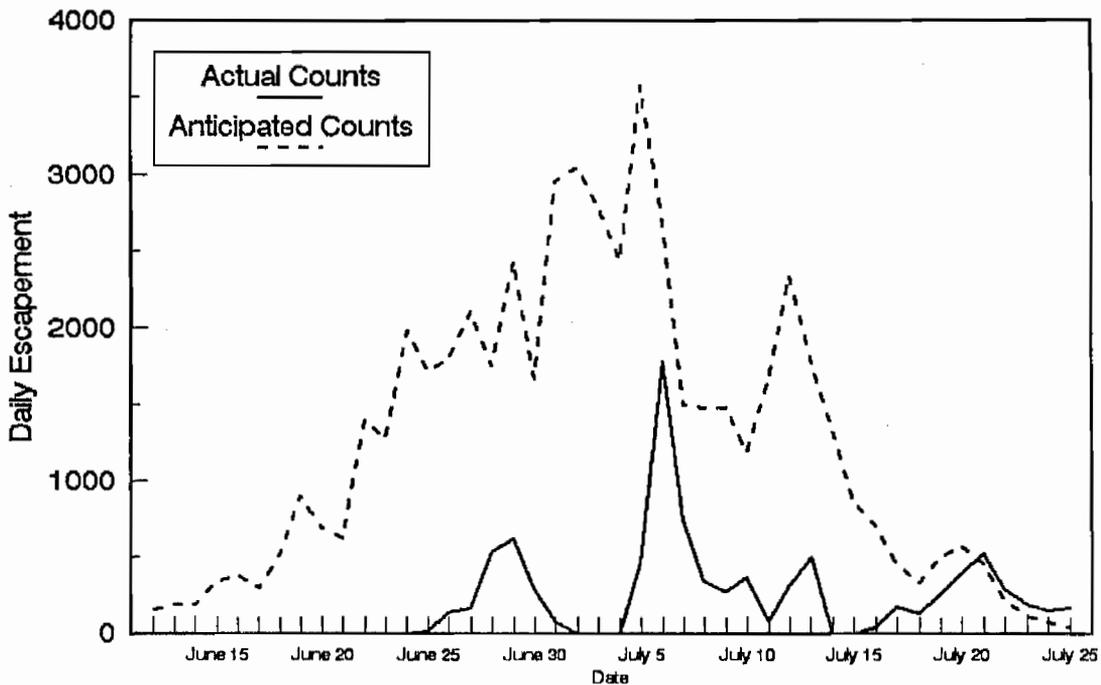
Year	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
Gear: Drift Gill Net						
1975	525	142,864	357	98,492	32,438	275,676
1976	102	54,334	72	53,219	89,170	196,897
1977	124	154,342	49	332,859	127,476	614,850
1978	469	193,899	64	49,527	110,679	354,638
1979	543	75,753	1,837	259,372	56,916	394,421
1980	107	56,957	1,053	355,684	68,071	481,872
1981	152	101,058	1,008	526,739	131,399	760,356
1982	127	929,965	213	181,925	252,077	1,364,307
1983	340	38,273	1,013	233,263	234,022	506,911
1984	396	94,956	563	897,496	264,878	1,258,289
1985	380	339,296	1,131	454,531	246,824	1,042,162
1986	617	381,565	789	68,887	218,971	670,829
1987	352	377,454	13,396	712,897	318,842	1,422,941
1988	501	82,294	41,307	1,314,061	346,388	1,784,551
1989	364	106,114	80,737	628,522	194,584	1,010,321
1990	126	11988	128605	1907510	301209	2,349,438
Ten Year Average (1980-89)	334	250,793	14,121	537,401	227,606	1,030,254
Gear: Purse Seine						
1975	246	4,985	30	145,155	2,561	152,977
1976	83	6,159	29	56,967	30,328	93,566
1977	40	16,436	50	230,215	37,102	283,843
1978	206	9,623	34	13,059	14,007	36,929
1979	692	3,047	55	38,560	5,709	48,063
1980	0	2,159	0	134,876	4,702	141,737
1981	1	1,997	0	34,083	23,378	59,459
1982	23	17,466	29	1,006,579	135,553	1,159,650
1983	0	175	16	41,048	8,958	50,197
1984	0	21	0	10,911	1,126	12,058
1985	85	10,757	112	69,242	19,330	99,526
1986	186	18,514	98	145,706	27,078	191,582
1987	58	38,899	1,956	865,671	59,252	965,836
1988	63	1,623	15,787	1,600,481	11,755	1,629,709
1989	61	2,030	39,484	3,296,965	124,639	3,463,179
1990	2	286	11,819	785,278	10,951	808,336
Ten Year Average (1980-89)	48	9,364	5,748	720,556	41,577	777,293
Gear: Combined Gear						
1975	771	147,849	389	244,647	34,999	428,655
1976	185	60,493	101	110,186	119,498	290,463
1977	164	170,778	99	563,074	164,578	898,693
1978	675	203,522	98	62,586	124,686	391,567
1979	1,235	78,800	1,892	297,932	62,625	442,484
1980	107	59,116	1,053	490,560	72,773	623,609
1981	153	103,055	1,008	560,822	154,777	819,815
1982	150	947,431	242	1,188,504	387,630	2,523,957
1983	340	38,448	1,029	274,311	242,980	557,108
1984	396	94,977	563	908,407	266,004	1,270,347
1985	465	350,053	1,243	523,773	266,154	1,141,688
1986	803	400,079	887	214,593	246,049	862,411
1987	410	416,353	15,352	1,578,568	378,094	2,388,777
1988	564	83,917	57,094	2,914,542	358,143	3,414,260
1989	425	108,144	120,221	3,925,487	319,223	4,473,500
1990	128	12,274	140,424	2,692,788	312,160	3,157,774
Ten Year Average (1980-89)	381	260,157	19,869	1,257,957	269,183	1,807,547

Appendix C.4. Daily salmon escapement through the Coghill River Weir, Prince William Sound, 1990.

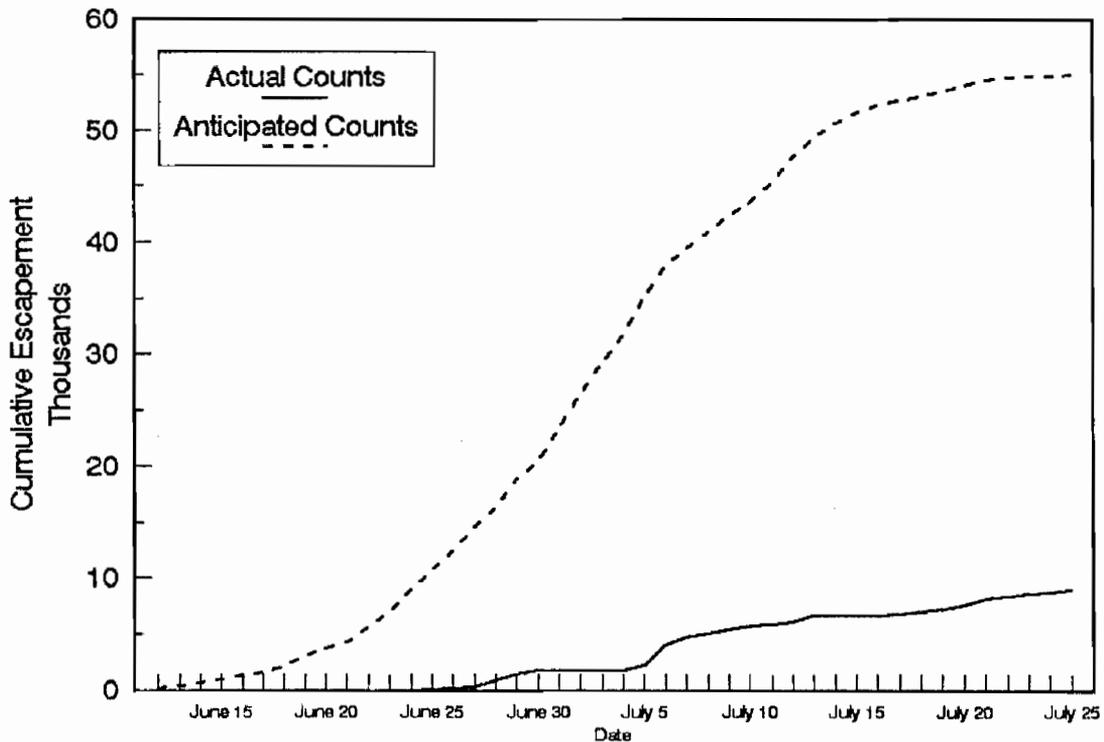
Date	Sockeye ^a		Pink		Chum		King	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/12								
6/13								
6/14								
6/15								
6/16								
6/17								
6/18								
6/19								
6/20								
6/21								
6/22								
6/23								
6/24								
6/25	12	12						
6/26	136	148						
6/27	159	307						
6/28	533	840						
6/29	621	1,461						
6/30	292	1,753						
7/01	8	1,833						
7/02		1,833						
7/03		1,833						
7/04		1,833						
7/05	465	2,298						
7/06	1,775	4,073			8	8	2	2
7/07	736	4,809			6	14		2
7/08	338	5,147			8	22		2
7/09	270	5,417				22		2
7/10	367	5,784			3	25		2
7/11	79	5,863				25		2
7/12	309	6,172			1	26		2
7/13	500	6,672				26		2
7/14		6,672				26		2
7/15		6,672				26		2
7/16	40	6,712	1	1		26		2
7/17	168	6,880	5	6	2	28	1	3
7/18	127	7,007	1	7		28		3
7/19	256	7,263	2	9	2	30		3
7/20	384	7,647	10	19	16	46	1	4
7/21	521	8,168	17	36	14	60	1	5
7/22	284	8,452	15	51	5	65		5
7/23	190	8,642	3	54	14	79		5
7/24	148	8,790	2	56	15	94	2	7
7/25	159	8,949	12	68	18	112		7
Total	8,949		68		112		7	

a Sockeye count includes 699 jack salmon.

1990 COGHILL SOCKEYE SALMON ESCAPEMENT DAILY



CUMULATIVE - GOAL OF 55,000 SALMON



Appendix C.5. Anticipated and actual daily and cumulative sockeye salmon escapement at the Coghill weir, Prince William Sound, 1990.

Appendix C.6. Salmon escapement by species in the Coghill District
Prince William Sound, 1969 - 1990.

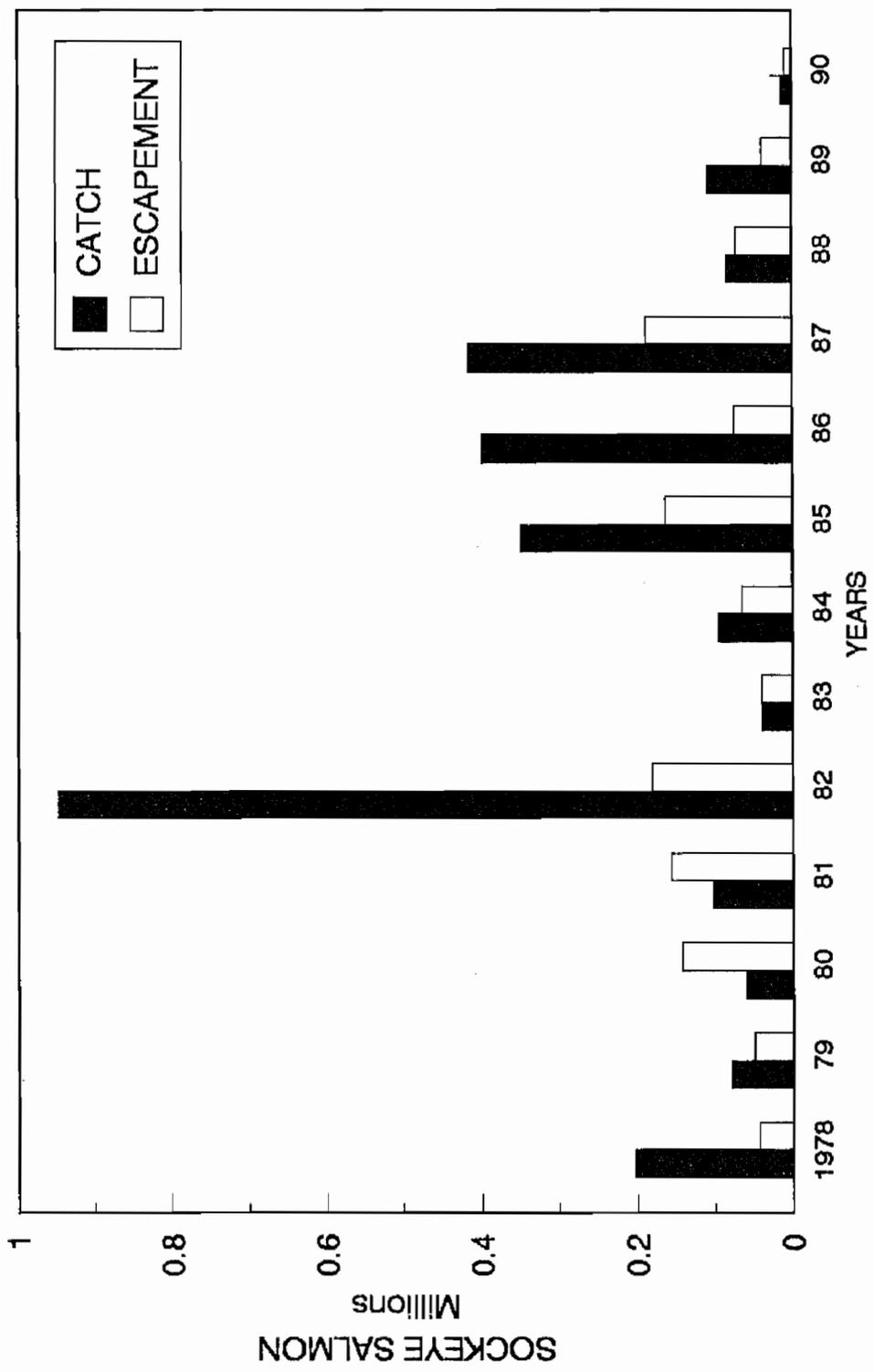
Year	Sockeye ^a	Pink ^b	Chum ^b
1969	81,000	39,020	8,410
1970	35,200	95,170	11,880
1971	15,000	62,160	6,600
1972	51,000	30,960	28,160
1973	55,000	493,780	72,610
1974	22,333	56,940	29,280
1975	34,855	452,430	3,640
1976	9,056	57,090	25,670
1977	31,562	130,510	43,940
1978	42,284	85,450	18,160
1979	48,281	70,980	6,330
1980	142,253	214,930	23,340
1981	156,112	106,450	2,050
1982	180,314	368,380	22,130
1983	38,783	310,330	61,410
1984	63,622	429,450	19,690
1985	163,311	296,970	22,140
1986	71,095	101,600	13,140
1987	187,263	147,060	24,510
1988	72,052	37,070	39,240
1989	37,751	45,510	22,680
1990	8,949	49,110	26,020
20 Year Average (1970-1989)	72,856	179,661	24,830

a Escapement count of sockeye salmon past the Coghill River weir.

b Pink and chum escapements estimated for streams in district by aerial surveys. Historical data revised in 1990.

SOCKEYE SALMON CATCH and ESCAPEMENT

COGHILL DISTRICT



Appendix C.7. Sockeye salmon catch and escapement in the Coghill District, Prince William Sound, 1978 - 1990.

Appendix C.8. Estimated age and sex composition of the sockeye salmon escapement past the Coghill River weir, 1990.

		Brood Year and Age Group									
		1987		1986		1985		1984		1983	
		0.2	0.3	1.2	1.3	2.2	1.4	2.3	2.4	Total	
Strata Combined		06/25 - 07/25									
Sampling Dates		07/05 - 07/20									
Sample Size:		857									
Female	Percent of Sample	0.1	0.5	7.5	38.3	2.6	1.4	2.8	0.0	53.2	
	Number in Catch	8	46	670	3,428	231	128	252	0	4,763	
Male	Percent of Sample	0.4	1.0	13.8	24.8	3.2	1.0	2.6	0.1	46.8	
	Number in Catch	33	87	1,232	2,219	283	90	229	13	4,186	
Total	Percent of Sample	0.5	1.5	21.3	63.1	5.7	2.4	5.4	0.1	100.0	
	Number in Catch	41	133	1,903	5,646	514	218	480	13	8,949	
	Standard Error	21	39	129	151	71	49	67	13		

Appendix C.9. Commercial salmon harvest by period in the Unakwik District drift gill net and purse seine fisheries, Prince William Sound, 1990. The periods listed are for those that registered active fishing participation. For a listing of all fishing periods see Appendix C.12. ^a

Period	Date	Hours	Permit	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Gear: Drift Gill Net														
01	7/23	12	2	3	1	7	54	390	0	0	140	539	12	87
02	7/26	12	1	1	0	0	20	108	0	0	5	18	0	0
04	8/02 - 8/04	48	1	1	2	20	34	241	0	0	24	84	0	0
05	8/06 - 8/10	108	1	5	0	0	97	597	86	636	2,857	8,564	8	66
06	8/13 - 8/24	24	1	2	0	0	24	140	10	61	1,830	5,494	0	0
07	8/17 - 8/19	56	2	5	0	0	18	124	31	241	5,130	15,412	3	31
Totals			5	17	3	27	247	1,600	127	938	9,986	30,111	23	184
Average Weight						9.00		6.48		7.39		3.02		8.00

^a No purse seine catch was recorded for 1990.

Appendix C.10. Commercial salmon catch by species in the Unakwik District, Prince William Sound, 1976 - 1990.^a

Year	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
DRIFT GILL NET						
1976	4	8,421	0	2,744	331	11,500
1977	3	7,912	2	257	141	8,315
1978	24	9,116	0	2,082	597	11,819
1979	11	9,250	9	2,359	289	11,918
1980	0	1,547	6	4,815	727	7,095
1981	0	2,445	0	4,152	1,330	7,927
1982	1	48,947	0	335	598	49,881
1983	3	13,215	0	1,515	1,426	16,159
1984	2	18,522	0	27,742	7,125	53,391
1985	26	27,532	22	9,191	3,942	40,713
1986	5	25,759	1	1,973	2,463	30,201
1987	2	5,894	1	4,871	1,356	12,124
1988	15	8,589	0	281	1,504	10,389
1989	31	21,412	27	41,820	404	63,694
1990	3	247	127	9,986	23	30,111
Ten Year Average (1980-89)	9	17,386	6	9,670	2,088	29,157
PURSE SEINE						
1976	0	7	0	8,526	225	8,758
1977 ^a						
1978	3	268	5	55,115	5,025	60,416
1979 ^a						
1980	0	6	0	9,113	355	9,474
1981	0	108	0	71,624	17,650	89,382
1982	0	2	4	89,137	517	89,660
1983	0	6	0	3,344	716	4,066
1984 ^a						
1985	0	138	0	28,210	4,123	32,471
1986	0	76	0	4,718	4,675	9,469
1987	0	146	0	187,752	6,549	194,447
1988	0	667	7	57,844	23,860	82,378
1989 ^a						
1990 ^a						
Ten Year Average (1980-89)	0	144	1	56,468	7,306	63,918
COMBINED GEARS						
1976	4	8,428	0	11,270	556	20,258
1977	3	7,912	2	257	141	8,315
1978	27	9,384	5	57,197	5,622	72,235
1979	11	9,250	9	2,359	289	11,918
1980	0	1,553	6	13,928	1,082	16,569
1981	0	2,553	0	75,776	18,980	97,309
1982	1	48,949	4	89,472	1,115	139,541
1983	3	13,221	0	4,859	2,142	20,225
1984	2	18,522	0	27,742	7,125	53,391
1985	26	27,670	22	37,401	8,065	73,184
1986	5	25,835	1	6,691	7,138	39,670
1987	2	6,040	1	192,623	7,905	206,571
1988	15	9,256	7	58,125	25,364	92,767
1989	31	21,412	27	41,820	404	63,694
1990	3	247	127	9,986	23	30,111
Ten Year Average (1980-89)	9	17,501	7	54,844	7,932	80,292

^a No catch recorded.

Appendix C.11. Summary of periods, dates, hours fished, and emergency orders issued for the commercial salmon fisheries in the Coghill and Unakwik districts, Prince William Sound, 1990.

Unakwik (229)			Coghill (223)			Emergency Orders Issued
Periods	Dates	Hours Fished	Periods	Dates	Hours Fished	
			1	6/14 - 6/15	24	2-F-E-16-90 ^a
			2	6/18 - 6/19	24	2-F-E-16-90
			3	6/21 - 6/22	24	2-F-E-16-90
			4	6/25 - 6/26	24	2-F-E-16-90
			5	6/28 - 6/29	24	2-F-E-16-90
			6	7/02 - 7/03	24	2-F-E-24-90 ^b
						2-F-E-25-90 ^c
1	7/23	12	7	7/23	12	2-F-E-32-90 ^d
2	7/26	12	8	7/26	12	2-F-E-35-90 ^e
3	7/30	12	9	7/30	12	2-F-E-36-90 ^f
4	8/02 - 8/04	48	10	8/02 - 8/04	48	2-F-E-38-90 ^g
5	8/06 - 8/10	108	11	8/06 - 8/10	108	2-F-E-39-90 ^g
6	8/13 - 8/14	24	12	8/13 - 8/14	24	2-F-E-41-90 ^h
7	8/17 - 8/19	56	13	8/17 - 8/26	228	2-F-E-43-90 ⁱ
						2-F-E-44-90 ⁱ
						2-F-E-45-90 ⁱ
			14	8/27 - 9/02	168	
			15	9/03 - 9/09	168	
			16	9/10 - 9/16	168	
			17	9/17 - 9/23	168	
			18	9/24 - 9/30	168	
			19	10/01 - 10/03	60	2-F-E-53-90

- a The season was officially open beginning 8:00 p.m. on Thursday, June 14. The Esther Subdistrict opened to a weekly schedule of two 24 hour fishing periods per week. The weekly schedule was from 8:00 a.m. Monday until 8:00 a.m. Tuesday and from 8:00 p.m. Thursday until 8:00 p.m. Friday.
- b Due to poor escapement trend of sockeye salmon at Coghill Lake and the decline in brood stock collection at the Esther Hatchery, the 60 mesh maximum depth restriction for gill nets in the Coghill and Unakwik Districts remained in effect after Monday, July 2, until further notice.
- c This emergency order closed the Esther Subdistrict to commercial fishing effective 8:00 p.m., Thursday, July 5, until further notice.
- d The Esther Subdistrict and the Unakwik District were both open for 12 hour fishing.
- e In the Esther Subdistrict, the special harvest area and sanctuary was closed inside of the normal markers at Esther Light and Hodgkin Point.
- f In the Coghill District, only the Esther Subdistrict was open.
- g The Coghill and Unakwik Districts were both open.
- h The Esther Subdistrict was closed.
- i The Unakwik and Coghill Districts were open for 56 hours. The Esther Subdistrict was extended until 8:00 p.m. Wednesday, August 22.
- j This emergency order superseded a portion of EO No. 2-F-E-44-90 and extended commercial fishing in the Esther Subdistrict to continuous seven day per week fishing until further notice. Fishing continued in the Esther Subdistrict until the season closed October 3 at 12 noon.

APPENDIX D
ESHAMY DISTRICT

Appendix D.1. Commercial salmon catch by species in the Eshamy District, Prince William Sound, 1977 - 1990.

Catch by Species						
Year ^a	Chinook	Sockeye	Coho	Pink	Chum	Total
DRIFT GILL NET						
1977	22	16,916	49	63,036	8,344	88,367
1980	0	684	25	3,235	130	4,074
1983	1	924	8	162,541	3,427	166,901
1984	7	23,490	282	247,326	15,451	286,556
1985	1	667	0	24,899	1,021	26,588
1986	0	4	1	938	65	1,008
1987	2	642	3	3,225	7,060	10,932
1988	94	50,868	794	348,873	206,060	606,689
1989 ^b						
1990	110	12,967	574	165,362	264,772	443,785
Ten Year Average (1979-88)	15	11,040	159	113,005	33,316	157,535
SET GILL NET						
1977	9	9,889	2	24,743	4,218	38,861
1980	0	2,000	38	2,471	134	4,643
1983	1	1,328	10	167,942	4,463	173,744
1984	5	23,226	98	278,176	3,000	304,505
1985	1	3,439	74	33,284	1,295	38,093
1986	9	1,043	86	42,123	5,764	49,025
1987	31	5,387	336	86,677	45,099	137,530
1988	100	18,321	283	180,456	93,577	292,737
1989 ^b						
1990	56	10,204	532	369,589	94,494	474,875
Ten Year Average (1979-88)	21	7,821	132	113,018	21,905	142,897
COMBINED GEAR						
1977	31	26,805	51	87,779	12,562	127,228
1980	0	2,684	63	5,706	264	8,717
1983	2	2,252	18	330,483	7,890	340,645
1984	12	46,716	380	525,502	18,451	591,061
1985	2	4,106	74	58,183	2,316	64,681
1986	9	1,047	87	43,061	5,829	50,033
1987	33	6,029	339	89,902	52,159	148,462
1988	194	69,189	1,077	529,329	299,637	899,426
1989 ^b						
1990	166	23,171	1,106	534,951	359,266	918,660
Ten Year Average (1979-88)	36	18,860	291	226,024	55,221	300,432

^a Fishing was closed for years 1975, 1976, 1978, 1979, 1981, and 1982.

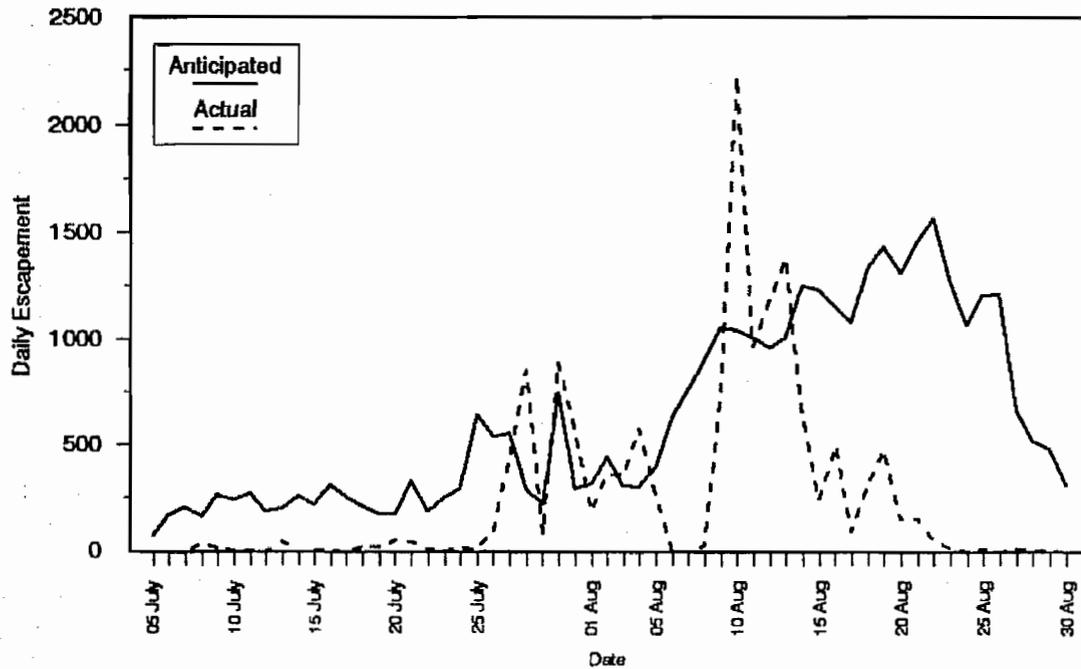
^b Closed due to oil contamination on beaches.

Appendix D.2. Daily salmon escapement at the Eshamy Lake weir, Prince William Sound, 1990.

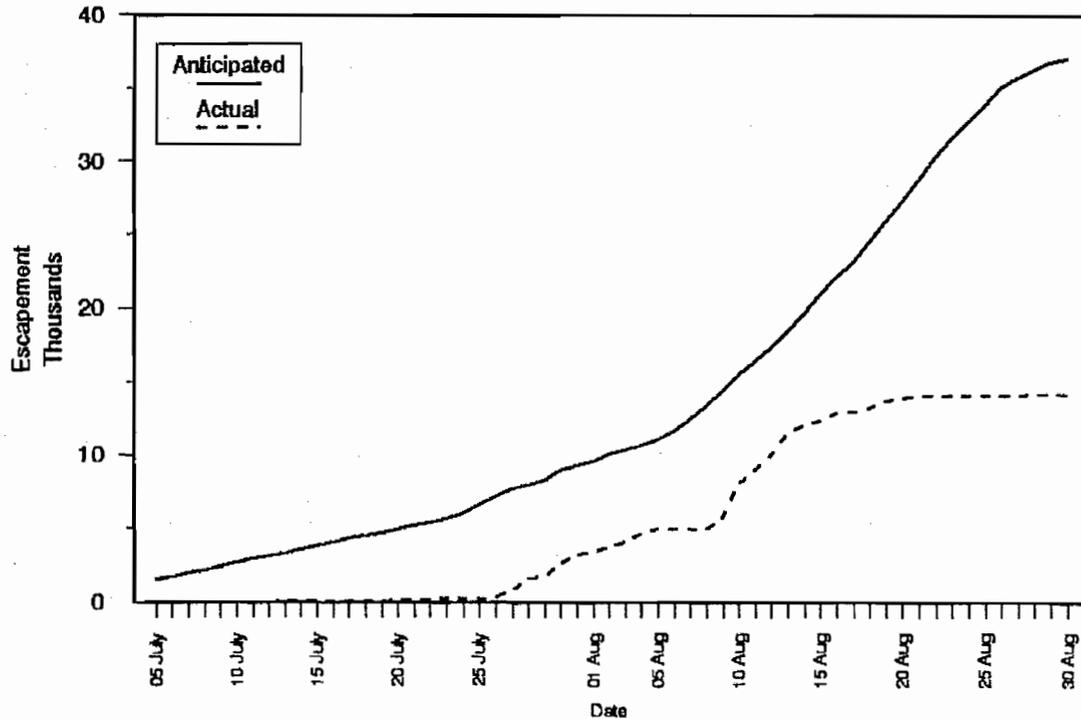
Date	Sockeye		Sockeye Jacks		Pink		Chum		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
07/05	0	0		0		0		0		0
07/06	0	0		0		0		0		0
07/07	0	0		0		0		0		0
07/08	35	35		0		0		0		0
07/09	18	53		0		0		0		0
07/10	4	57		0		0		0		0
07/11	2	59		0		0		0		0
07/12	0	59		0		0		0		0
07/13	46	105		0		0		0		0
07/14	1	106		0		0		0		0
07/15	2	108		0		0		0		0
07/16	3	111		0		0		0		0
07/17	0	111		0		0		0		0
07/18	21	132		0		0		0		0
07/19	21	153		0		0		0		0
07/20	51	204		0	1	1		0		0
07/21	44	248		0	4	5		0		0
07/22	9	257		0	0	5		0		0
07/23	6	263		0	4	9		0		0
07/24	17	280		0	4	13		0		0
07/25	12	292		0	2	15		0		0
07/26	99	391		0	5	20		0		0
07/27	443	834		0	15	35		0		0
07/28	854	1,688		0	88	123		0		0
07/29	85	1,773		0	2	125		0		0
07/30	888	2,661	3	3	83	208		0	1	1
07/31	563	3,224	3	6	49	257		0	0	1
08/01	189	3,413	0	6	12	269		0	0	1
08/02	364	3,777	1	7	74	343		0	0	1
08/03	359	4,136	3	10	55	398		0	0	1
08/04	578	4,714	2	12	85	483	1	1	0	1
08/05	272	4,986	0	12	27	510	4	5	0	1
08/06	0	4,986	0	12	0	510	0	5	0	1
08/07	0	4,986	0	12	0	510	0	5	0	1
08/08	30	5,016	0	12	6	516	0	5	0	1
08/09	757	5,773	0	12	35	551	0	5	1	2
08/10	2,230	8,003	0	12	353	904	0	5	10	12
08/11	968	8,971	9	21	223	1,127	0	5	8	20
08/12	1,190	10,161	1	22	216	1,343	0	5	30	50
08/13	1,377	11,538	1	23	326	1,669	0	5	120	170
08/14	633	12,171	3	26	75	1,744	0	5	52	222
08/15	242	12,413	2	28	64	1,808	0	5	10	232
08/16	495	12,908	5	33	73	1,881	0	5	9	241
08/17	94	13,002	2	35	23	1,904	0	5	2	243
08/18	305	13,307	4	39	70	1,974	0	5	12	255
08/19	481	13,788	3	42	47	2,021	0	5	6	261
08/20	150	13,938	0	42	44	2,065	0	5	10	271
08/21	155	14,093	1	43	48	2,113	0	5	0	271
08/22	55	14,148	0	43	21	2,134	0	5	9	280
08/23	13	14,161	0	43	4	2,138	0	5	0	280
08/24	0	14,161	0	43	0	2,138	0	5	0	280
08/25	8	14,169	0	43	0	2,138	0	5	1	281
08/26	0	14,169	0	43	0	2,138	0	5	0	281
08/27	11	14,180	0	43	31	2,169	0	5	0	281
08/28	4	14,184	0	43	20	2,189	0	5	2	283
08/29	7	14,191	0	43	20	2,209	0	5	3	286
08/30	0	14,191	0	43	0	2,209	0	5	0	286
Totals	14,191		43		2,209		5		286	

1990 ESHAMY SOCKEYE SALMON ESCAPEMENT

DAILY COUNTS



CUMULATIVE - ESCAPEMENT GOAL OF 40,000



Appendx D.3. Anticipated and actual daily and cumulative sockeye salmon escapement at the Eshamy weir, Prince William Sound, 1990.

Appendix D.4. Salmon escapement by species at the Eshamy weir, Prince William Sound, 1967 - 1990.

Year	Escapement by Species ^a					Total
	Chinook	Sockeye	Coho	Pink	Chum	
1967	0	10,821	192	10,433	1	21,447
1968	1	68,048	450	919	1	69,419
1969	0	61,196	96	3,095	2	64,389
1970	0	11,460	25	387	0	11,872
1971	0	954 ^b	97	3,179	0	4,230
1972		28,683				28,683
1973	0	10,202	205	1,698	0	12,105
1974		633				633
1975		1,724				1,724
1976		19,367				19,367
1977	0	11,746	230	32,080	0	44,056
1978	0	12,580	20	552	0	13,152
1979	0	12,169	5	3,654	1	15,829
1980	5	44,263	128	963	2	45,361
1981	1	23,048 ^c	249	5,956	13	29,267
1982	0	6,782 ^d	79	1,056	79	7,996
1983	0	10,348	40	7,047	4	17,439
1984	2	36,121 ^e	881	3,970	0	40,974
1985	0	26,178	96	6,271	0	32,545
1986	2	6,949	55	1,004	31	8,041
1987 ^f						
1988	2	31,747	48	1,205	1	33,003
1989 ^g	1	57,106	0	6,283	210	63,600
1990 ^h		14,191	43	2,209	5	16,448
20 Year Average	1	20,663	141	4,900	21	24,713

^aIncidental passage of salmon other than sockeye were not recorded for each year.

^bProbably inaccurate because of holes in weir. Actual escapement is estimated to be at least 3,000.

^cAssuming the run was 90 percent complete, an additional 2,600 sockeye are estimated to have escaped following weir removal.

^dAn estimated 270 sockeye below the weir when pulled is included in the total count.

^eAn estimated 25 sockeye below the weir at removal are included in the total count.

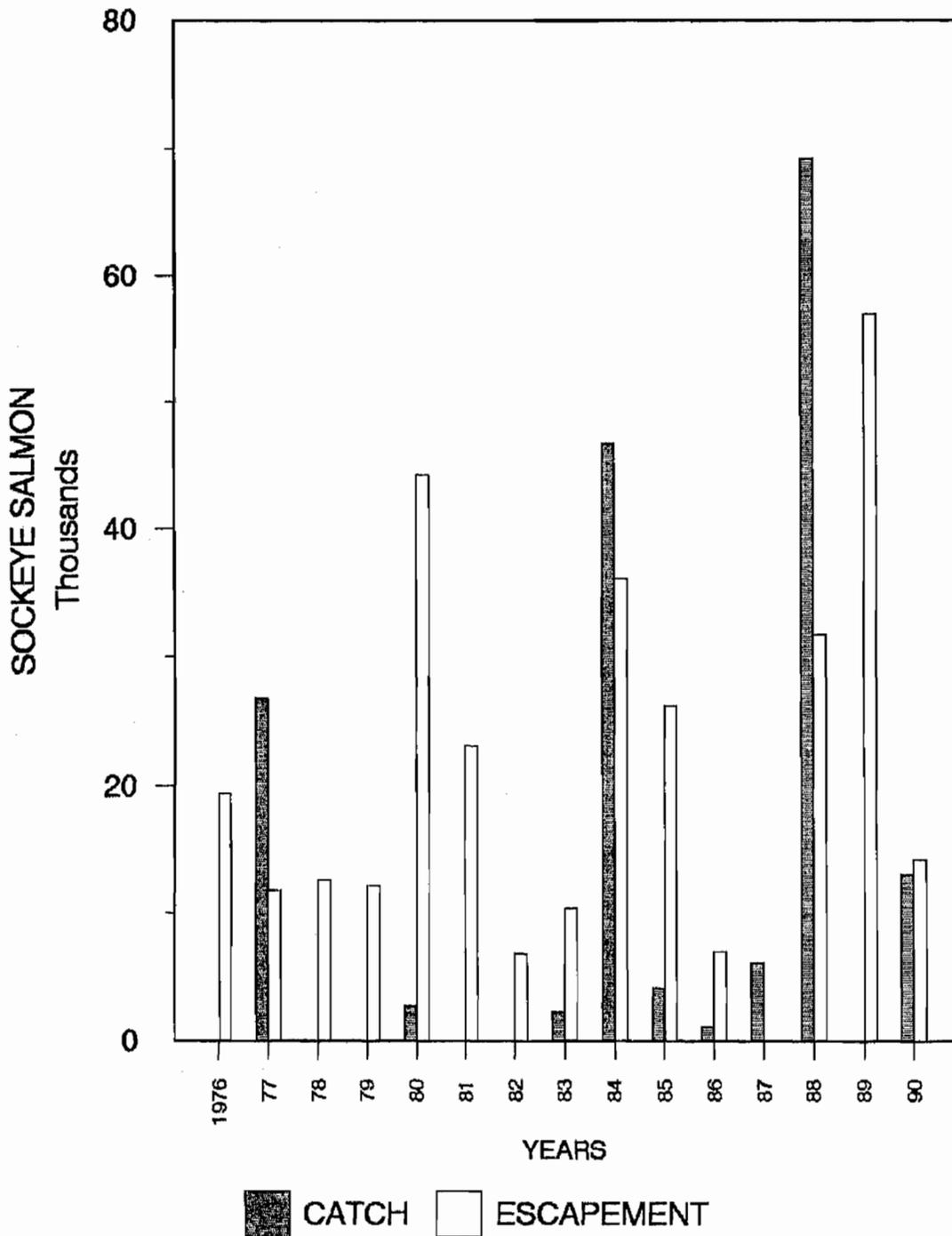
^fThe Eshamy weir was not in operation during 1987.

^gTotal does not include 126 jacks.

^hTotal does not include 286 sockeye jacks.

SOCKEYE SALMON CATCH AND ESCAPEMENT

ESHAMY DISTRICT



Appendix D.5. Sockeye salmon catch and escapement, Eshamy District, Prince William Sound, 1976 - 1990.

Appendix D.6. Estimated age and sex composition of sockeye salmon harvested in the Eshamy District commercial gill net fishery and to the lake at the head of Eshamy Lagoon, 1990.

		Brood Year and Age Group									
		1987		1986		1985		1984		1983	
		0.2	1.1	0.3	1.2	1.3	2.2	1.4	2.3	2.4	Total
Eshamy District Commercial Catch											
Stratum Dates		06/11 - 08/28									
Sampling Date		06/28 - 08/01									
Sample Size:		175									
Female	Percent of Sample	1.7	0.6	4.0	11.4	38.3	7.4	0.0	5.1	0.0	68.6
	Number in Catch	397	132	927	2,648	8,871	1,721	0	1,192	0	15,889
Male	Percent of Sample	0.0	0.0	0.6	11.4	17.7	0.6	0.0	1.1	0.0	31.4
	Number in Catch	0	0	132	2,648	4,105	132	0	265	0	7,282
Total	Percent of Sample	1.7	0.6	4.6	22.9	56.0	8.0	0.0	6.3	0.0	100.0
	Number in Catch	397	132	1,059	5,296	12,976	1,854	0	1,456	0	23,171
	Standard Error	228	132	367	738	872	477	0	426	0	
Eshamy Lake Escapement											
Strata Combined		07/05 - 08/30									
Sampling Date		07/28 - 08/10									
Sample Size:		1,043									
Female	Percent of Sample	0.0	0.0	0.0	13.3	28.9	3.4	0.6	2.5	0.1	48.7
	Number in Catch	0	0	0	1,886	4,108	476	86	349	10	6,916
Male	Percent of Sample	0.0	0.0	0.1	10.5	33.5	1.9	1.2	3.6	0.1	50.9
	Number in Catch	0	0	17	1,494	4,752	265	168	509	20	7,224
Total	Percent of Sample	0.0	0.0	0.1	24.1	62.6	5.2	1.8	6.0	0.2	100.0
	Number in Catch	0	0	17	3,415	8,877	740	254	858	30	14,191
	Standard Error	0	0	17	195	220	102	50	100	17	

Appendix D.7. Summary of periods, dates, hours fished, and emergency orders issued for the commercial salmon fisheries in the Eshamy District, Prince William Sound, 1990.

Main Bay Subdistrict (225-21)			Crafton Island Subdistrict (225-10, 20, 30)			Emergency Orders Issued
Periods	Dates	Hours Fished	Periods	Dates	Hours Fished	
1	6/11 - 6/17	160	1	6/11 - 6/15	60	2-F-E-16-90 ^a 2-F-E-18-90 ^b 2-F-E-21-90 ^c
2	6/18 - 6/24	168	2	6/18 - 6/22	60	
3	6/25 - 7/01	168	3	6/25 - 6/29	60	
4	7/02 - 7/08	168	4	7/02-03, 7/05-06	48	2-F-E-24-90 ^d
5	7/09 - 7/15	168	5	7/09-10, 7/12-13	48	2-F-E-27-90 ^e
6	7/30 - 8/05	160				2-F-E-36-90 ^f 2-F-E-37-90 ^g 2-F-E-40-90 ^h 2-F-E-41-90 ⁱ
7	8/06 - 8/12	168				
8	8/13 - 8/19	168				
9	8/20 - 8/26	168				
10	8/27 - 9/02	168				
	9/03 - 10/03	732				2-F-E-53-90 ^j

^aSeparate schedules were established for the Crafton Island and Main Bay Subdistricts. The Main Bay Subdistrict opened to set and drift gill nets at 8:00 a.m. on June 11, and remained open to continuous fishing until further notice. In an effort to collect sockeye brood at the hatchery, the AGZ was closed at the start of the fishery. The Crafton Island Subdistrict was opened at 8:00 a.m. June 11 to a weekly schedule of five day fishing periods per week lasting from 8:00 a.m. Monday until 8:00 p.m. Friday.

^bThis emergency order established closures of two designated beach areas impacted by the Exxon Valdez oil spill which posed an appreciable likelihood of fouling commercial fishing gear or adulterating product.

^cThis emergency order opened the Alternating Gear Zone in Main Bay, on alternating days to drift gill nets and set gill nets effective at 8:00 a.m., June 16, and lasting until further notice. Drift gill net gear was operated for 24 hour periods commencing at 8:00 a.m. ADT on even numbered days, and set gill net gear on odd numbered days.

^dThe weekly fishing schedule in the Crafton Island Subdistrict was reduced as follows: Effective 8:00 a.m. Monday, July 2, the weekly fishing schedule will be from 8:00 a.m. Monday until 8:00 a.m. Tuesday (24 hours) and from 8:00 p.m. Thursday until 8:00 p.m. Friday (24 hours) until further notice.

^eThe Alternating Gear Zone was closed effective 8:00 a.m., Tuesday, July 10, and lasting until further notice.

^fThe Main Bay Subdistrict was re-opened to continuous seven day per week fishing commencing at 8:00 a.m. Monday, July 30. The Alterating Gear Zone was closed until further notice for the protection of sockeye brood stock.

^gThis emergency order reopened the AGZ effective 8:00 a.m., Tuesday, July 31, and lasting until further notice.

^hThe AGZ was closed effective 8:00 a.m., Monday, August 6, until further notice.

ⁱThe AGZ was reopened commencing at 8:00 a.m., Saturday, August 11.

^jDistrict closed for the remainder of season at 12 noon, Oct 3.

APPENDIX E

PRINCE WILLIAM SOUND

PURSE SEINE FISHERY

Appendix E.1.

Commercial purse seine catch of salmon by species by day, Prince William Sound, 1990. Includes the common property commercial catch of salmon from all districts open to purse seines: Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern and Southeastern districts. Districts referenced as open may have been partially closed. See appendices C.12. and E.16 for more detailed information.

Catch Date	Hours	Permits	Chinook		Sockeye		Coho		Pink		Chum	
			Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
06/28 ^a	12	213	23	214	277	1,757	18	130	594,432	1,736,072	51,029	460,612
07/02 ^b	12	229	20	258	170	1,070	21	131	1,098,831	3,048,768	7,768	72,945
07/05 ^c	12	199	5	70	133	880	23	175	1,726,726	4,986,587	2,292	21,150
07/06 ^c	24	176	11	191	38	247	7	62	867,673	2,461,165	1,552	14,284
07/09 ^d	12	240	2	13	156	1,002	20	140	854,237	2,442,171	10,271	95,603
07/12 ^e	12	235	13	136	226	1,427	142	1,026	437,126	1,246,619	8,967	82,031
07/16 ^f	11	191	1	20	47	288	15	123	501,886	1,469,855	5,560	52,017
07/19 ^g	12	200	1	15	53	335	32	321	800,689	2,316,500	7,207	73,193
07/23 ^h	12	247	10	129	413	2,727	146	1,144	674,643	1,951,554	22,778	231,122
07/26 ⁱ	12	245	2	14	582	3,541	1,282	10,337	435,571	1,272,350	21,445	203,387
07/30 ^j	12	257	6	59	2,161	13,999	1,506	10,986	1,554,440	4,466,182	17,230	157,345
08/02 ^k	16	200	1	9	2,227	14,516	449	3,592	1,400,940	4,104,962	14,105	130,772
08/03 ^k	24	201	2	47	2,443	16,100	898	7,022	1,583,212	4,669,671	8,214	75,554
08/04 ^k	8	142	0	0	1,069	7,121	827	6,553	698,745	2,060,585	4,129	36,493
08/06 ^l	16	213	5	92	1,414	9,145	1,198	10,264	1,605,865	4,795,503	8,480	77,565
08/07 ^l	24	198	1	7	1,289	8,538	1,334	10,945	1,459,953	4,365,359	6,542	62,230
08/08 ^l	24	208	2	33	1,701	11,629	3,125	24,590	1,519,119	4,482,441	5,905	54,250
08/09 ^l	24	181	1	11	829	5,669	1,539	12,694	1,188,643	3,544,875	3,119	28,996
08/10 ^l	20	230	1	30	1,245	8,342	4,036	32,705	1,656,050	4,932,534	4,797	45,695
08/11 ^m	16	211	1	12	792	5,325	5,046	41,309	1,963,245	5,958,261	29,608	284,312
08/14 ^m	8	184	1	20	327	2,208	1,155	9,583	828,685	2,536,003	7,353	74,640
08/17 ⁿ	12	211	1	2	821	5,396	4,525	37,525	1,826,274	5,602,996	7,457	72,005
08/18 ⁿ	24	216	2	29	808	5,330	7,668	64,074	1,874,139	5,751,436	4,604	43,930
08/19 ⁿ	24	205	0	0	584	3,909	9,313	83,361	1,206,666	3,692,417	4,248	41,028
08/20 ⁿ	24	20	0	0	9	52	457	3,828	43,945	135,450	106	844
08/21 ^o	24	192	2	30	559	3,646	10,027	92,387	1,221,621	3,806,614	2,651	23,760
08/22 ^o	24	212	0	0	578	3,793	11,636	100,464	1,168,396	3,603,990	3,144	27,901
08/23 ^o	24	7	1	11	3	19	675	6,788	19,229	57,961	20	170
08/24 ^o	24	163	0	0	507	3,384	6,016	52,834	938,202	2,882,283	790	6,906
08/25 ^o	24	182	0	0	577	3,916	9,137	83,731	735,865	2,246,588	898	8,191
08/26 ^q	24	7	0	0	0	0	444	4,042	10,288	31,933	4	32
08/27 ^p	24	69	0	0	83	563	559	5,044	128,402	393,526	63	577
08/28 ^p	24	62	0	0	89	608	645	6,060	163,692	506,534	97	845
08/29 ^q	24	6	0	0	0	0	439	4,242	18,568	56,469	12	115
08/30 ^q	24	16	0	0	1	8	2,262	19,249	62,016	184,740	31	284
08/31 ^q	24	14	0	0	0	0	1,531	13,879	46,703	143,985	18	169
09/01 ^q	24	10	0	0	1	7	800	6,534	25,950	78,550	13	111
09/02 ^q	24	8	0	0	0	0	498	4,219	10,826	32,520	4	32
09/03 ^q	24	4	0	0	0	0	309	2,899	6,621	19,724	3	29
09/04 ^q	24	-	0	0	0	0	139	1,260	1,040	3,647	0	0
09/05 ^q	24	-	0	0	0	0	30	265	2,281	6,909	3	14
09/06 ^q	24	-	0	0	1	5	68	515	2,698	10,000	1	5
Totals		266	115	1,452	22,213	146,502	89,997	777,032	32,964,133	98,096,289	272,518	2,561,144
Average Weight				12.63		6.60		8.63		2.98		9.40

a Areas open included the Eastern District, Southeastern District, and all waters of the Northern District east of the longitude of Pt. Pellew. The Valdez Narrows Subdistrict and the Port of Valdez was closed.

b Areas open included the Eastern District, Southeastern District, and all waters of the Northern District east of the longitude of Pt. Pellew. All waters of Boulder Bay and the Valdez Narrows Subdistrict were open. Port Valdez was closed inside of 146°30.5' W. longitude. The SHTF enlarged closed waters were placed into effect until further notice.

- c Areas open included the Eastern District, Southeastern District, and Northern District east of the longitude of Pt. Pellew for 12 hours. The Valdez Narrows Subdistrict and waters of Port Valdez including the Special Harvest area were open for 36 hours. In Boulder Bay only, fishing was permitted inside of marked stream closures.
- d Areas open included the Eastern District, Southeastern District, and Northern District east of longitude of Pt. Pellew. Port Valdez was closed inside of $146^{\circ}26.9'$ W. longitude.
- e Areas open included the Eastern District, Southeastern District, and Northern District east of longitude of Pt. Pellew. Waters of the Port Valdez east of $146^{\circ}30.5'$ W. longitude were closed.
- f The Valdez Narrows Subdistrict and waters of Port Valdez were the only waters open. Solomon Gulch Special Harvest Area was closed.
- g The Valdez Narrows Subdistrict and waters of Port Valdez were open. Solomon Gulch Special Harvest Area was closed inside of a line from a shore marker at Allison Pt. 300 yards east of the western Special Harvest Area Boundary marker, to the octagonal net pen.
- h The Valdez Narrows Subdistrict and waters of Port Valdez were open. Solomon Gulch Special Harvest Area was closed inside of a line from a shore marker at Allison Pt. 300 yards east of the western Special Harvest Area Boundary marker, to the octagonal net pen. The Esther Subdistrict, the San Juan Subdistrict and waters of Unakwik Inlet west of $147^{\circ}30.0'$ W. longitude and north of $60^{\circ}52.6'$ N. latitude were also open.
- i Open waters included the Valdez Narrows Subdistrict and the inside waters of Port Valdez, the Esther Subdistrict, the San Juan Subdistrict and waters of Unakwik Inlet west of $147^{\circ}30.0'$ W. longitude and north of $60^{\circ}52.6'$ N. latitude.
- j Open waters included the Northern, Unakwik, Northwestern, Southwestern, Montague, Southeastern, and the Esther Subdistricts.
- k The Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague, and Southeastern District were open. Closed waters included the waters of Unakwik Inlet in the Northern District west of $147^{\circ}30.0'$ W. long., and north of $60^{\circ}52.6'$ N. lat.
- l The Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague, and Southeastern Districts were open. The Port San Juan and Point Elrington subdistricts were closed.
- m The Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague, and Southeastern Districts were open. The Esther Subdistrict, the Port San Juan Subdistrict, and Point Elrington Subdistrict were closed.
- n The Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague, and Southeastern Districts were open from 8/17-8/19 for 56 hours. The Port San Juan Subdistrict and waters of Unakwik Inlet were closed. The Esther Subdistrict opening was extended until the season closed, October 3.
- o The Eastern, Southwestern, Montague and Southeastern Districts were open 8/21 - 8/22 for 36 hrs. and 8/24 - 8/25 for 36 hrs; The waters of the Northern District west of the Longitude of Pay Day Point and the waters of the Northwestern District east of the Longitude of Pt. Culross. The Port San Juan Subdistrict was closed.
- p The Port San Juan Subdistrict was open for 36 hours, 8/27 - 8/28.
- q The Esther Subdistrict was open to continuous fishing until the season closed, Oct. 3.

Appendix E.2. Commercial salmon harvest by all gear types, by species,
Prince William Sound, 1971 - 1990.^a

Catch by Species						
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1971	3,551	88,368	30,551	7,310,964	574,265	8,007,699
1972 ^b	547	197,526	1,634	54,783	45,370	299,860
1973	2,405	124,802	1,399	2,056,878	729,839	2,915,323
1974 ^b	1,590	129,366	801	448,773	88,544	669,074
1975	2,519	189,613	6,142	4,452,805	100,479	4,751,558
1976	1,044	112,809	6,171	3,018,991	370,478	3,509,493
1977	648	310,358	843	4,513,082	572,610	5,397,541
1978	1,042	222,083	1,495	2,913,721	485,147	3,623,488
1979	2,015	150,040	6,843	15,607,620	326,414	16,092,932
1980	189	189,816	2,952	14,157,057	482,016	14,832,030
1981	404	251,222	4,383	20,524,470	1,878,716	22,659,195
1982	255	1,055,099	24,362	20,396,222	1,335,368	22,811,306
1983	1,048	92,111	10,496	14,038,796	1,041,309	15,183,760
1984	489	311,955	12,420	22,086,806	1,201,842	23,613,512
1985	1,104	493,278	19,753	25,056,663	1,280,093	26,850,891
1986	1,330	488,715	12,277	11,407,271	1,683,049	13,592,642
1987	874	540,109	47,751	29,198,507	1,904,494	31,691,735
1988	1,037	183,572	75,709	11,817,323	1,832,114	13,846,584
1989	1,113	140,090	203,574	21,860,582	995,962	23,201,321
1990	447	58,497	234,525	44,163,479	959,838	45,416,786
<hr/>						
Ten Year						
Average	784	374,597	41,368	19,054,370	1,363,496	20,828,298
(1980-89)						

a Includes purse seine, drift gill net and set gill net catches from all Prince William Sound fishing districts; Eastern, Northern, Unakwik, Coghill, Northwestern, Eshamy, Southwestern, Montague and Southeastern. Also includes hatchery sales salmon harvest to offset operational costs for hatcheries, confiscated salmon and educational special use permits.

b General purse seine season closed.

Appendix E.3. Commercial pink salmon harvest for all gear types, by district, Prince William Sound, 1969-1990. Includes purse seine, drift gill net and set gill net catches from all Prince William Sound districts; Unakwik catches are included in the Northern District. Does not include hatchery cost recovery harvests.

Year	District							Total	
	Eastern	Northern	Coghill	Northwestern	Eshamy	Southwestern	Montague		Southeastern
1969	963,583	262,403	43,134	268,240	0	2,565,737		696,182	4,799,279
1970	358,326	308,797	100,338	371,528	0	1,518,700		90,438	2,748,127
1971 ^a	1,974,605	666,308	323,841	163,401		3,901,939		276,605	7,306,699
1972 ^b		9,408			54,781				64,189
1973	327,453	183,467	95,793	127,197	0	407,388		657,429	1,945,505
1974 ^b		163,328			285,441				448,769
1975	712,328	171,657	303,597	420,891		1,673,887		875,456	4,276,283
1976	1,380,943	384,267	217,696	207,190		589,458		82,366	2,861,920
1977	1,673,044	147,964	230,215	208,727	0	930,469		824,374	4,091,897
1978	1,516,076	933,013	13,059					216,696	2,678,844
1979	4,500,032	115,886	38,560	59,423		5,111,073		4,160,925	15,333,312
1980	3,140,134	1,271,177	134,876	306,109	0	7,507,776		1,271,389	13,632,411
1981	4,797,583	1,194,621	34,155	46,874		10,371,220		278,879	19,944,600
1982	2,959,601	2,331,903	1,000,524	520,972	3,997	10,801,771		6,444	18,372,328
1983	2,430,063	1,021,345	273,131	714,522		5,957,068		158,241	12,036,383
1984	4,525,029	2,194,904	996,483	1,412,822	544,082	10,197,349		11,587	21,127,298
1985	6,715,143	1,002,872	523,773	527,132	58,183	10,843,752		1,448,809	23,853,226
1986	2,488,540	944,871	214,593	285,184	43,061	6,374,535		147,268	10,498,052
1987	6,964,549	2,419,611	1,578,568	750,877	89,902	13,341,940		111,011	26,212,446
1988	481,324	286,743	2,932,072	7,738	529,329	5,411,424		1,776	9,650,406
1989	3,151,096	6,464,090	3,925,487	181,565	0 ^c	0 ^c		0 ^c	13,795,415
1990	7,970,364	5,482,585	2,692,788	891,444	534,951	17,811,479		10,658	35,406,594
10 year									
Average (1980-89)	3,765,306	1,913,214	1,161,366	475,380	158,569	8,080,684		251,990	16,912,257

^a The Eshamy District was closed to fishing.

^b The general purse seine district was closed to fishing.

^c These districts were closed due to the Exxon Valdez oil spill.

Appendix E.4. Aerial escapement indices for pink and chum salmon by district, Prince William Sound, 1990.

PINK SALMON (EVEN CYCLE)						
District	Even Cycle Desired Escapement Range		1966-88 Mean Index	Observed Escapement Index ^a	Deviation From Mean	
Eastern	427,000	- 521,000	473,923	443,660	-6.4%	
Northern/Unakwik	192,000	- 235,000	213,228	131,580	-38.3%	
Coghill	129,000	- 158,000	143,375	49,110	-65.7%	
Northwestern	122,000	- 149,000	135,387	115,870	-14.4%	
Eshamy	7,000	- 9,000	8,173	17,870	118.6%	
Southwestern	130,000	- 159,000	144,445	150,100	3.9%	
Montague	63,000	- 77,000	69,923	113,572	62.4%	
Southeastern	215,000	- 263,000	239,263	304,090	27.1%	
Total	1,285,000	- 1,571,000	1,427,717	1,325,852	-7.1%	

CHUM SALMON						
District	Desired Escapement Range		1965-89 Mean Index	Observed Escapement Index ^a	Deviation From Mean	
Eastern	84,000	- 102,000	93,844	115,100	22.7%	
Northern/Unakwik	37,000	- 45,000	41,027	112,480	174.2%	
Coghill	20,000	- 24,000	22,102	26,020	17.7%	
Northwestern	11,000	- 14,000	12,985	37,020	185.1%	
Eshamy	15	- 20	30	0	-100.0%	
Southwestern	1,300	- 1,600	1,868	80	-95.7%	
Montague	2,700	- 3,300	2,881	1,050	-63.6%	
Southeastern	15,000	- 18,000	16,683	7,275	-56.4%	
Total	171,015	- 207,920	191,420	299,025	56.2%	

^a Based on weekly aerial survey counts of 209 index spawning streams in Prince William Sound. This does not represent the total spawning escapement but rather a comparable annual index.

Appendix E.5. Pink salmon harvests and escapement indices, including hatchery sales harvests and brood stock, Prince William Sound, 1965 - 1990. Historical data revised in 1989.

Year	PINK SALMON ESCAPEMENTS ^a										Hatchery		Common Property Catch ^b	Total Run ^c
	Eastern	Northern	Coghill	Northwest	Eshamy	Southwest	Montague	Southeastern	Total	Sales	Brood			
1965	257,853	59,820	91,584	159,011	9,340	65,380	77,042	255,926	975,956	2,398,691		2,460,471	3,436,427	
66	544,980	288,710	135,840	79,960	11,720	115,570	42,220	204,570	1,423,170			2,699,418	4,122,588	
67	255,240	144,200	65,240	82,980	5,020	42,950	10,020	236,610	842,260			2,626,340	3,468,600	
68	364,930	151,120	108,020	117,430	10,770	172,770	52,350	179,120	1,156,510			2,452,168	3,608,678	
69	160,600	94,770	39,020	23,830	0	57,890	1,550	26,910	404,570			4,828,579	5,233,149	
1970	387,090	125,360	95,170	82,660	7,610	66,790	73,880	140,660	979,220			2,809,996	3,789,216	
71	352,800	126,210	62,160	14,320	1,710	79,140	296,730	179,480	1,112,550			7,310,964	8,423,514	
72	344,470	83,900	30,960	39,020	1,100	29,530	33,140	79,060	641,180			54,783	695,963	
73	309,040	69,660	493,780	2,910	0	52,320	119,520	177,780	1,225,010			2,056,878	3,281,888	
74	256,880	206,750	56,940	163,930	6,240	160,980	11,750	94,650	958,120			448,773	1,406,893	
1975	412,560	38,260	452,430	4,990	0	77,270	85,380	194,670	1,265,560		15,155	4,452,805	5,733,520	
76	472,080	139,600	57,090	68,150	5,840	52,120	13,790	117,590	926,260		40,432	3,018,995	3,985,687	
77	390,930	69,980	130,510	80,890	16,450	178,670	152,960	277,780	1,298,170		54,207	4,514,431	5,866,808	
78	279,120	163,010	85,450	132,300	5,430	258,980	56,690	164,030	1,145,010		133,648	145,061	4,203,792	
79	642,220	200,730	70,980	124,020	0	231,300	219,400	728,630	2,217,280		211,801	15,393,223	18,046,065	
1980	535,960	189,140	214,930	159,260	13,100	133,470	118,400	307,680	1,671,940		346,928	13,434,024	15,723,637	
81	599,340	243,170	106,450	51,210	3,990	93,630	255,420	359,870	1,713,080		707,037	19,286,542	22,085,837	
82	573,070	332,560	368,380	174,290	15,080	195,950	132,380	482,860	2,274,570		1,355,315	18,858,647	23,051,963	
83	481,950	168,410	310,330	196,630	12,610	161,290	230,200	601,680	2,163,100		765,924	13,309,461	16,696,998	
84	1,209,740	593,310	429,450	452,370	16,860	345,760	191,810	792,560	4,031,860		402,825	21,683,076	26,476,567	
1985	750,530	214,210	296,970	199,190	1,410	181,270	332,240	645,510	2,621,330		1,273,951	399,610	23,959,698	
86	356,380	141,420	101,600	81,490	3,840	74,980	44,680	155,830	960,220		909,219	404,038	10,498,052	
87	514,570	132,960	147,060	75,390	3,450	112,920	149,260	330,630	1,466,240		2,986,061	966,557	26,125,769	
88	362,370	143,850	37,070	73,780	490	126,440	67,990	152,540	964,530		1,667,238	844,302	9,650,406	
89	359,730	106,530	45,510	68,540	19,470	176,230	181,760	315,000	1,272,770		7,795,713	1,230,077	13,854,209	
1990	443,660	131,580	49,110	115,870	17,870	150,100	113,572	304,090	1,325,852		8,732,658	1,197,629	35,430,821	

EVEN CYCLE AVG. (1966-88)
473,923 213,228 143,175 135,387 8,173 144,445 69,923 239,263 1,427,716 802,529 375,259 7,365,701 9,413,582

ODD CYCLE AVG. (1965-89)
422,105 128,378 177,848 83,378 5,650 116,174 162,422 333,114 1,429,067 2,292,075 464,387 10,783,028 13,555,753

4198310

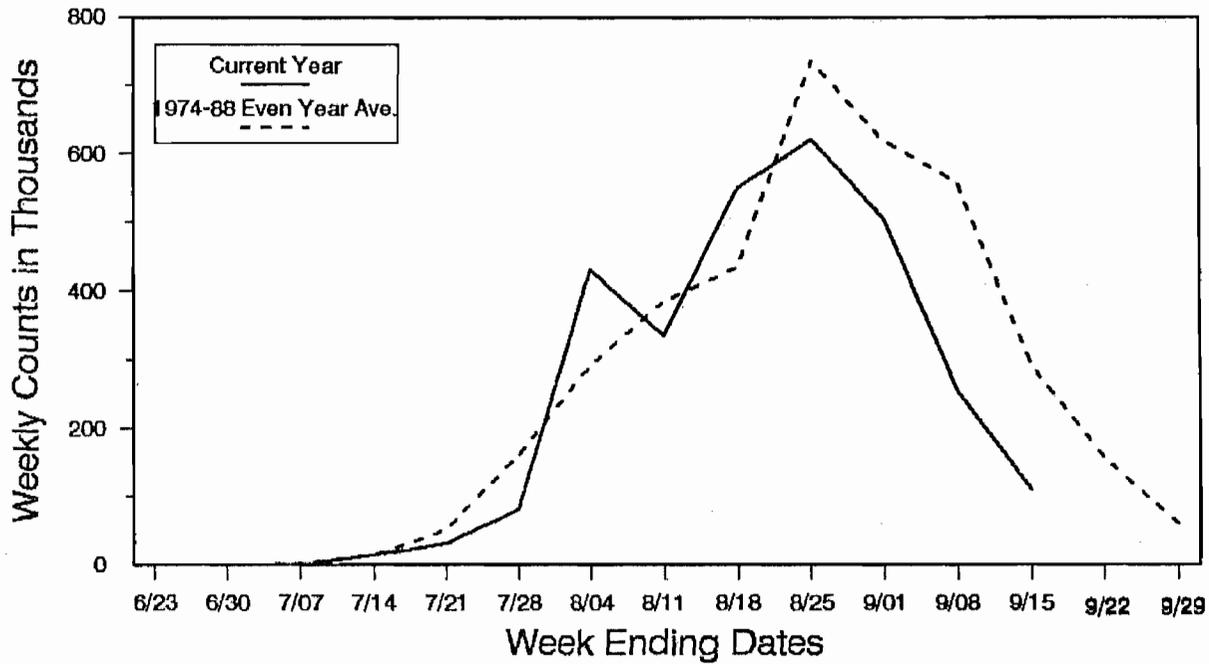
- a Coghill and Northwestern escapement figures correspond to current district boundaries.
- b Includes the common property harvest of both wild and hatchery stocks. Does not include hatchery sales harvests.
- c Represents the sum of the commercial catch, hatchery sales and brood, plus the escapement index. Does not account for wild stock escapement into non-index streams.

Appendix E.6. Weekly aerial estimates of pink salmon escapement by statistical area, Prince William Sound, 1990.

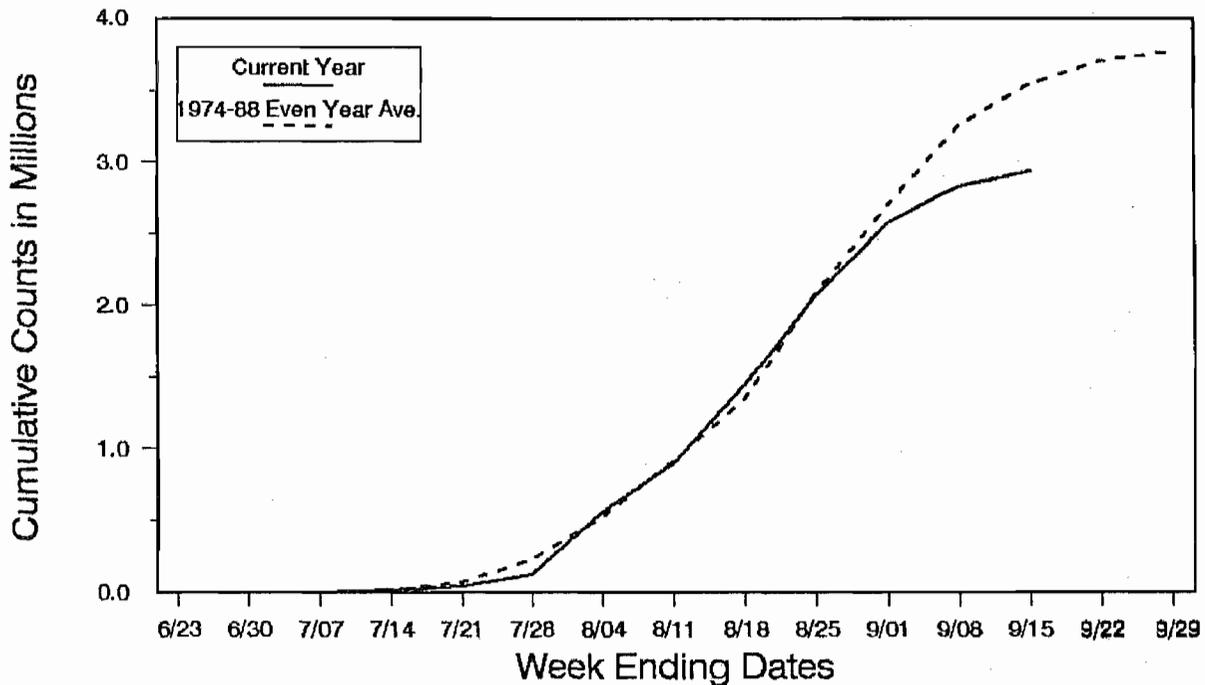
Survey Location	Subdistrict	Week Ending Dates											TOTAL	ADJ STREAM		
		6/23	6/30	7/07	7/14	7/21	7/28	8/04	8/11	8/18	8/25	9/01			9/08	9/15
Orca Inlet	221-10	0	0	0	10	570	950	1,725	2,750	4,370	1,600	2,500	580	ns	15,055	6,350
Simpson/Sheep	221-20	0	0	112	0	120	750	8,950	9,700	28,280	16,950	32,000	23,235	17,000	137,097	55,610
Gravina	221-30	0	0	630	50	350	1,670	10,950	36,100	47,970	57,775	71,950	29,460	13,100	270,005	119,360
Fidalgo	221-40	0	0	1,125	870	8,850	32,980	35,050	33,180	50,850	38,400	38,400	23,160	34,200	258,665	109,520
Valdez Arm	221-50	20	0	20	600	2,650	15,300	20,600	37,700	102,390	90,600	18,100	39,050	0	346,050	146,530
Port Valdez	221-60	0	0	0	1,500	800	3,550	5,830	8,400	1,680	1,800	225	310	0	24,095	12,290
Eastern District TOTAL		20	0	762	3,285	5,360	31,070	81,035	111,020	153,180	231,365	235,675	94,845	103,350	1,050,967	443,660
Columbia/Long Wells/Unakvik Eaglek	222-10	0	0	300	0	1,580	4,500	6,810	5,100	6,386	5,920	7,450	3,220	120	41,386	20,320
	222-20	0	0	0	25	1,570	3,350	14,450	10,140	29,260	32,750	11,740	10,630	5,460	119,375	59,570
	222-30	ns	ns	0	0	0	0	12,850	13,430	22,400	30,450	15,340	7,800	3,520	105,790	51,690
Northern District TOTAL		0	0	300	25	3,150	7,850	34,110	28,670	58,046	69,120	34,530	21,650	9,100	266,551	131,580
Unakvik District (229) TOTAL		ns	ns	ns	ns	0	ns	0	0	0	ns	0	ns	ns	0	0
W. Port Wells	223-10	ns	ns	0	0	0	600	15,450	14,870	22,240	20,750	9,650	2,070	ns	85,630	40,940
Esther Passage	223-20	ns	ns	0	0	0	0	500	3,430	800	1,500	1,000	200	ns	7,430	3,830
E. Port Wells	223-30	ns	ns	0	0	0	700	3,160	3,350	800	900	400	210	ns	9,540	4,340
Coghill District TOTAL		ns	ns	0	0	0	1,300	19,130	21,650	23,840	23,150	11,050	2,480	ns	102,600	49,110
Passage/Cochrane	224-10	ns	ns	0	7,300	1,250	3,100	9,850	12,770	16,600	16,830	5,995	1,480	ns	74,975	39,730
Chuiross Pass	224-30	ns	ns	0	0	0	0	21,050	3,100	2,100	4,000	15,375	900	ns	46,525	31,240
Nellie Juan	224-40	ns	ns	0	0	4,000	7,000	20,335	11,200	21,200	19,600	12,500	4,150	ns	99,985	44,900
Northwestern District TOTAL		ns	ns	0	7,300	5,250	10,100	51,035	27,070	39,900	40,430	33,870	6,530	ns	221,485	115,870
Eshamy	225-30	ns	ns	ns	0	1,400	40	5,910	500	13,000	6,370	3,450	9,500	ns	40,170	17,870
Eshamy District TOTAL		ns	ns	ns	0	1,400	40	5,910	500	13,000	6,370	3,450	9,500	ns	36,204	17,870
Chenega	226-20	ns	ns	800	3,060	5,210	42,900	17,760	46,825	45,730	14,640	14,640	30,210	ns	207,135	96,180
Knight Island	226-30	ns	ns	0	1,400	700	6,000	5,000	14,000	2,900	1,300	4,500	4,500	ns	35,800	15,160
Rainbridge/Latouche	226-40	ns	ns	0	560	1,400	17,900	9,350	14,955	11,370	5,350	17,650	17,650	ns	78,535	36,690
Port Bainbridge	226-50	ns	ns	250	0	0	1,400	350	600	700	200	1,300	1,300	ns	4,800	2,070
Southwestern District TOTAL		ns	ns	1,050	5,020	7,310	68,200	32,460	76,380	60,700	21,490	53,660	53,660	ns	326,270	150,100
S. Montague	227-10	ns	ns	ns	60	64	0	3,460	6,350	7,682	13,320	6,025	6,025	ns	36,961	19,522
N. Montague	227-20	ns	ns	ns	275	1,020	21,870	14,187	41,000	40,913	49,484	20,620	20,620	ns	189,369	94,050
Montague District TOTAL		ns	ns	ns	335	1,084	21,870	17,647	47,350	48,595	62,804	26,645	26,645	ns	226,330	113,572
S. Hawkins	228-10	ns	ns	0	200	2,000	3,700	6,000	5,500	4,600	7,000	1,600	1,600	ns	37,500	15,120
Cutoff	228-20	ns	ns	25	135	230	100	28,900	13,000	24,660	8,220	8,220	1,225	ns	94,095	40,160
N. Hawkins	228-30	ns	ns	195	3,400	7,400	11,000	58,000	43,600	57,600	60,300	55,500	21,400	ns	318,395	136,390
Double Bay	228-40	ns	ns	0	1,400	1,440	36,200	10,100	11,050	20,390	11,655	5,500	5,500	ns	97,735	45,220
Johnstone	228-50	ns	ns	105	0	130	510	5,750	5,400	6,030	3,980	1,400	1,400	ns	31,705	12,780
Etches	228-60	ns	ns	30	0	50	6,200	15,325	16,690	31,705	31,280	16,775	9,650	ns	127,705	54,420
Southeastern District TOTAL		ns	ns	355	3,735	11,210	22,950	150,175	95,690	138,915	140,200	103,130	40,775	ns	707,135	304,090
TOTAL OF 8 DISTRICTS		20	0	1,417	15,395	31,725	81,704	431,465	334,707	550,611	619,930	505,999	256,085	112,450	2,937,542	1,325,852

PWS PINK STREAM COUNTS - ALL DISTRICTS

CURRENT VS. 1974 - 88 EVEN YEAR AVERAGE

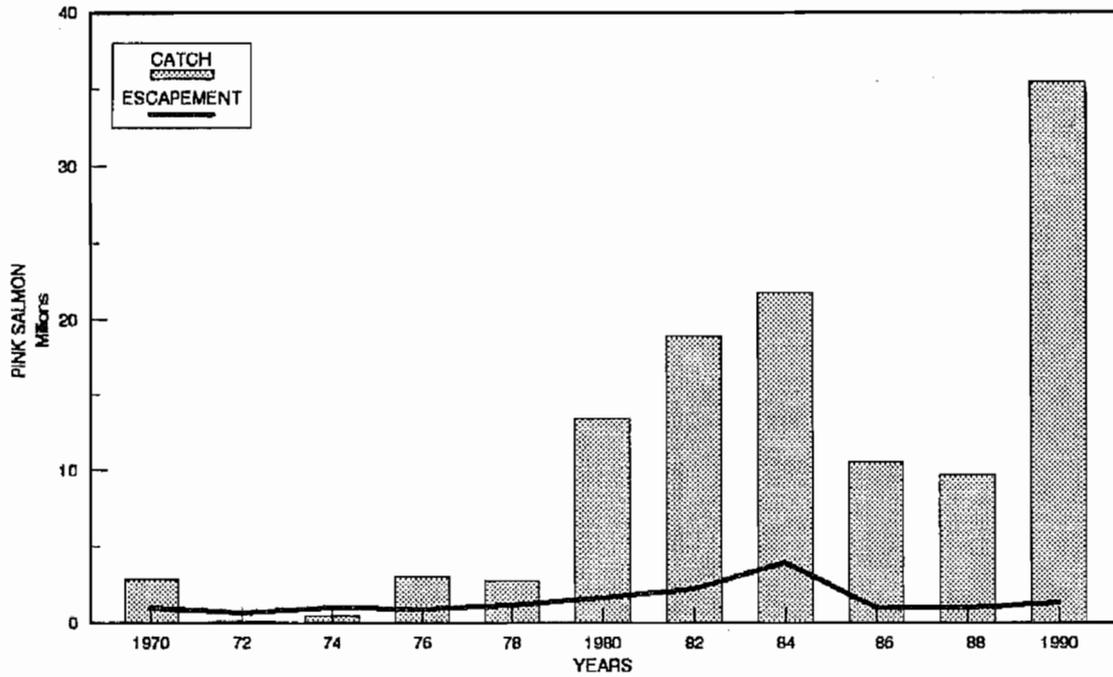


CUMULATIVE

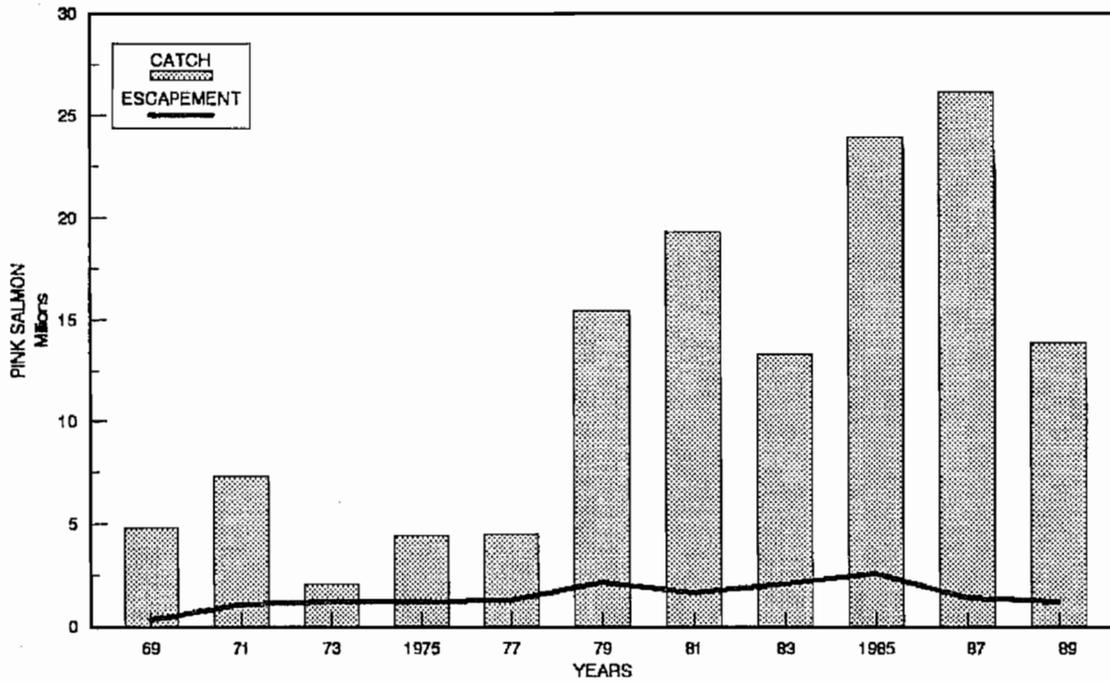


Appendix E.7. Current year and historical weekly pink salmon escapement performance from index spawning streams, Prince William Sound, 1990.

**PINK SALMON EVEN YEAR CATCH AND ESCAPEMENT
PRINCE WILLIAM SOUND**



**PINK SALMON ODD YEAR CATCH AND ESCAPEMENT
PRINCE WILLIAM SOUND**



Appendix E.8. Pink salmon catch and escapement, even years (1970 - 1990) and odd years (1969 - 1989), Prince William Sound.

Appendix E.9. Chum salmon harvests and escapement indices, including hatchery sales harvests and brood stock, Prince William Sound, 1965 - 1990.

Year	CHUM SALMON ESCAPEMENTS ^a										Hatchery			Common Property Catch ^b	Total Run ^c
	Eastern	Northern	Coghill	Northwest	Eshamy	Southwest	Montague	Southeast	Total	Sales	Brood				
1965	69,180	20,980	20,768	18,907	0	1,829	17,500	46,480	195,644			201,043	396,687		
66	75,690	24,870	10,540	5,770	0	2,180	14,100	9,410	142,360			426,628	569,188		
67	74,570	23,270	7,450	1,670	0	6,200	4,980	9,070	127,210			274,234	401,444		
68	48,960	10,620	8,780	800	0	580	220	4,610	74,570			342,939	417,509		
69	58,690	17,340	8,410	780	0	0	0	6,320	91,540			320,977	412,517		
1970	34,430	4,020	11,880	2,720	0	550	0	7,950	61,550			230,661	292,211		
71	49,730	11,870	6,600	5,600	100	1,430	27,990	6,450	109,770			574,265	684,035		
72	112,950	70,760	28,160	22,980	0	4,010	3,340	26,990	269,190			45,370	314,560		
73	213,170	140,030	72,610	13,250	0	1,020	3,110	48,080	491,270			729,839	1,221,109		
74	72,010	55,310	29,280	6,580	0	240	80	3,200	166,900			88,544	255,444		
1975	30,040	8,910	3,640	430	0	1,280	140	2,850	47,290			100,479	147,769		
76	16,260	29,430	25,670	8,300	0	90	0	770	80,520			370,478	450,998		
77	47,880	48,600	43,940	10,090	0	700	0	8,280	159,490			575,839	735,329		
78	90,250	27,480	18,160	12,940	0	790	0	6,550	156,170			485,147	641,317		
79	42,630	17,320	6,330	8,770	0	90	0	5,140	80,280			324,040	404,320		
1980	26,720	27,880	23,340	3,060	0	2,040	70	6,710	89,820	6		412,948	502,774		
81	71,560	28,670	2,050	15,130	0	710	0	16,010	134,130	118		1,745,869	1,880,117		
82	146,120	68,580	22,130	21,880	0	1,530	0	25,260	285,500	0		1,335,368	1,707,068		
83	143,800	85,720	61,410	31,660	340	3,170	0	21,410	347,510	0	86,200	1,030,546	1,422,056		
84	129,190	59,080	19,690	7,920	0	20	0	8,650	224,550	4,886	3,000	1,196,785	1,429,221		
1985	111,310	33,410	22,140	13,290	0	620	0	4,470	185,240	3,840	0	1,302,090	1,491,170		
86	126,690	50,740	13,140	17,420	0	1,890	0	8,830	218,710	20,683	12,523	1,662,366	1,914,282		
87	183,620	38,700	24,510	26,450	0	1,690	0	44,020	319,000	2,549	15,574	1,902,063	2,239,186		
88	258,560	75,420	39,240	40,780	0	2,350	500	66,930	483,780	42,694	108,271	1,792,616	2,427,361		
89	112,080	46,470	22,680	27,430	320	11,690	0	22,640	243,310	129,551	74,513	862,551	1,309,925		
1990	115,100	112,480	26,020	37,020	0	80	1,050	7,275	299,025	24,554	107,284	935,284	1,366,147		
1965-89															
AVG	93,844	41,027	22,102	12,985	30	1,868	2,881	16,683	191,420	20,433	43,010	733,347	946,704		

a Coghill and Northwestern escapement figures correspond to current district boundaries.

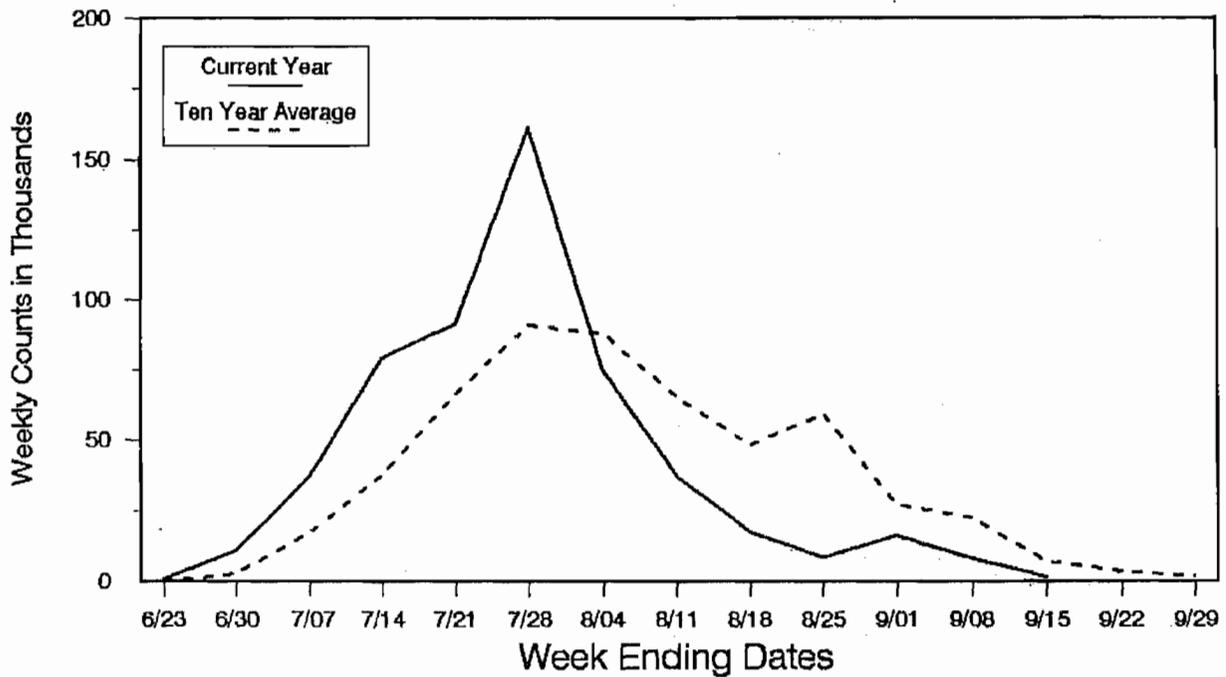
b Includes the common property harvest of both wild and hatchery stocks. Does not include hatchery sales harvests.

c Represents the sum of the common property catch, hatchery sales and brood, plus the escapement index. Does not account for wild stock escapement into non-index streams.

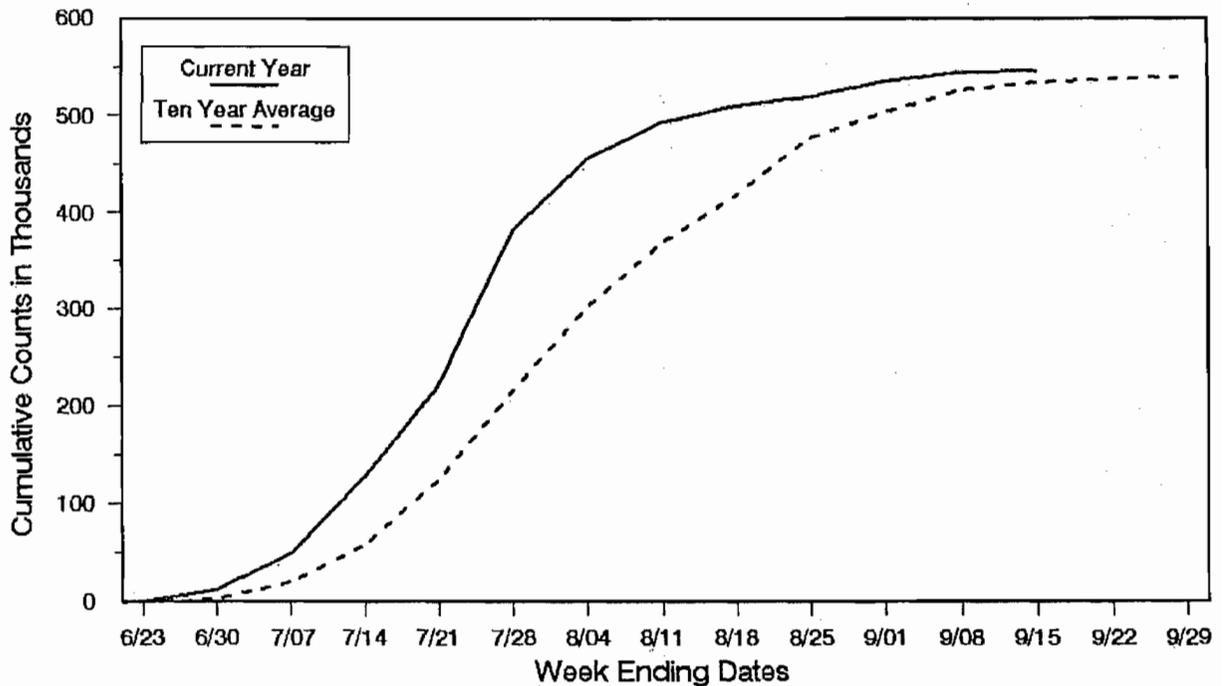
Appendix E.10. Weekly aerial estimates of chum salmon escapement by statistical area, Prince William Sound, 1990.

Survey ADJ. STREAM Location	Statistical Area														TOTAL
	6/23	6/30	7/07	7/14	7/21	7/28	8/04	8/11	8/18	8/25	9/01	9/08	9/15	TOTAL	
Orca Inlet	0	0	40	35	0	370	100	400	60	650	0	0	ns	1,655	
Simpson/Sheep	0	6	260	1,840	7,050	970	8,500	4,085	0	0	650	200	0	23,561	
Gravina	750	3,800	10,150	19,410	12,950	11,194	12,800	12,100	5,000	0	1,500	0	0	88,654	
Fidalgo	0	35	2,225	4,150	8,370	3,310	2,900	0	1,000	0	8,030	980	1,100	32,100	
Valdez Arm	240	4,640	11,765	15,712	20,125	10,650	9,500	40	400	0	2,250	790	300	76,412	
Port Valdez	0	415	730	4,037	9,360	2,470	30	100	120	670	595	1,220	580	20,327	
Eastern District TOTAL	990	8,896	25,170	45,184	57,855	28,964	33,830	16,725	6,580	1,320	13,025	3,190	1,980	243,709	
Columbia/Long	0	0	2,045	7,685	6,500	12,900	2,800	1,500	4,000	50	2,350	20	0	39,850	
Wells/Unakwik	20	1,900	9,532	11,500	1,465	16,650	5,550	3,440	700	1,200	0	95	30	52,082	
Eaglek	ns	0	0	0	14,260	67,700	6,950	0	0	1,900	500	50	0	91,360	
Northern District TOTAL	20	1,900	11,577	19,185	22,225	97,250	15,300	4,940	4,700	3,150	2,850	165	30	183,292	
Unakwik District (229) TOTAL	ns	ns	ns	ns	0	ns	0	0	0	ns	0	ns	ns	0	
W. Port Wells	ns	ns	0	1,771	2,510	11,508	4,500	2,713	2,600	1,420	0	60	ns	27,082	
Esther Passage	ns	ns	0	0	0	0	0	0	0	0	0	0	ns	0	
E. Port Wells	ns	ns	0	0	0	5,300	4,500	4,800	2,000	900	40	50	ns	17,590	
Coghill District TOTAL	ns	ns	0	1,771	2,510	16,808	9,000	7,513	4,600	2,320	40	110	ns	44,672	
Passage/Cochrane	ns	ns	72	1,754	2,300	9,400	5,950	3,850	700	1,300	220	20	ns	25,566	
Culross Pass	ns	ns	0	0	900	2,400	2,800	0	0	300	0	1,800	ns	8,200	
Nellie Juan	ns	ns	0	10,400	4,900	2,980	4,900	500	0	0	0	1,250	ns	24,930	
Northwestern District TOTAL	ns	ns	72	12,154	8,100	14,780	13,650	4,350	700	1,600	220	3,070	ns	58,696	
Eshamy	ns	ns	ns	0	0	0	0	0	0	0	0	0	ns	0	
Eshamy District TOTAL	ns	ns	ns	0	0	0	0	0	0	0	0	0	ns	350	
Chenega	ns	ns	ns	0	0	0	0	0	0	0	0	0	ns	0	
Bainbridge/Latouche	ns	ns	ns	80	0	0	0	0	0	0	0	0	ns	80	
Southwestern District TOTAL	ns	ns	ns	80	0	0	0	0	0	0	0	0	ns	80	
S. Montague	ns	ns	ns	ns	0	0	0	200	0	280	0	200	ns	680	
N. Montague	ns	ns	ns	ns	0	200	0	110	0	0	0	300	ns	420	
Montague District TOTAL	ns	ns	ns	ns	0	200	0	310	0	280	0	500	ns	680	
Hawkins Cutoff	ns	ns	0	25	30	120	0	380	0	0	0	100	ns	655	
N. Hawkins	ns	ns	0	0	0	0	0	0	0	0	0	0	ns	0	
Double Bay	ns	ns	0	0	0	0	0	130	0	0	0	450	ns	580	
Johnstone	ns	ns	5	0	0	0	0	500	0	0	0	50	ns	555	
Port Etches	ns	ns	220	1,150	1,082	3,400	3,000	2,400	1,000	0	200	550	ns	13,002	
Southeastern District TOTAL	ns	ns	225	1,175	1,112	3,520	3,000	3,410	1,000	0	200	1,150	ns	14,792	
TOTAL OF 8 DISTRICTS	1,010	10,796	37,044	79,549	91,802	161,522	74,780	37,248	17,580	8,670	16,335	8,185	2,010	546,271	

PWS CHUM STREAM COUNTS - ALL DISTRICTS CURRENT VS. TEN YEAR AVERAGE

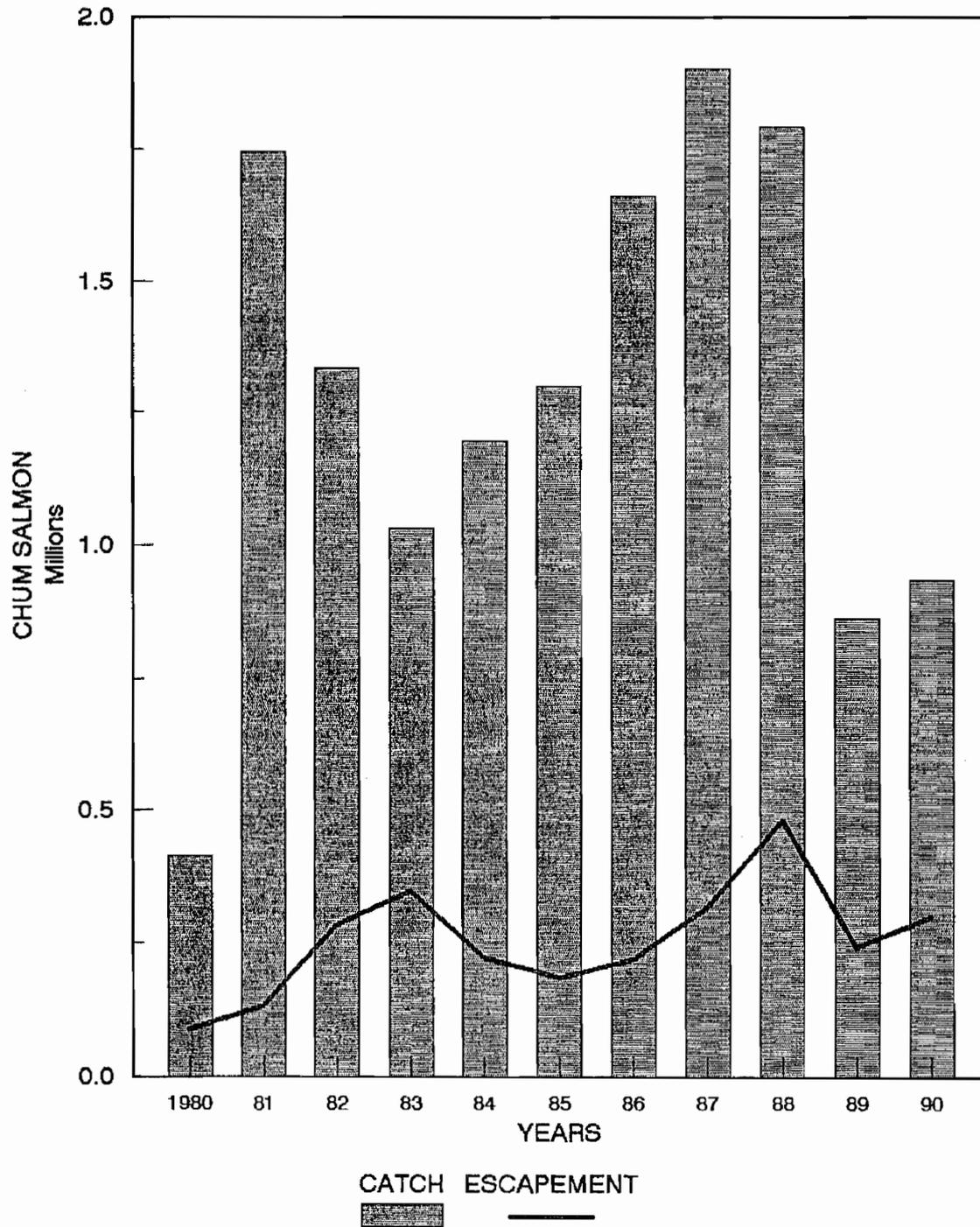


CURRENT YEAR CUMULATIVE VS. TEN YEAR AVERAGE



Appendix E. 11. Current year and historical weekly chum salmon escapement performance from index spawning streams, Prince William Sound, 1990. Historical data is from 1980 - 1989.

CHUM SALMON CATCH AND ESCAPEMENT PRINCE WILLIAM SOUND



Appendix E.12. Chum salmon catch and escapement, Prince William Sound, 1980 - 1990.

Appendix E.13. Sockeye salmon escapement counts from selected systems, Prince William Sound, 1990.^a

Stream Name	Stream Number	Weekly Count (week ending dates)									
		14-Jul	21-Jul	28-Jul	04-Aug	11-Aug	18-Aug	25-Aug	01-Sep	08-Sep	15-Sep
Robe River	137	NS	450	300	60	NS	NS	NS	NS	0	NS
Billy's Hole	218	100	0	800	1,900	1,400	630	900	110	210	10
Wells River	234	0	0	0	0	0	0	0	NS	12	0
Miners Lake	244	NS	NS	NS	2,600	160	25	NS	27	NS	NS
Red Lake	300	0	0	0	1,500	0	0	0	0	0	NS
Hobo Creek	417	0	0	0	0	0	0	2	NS	0	NS
Halferty Creek	454	0	0	0	0	0	0	270	500	0	NS
Cochrane Creek	461	0	0	0	0	0	0	0	0	0	NS
Shrode Lake	476	0	0	0	0	0	630	800	650	350	NS
Jackpot Lakes	608	0	0	0	310	0	140	0	60	0	NS
Bainbridge	630	0	0	0	25	0	50	0	60	0	NS
Point Creek	702	NS	0	0	NS	0	0	0	0	0	NS
Cabin Creek	747	NS	0	0	0	0	0	0	0	0	NS
Udall Creek	770	NS	0	0	0	0	0	0	0	0	NS
Pautzke Creek	775	NS	0	0	0	0	0	0	0	0	NS
Total		100	450	1,100	6,395	1,560	1,475	1,972	1,407	572	10

^aCounts contained in this table are obtained in conjunction with the regular pink and chum aerial survey program. Many of these sockeye systems are difficult to survey by air and thus the counts do not necessarily represent total live abundance at a particular time.

Appendix E.14. Age and sex composition of Prince William Sound chum salmon commercial catches by district, 1990.

		Brood Year and Age Group					
		1987	1986	1985	1984	1983	
		0.2	0.3	0.4	0.5	0.6	Total
EASTERN DISTRICT							
Strata Combined:		06/28 - 08/25					
Sampling Dates:		06/29 - 08/14					
Sample Size:		1,012					
Female	Percent of Sample	0.1	12.3	42.8	1.3		56.5
	Number in Catch	158	18,786	65,660	1,972		86,576
Male	Percent of Sample	0.1	8.3	34.4	0.7		43.5
	Number in Catch	158	12,761	52,760	1,089		66,768
Total	Percent of Sample	0.2	20.6	77.2	2.0		100.0
	Number in Catch	316	31,548	118,420	3,061		153,344
	Standard Error	223	1,856	1,940	676		
NORTHERN DISTRICT							
Strata Combined:		06/28 - 08/25					
Sampling Dates:		06/29 - 08/08					
Sample Size:		643					
Female	Percent of Sample	0.1	15.3	33.7	0.9		50.0
	Number in Catch	78	11,508	25,436	704		37,726
Male	Percent of Sample	0.2	11.4	37.5	0.9		50.0
	Number in Catch	156	8,613	28,273	674		37,717
Total	Percent of Sample	0.3	26.7	71.2	1.8		100.0
	Number in Catch	235	20,121	53,709	1,378		75,443
	Standard Error	135	1,376	1,448	558		
COGHILL DISTRICT							
Strata Combined:		06/14 - 09/23					
Sampling Dates:		06/23 - 08/07					
Sample Size:		2,114					
Female	Percent of Sample	0.2	30.7	31.7	0.7	0.0	63.3
	Number in Catch	666	95,775	98,826	2,108	112	197,487
Male	Percent of Sample	0.2	11.8	24.4	0.2	0.0	36.6
	Number in Catch	735	36,694	76,187	585	0	114,200
Total	Percent of Sample	0.4	42.6	56.1	0.9	0.0	100.0
	Number in Catch	1,401	132,836	175,119	2,693	112	312,160
	Standard Error	585	4,049	4,073	871	112	

-Continued-

		Brood Year and Age Group					
		1987	1986	1985	1984	1983	
		0.2	0.3	0.4	0.5	0.6	Total
ESHAMY DISTRICT							
<u>Strata Combined: 06/11 - 08/26</u>							
<u>Sampling Dates: 06/13 - 08/01</u>							
<u>Sample Size: 2,176</u>							
Female	Percent of Sample	0.3	45.3	21.1	0.5	0.0	67.2
	Number in Catch	705	120,025	55,859	1,388	42	178,020
Male	Percent of Sample	0.1	22.5	9.9	0.2	0.0	32.8
	Number in Catch	368	59,478	26,264	642	0	86,752
Total	Percent of Sample	0.4	67.8	31.0	0.8	0.0	100.0
	Number in Catch	1,074	179,503	82,124	2,029	42	264,772
	Standard Error	368	3,165	3,140	587	42	
SOUTHWESTERN DISTRICT							
<u>Strata Combined: 07/23 - 08/28</u>							
<u>Sampling Dates: 07/27 - 08/08</u>							
<u>Sample Size: 229</u>							
Female	Percent of Sample	1.1	21.8	41.1			63.9
	Number in Catch	298	6,088	11,494			17,880
Male	Percent of Sample	1.1	9.8	24.9			35.7
	Number in Catch	298	2,746	6,954			9,998
Total	Percent of Sample	2.1	31.7	66.1			100.0
	Number in Catch	596	8,882	18,497			27,974
	Standard Error	418	1,166	1,195			
DISTRICTS COMBINED							
<u>Sample Size: 6,174</u>							
Female	Percent of Sample	0.2	30.2	30.9	0.7	0.0	62.1
	Number in Catch	1,906	252,182	257,276	6,172	154	517,690
Male	Percent of Sample	0.2	14.4	22.8	0.4	0.0	37.8
	Number in Catch	1,715	120,292	190,438	2,989	0	315,435
Total	Percent of Sample	0.4	44.7	53.7	1.1	0.0	100.0
	Number in Catch	3,621	372,890	447,867	9,162	154	833,693
	Standard Error	849	5,754	5,808	1,368	119	

Appendix E.15. Summary of periods, dates, hours fished, and emergency orders issued by district, for the commercial purse seine salmon fishery, Prince William Sound, 1990. Includes openings in hatchery harvest areas.

Eastern		Northern		Coghill and Unakwik (223 & 229)		Northwestern		Southwestern		Montague		Southeastern		Emergency Orders	
(221)		(222)		(223 & 229)		(224)		(226)		(227)		(228)			
Dates	Hours Fished	Dates	Hours Fished	Dates	Hours Fished	Dates	Hours Fished	Dates	Hours Fished	Dates	Hours Fished	Dates	Hours Fished	Emergency Orders	Issued
6/28	12 ^a	6/28	12 ^a							6/28	12 ^a	6/28	12 ^a	2-F-E-23-90	
7/02	12 ^b	7/02	12 ^b							7/02	12 ^b	7/02	12 ^b	2-F-E-24-90	
7/05 - 7/06	36 ^c	7/05	12 ^c							7/05	12 ^c	7/05	12 ^c	2-F-E-25-90	
7/09	12 ^d	7/09	12 ^d							7/09	12 ^d	7/09	12 ^d	2-F-E-26-90	
7/12	12 ^e	7/12	12 ^e							7/12	12 ^e	7/12	12 ^e	2-F-E-28-90	
7/16	11 ^f													2-F-E-29-90	
7/19	12 ^g													2-F-E-30-90	
7/23	12 ^h	7/23	12 ^h	7/23	12 ^h			7/23	12 ^h					2-F-E-31-90	
7/26	12 ⁱ	7/26	12 ⁱ	7/26	12 ⁱ			7/26	12 ⁱ					2-F-E-32-90	
8/02 - 8/04	48 ^k	8/02 - 8/04	48 ^k	7/30	12 ^j	7/30	12 ^j	7/30	12 ^j	7/30	12 ^j	7/30	12 ^j	2-F-E-33-90	
8/06 - 8/10	108 ^l	8/06 - 8/10	108 ^l	8/02 - 8/04	48 ^k	8/02 - 8/04	48 ^k	8/02 - 8/04	48 ^k	8/02 - 8/04	48 ^k	8/02 - 8/04	48 ^k	2-F-E-35-90	
8/13 - 8/14	24 ^m	8/13 - 8/14	24 ^m	8/06 - 8/10	108 ^l	8/06 - 8/10	108 ^l	8/06 - 8/10	108 ^l	8/06 - 8/10	108 ^l	8/06 - 8/10	108 ^l	2-F-E-36-90	
8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	8/13 - 8/14	24 ^m	8/13 - 8/14	24 ^m	8/13 - 8/14	24 ^m	8/13 - 8/14	24 ^m	8/13 - 8/14	24 ^m	2-F-E-38-90	
				8/17 - 10/3	1,128 ⁿ	8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	2-F-E-39-90	
						8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	8/17 - 8/19	56 ⁿ	2-F-E-41-90	
														2-F-E-42-90	
														2-F-E-43-90	
														2-F-E-44-90	
														2-F-E-45-90	
														2-F-E-45-90	
														2-F-E-46-90	

a The season was officially open for a 12 hour period beginning 8 a.m. until 8 p.m., Thursday, June 28. In the Eastern District all waters of Valdez Narrows Subdistrict and the Port of Valdez were closed. In the Northern District all waters east of the longitude of Point Pellew were open.

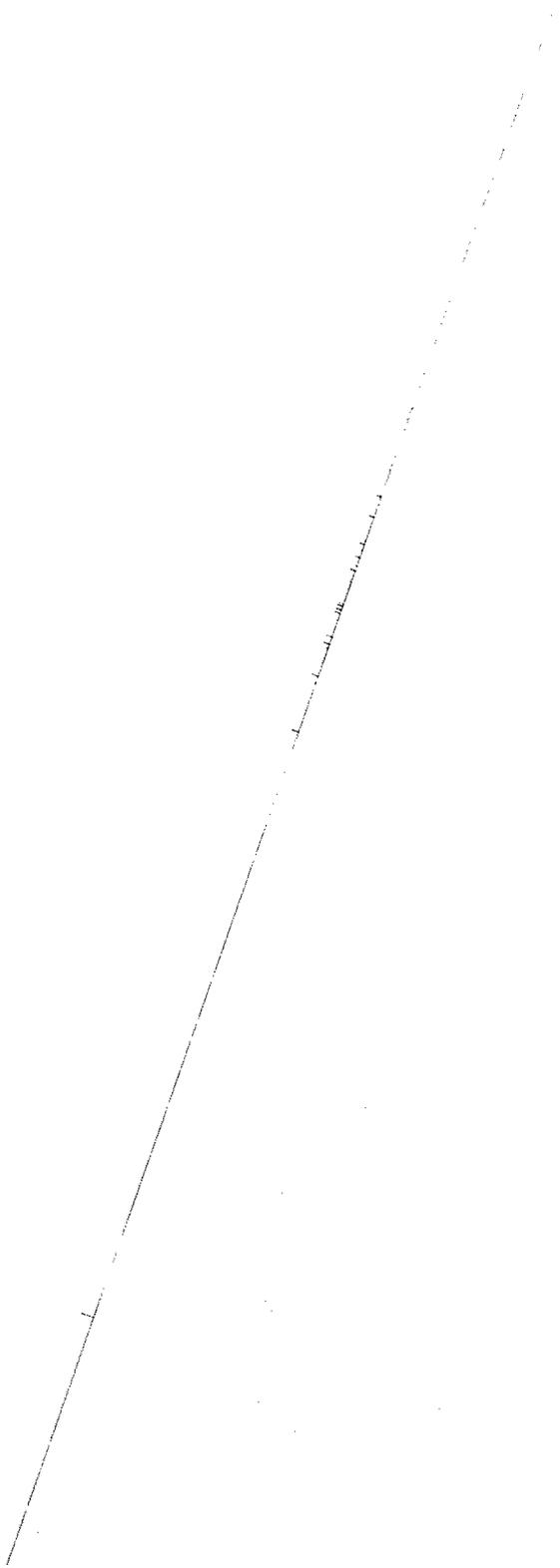
b All waters of the Northern District east of the longitude of Point Pellew were open. In the Eastern District all waters of Boulder Bay and the Valdez Narrows Subdistrict were open. Port Valdez was closed inside of 146°30.5' W. longitude. SHTF enlarged closed waters in effect until further notice.

c In the Northern District all waters east of the longitude of Point Pellew were open. In the Eastern District all waters of Boulder Bay, the Valdez Narrows Subdistrict, and waters of the Port Valdez, including the Solomon Gulch SHA were open. In Boulder Bay only, fishing was permitted inside of marked stream closures. The Port of Valdez and the Valdez Arm Subdistrict remained open for an additional 24 hours after the closure of the remainder of the Eastern District.

d In the Northern District all waters east of the longitude of Point Pellew were open. Waters of the Port Valdez east of the longitude of the western stream marker of Sawmill Creek (146°26.9' W. long.) were closed for the protection of hatchery brood fish. In Boulder Bay, fishing was permitted inside of marked stream closures.

e In the Northern District all waters east of the longitude of Point Pellew were open. Waters of the Port Valdez east of 146 30.5 W. longitude (7 mile beach markers) were closed for the protection of hatchery brood fish. In Boulder Bay only, fishing was permitted inside of marked stream closures.

- f Only the Valdez Narrows Subdistrict and the inside waters of Port Valdez were open. The Solomon Gulch SHA was closed inside of a line from the octagonal net pen to the corner buoy at the eastern boundary of the Alyeska Security zone.
- g Open waters included only the Valdez Narrows Subdistrict and the inside waters of Port Valdez. That portion of the Solomon Gulch SHA inside of a line extending from a shore marker approximately 300 yards east of the western SHA marker at Allison Point to the octagonal net pen was closed.
- h Open waters included the Valdez Narrows Subdistrict and the inside waters of Port Valdez, except that the Solomon Gulch SHA was closed inside of a line extending from a shore marker approximately 300 yards east of the western SHA marker at Allison Point to the octagonal net pen; The Esther Subdistrict; the San Juan Subdistrict; and the waters of Unakwik Inlet west of 147°30.0' W. long. and north of 60°52.6' N. latitude, including the waters of the Unakwik District, except that the Cannery Creek Hatchery SHA and sanctuary was closed inside of a line extending from the eastern Unakwik District boundary at 61°01.0' N. lat., 147°31.5' W. long., westward to a point on the Unakwik District boundary at 61°01.0' N. lat., 147°33.0' W. long., and southward to a point on the shore south of the old cannery site located at 60°59.5' N. lat., 147°32.0' W. long.
- i Open waters were the same as the opening on July 23 except that the head of Port Valdez was closed inside of a line extending from the buoy at the eastern end of the Alyeska Security Zone north to the regulatory marker sign west of the Valdez Boat Harbor. The Special Harvest Areas for both the Esther Subdistrict and the San Juan Subdistrict were closed at the normal markers.
- j The following closures were put in to effect until further notice commencing at 8:00 a.m. Monday, July 30; the waters of Port Valdez east of 146°30.5' W. long.; the waters of Knight Island Passage within one nautical mile of the eastern shoreline of Chenega Island from a point near the old village of Chenega at 60°16.5' N. lat., 148°04.0' W. long. to the northernmost tip of Chenega Island at 60°23.3' N. lat., 148°0.0' W. long.
- k Open waters included the Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague and Southeastern Districts. For the protection of the hatchery return to Cannery Creek, the waters of Unakwik Inlet in the Northern District west of 147°30.0' W. long., and north of 60°52.6' N. lat. were closed commencing at 8:00 a.m., Thursday, August 2, until further notice.
- l For the protection of the pink return to the Armin F. Koernig Hatchery, the Port San Juan and Point Elrington Subdistricts was closed commencing at 8:00 a.m. Monday, August 6 until further notice.
- m The Esther Subdistrict, the Port San Juan Subdistrict and Point Elrington Subdistrict were closed. The waters of the Port Fidalgo Subdistrict and the waters of Beartrap Bay, Olsen Bay, St. Matthews Bay, Irish Cove and Landlocked Bay were reopened to the traditional closed waters markers.
- n For the protection of the pink salmon return to the Armin F. Koernig and Cannery Creek Hatcheries, the Port San Juan Subdistrict and waters of Unakwik Inlet were closed. The Esther Subdistrict was extended to continuous seven day per week fishing until the season closed on Oct. 3 at 12:00 noon.
- o Open waters in the Northern District included the waters west of the longitude of Pay Day Point and in the Northwestern District, the waters east of the longitude of Point Culross. The waters of Perry Passage, and waters around Ragged Point and Kinikiek were open. The Port San Juan Subdistrict was closed.
- p The Unakwik District was open.
- q Only the Port San Juan Subdistrict was open.



APPENDIX F

HATCHERY RETURNS

Appendix F.1. Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Wally Noerenberg Hatchery, 1990. Data provided by Prince William Sound Aquaculture Corporation.

Date	Fish Sales (numbers)		Pounds Sold	Average Fish Wt	Price/Pound	Revenue		Brood Stock ^a		% Female
	Daily	Cumulative				Daily	Cumulative	Fish/Day	Cumulative	
07/20	0	0						1,640	1,640	6.0
07/21	0	0							1,640	
07/22	12,002	12,002	26,525	2.21	\$0.477	\$12,650	\$12,650		1,640	5.0
07/23	0	12,002	0				\$12,650		1,640	
07/24	11,545	23,547	28,862	2.50	\$0.457	\$13,187	\$25,837		1,640	6.0
07/25	0	23,547	0				\$25,837	22	1,662	6.0
07/26	0	23,547	0				\$25,837	17	1,679	6.0
07/27	19,069	42,616	47,673	2.50	\$0.487	\$23,217	\$49,054		1,679	3.4
07/28	26,030	68,646	65,074	2.50	\$0.499	\$32,465	\$81,519		1,679	3.6
07/29	49,428	118,074	123,569	2.50	\$0.509	\$62,897	\$144,416		1,679	4.9
07/30	126,862	244,936	317,156	2.50	\$0.500	\$158,575	\$302,991	37	1,716	5.4
07/31	105,363	350,299	263,408	2.50	\$0.500	\$131,696	\$434,687	32	1,748	5.2
08/01	145,158	495,457	391,927	2.70	\$0.480	\$188,124	\$622,811		1,748	9.7
08/02	61,232	556,689	162,597	2.66	\$0.508	\$82,598	\$705,409	6	1,754	
08/03	0	556,689	0				\$705,409		1,754	8.4
08/04	123,031	679,720	328,829	2.67	\$0.500	\$164,414	\$869,823		1,754	
08/05	0	679,720	0				\$869,823		1,754	9.6
08/06	0	679,720	0				\$869,823	13,002	14,756	17.0
08/07	143,493	823,213	405,753	2.83	\$0.436	\$176,746	\$1,046,569	9,750	24,506	15.2
08/08	85,250	908,463	241,529	2.83	\$0.402	\$97,143	\$1,143,712	14,300	38,806	26.8
08/09	118,074	1,026,537	342,416	2.90	\$0.420	\$143,815	\$1,287,527	10,950	49,756	28.6
08/10	55,538	1,082,075	166,613	3.00	\$0.423	\$70,477	\$1,358,004	8,850	58,606	42.6
08/11	75,514	1,157,589	226,543	3.00	\$0.460	\$104,212	\$1,462,216	14,800	73,406	43.9
08/12	0	1,157,589	0				\$1,462,216	21,250	94,656	43.9
08/13	138,592	1,296,181	433,843	3.13	\$0.475	\$206,206	\$1,668,422	1,600	96,256	48.8
08/14	412,213	1,708,394	1,326,581	3.22	\$0.412	\$545,933	\$2,214,355	13,150	109,406	51.8
08/15	603,427	2,311,821	1,848,944	3.06	\$0.350	\$647,129	\$2,861,484	21,700	131,106	55.8
08/16	377,956	2,689,777	1,194,276	3.16	\$0.350	\$417,998	\$3,279,482	(1,106)	130,000	55.8
08/17	0	2,689,777	0				\$3,279,482	20,100	150,100	60.0
08/18	0	2,689,777	0				\$3,279,482	72,951	223,051	61.0
08/19	148,083	2,837,860	482,027	3.26	\$0.432	\$208,022	\$3,487,504	55,965	279,016	60.4
08/20	66,410	2,904,270	225,792	3.40	\$0.300	\$67,738	\$3,555,242	39,380	318,396	62.5
08/21	0	2,904,270	0				\$3,555,242	13,250	331,646	62.5
08/22	210,652	3,114,922	695,154	3.30	\$0.283	\$196,389	\$3,751,631	6,175	337,821	65.3
08/23	44,152	3,159,074	145,702	3.30	\$0.300	\$43,711	\$3,795,342	24,005	361,826	66.9
08/24								3,830		66.9
08/25								5,480		66.9
08/26	76,208	3,235,282	251,486	3.30	\$0.250	\$62,872	\$3,858,214	16,467	378,293	69.6
08/27	6,703	3,241,985	22,120	3.30	\$0.250	\$5,530	\$3,863,744	7,057	385,350	69.6
08/28	20,051	3,262,036	66,167	3.30	\$0.250	\$16,542	\$3,880,286	8,475	393,825	67.5
08/29								8,325		67.5
08/30	9,186	3,271,222	30,313	3.30	\$0.300	\$9,094	\$3,889,380		393,825	71.3
08/31								3,000		71.3
09/01	25,006	3,296,228	80,018	3.20	\$0.150	\$12,003	\$3,901,383		393,825	
09/06	14,262	3,310,490	42,787	3.00	\$0.150	\$6,418	\$3,907,801		393,825	
09/07	0	3,310,490	0				\$3,907,801		393,825	
Totals	3,310,490		9,983,684	3.02	\$0.391	\$3,907,801		387,603		

^aInseason estimates. Includes overmature or green fish, holding mortalities and fish excess to spawning needs. Actual number of adult pink salmon spawned as brood stock in 1990 was 229,747, holding mortalities numbered 57,455, green and overmature fish numbered 11,759, and 137,061 fish were excess to brood stock needs.

Appendix F.2. Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Armin F. Koernig Hatchery, 1990. Data provided by Prince William Sound Aquaculture Corporation.

Date	Fish Sales (numbers)		Pounds Sold	Average Fish Wt	Price/Pound	Revenue		Brood Stock ^a		% Female
	Daily	Cumulative				Daily	Cumulative	Fish/Day	Cumulative	
07/22	20,403	20,403	48,966	2.40	\$0.495	\$24,233	\$24,233	0	0	5.5
07/23	9,600	30,003	23,999	2.50	\$0.499	\$11,973	\$36,206	0	0	3.1
07/24	15,189	45,192	37,972	2.50	\$0.468	\$17,763	\$53,969	0	0	5.1
07/25		45,192					\$53,969	0	0	5.1
07/26	37,818	83,010	94,544	2.88	\$0.443	\$41,858	\$95,827	0	0	6.1
07/27	32,774	115,784	85,212	2.60	\$0.500	\$42,601	\$138,428	0	0	4.9
07/28		115,784					\$138,428	0	0	4.9
07/29	27,774	143,558	72,212	2.60	\$0.500	\$36,103	\$174,531	0	0	4.6
07/30	101,413	244,971	269,685	2.66	\$0.482	\$129,951	\$304,482	0	0	6.1
07/31		244,971					\$304,482	0	0	9.3
08/01	73,680	318,651	198,937	2.70	\$0.500	\$99,468	\$403,950	0	0	11.4
08/02	70,989	389,640	191,670	2.70	\$0.500	\$95,835	\$499,785	0	0	11.2
08/03	34,166	423,806	95,525	2.80	\$0.500	\$47,762	\$547,547	0	0	12.7
08/04	40,439	464,245	109,199	2.70	\$0.487	\$53,169	\$600,716	4,350	4,350	15.8
08/05	60,409	524,654	175,187	2.90	\$0.504	\$88,277	\$688,993	4,300	8,650	15.8
08/06		524,654					\$688,993	2,100	10,750	20.5
08/07	172,593	697,247	508,840	2.95	\$0.491	\$250,049	\$939,042	2,950	13,700	27.2
08/08		697,247					\$939,042	4,300	18,000	27.2
08/09	132,520	829,767	404,451	3.05	\$0.443	\$179,009	\$1,118,051	6,450	24,450	40.8
08/10		829,767					\$1,118,051	6,550	31,000	40.8
08/11	151,329	981,096	469,122	3.10	\$0.445	\$208,673	\$1,326,724	11,150	42,150	44.6
08/12	120,705	1,101,801	386,255	3.20	\$0.467	\$180,227	\$1,506,951	0	42,150	49.9
08/13		1,101,801					\$1,506,951	8,300	50,450	49.9
08/14	246,552	1,348,353	805,170	3.27	\$0.418	\$336,845	\$1,843,796	53,550	104,000	52.9
08/15	326,998	1,675,351	983,385	3.01	\$0.350	\$344,185	\$2,187,981	21,100	125,100	57.6
08/16	342,748	2,018,099	1,030,798	3.01	\$0.350	\$360,780	\$2,548,761	(800)	124,300	57.6
08/17		2,018,099					\$2,548,761	30,100	154,400	60.0
08/18	139,468	2,157,567	446,299	3.20	\$0.455	\$203,200	\$2,751,961	32,400	186,800	60.4
08/19		2,157,567					\$2,751,961	2,150	188,950	60.4
08/20	247,810	2,405,377	778,634	3.14	\$0.442	\$343,786	\$3,095,747	(198)	188,752	61.6
08/21	34,669	2,440,046	110,940	3.20	\$0.390	\$43,267	\$3,139,014	(11,998)	176,754	61.7
08/22	56,672	2,496,718	181,351	3.20	\$0.300	\$54,405	\$3,193,419	10,424	187,178	59.6
08/23	35,064	2,531,782	112,205	3.20	\$0.300	\$33,662	\$3,227,081	(213)	186,965	65.4
08/24	64,841	2,596,623	207,492	3.20	\$0.300	\$62,248	\$3,289,329	22,650	209,615	63.4
08/25	36,188	2,632,811	115,801	3.20	\$0.300	\$34,740	\$3,324,069	0	209,615	64.1
08/26	27,070	2,659,881	83,916	3.10	\$0.250	\$20,979	\$3,345,048	0	209,615	67.9
08/27	25,132	2,685,013	80,420	3.20	\$0.300	\$24,126	\$3,369,174	(876)	208,739	61.3
08/28		2,685,013					\$3,369,174	7,554	216,293	61.3
08/29		2,685,013					\$3,369,174	19,472	235,765	65.0
08/30	31,428	2,716,441	97,427	3.10	\$0.300	\$29,228	\$3,398,402	8,700	244,465	64.6
08/31		2,716,441					\$3,398,402	(6,465)	238,000	64.6
09/01		2,716,441					\$3,398,402	(483)	237,517	64.6
09/02	36,857	2,753,298	114,256	3.10	\$0.250	\$28,564	\$3,426,966	0	237,517	75.8
09/03	37,609	2,790,907	112,827	3.00	\$0.200	\$22,565	\$3,449,531	0	237,517	72.5
09/04	28,384	2,819,291	85,151	3.00	\$0.200	\$17,030	\$3,466,561	0	237,517	76.7
Totals	2,819,291		8,517,848	3.02	\$0.403	\$3,430,355		237,517		

^aInseason estimates. Includes overmature/green fish, holding mortalities and fish excess to spawning needs. Actual number of pink salmon adults spawned as brood stock in 1990 was 108,888, 13,504 fish were green or overmature, 58,526 fish were excess to spawning needs and holding mortalities numbered 56,526. Additionally 35,000 pinks were estimated to have strayed in Sawmill Bay.

Appendix F.3. Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Solomon Gulch Hatchery, 1990. Data provided by Valdez Fisheries Development Association.

Date	Fish Sales		Pounds Sold	Price/Pound	Revenue		Brood Stock ^a		% Female
	Daily	Cumulative			Daily	Cumulative	Fish/Day	Cumulative	
06/22									20.4
06/23	35,441	35,441	99,268	\$0.523	\$51,868	\$51,868			13.0
06/24	37,648	73,089	101,650		\$44,665	\$96,533			
06/25	241,967	315,056	612,138	\$0.421	\$257,865	\$354,398			15.1
06/26	141,475	456,531	355,966		\$148,282	\$502,680			18.9
06/27	171,053	627,584	448,547	\$0.440	\$197,227	\$699,907			16.7
06/28	92,167	719,751	237,921		\$93,944	\$793,851			15.0
06/29	302,140	1,021,891	756,223		\$324,097	\$1,117,948			16.2
06/30	386,206	1,408,097	1,004,962	\$0.463	\$465,133	\$1,583,081			18.6
07/01	183,183	1,591,280	469,744	\$0.465	\$218,504	\$1,801,585			23.0
07/02	76,017	1,667,297	197,644	\$0.466	\$92,043	\$1,893,628			24.6
07/03	14,555	1,681,852	36,388	\$0.465	\$16,931	\$1,910,559			22.2
07/04	105,248	1,787,100	263,668	\$0.466	\$122,759	\$2,033,318			26.1
07/05		1,787,100				\$2,033,318			
07/06		1,787,100				\$2,033,318			
07/07		1,787,100				\$2,033,318	516	516	
07/08		1,787,100				\$2,033,318	997	1,513	
07/09	35,399	1,822,499	97,702	\$0.467	\$45,617	\$2,078,935	257	1,770	41.0
07/10		1,822,499				\$2,078,935	1,516	3,286	
07/11	97,310	1,919,809	282,861	\$0.461	\$130,306	\$2,209,241	2,480	5,766	47.0
07/12	67,129	1,986,938	186,288	\$0.451	\$84,052	\$2,293,293	1,172	6,938	59.8
07/13	103,726	2,090,664	284,297	\$0.450	\$127,991	\$2,421,284	772	7,710	49.7
07/14	98,762	2,189,426	272,251	\$0.531	\$144,572	\$2,565,856	880	8,590	60.2
07/15							1,459	10,049	
07/16							1,072	11,121	
07/17							3,048	14,169	
07/18							2,043	16,212	
07/19							2,776	18,988	
07/20							4,000	22,988	
07/21							5,000	27,988	
07/22							6,000	33,988	
07/23							7,000	40,988	
07/24							8,000	48,988	
07/25							9,221	58,209	
07/26							10,000	68,209	
07/27							10,000	78,209	
07/28							10,000	88,209	
07/29							10,000	98,209	
07/30							10,000	108,209	
07/31							7,000	115,209	
08/01							7,000	122,209	
08/02							7,000	129,209	
08/03							7,000	136,209	
08/04							7,000	143,209	
08/05							7,000	150,209	
08/06							7,000	157,209	
08/07							5,000	162,209	
08/08							6,000	168,209	
08/09							6,000	174,209	
08/10							6,000	180,209	
08/11							6,000	186,209	
08/12							6,000	192,209	
08/13									
Totals	2,189,426		5,707,518	\$0.450	\$2,565,856		192,209		
Average Weight:	2.64 pounds								

^aInseason estimate. Includes overmature/green fish, holding mortalities and fish excess to spawning needs. Actual number of adults spawned as brood stock in 1990 was 124,136 pink salmon.

Appendix F.4. Daily pink salmon sales harvests, sex ratios, revenue and brood stock collection at the Cannery Creek Hatchery, 1990. Data provided by Prince William Sound Aquaculture Corporation.

Date	Fish Sales (numbers)		Pounds Sold	Average Fish Wt	Price/Pound	Revenue		Brood Stock ^a		X Female
	Daily	Cumulative				Daily	Cumulative	Fish/Day	Cumulative	
08/04								500	500	
08/05								500	1,000	25.7
08/06	20,366	20,366	56,940	2.80	\$0.415	\$23,623	\$23,623	20,555	21,555	25.7
08/07		20,366					\$23,623	30,250	51,805	25.7
08/08		20,366					\$23,623	8,212	60,017	25.7
08/09	29,810	50,176	83,468	2.80	\$0.373	\$31,125	\$54,748	575	60,592	39.0
08/10		50,176					\$54,748	2,052	62,644	39.0
08/11	53,140	103,316	148,792	2.80	\$0.395	\$58,758	\$113,506	5,671	68,315	38.0
08/12		103,316					\$113,506	9,244	77,559	38.0
08/13		103,316					\$113,506	8,746	86,305	45.0
08/14	132,570	235,886	391,807	2.96	\$0.389	\$152,439	\$265,945	22,551	108,856	50.0
08/15	52,269	288,155	166,273	3.18	\$0.350	\$58,196	\$324,141	54,310	163,166	60.0
08/16	139,079	427,234	420,231	3.02	\$0.167	\$70,345	\$394,486	205	163,371	60.0
08/17		427,234					\$394,486	22,336	185,707	60.0
08/18		427,234						38,657	224,364	60.0
08/19		427,234						38,730	263,094	60.0
08/20	50,872	478,106	152,619	3.00	\$0.349	\$53,231		11,940	275,034	70.0
08/21		478,106						1,490	276,524	72.0
08/22		478,106						5,170	281,694	72.0
08/23	60,627	538,733	183,933	3.03	\$0.300	\$55,180		0	281,694	68.5
08/24		538,733						4,010	285,704	68.5
08/25		538,733						5,010	290,714	68.5
Totals	538,733		1,604,063	2.98	\$0.314	\$502,897		290,714		

^aInseason estimates. Includes overmature or green fish, holding mortalities and fish excess to spawning needs. Actual number of pink salmon adults spawned in 1990 was 140,837, fish excess to spawning needs numbered 23,659, inviable brood stock numbered 10,959, and 13,585 pinks were counted as eggtake mortalities. Additionally, 99,800 pinks spawned in the watershed.

Appendix F.5. Sales harvests of salmon by species from private nonprofit hatcheries, Prince William Sound, 1978 - 1990.^a

Year	Hatchery ^b	Catch by Species			Total
		Coho	Pink	Chum	
1978	AFK		133,648		133,648
1979	AFK		223,761		223,761
1980	AFK, N		346,928	6	346,934
1981	AFK		707,037	118	707,155
1982	AFK		1,355,315		1,355,315
1983	AFK		765,924		765,924
1984	AFK, SG		402,825	4,886	407,711
1985	AFK, SG		1,273,951	3,840	1,277,791
1986	AFK, SG	2,156	909,219	20,683	932,058
1987 ^c	AFK, SG, E, CC	7,015	2,986,061	2,549	2,995,625
1988	AFK, SG, E	6,110	1,667,238	42,694	1,716,042
1989 ^d	AFK, SG, WNH, CC, MB	52,307	7,795,713	131,362	7,979,382
1990 ^e	AFK, SG, WNH, CC	14,199	8,732,658	24,554	8,771,411
TOTAL		81,787	27,300,278	230,692	27,612,757

a Includes salmon harvested by private nonprofit hatcheries in Prince William Sound to generate revenues to offset operational costs. Does not include carcass sales.

b Hatchery codes: AFK = Armin F. Koernig Hatchery (PWSAC)
 E = Esther Hatchery (PWSAC), renamed WNH in 1989
 SG = Solomon Gulch Hatchery (VFDA)
 N = NERKA Inc.
 CC = Cannery Creek (PWSAC)
 WNH = Wally Noerenberg Hatchery (PWSAC)
 MB = Main Bay (ADF&G)

c PWSAC administered a sales harvest at the state owned Cannery Creek hatchery. A majority of the coho salmon sold were carcasses and surplus brood fish from the Solomon Gulch hatchery.

d PWSAC administered a sales harvest at the state owned Main Bay Hatchery to harvest a surplus of chum salmon due to the closure of the common property fishery. 1989 data provided by PWSAC and VFDA.

e Catches as reported on fish tickets.

Appendix F.6. Summary of pink and chum salmon returns to Prince William Sound hatcheries, 1990.

Pink salmon returns to P.W.S. hatcheries.^a

Hatchery (millions)	1989 Fry Release (millions)	1990 Forecast Return	Estimated Total Return	Marine Survival	Estimated C.P.F. Comm Catch	Sales Harvest ^b	Escmt. and Brood ^c	Eggs Taken
Solomon Gulch ^d	128.4	5,020,000	9,017,483	5.6%	6,908,361	2,146,469	200,000	159.4
A. F. Koernig	161.9	8,580,000	7,125,111	4.4%	5,636,918	2,669,519	272,767	127.9
Wally Noerenberg	159.9	8,550,000	14,006,111	8.8%	10,492,000	3,364,172	436,022	240.1
Cannery Creek	59.1	2,660,000	2,949,090	5.0%	2,132,453	552,498	288,840	151.8
Main Bay	10.5	----- NOT AVAILABLE -----				0	0	0
Total Pink	519.8	24,810,000	33,097,795		25,169,732	8,732,658	1,197,629	679.2

Chum salmon returns to P.W.S. hatcheries.^a

Hatchery	1990 Forecast Return	Estimated Total Return	Estimated C.P.F. Comm Catch	Sales Harvest ^b	Escmt. and Brood ^c	Eggs Taken (millions)	
Solomon Gulch	46,800	5,360	2,589	1,085	1,686	1.1	
A. F. Koernig	7,300	445	0	445	0	0	
Wally Noerenberg	521,500	----- NOT AVAILABLE -----			23,024	106,098	86.1
Cannery Creek	0	0	0	0	0	0	
Main Bay	847,300	165,308	165,308	0	0	0	
Total Chum	1,422,900	171,113	167,897	24,554	107,784	87.2	

a Estimates of the common property catch of pink salmon from PWS hatcheries are based on analysis of CWT recoveries and location of catch as reported on fish tickets.

b Does not include carcass sales which are part of the brood stock. Data are from fish ticket information.

c Includes brood stock, overmature/green fish, holding mortalities and excess fish.

d Includes Boulder Bay remote release.

Appendix F.7. Estimated total hatchery and wild stock production of pink salmon, Prince William Sound, 1978 to 1990.^a

Year	Total Return by Hatchery ^b					Total Hatchery	Total Wild Stock Component ^c
	Solomon Gulch (VFDA)	Armin F. Koernig (PWSAC)	Wally Noerenberg (PWSAC)	Main Bay (ADF&G)	Cannery Cr. (ADF&G - PWSAC)		
1978		154,620				154,620	4,049,172
1979		552,955				552,955	17,493,110
1980		1,493,489			90,348	1,583,837	14,139,800
1981		2,264,854			141,328	2,406,182	19,679,655
1982		5,134,363		35,000	760,389	5,929,752	17,122,211
1983	92,000	3,722,502		496,850	469,436	4,780,788	11,916,210
1984	200,000	2,900,000		1,200,000	1,139,000	5,439,000	21,037,567
1985	421,000	5,030,000		383,000	2,686,000	8,520,000	19,734,589
1986	1,240,000	4,964,000		232,000	853,000	7,289,000	5,482,529
1987	5,406,153	7,613,551	3,032,443	328,000	2,122,786	18,502,933	13,041,094
1988	1,057,996	6,108,238	3,866,618	100,000	227,688	11,360,540	1,765,936
1989	3,378,761	3,937,926	7,130,475	0	6,946,635	21,393,797	2,758,972
1990	9,017,483	7,125,111	14,006,111	d	2,949,090	33,097,795	13,549,696

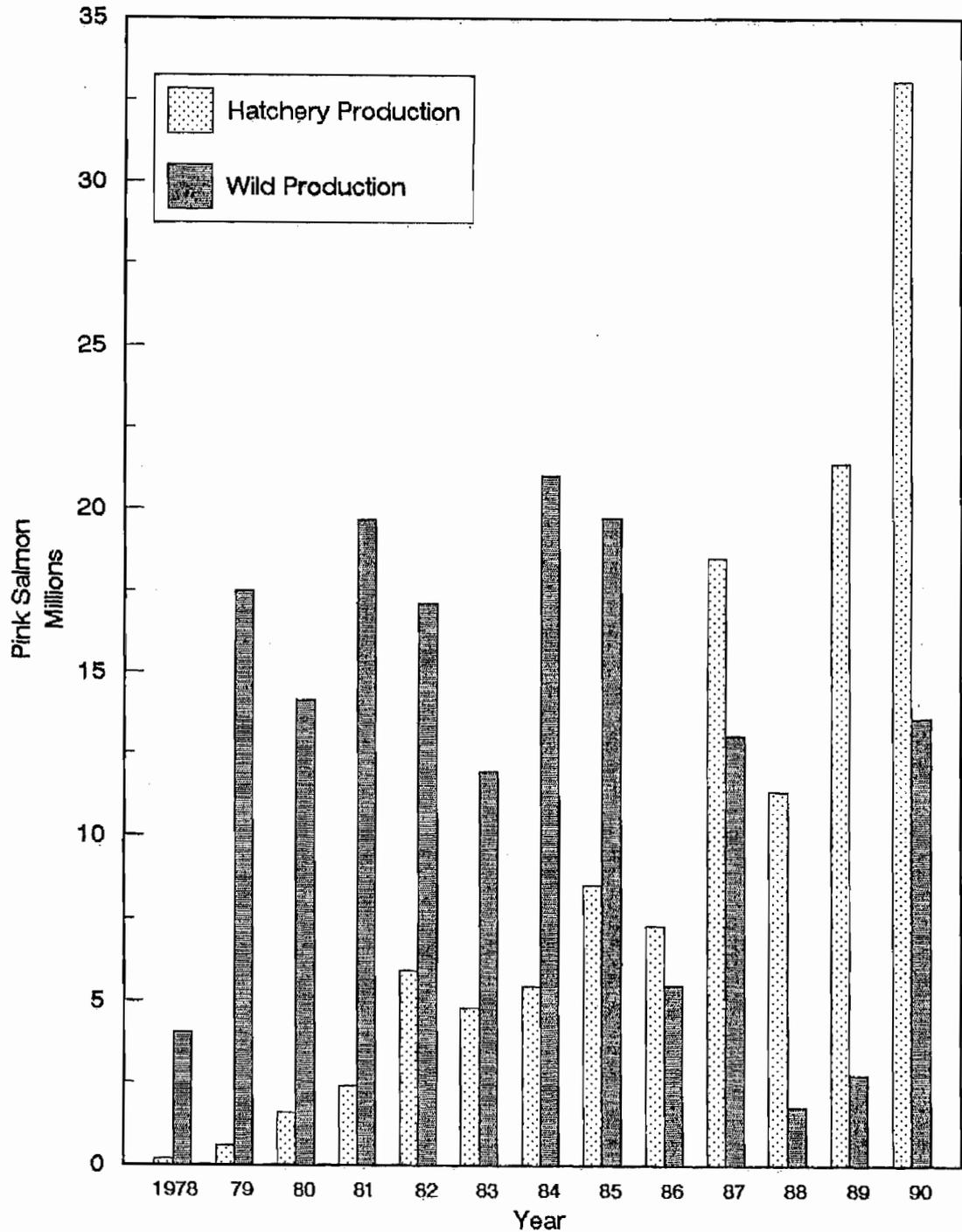
a Prior to 1987, there was no definitive or statistically valid method of separating hatchery and wild stock composition in the commercial catch. The above estimates are based on presumed wild stock exploitation rates which in turn are determined by the wild stock escapement estimate. The wild stock escapement index is only a minimum estimate. The true wild stock escapement is not known. Consequently estimates prior to 1987 may exaggerate hatchery contributions somewhat. In 1987 returning adults from the Cannery Creek, Armin F. Koernig and and Esther hatcheries were marked with half length coded wire tags. In a jointly funded program conducted by ADF&G and PWSAC, these marked fish were recovered and analyzed to estimate hatchery contributions to the fishery (Geiger, 1990).

b Hatchery totals include cost recovery harvests, brood stock collection and escapement escapement, and estimated common property fishery interception.

c Total wild stock return represents the estimated wild stock catch plus the aerial escapement index. 1990 wild stock component = 12,263,313 catch plus 1,325,852 escapement index.

d Not available.

Hatchery and Wild Stock Pink Returns Prince William Sound



Appendix F.8. Estimated total pink salmon returns to hatcheries and wild stock systems, Prince William Sound, 1978 - 1990.

APPENDIX G

SUBSISTENCE AND PERSONAL USE FISHERIES

Appendix G.1. Subsistence salmon harvest by species and gear type, Prince William Sound, 1990.

Area	Permits Issued	Permits Fished	Gear ^a Type	King	Sockeye	Coho	Other ^b	TOTALS
Prince William Sound	5	1	D.G.N.	0	0	7	4	11
	2	0	P.S.	0	0	0	0	0
	1	1	S.N.	0	0	0	0	0
P.W.S. Total	8	2		0	0	7	4	11
Copper River Flats	88	38	D.G.N.	60	469	82	0	611
Upper Copper River	95	95	D.N.	38	2,504	45	3	2,590
	311	311	F.W.	564	27,316	58	4	27,942
Tatitlek ^c	13	3	MX.	0	5	241	14	260
Southwestern ^c	7	2	MX.	1	36	5	20	61
Area Total	522	451		663	30,330	438	45	31,475

a D.G.N. = Drift gill net; P.S. = Purse seine; S.N. = Set net; MX. = Combination of gear (drift gill net and dip net); D.N. = Dip Net; F.W. = Fish Wheel

b Includes cutthroat and Dolly Varden as well as misc. salmon species.

c The "other" species catch column is composed of approximate 50/50 pink and chum salmon. This is the second year using these special subsistence permits.

Appendix G.2. Salmon catch and effort in the Copper River District subsistence gill net fishery, 1960 - 1990.

Year	Total Issued	Permits Returned				Catch			
		Unused	Unsuccessful	Successful	Total	Chinook	Sockeye	Coho	Total
1960	13	No Record	No Record	Unknown	No Record			158	158
1961	14	"	"	"	14	60	137	99	296
1962	14	"	"	"	No Record	44	135	3	182
1963	8	0	2	6	8	3	13	157	173
1964	5	2			3	14			14
1965	31	5	2	13	20	12	459	85	556
1966	45	10	2	19	31	47	175		222
1967	61	19	9	28	56	83	153		236
1968	17	8	1	6	15	11	36		47
1969	49	13	7	13	33	16	63	85	164
1970	32	3	1	23	27	66	179		245
1971	29	9	12	5	26	10	32	4	46
1972	104	5		75	80	149	569	53	771
1973	94			89	89	153	326	180	659
1974	9	2	2	1	5	5	4	2	11
1975	2			2	2	0	5	0	5
1976	27			14	14	1	10	0	11
1977	23			22	22	10	71	0	81
1978	34	19		9	28	37	18	12	67
1979	49	20	4	17	41	45	26	17	88
1980	39	17	6	12	35	19	27	17	63
1981	72	21	4	26	51	48	145	104	297
1982	108	42	3	45	90	60	634	106	802
1983	87	42	4	27	73	79	107	57	254
1984	118	47	14	43	104	68	324	135	549
1985	94	27	9	58	94	88	261	83	433
1986	88	28	9	48	85	86	348	47	481
1987	95	50	5	34	89	49	359	14	510
1988	114	40	17	40	97	59	226	42	440
1989	75	32	2	30	64	56	339	51	454
1990	88	38	0	38	76	60	469	82	611

a Includes 1 pink and 1 chum.

b Includes 11 pinks.

c Includes 22 pinks.

d Includes 1 chum.

e Includes 23 Dolly Varden.

f Includes 73 Dolly Varden, 6 Whitefish and 9 Cutthroat

g Includes 4 chum, 87 Dolly Varden, 15 Whitefish and 7 Cutthroat

h Includes 3 chum, 2 Dolly Varden, and 3 Whitefish

Appendix G.3. Salmon catch and effort in the Prince William Sound subsistence fishery, 1960 - 1990.^a

Year	Permits		Catch						
	Issued	Returned	Chinook	Sockeye	Coho	Pink	Chum	Unknown	Total
1960	50		1	139	505	1292	75	150	2162
1961	12		3	41	123	732	3		902
1962	9				119	214	142		475
1963	9				406	298	24		728
1964	15			11		900			911
1965	22	16				179	25		204
1966	3	3		3	19	20	50		92
1967	4	3			4	4			8
1968	4	3			20	156		22	198
1969	7	3			16				16
1970	1	1							0
1971	3	2				46			46
1972	0								0
1973	19	16			289				289
1974	3	1							0
1975	2	0							0
1976	0								0
1977	4	4							0
1978	3	2							0
1979	15	2							0
1980	26	15		7	6				13
1981	12	8		3	29		2		34
1982	35	27		84	4	31	24		143
1983	26	21		22	36	9	79		146
1984	8	8		10		11	2		23
1985	22	16	1	27	16	14	26		84
1986	25	14		5	15				20
1987	18	17	5	31	6		16		58
1988	7	7	2	51	7	10	9		79
1989	11	7	0	0	0	0	3	0	3
1990	8	8	0	0	7	4	0	0	11

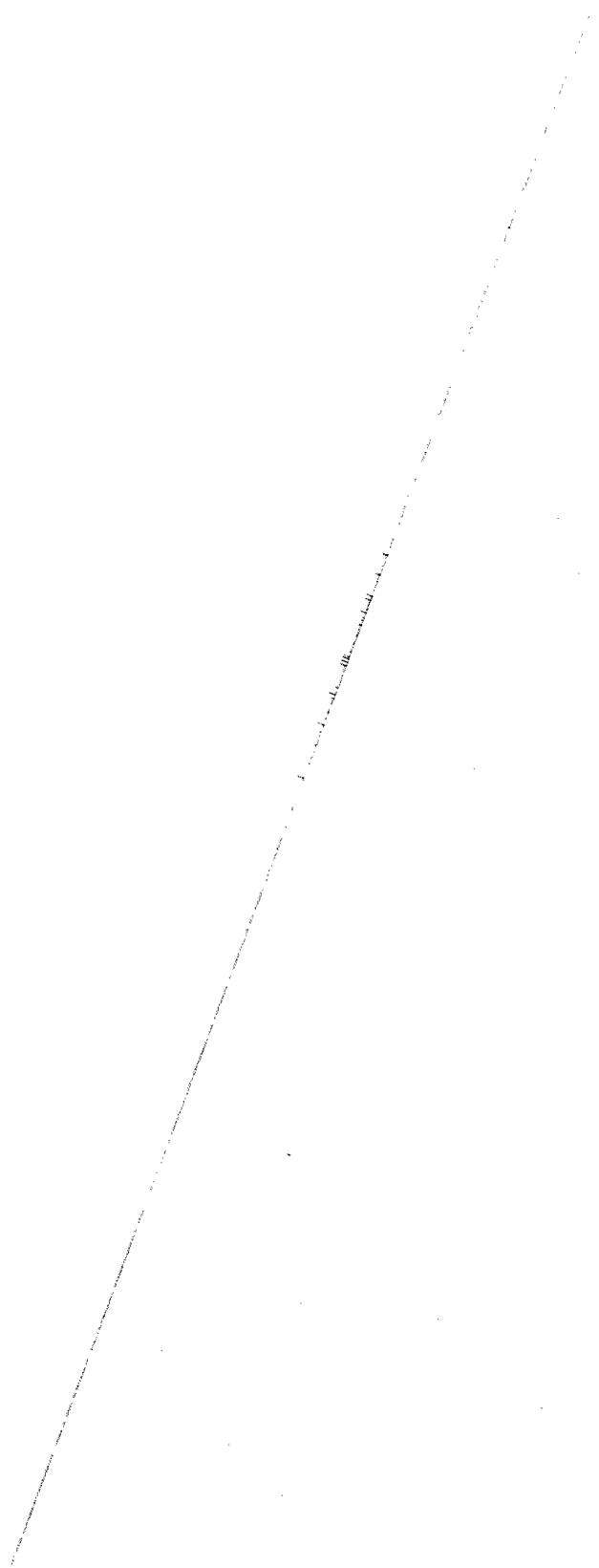
^a Includes only catches from Prince William Sound proper.

Appendix G.4. Salmon catch by species and numbers of permits by gear type for the Upper Copper River subsistence and personal use fisheries, 1965 - 1990.

Year	Permits Issued			Reported Catch			Reported Catch by Species			Total Catch	
	Dip Net	Fish Wheel	Total	Dip Net	Fish Wheel	Total	Chinook	Sockeye	Coho	Reported	Estimated
1965	982	143	1,125	7,215	5,813	13,028	664	12,760	52	13,476	16,818
1966	1,132	138	1,270	7,452	9,188	16,640	555	16,718		17,273	21,896
1967	1,166	154	1,320	6,146	8,360	14,506	419	14,457		14,876	19,007
1968	1,235	143	1,378	8,040	6,071	14,111	644	14,819	233	15,696	20,383
1969	1,415	167	1,582	18,054	6,220	24,274	719	27,604	224	28,547	29,266
1970	3,220	267	3,487	22,700	9,886	32,586	427	36,500	554	37,481	42,757
1971 ^a	4,168	374	4,542	28,115	9,370	37,485	1,363	37,517	363	39,243	48,449
1972 ^b	3,485	205	3,690	18,996	7,854	26,850	1,501	26,850	248 2	28,599	32,668
1973 ^c	3,840	305	4,145	16,407	10,943	27,350	1,846	27,350	51 3	29,247	29,248
1974 ^d	3,305	288	3,593	15,143	7,657	22,800	1,141	22,800	163 4	24,104	26,001
1975	2,452	350	2,802	7,694	5,626	13,320	1,705	13,320		15,025	15,357
1976	2,512	451	2,963	12,130	8,321	20,451	2,017	20,451	17	22,485	23,623
1977	3,526	540	4,066	22,612	12,751	35,363	2,171	35,363	454	37,988	41,815
1978	3,313	392	3,705	12,569	6,638	19,207	2,050	19,207	633	21,890	22,029
1979	2,730	470	3,200	11,887	10,251	22,138	2,372	22,138	705	25,215	30,963
1980	2,804	399	3,203	14,650	9,805	24,455	2,256	21,437	639	24,332	35,081
1981	3,555	523	4,078	28,872	26,924	55,796	1,913	53,008	849	55,770	68,746
1982 ^e	5,475	615	6,090	62,614	38,120	100,734	2,532	96,799	1,246	100,577	110,006
1983	6,911	630	7,541	72,257	35,791	108,228	5,421	100,995	1,690	108,106	118,728
1984 s	104	458	562	1,288	20,374	21,662	415	20,999	237	21,651	23,093
p	5,311	17	5,328	46,018	223	46,241	1,592	44,079	552	46,223	49,940
s&p	5,415	475	5,890	47,306	20,597	67,903	2,007	65,078	789	67,874	73,033
1985	4,153	533	5,686	29,856	22,877	52,733	1,673	50,488	544	52,705	64,200
1986 s ^f	39	366	405	645	25,136	25,781	622	24,890	264	25,776	28,423
p	3,966	65	4,031	41,641	1,054	42,695	2,294	39,794	521	42,609	44,047
s&p	4,005	431	4,436	42,286	26,190	68,476	2,916	64,684	785	68,385	72,470
1987 s ^f	59	372	431	1,148	21,821	22,969	541	22,286	100	22,969	35,035
p	4,186	73	4,259	42,301	470	42,771	2,739	39,614	398	42,771	46,115
s&p	4,245	445	4,690	43,449	22,291	65,740	3,280	61,900	498	65,740	81,150
1988 s	70	339	409	1,860	18,955	20,815	672	19,761	245	20,678	30,514
p	4,205	46	4,251	40,492	1,238	41,730	2,723	38,533	450	41,730	45,921
s&p	4,275	385	4,660	42,352	20,193	62,545	3,395	58,294	695	62,545	76,435
1989 s	78	309	386	2,235	25,377	27,612	744	26,716	65	27,525	29,317
p	4,447	137	4,584	53,321	3,223	56,544	2,160	53,505	825	56,490	58,914
s&p	4,525	446	4,970	55,556	28,600	84,156	2,904	80,221	890	84,015	88,231
1990 s	95	311	406	2,703	27,942	30,645	604	29,947	87	30,638	32,290
p	5,631	58	5,689	67,241	747	67,988	2,594	63,793	1,446	67,833	70,478
s&p	5,726	369	6,095	69,944	28,689	98,633	3,198	93,740	1,533	98,471	102,768

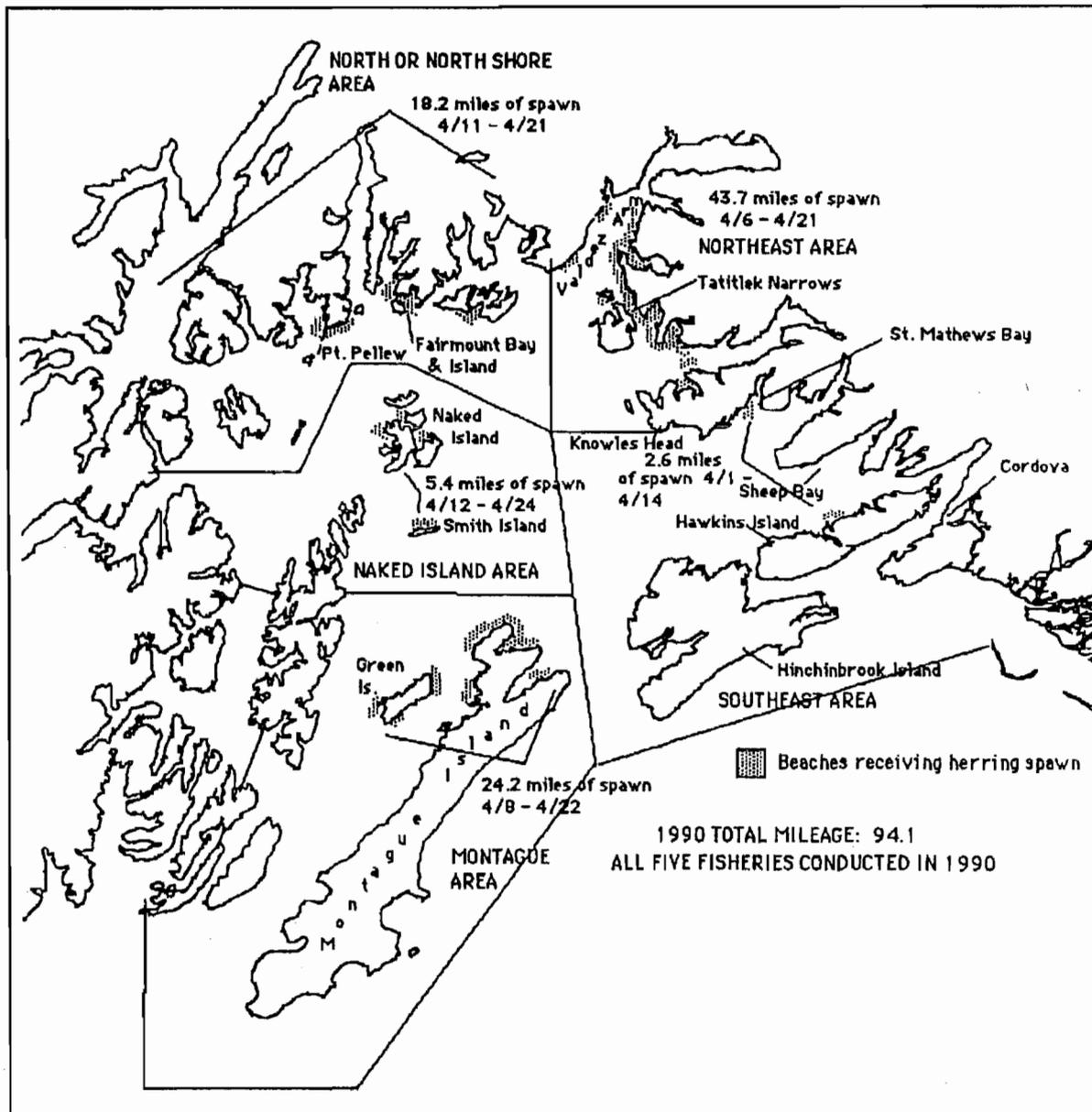
a Last use of Dip Net/Fishwheel combination permits.
b First issue of permits at Chitina
c Last "Blacklist" used
d Issue of permits at Chitina and Glennallen only.
e Return requirement enforced.
f Subsistence dip net catch estimated.

s = subsistence
p = personal use
s&p = total catch (1984, 1986 - 1990)



APPENDIX H

HERRING



Appendix H.1. Miles and dates of herring spawn recorded by skiff and aerial surveys in Prince William Sound, 1990.

Appendix H.2. Commercial herring harvest summary with fishing locations and effort by gear type, Prince William Sound, 1990.

Fishery	Area	Fishing		Harvest (short tons)		
		Date(s)	Duration	Effort	Roe on Kelp	Herring
Sac Roe Seine	Tatitlek	4/12	20 min.	97		8,362.1
	Total		20 min.	97		8,362.1
Sac Roe Gillnet	Tatitlek	4/13	4 hrs.	24		505.4
	Total		4 hrs.	24		505.4
Spawn on Kelp ^a	Tatitlek	4/21	8 hrs.	86	47.4	
	Tatitlek	4/22	8 hrs.	104	71.4	
	Total		16 hrs.	134	118.8	950.4 ^b
Pound Kelp ^c	Galena Bay	4/11-4/22		128	101.1	
	Tatitlek					
	Total			128	101.1	1,263.8 ^d
Bait/Food	Knowles Head	9/21-11/28		6		
	Montague-Green Island					
Total				6		2,015.9
Total Equivalent harvest of herring						13,097.6

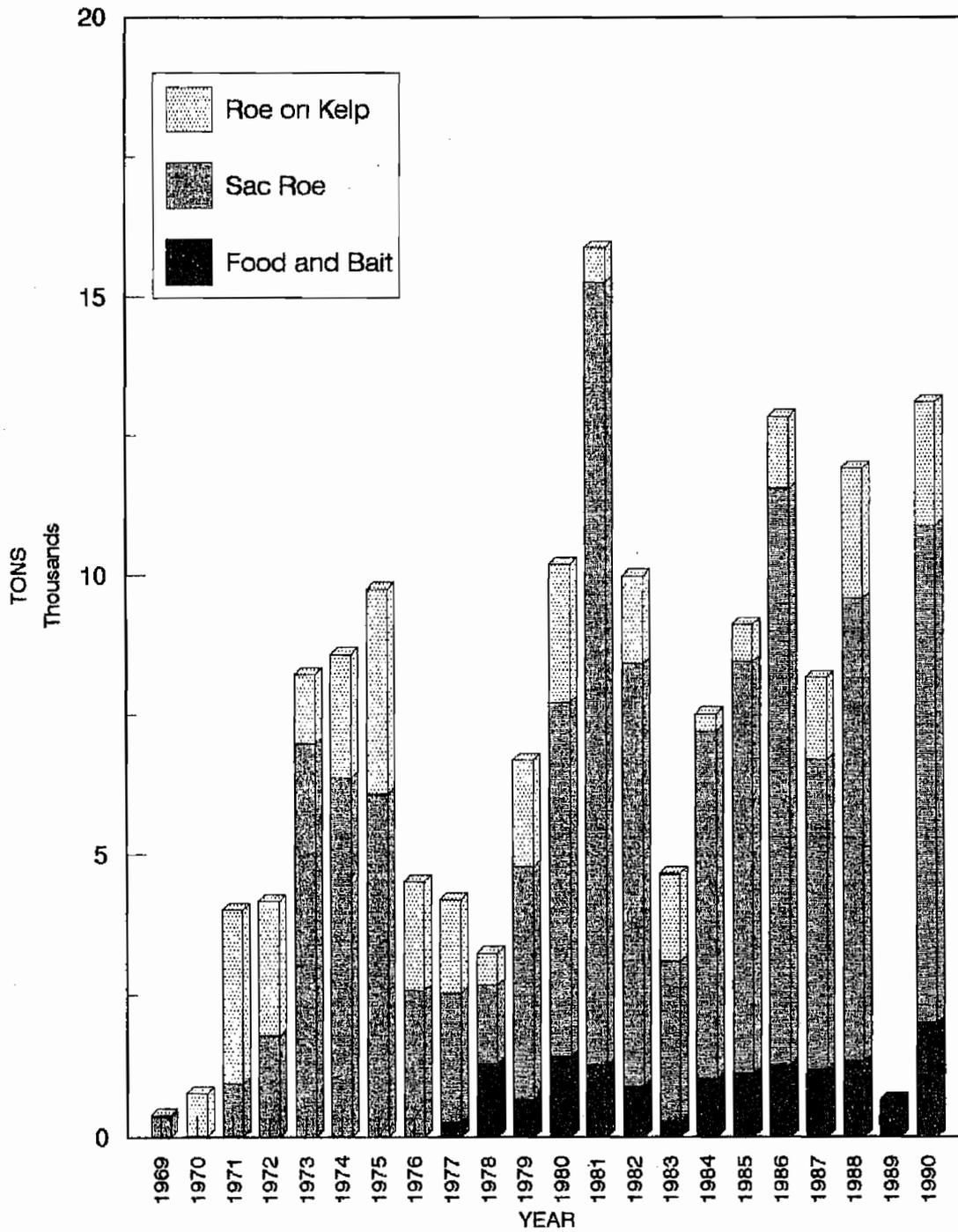
^aThe harvest by divers of naturally occurring herring roe on native kelp species in P.W.S.

^bThe equivalent harvest of herring due to the removal of reproductive capacity from the population based on the assumption that the average fish roe recovery is 10%, and 80% of the spawn on kelp harvest weight consists of eggs.

^cThe harvest of herring roe on kelp produced in net pens or pounds.

^dThe equivalent harvest of herring due to stress mortality and the removal of reproductive capacity of the population based on the assumption that 12.5 tons of herring are used to produce 1 ton of roe on kelp.

ALL FISHERIES HERRING HARVEST PRINCE WILLIAM SOUND



Appendix H.3. Commercial herring harvest by fishery, Prince William Sound, 1969 - 1990.

Appendix H.4. Herring sac roe seine and gill net fishery effort, anticipated and actual harvest, Prince William Sound, 1969 - 1990.

Seine Fishery								Combined Fisheries
Year	Seine Fishery Opening Dates	Effort Hours (Boats)	CPUE Tons/Boat Hr.	Anticipated Harvest ^a	Harvest (Tons)	Estimated Mean Roe %	Harvest (Tons)	
1969	3/01 - 6/30		6		355.7		355.7	
1970	3/01 - 6/30		1					
1971	3/01 - 6/30		14		919.3		919.3	
1972	3/01 - 6/30		15		1,772.6		1,772.6	
1973	4/23 - 5/09		28		6,984.4		6,984.4	
1974	4/10 - 4/17		72		6,368.2		6,372.0	
1975	4/15 - 4/22	14	76	5.72	6,081.5		6,081.5	
1976	5/08 & 6/01	13	66	3.01	2,584.5		2,584.5	
1977	4/09 - 4/10	38	60	1.00	2,282.9		2,284.5	
1978	4/17 - 4/21 ^b	106	75	0.17	1,329.6		1,391.3	
1979	4/07 - 4/19	215.5	89	0.22	4,138.6		4,138.6	
1980	4/01 - 4/09	162	74	0.50	6,043.		6,307.7	
1981	4/01 - 4/09	60	101	2.27	13,770.6		14,005.2	
1982	4/23	2	104	34.37	7,148.3	10-14%	7,542.2	
1983	4/13	1	103 ^c	26.45	2,724.2	11.0%	2,829.6	
1984	4/14	3	105 ^d	18.53	5,836.9	10-11%	6,179.8	
1985	4/28 - 4/29	4	103 ^e	16.81	5,000	6,924.8	10-12%	7,338.1
1986	4/17	3	105	31.20	5-7,000	9,828.1	11.0%	10,276.7
1987	4/08 - 4/09	1.5	96	34.60	3-5,000	4,982.2	10.0%	5,515.5
1988	4/21 - 4/22	2	105	37.60	4-5,000	7,895.9	10.5%	8,254.0
1989	CLOSED				6,400		0.0	
1990	04/12	0.3	96	290.35	6,038	8,362.1	10.0%	8867.5

Gillnet Fishery

Year	Gillnet Fishery Opening Dates	Effort Hours (Boats)	CPUE Tons/Boat Hr.	Anticipated Harvest ^a	Harvest (Tons)	Estimated Mean Roe%	
1969							
1970							
1971							
1972							
1973							
1974	4/10 - 04/17	3			3.8		
1975		14					
1976		13					
1977	4/09 - 04/10	38	1	0.04	1.6		
1978	4/17 - 04/21	106	38	0.02	61.7		
1979	CLOSED						
1980	4/17 - 5/05		16		264.5		
1981	4/16 - 4/18	53	18	0.25	234.6		
1982	4/24 - 4/26	54	18	0.41	393.9	12-15%	
1983	4/21 - 4/22	24	22	0.20	105.4	11.0%	
1984	4/18 - 4/22	59	24	0.24	250	342.9	8-14%
1985	4/29 - 5/01	34	21	0.58	250	413.3	10-12%
1986	4/24 - 4/28	90	25	0.20	3-400	448.6	11.4%
1987	4/10 - 4/11	24	25	0.89	2-300	533.3	9.5%
1988	04/23	5.5	24	2.71	275	358.1	10.0%
1989	CLOSED	0	0		375	0	
1990	04/13	4	24	5.26	353	505.4	10.6%

^aAnticipated harvest figures based on pre-season harvest outlook projections.

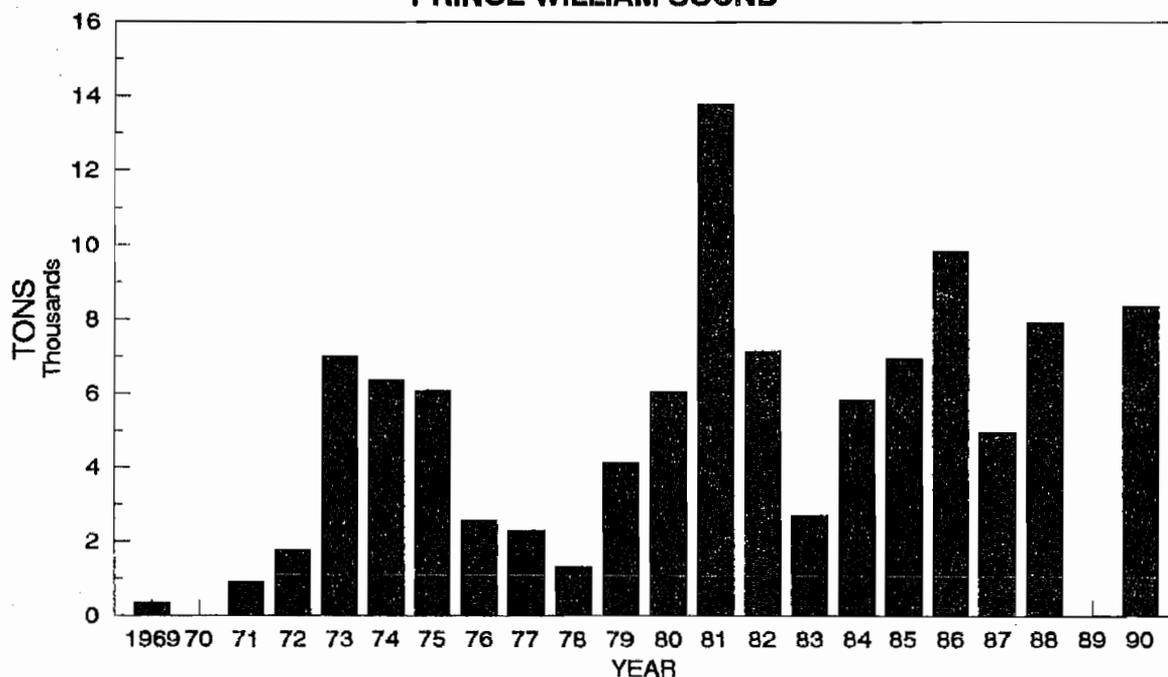
^bAn additional opening was scheduled on 6/14 for 6 hours, but resulted in no harvest.

^c103 boats participating but only 72 actually made deliveries.

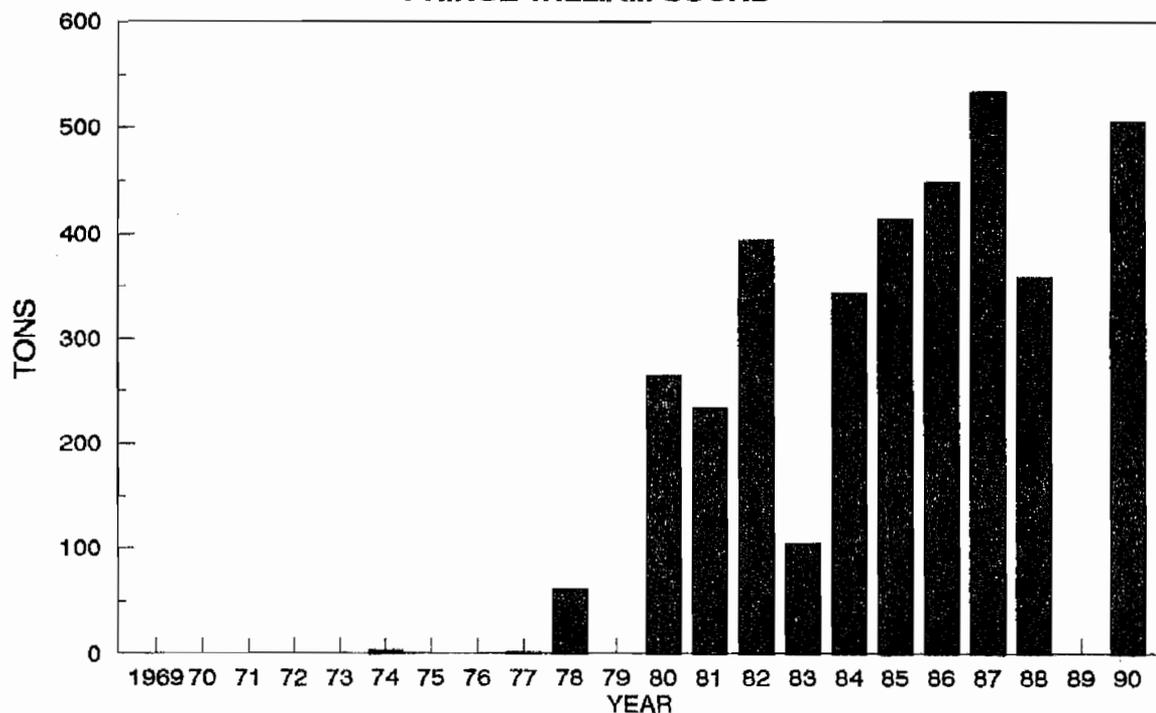
^d105 boats participating but only 101 actually made deliveries.

^e103 boats participating; 62 made deliveries at Montague and 90 made deliveries in the Northern District.

**SAC ROE PURSE SEINE HARVEST
PRINCE WILLIAM SOUND**



**SAC ROE GILL NET HARVEST
PRINCE WILLIAM SOUND**



Appendix H.5. Herring sac roe purse seine and gill net harvests,
Prince William Sound, 1969 - 1990.

Appendix H.6. Herring eggs on kelp harvests from natural spawning, Prince William Sound, 1969 - 1990.

Year	Fishery Dates	Hours	Effort (Divers)	Harvest		Herring Utilized ^b
				Pounds ^a	Tons	Tons
1969	5/18-5/31		3	5,300	2.7	21.2
1970	4/19-6/06		29	190,300	95.2	761.2
1971	4/18-5/15		34	769,300	384.7	3,077.2
1972	4/30-5/20		397	599,300	299.7	2,397.2
1973	4/23-5/26		176	306,300	153.2	1,225.2
1974	4/22-5/04		166	552,100	276.1	2,208.4
1975	4/25-5/10		437	917,100	458.6	3,668.4
1976	4/21- ?		357	484,900	242.5	1,939.6
1977	4/27-12/31		164	417,000	208.5	1,668.0
1978	4/20-4/30		66	140,900	70.5	563.6
1979	4/25-5/03		198	473,200	236.6	1,892.8
1980	4/23-4/30	10	469	612,300	306.2	2,449.2
1981	4/25	12	214	122,400	61.2	489.6
1982	5/05-5/08	73	151	309,600	154.8	1,238.4
1983	4/27	12	186	303,200	151.6	1,212.8
1984	SEASON CLOSED		225 ^c			0.0
1985	5/06&5/08	20	95	41,300	20.7	165.2
1986	4/30-5/03	86	29	95,200	47.6	380.8
1987	4/15-4/17	44	60	176,400	88.2	705.6
1988	4/29&4/30	12	158	193,200	96.6	772.8
1989	SEASON CLOSED				0	
1990	4/21-4/22	16	134	237,600	118.8	950.4

^aRounded to nearest 100 pounds.

^bIndicates the annual removal of reproductive capacity from the population based on the assumption that average fish roe recovery is 10% and 80% of spawn on kelp harvest weight consists of eggs.

^cPermits issued.

Appendix H.7. Herring eggs on kelp produced in pounds, Prince William Sound, 1979 - 1990.

Year	Fishery Dates ^a	Permits Issued ^b	Pounds Built ^c	Producing Pounds ^d	Herring				Total ^f		Allocation in Tons
					Utilized (Tons) ^e	Ribbon lbs.	Tons	Macrocystis lbs.	Tons	lbs.	
1979		2	0								
1980	4/14	14	4	2	17	1,771	0.9	880	0.4	2,651	1.3
1981	4/14	18	18	7	121	17,217	8.6	2,100	1.1	19,317	9.7
1982	4/29-5/10	25	20	18	319	50,165	25.1	900	0.5	51,065	25.5
1983	4/30-5/04	47	38	26	347	35,364	17.7	20,100	10.1	55,464	27.7
1984	4/24-5/08	65	45	37	315	12,839	6.4	37,572	18.8	50,411	25.2
1985	4/25-5/07	81	59	50	502	24,199	12.1	56,131	28.1	80,262	40.1
1986	4/21-4/28	104	82	81	903	0	0	144,400	72.2	144,400	72.2
1987	4/10-4/21	111	111	108	765	0	0	122,400	61.2	122,400	61.2
1988	4/12-4/23	122	122	119	1,550	0	0	248,000	124.0	248,000	124.0
1989	SEASON CLOSED				0						
1990	4/11-4/26	128	128	122	1,264	0	0	200,200	101.1	200,200	101.1

^aDates that the fishery was opened to seine herring for placement into pounds.

^bPermits issued to applicants on register prior to the March 1 deadline.

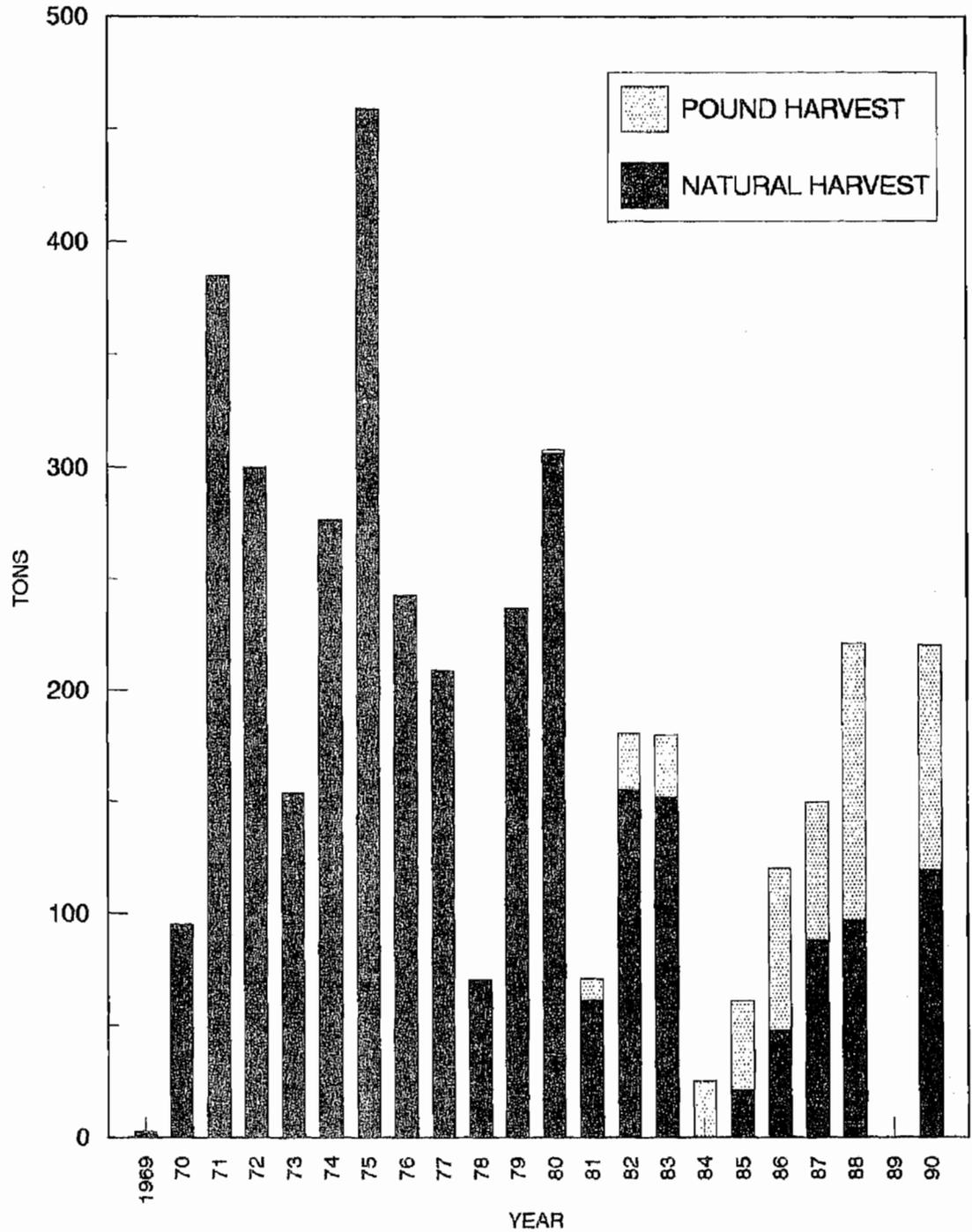
^cNumber of individual pounds constructed by the April 1 deadline, and consequently the number of individuals receiving an equal allocation of the guideline harvest.

^dNumber of pounds that were successful in producing roe on kelp product. Due to the group cooperation in this fishery production is frequently reported for a few individuals whose pounds did not produce roe on kelp product.

^eThe equivalent harvest of herring due to stress mortality and the removal of reproductive capacity of the population based on the assumption that 12.5 tons of herring are used to produce 1 ton of roe on kelp.

^fProduction figures represent processed weights as reported on fish tickets.

HERRING SPAWN ON KELP HARVEST PRINCE WILLIAM SOUND



Appendix H.8. Herring spawn on kelp harvest, Prince William Sound, 1969 - 1990.

Appendix H.9. Daily commercial herring food and bait harvest as reported on fish tickets, Prince William Sound, 1990.

Year	Date	Effort	Harvest ^a		Cumulative Harvest	
			lbs.	Tons	lbs.	Tons
1990	10/04	-	50,325	25.2	50,325	25.2
"	10/07	-	71,346	35.7	121,671	60.8
"	10/14	-	246,690	123.3	368,361	184.2
"	10/19	-	54,000	27.0	422,361	211.2
"	10/20	-	287,590	143.8	709,951	355.0
"	10/21	-	140,000	70.0	849,951	425.0
"	10/22	-	275,880	137.9	1,125,831	562.9
"	10/23	-	150,000	75.0	1,275,831	637.9
"	10/25	-	10,648	5.3	1,286,479	643.2
"	10/29	-	815,360	407.7	2,101,839	1050.9
"	11/02	-	83,720	41.9	2,185,559	1092.8
"	11/05	-	113,238	56.6	2,298,797	1149.4
"	11/13	-	140,000	70.0	2,438,797	1219.4
"	11/14	-	55,350	27.7	2,494,147	1247.1
"	11/16	-	186,203	93.1	2,680,350	1340.2
"	11/17	-	222,511	111.3	2,902,861	1451.4
"	11/19	-	364,000	182.0	3,266,861	1633.4
"	11/21	-	416,300	208.2	3,683,161	1841.6
"	11/23	-	100,570	50.3	3,783,731	1891.9
"	11/24	-	248,000	124.0	4,031,731	2015.9
Totals		6	4,031,731	2,015.9		

^aEffort was concentrated in the vicinity of Green Island.

Appendix H.10. Commercial herring bait and food harvests in short tons, Prince William Sound, 1970 - 1990.

Year ^a	Seine		Pair Trawl		Mid-Water Trawl		Otter Trawl		Total Tons
	Effort	Harvest Tons	Effort	Harvest Tons	Effort	Harvest Tons	Effort	Harvest Tons	
1970	-	10.0							10.0
1971	-	20.0							20.0
1972	-	4.9							4.9
1973	-	8.5							8.5
1977-78 ^b	-	17.0	-	145.3	-	90.4			252.7
1978-79 ^c	-	195.4	-	988.8	-	103.2	-	2.5	1,289.9
1979-80 ^d	-	510.9	-	145.1					656.0
1980-81 ^e	-	1,030.5	-	386.0					1,416.5
1981-82 ^f	6	1,189.5	-	73.1					1,262.6
1982-83	5	883.2							883.2
1983-84	-	273.6							273.6
1984-85	-	1,021.7							1,021.7
1985-86 ^g	5	1,118.1							1,118.1
1986-87 ^h	5	1,276.2							1,276.2
1987-88 ⁱ	7	1,189.4							1,189.4
1988-89 ^j	7	1,335.3							1,335.3
1989-90 ^k	-	646.1							646.1
1990 ^l	5	1,955.0			-	60.8			2,015.9

^aNo harvest in years not listed.

^bStarting 1977 bait herring season includes portions of two calendar years, unless closed by E.O.

^cFishery opened by emergency order on October 16, 1979 and extended on January 7, 1980. Deliveries made through March 2.

^dFishery season opened by emergency order September 15, 1979, closed Dec. 31, 1979, and reopened by emergency order from Feb. 16 - 28, 1980.

^eFishing season opened by regulation on September 15, 1980 and closed by emergency order on November 7, 1980.

^fFishing season opened by regulation on September 15, 1981 and closed by emergency order on September 30, 1981.

^gFishing season opened by regulation on September 1, 1985 and closed by emergency order on February 15, 1986.

^hFishing season opened by regulation on September 1, 1986 and closed by emergency order on October 24, 1986.

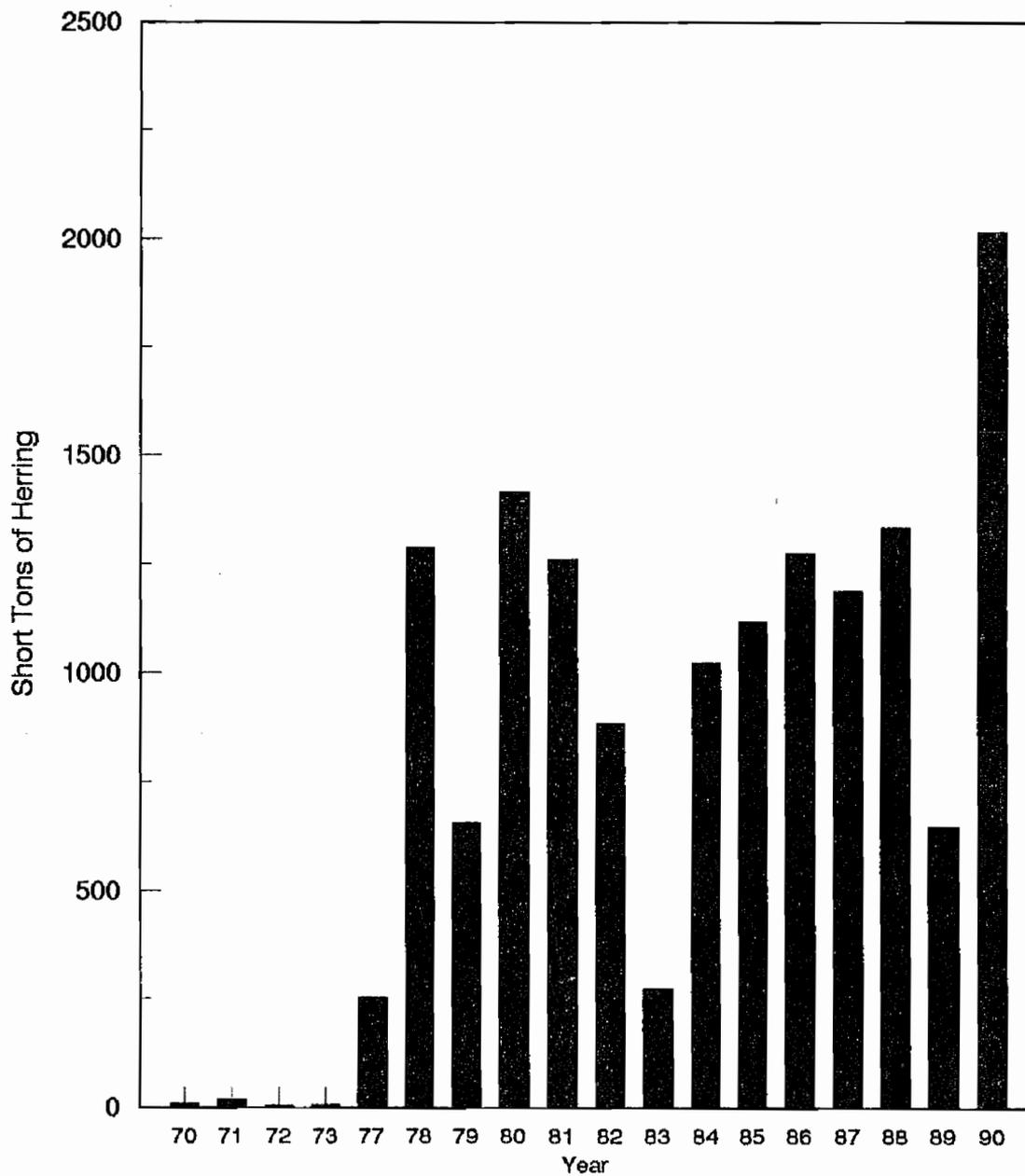
ⁱFishing season opened by regulation on September 1, 1987 in the General District. The Northern and Eastern Herring Districts opened on September 23. The season was then closed by emergency order on October 6 for a period of five weeks, reopened on November 9, and closed for the duration of the 1987-88 season on November 12, 1987.

^jFishery open from November 1 until November 5.

^kFishery opened by regulation from November 1, 1989 and closed by emergency order on January 31, 1990.

^lFishery open from Sept. 21 until Nov. 24. The Montague area was open from Sept. 24 until Nov. 24.

HISTORICAL BAIT HERRING HARVEST PRINCE WILLIAM SOUND



Appendix H.11. Food and bait herring harvests, Prince William Sound, 1970 - 1990.

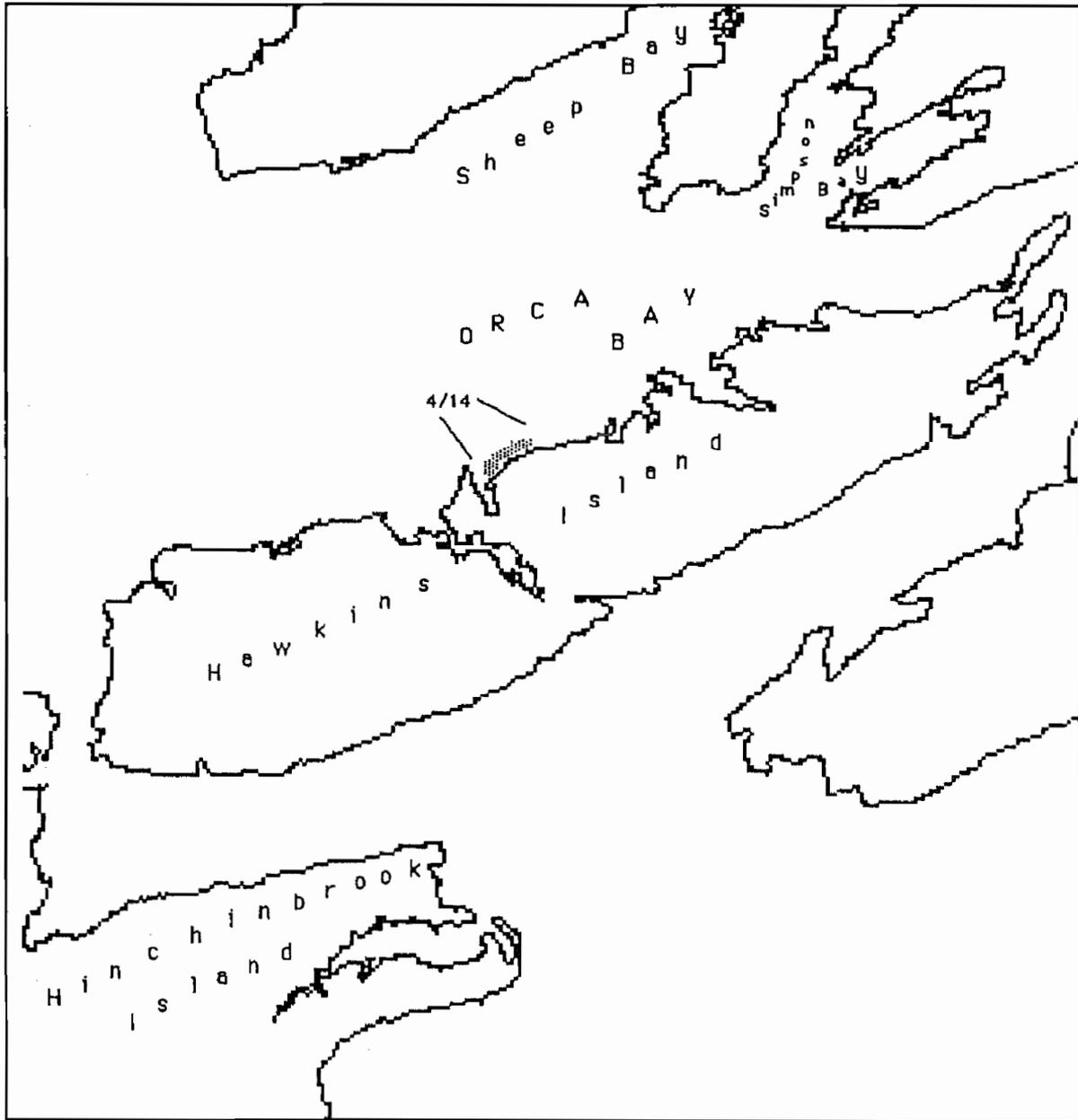
Appendix H.12. Peak aerial survey herring biomass, spawn deposition biomass estimate, and miles of spawn by area, Prince William Sound, 1990.

Survey Area	Peak Aerial Survey Date ^a	Peak Aerial Biomass Est. (tons)	Spawn Deposition Biomass Est. (tons) ^b	Total Miles of Spawn
SOUTHEAST AREA				
Simpson Bay		0		
Sheep Bay		0		
Hinchinbrook	4/16	70		
Port Gravina	3/31	240		
AREA TOTAL		310	419	2.6
NORTHEAST AREA				
Port Fidalgo	4/14	5,700		
Tatitlek Area	4/11	12,980		
Valdez Arm	4/07 & 4/10 & 4/22	12,040 ^c		
AREA TOTAL		30,720	53,889	43.7
NORTH SHORE				
Pt. Free.-Granite Pt.	4/10 & 4/14	1,510 ^c		
Granite Pt.-Esther Pass	4/09 & 4/13	11,600 ^c		
AREA TOTAL		13,110	14,512	18.2
NAKED ISLAND AREA				
Perry Island		0		
Naked Island Group	4/10 & 4/12	10,900 ^c		
Knight Island Area		0		
AREA TOTAL		10,900	3,171	5.4
MONTAGUE AREA				
Montague Island	4/06 & 4/16	2,860 ^c		
Green Island		0		
AREA TOTAL		2,860	42,906	24.2
ALL AREAS TOTAL		57,900	114,998	94.1

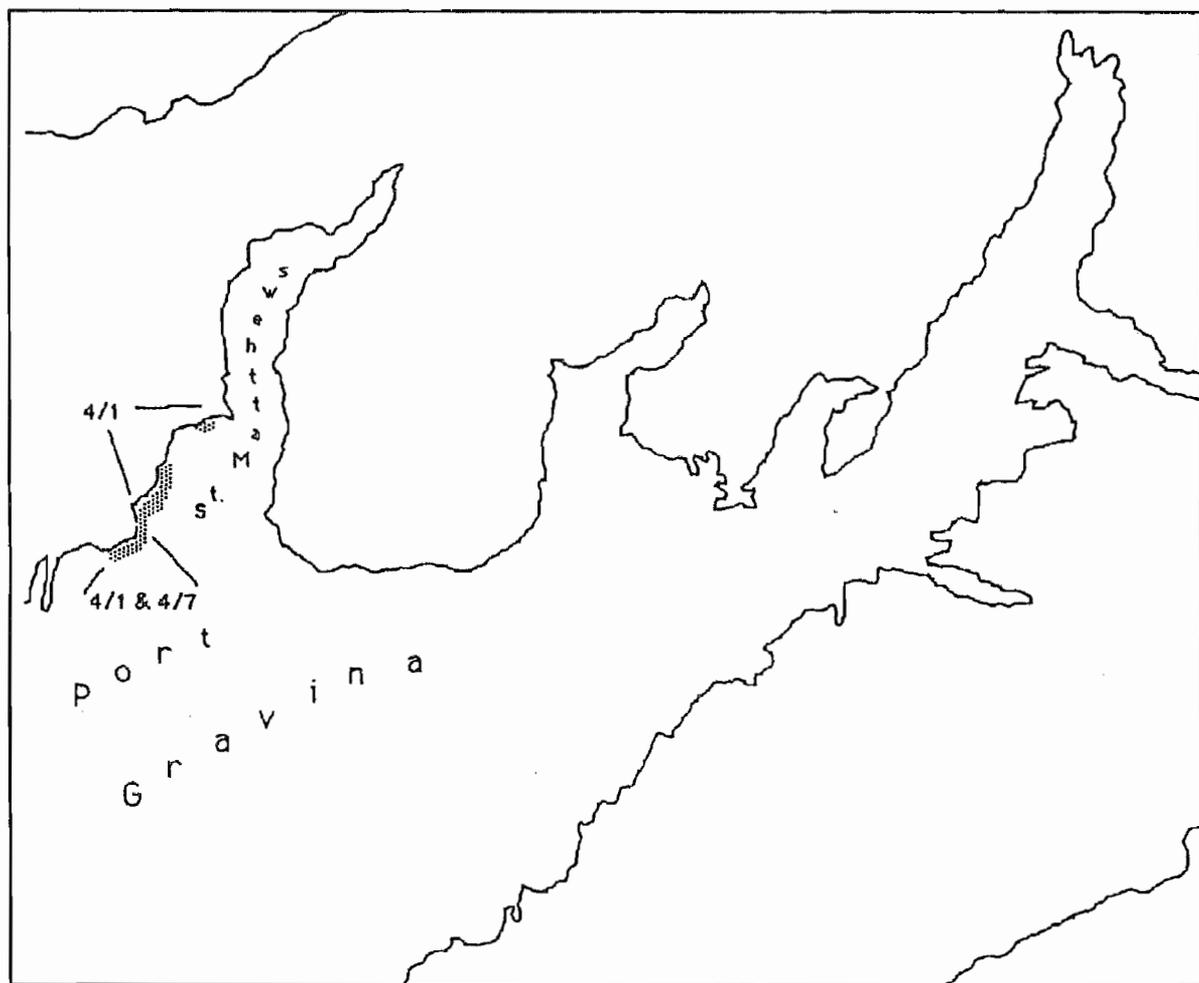
^aDate or dates that the peak biomass observations were made.

^bHerring spawner biomass estimates based on dive surveys. This estimate does not include the commercial catch.

^cAerial estimates that are based on more than one peak or date.



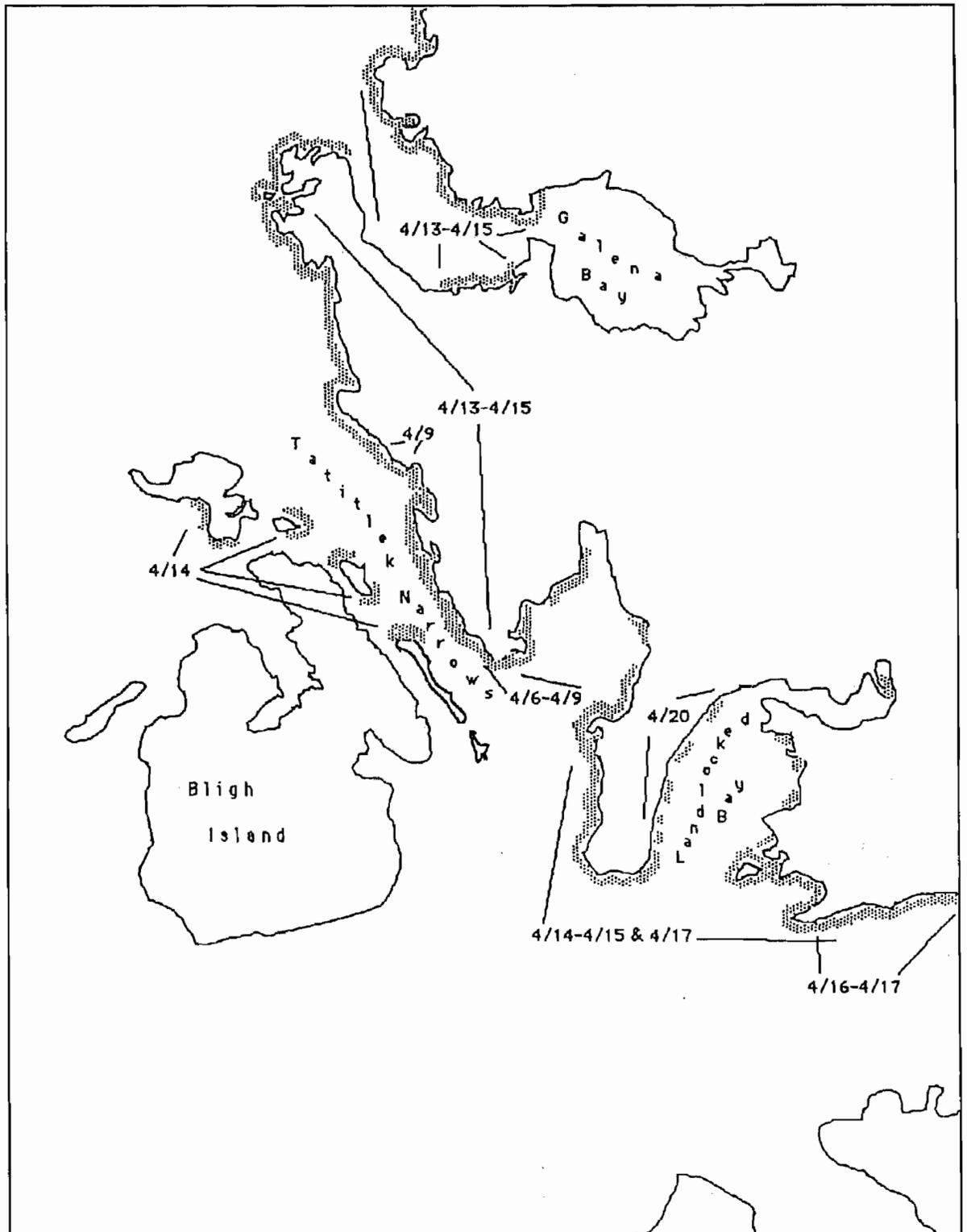
Appendix H.13. Beach areas receiving herring spawn in the Hawkins Island (Southeast) area, Prince William Sound, April 14, 1990.



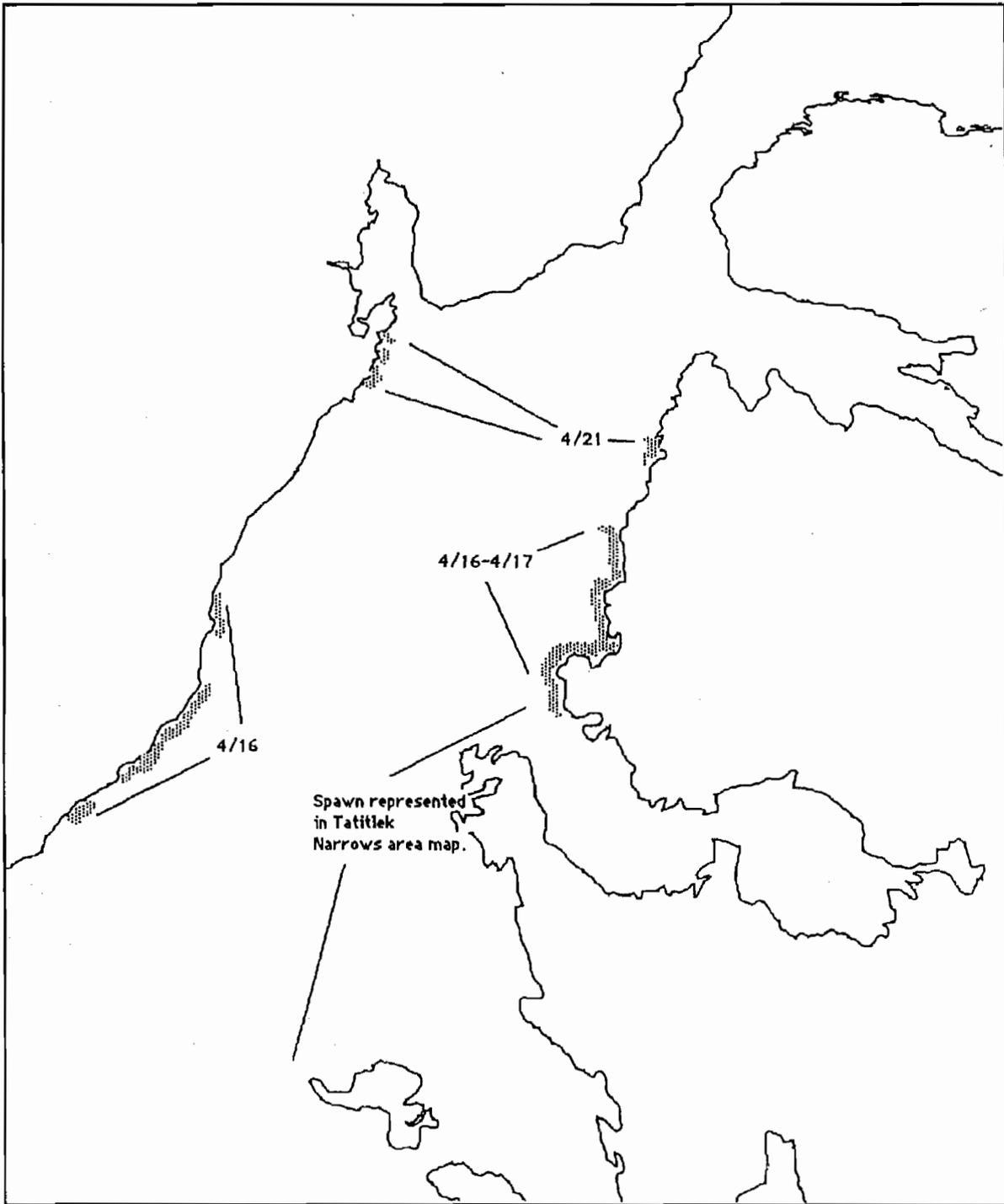
Appendix H.14. Beach areas receiving herring spawn in St Matthews Bay, Prince William Sound, April 1, and April 7, 1990.



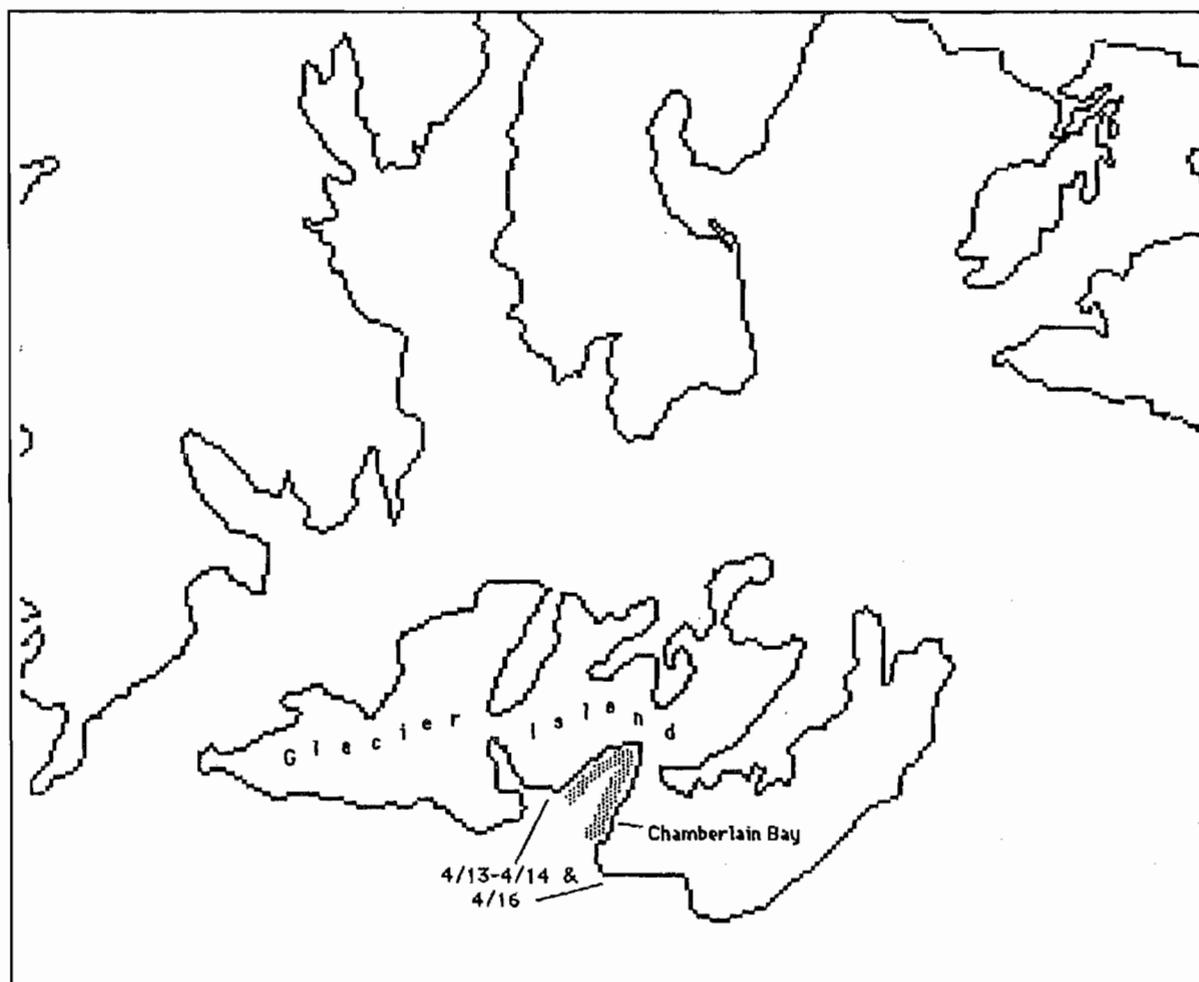
Appendix H.15. Beach areas receiving herring spawn in Two Moon Bay, Prince William Sound, April 15 to April 17, 1990.



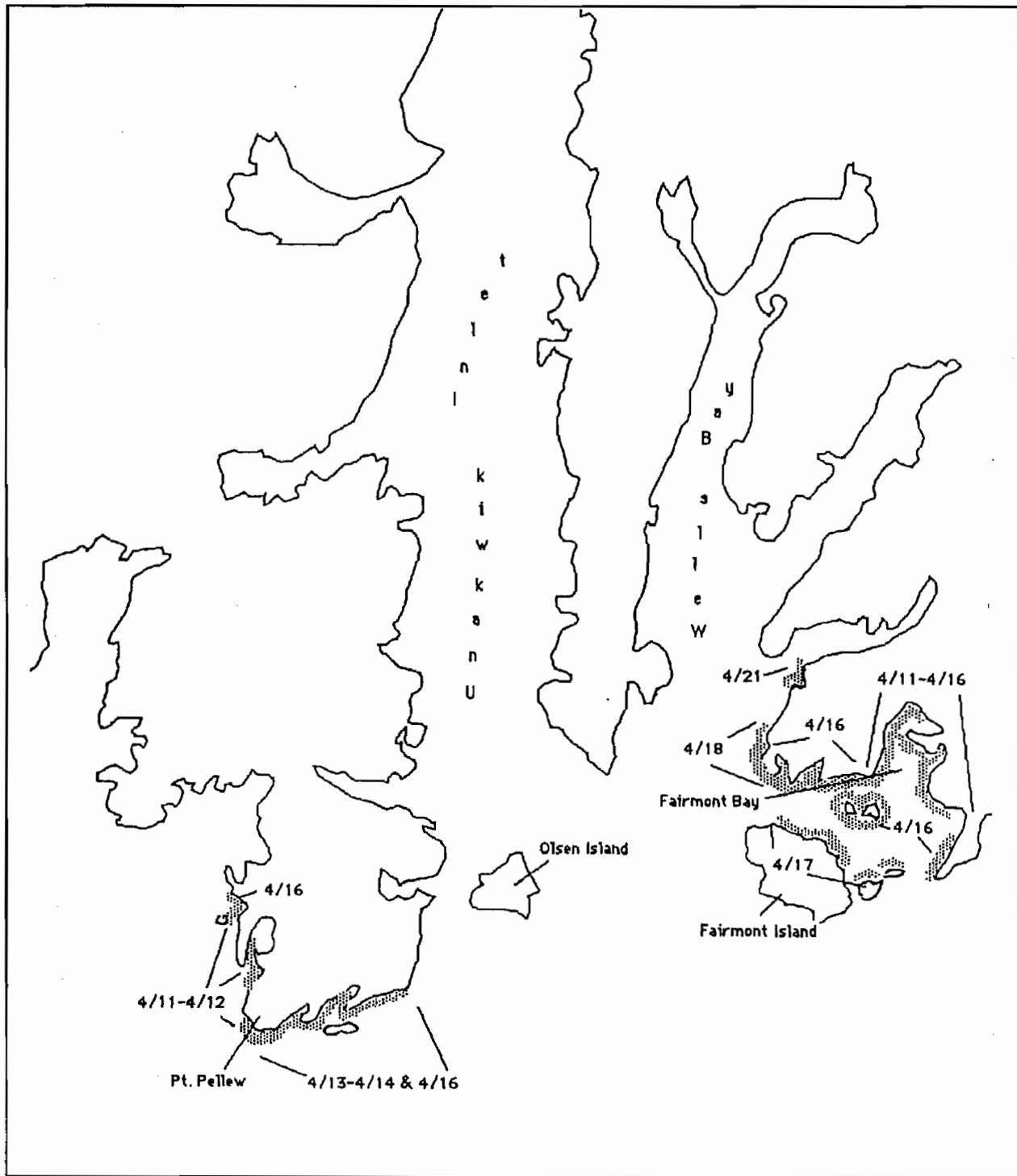
Appendix H.16. Beach areas receiving herring spawn in Tatitlek Narrows, Prince William Sound, April 6 to April 20, 1990.



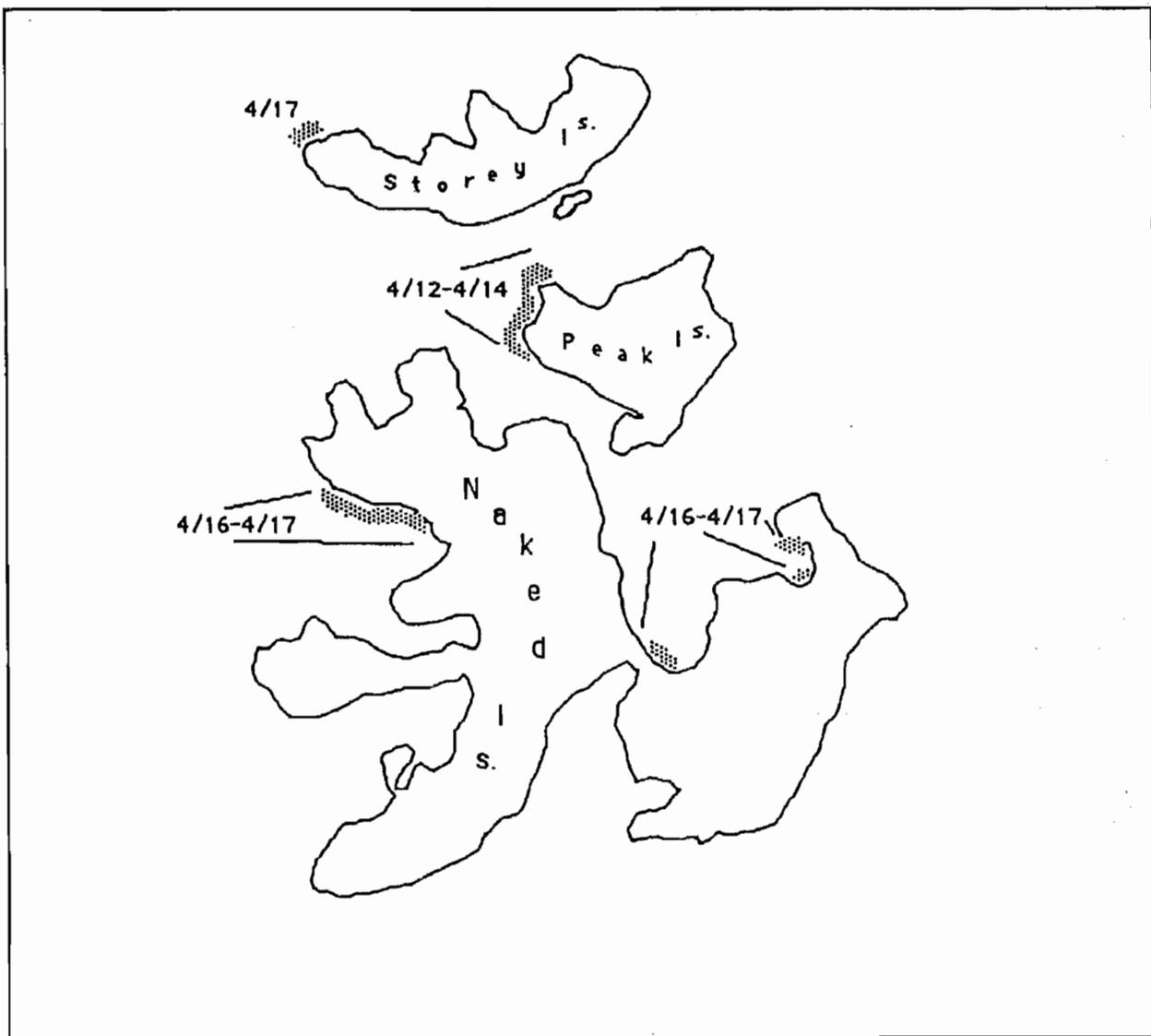
Appendix H.17. Beach areas receiving herring spawn in Valdez Arm, Prince William Sound, April 16 to April 21, 1990.



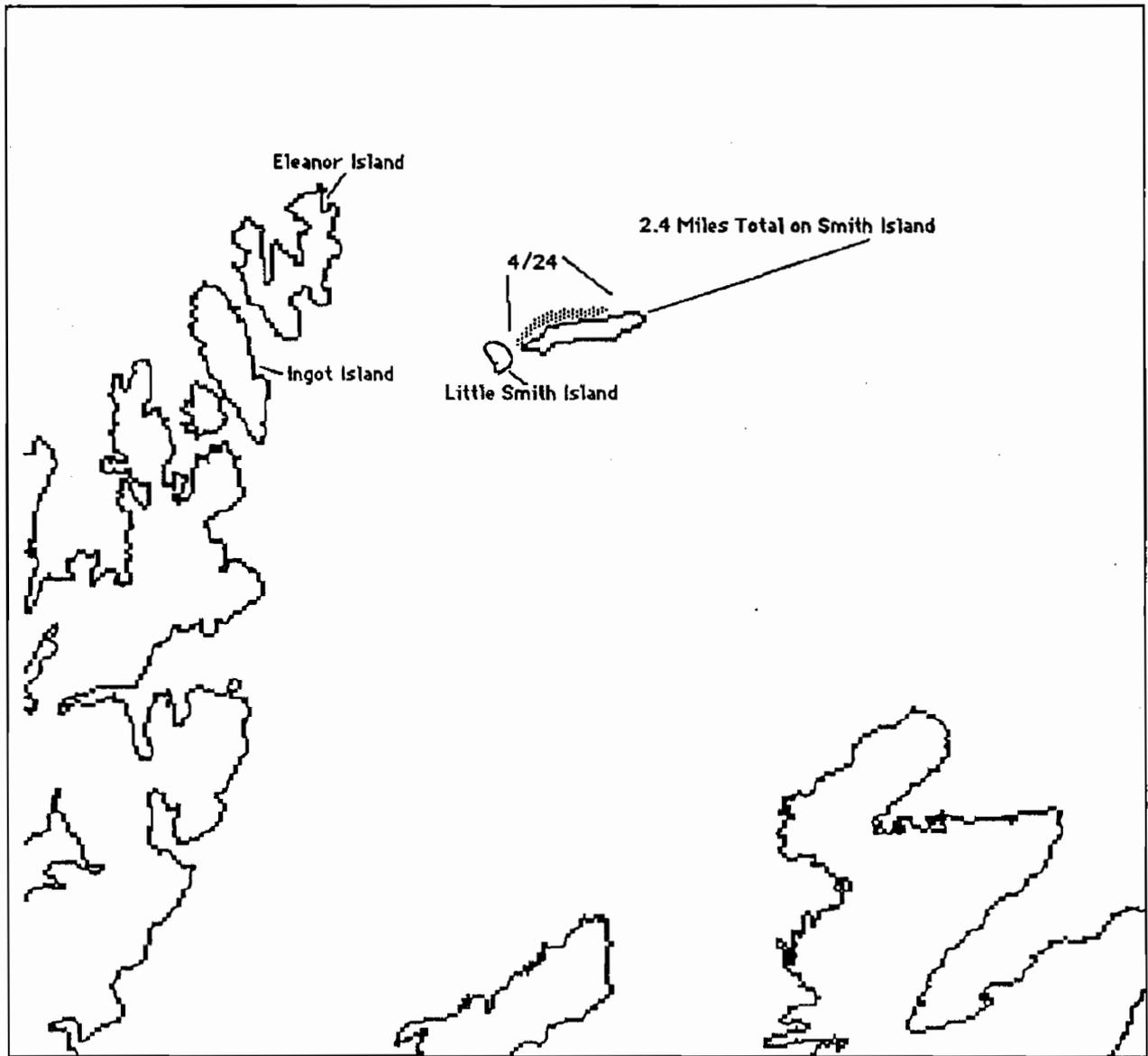
Appendix H.18. Beach areas receiving herring spawn on Glacier Island (North Shore area), Prince William Sound, April 13 to April 16, 1990.



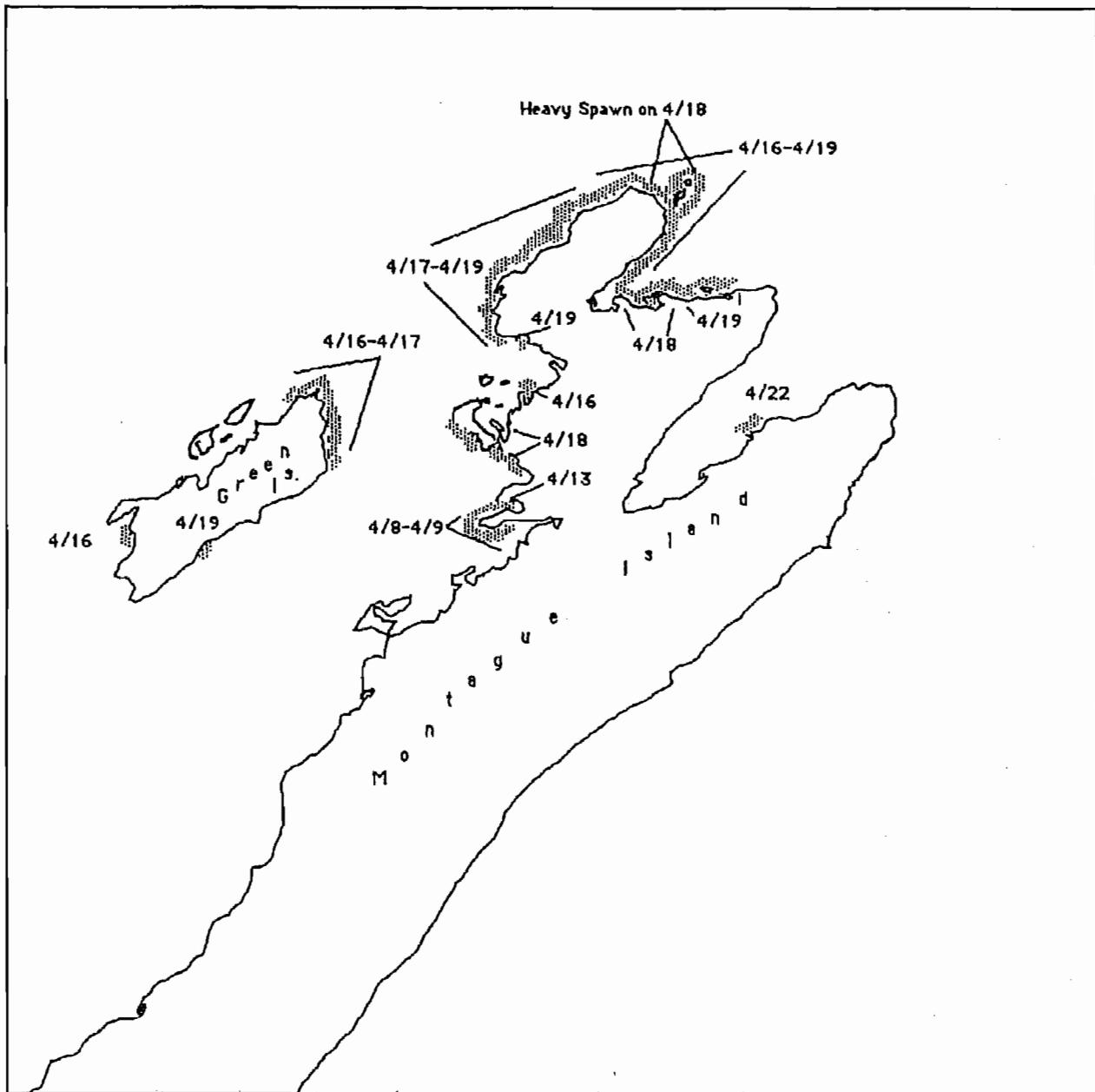
Appendix H.19. Beach areas receiving herring spawn in the North Shore area, Prince William Sound, April 11 to April 21, 1990.



Appendix H.20. Beach areas receiving herring spawn in the Naked Island area, Prince William Sound, April 12 to April 17, 1990.



Appendix H.21. Beach areas receiving herring spawn on Smith Island (in the Naked Island area), Prince William Sound, April 24, 1990.



Appendix H.22. Beach areas receiving herring spawn in the northern Montague Island area, Prince William Sound, April 8 to April 22, 1990.

Appendix H.23. Annual herring biomass indices, Prince William Sound,
1978 - 1990.

Year	Total Sac Roe Harvest ^a	Peak Aerial Estimate ^b	Maximum Possible Observed Biomass ^c	Miles of Spawn ^d	Mile Days of Spawn ^e	Est. Biomass from Spawn Surveys ^f
1978	1,391	13,410	36,060	47.4	36.3	
1979	4,139	42,100	107,390	67.1	72.2	
1980	6,308	62,110	122,020	53.3	73.9	
1981	14,005	77,810	161,690	99.7	140.1	
1982	7,542	68,790	97,620	59.1	65.1	
1983	2,830	41,850	107,710	49.7	99.7	22,000
1984	6,180	58,870	158,760	65.8	86.8	79,710
1985	7,494	20,660	60,784	83.2	149.5	
1986	10,277	15,180	54,820	78.6	152.3	
1987	5,516	26,530	52,192	72.8	155.9	
1988	8,254	34,270	67,175	166.3	236.9	43,581
1989	0	56,915	186,708	98.4	183.7	57,580
1990	8,867	57,900	145,013	94.1	135.9	114,998

^aRepresents the combined seine and gillnet sac roe harvest in short tons.

^bLargest single day aerial estimate of herring biomass in short tons.
Peak estimates for different areas (ie. Valdez Arm vs. Montague) may occur on different days. Estimates for all years revised in 1990.

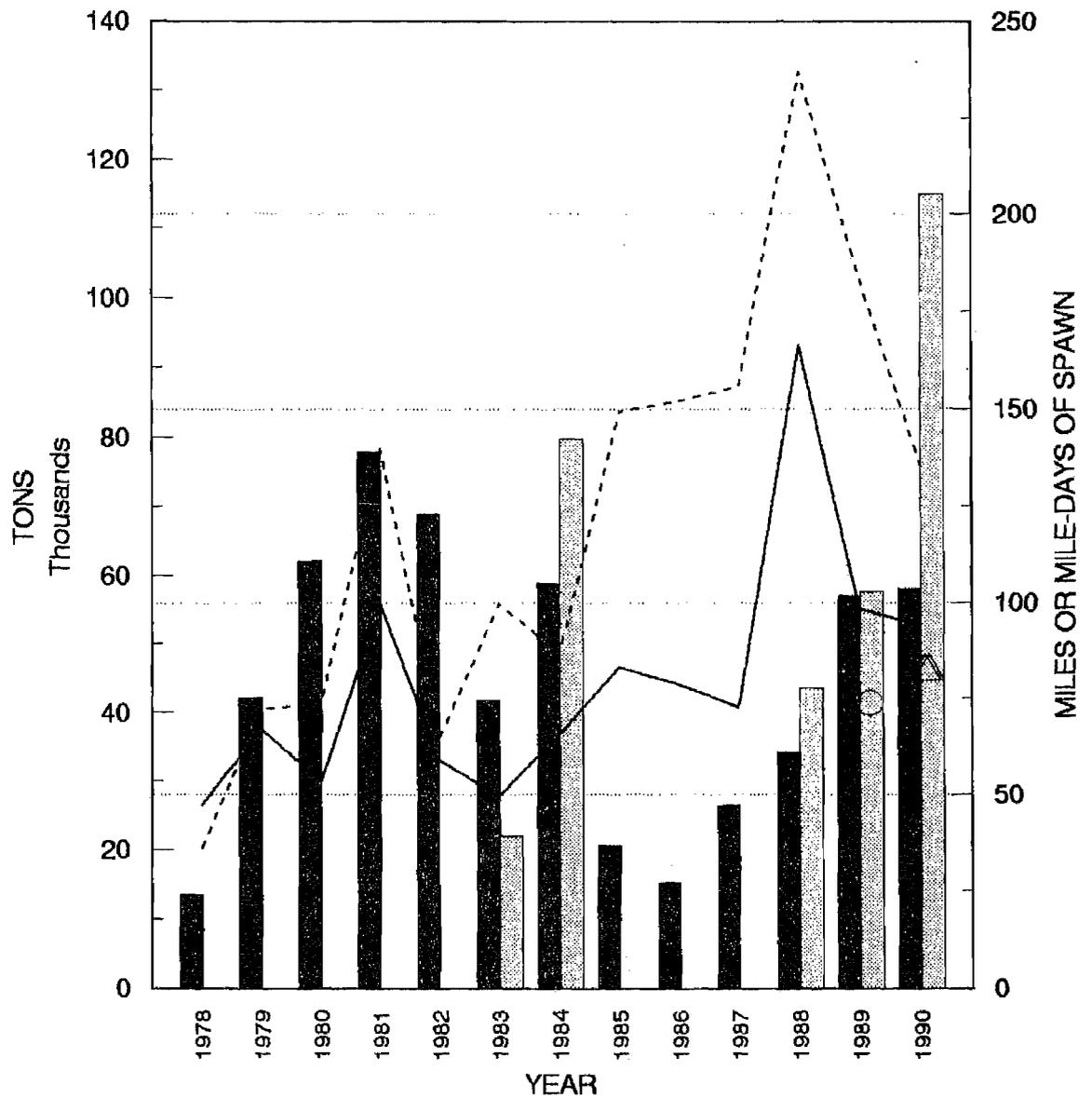
^cThe sum of all daily aerial biomass estimates for a given year.

^dTotal linear miles of spawn.

^eThe sum of the daily observed linear miles of herring spawn.

^fEstimates are made from underwater surveys of spawn deposition; 1983 is a partial estimate of the spawning biomass, while 1984, and 1988-1990 estimates are of the entire spawning biomass.

HERRING BIOMASS INDICIES, 1978 - 1990. PRINCE WILLIAM SOUND



PEAK AERIAL EST. DIVER SURVEY EST. MILES OF SPAWN MILE-DAYS OF SPAWN

1989 Projected Biomass Estimate (from Diver Survey Data)
 1990 Projected Biomass Estimate (from Diver Survey Data)

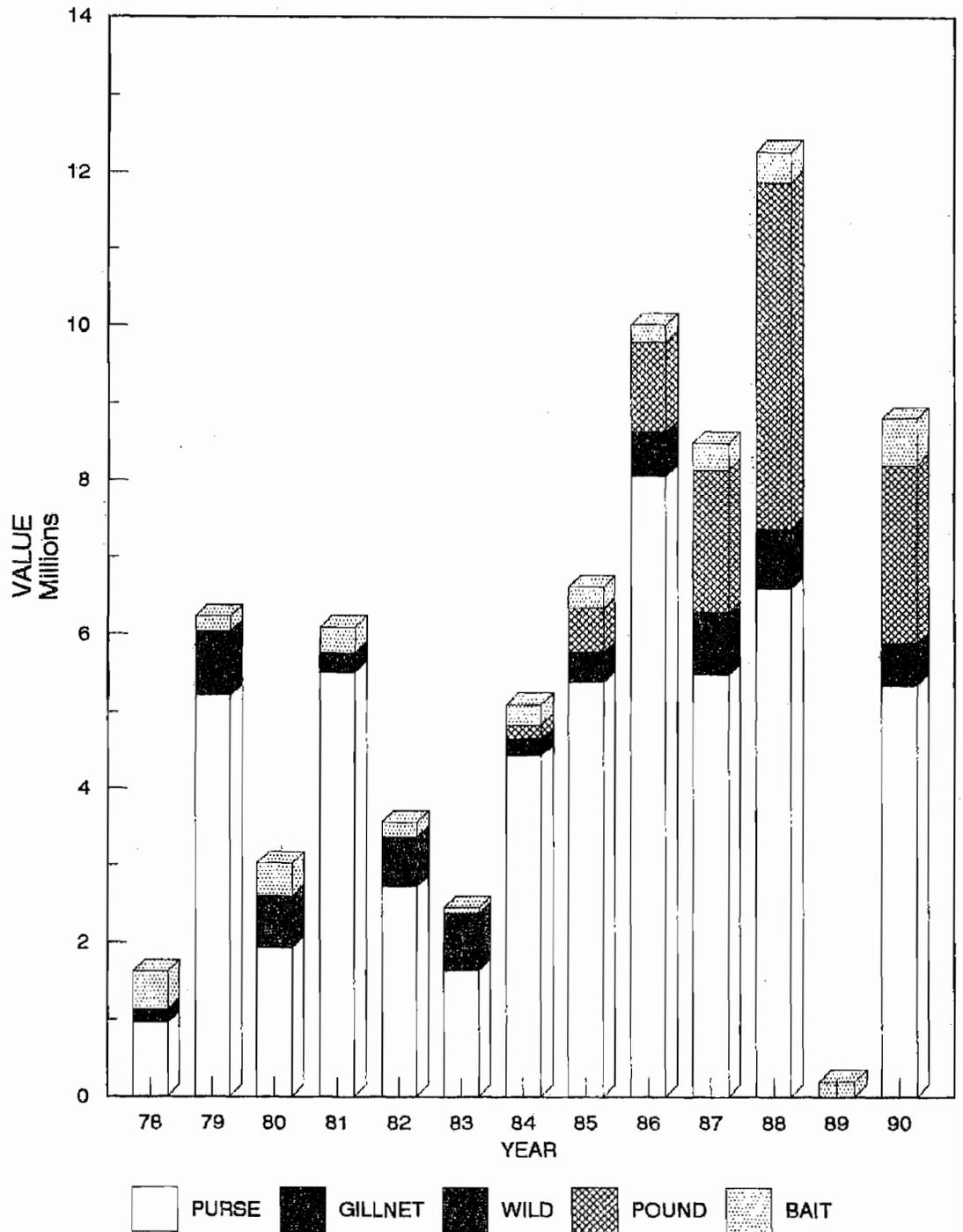
Appendix H.24. Annual herring biomass indices, Prince William Sound, 1978 - 1990.

Appendix H.25. Mean price and estimated exvessel value of the commercial herring harvest by gear type, Prince William Sound, 1978 - 1990.^a

Year	Sac Roe Fisheries			Roe on Kelp Fisheries			Food and Bait Fishery		
	Purse Seine			Wild Harvest			Mixed Gear		
	Price per ton	Total Value	Gillnet	Price per pound	Total Value	Pounding	Price per ton	Total Value	TOTAL VALUE
1978	\$720	\$956,800	\$0	\$1.25	\$175,000	\$0	\$380	\$489,820	\$1,621,700
1979	\$1,260	\$5,213,880	\$0	\$1.74	\$821,280	\$0	\$300	\$196,800	\$6,231,960
1980	\$320	\$1,933,760	\$0	\$1.09	\$657,080	\$0	\$300	\$424,800	\$3,025,640
1981	\$400	\$5,508,000	\$580	\$1.00	\$122,000	\$0	\$260	\$328,120	\$6,093,840
1982	\$380	\$2,716,240	\$640	\$1.29	\$397,320	\$0	\$220	\$194,260	\$3,559,340
1983	\$600	\$1,634,400	\$1,040	\$2.10	\$634,200	\$0	\$260	\$70,980	\$2,448,780
1984	\$760	\$4,435,360	\$640		\$0	\$3.50	\$260	\$265,460	\$5,096,139
1985	\$760	\$5,380,800	\$900	\$0.48	\$19,200	\$7.00	\$250	\$279,500	\$6,620,258
1986	\$820	\$8,058,960	\$920	\$1.70	\$159,800	\$8.00	\$180	\$229,680	\$10,015,800
1987	\$1,100	\$5,480,200	\$960	\$1.70	\$299,200	\$15.00	\$300	\$356,700	\$8,483,780
1988	\$840	\$6,600,000	\$1,400	\$1.20	\$232,000	\$18.00	\$300	\$400,590	\$12,236,500
1989	0.00	0.00	0.00	0.00	0.00	0.00	\$300	\$193,830	\$193,830
1990	\$640	\$5,351,744	\$640	\$0.90	\$213,840	\$11.40	\$300	\$604,770	\$8,798,890

^aValue of harvest and price per ton are estimates based on verbal reports from processors and fishermen obtained post season.

PRINCE WILLIAM SOUND EXVESSEL VALUE OF HERRING FISHERIES



Appendix H.26. Annual exvessel value of commercial herring fisheries, Prince William Sound, 1978 - 1990.

Appendix H.27. Age, sex, and size composition of Pacific herring from the spring purse seine sac roe fishery, Prince William Sound, 1990.

SAMPLE LOCATION AND DATE	SEXES COMBINED															
	MALES						FEMALES									
	AGE	NUMBER	PERCENT	LENGTH	WEIGHT	STD	NUMBER	PERCENT	LENGTH	WEIGHT	STD					
	2	0	0.0	NA	NA	NA	0	0.0	NA	NA	NA	0	0.0	NA	NA	NA
Galena Bay,	3	0	0.0	NA	NA	NA	0	0.0	NA	NA	NA	0	0.0	NA	NA	NA
Boulder Bay,	4	0	0.0	NA	NA	NA	1	0.2	206	106	NA	1	0.2	206	106	NA
Tatitlek Narrows,	5	22	4.0	206	116	24	22	4.0	210	8	125	44	8.0	208	9	120
and Landlocked	6	205	37.1	214	130	17	172	31.2	217	9	135	377	68.3	215	9	133
Bay,	7	30	5.4	217	136	16	16	2.9	220	11	143	46	8.3	218	8	138
12 April, 1990	8	23	4.2	229	152	20	8	1.4	231	12	165	31	5.6	230	10	156
	9	16	2.9	235	173	22	13	2.4	243	9	199	29	5.3	239	9	184
	10	10	1.8	237	169	28	9	1.6	235	19	183	19	3.4	236	14	175
	11	1	0.2	250	211	NA	1	0.2	256	NA	227	2	0.4	253	4	219
	12	1	0.2	235	180	NA	0	0.0	NA	NA	NA	1	0.2	235	NA	180
	13	1	0.2	239	189	NA	0	0.0	NA	NA	NA	1	0.2	239	NA	189
TOTAL	310	56.2	217	12	136	23	242	43.8	219	12	141	552	100.0	218	12	138
UNAGED	21	43.8	218	10	135	23	27	56.3	218	10	138	48	100.0	218	10	137
																21

Appendix H.28. Age, sex, and size composition of Pacific herring from the spring gill net sac roe fishery, Prince William Sound, 1990.

SAMPLE LOCATION AND DATE	MALES											FEMALES											SEXES COMBINED																
	AGE			PERCENT			LENGTH			WEIGHT			NUMBER			PERCENT			LENGTH			WEIGHT			NUMBER			PERCENT			LENGTH			WEIGHT					
	AGE	NUMBER	PERCENT	MEAN	STD	NA	MEAN	STD	NA	MEAN	STD	NA	NUMBER	PERCENT	MEAN	STD	NA	MEAN	STD	NA	NUMBER	PERCENT	MEAN	STD	NA	MEAN	STD	NA	NUMBER	PERCENT	MEAN	STD	NA	MEAN	STD	NA			
2	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	NA	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA		
3	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	NA	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
4	1	0.2	199	NA	NA	NA	0	0.0	0.0	NA	NA	NA	0	0.0	0.0	NA	NA	NA	NA	1	0.2	199	NA	NA	NA	1	0.2	199	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
5	9	2.2	219	7	133	8	5	1.2	218	5	124	13	14	3.4	218	6	130	11	11	14	3.4	218	6	130	11	11	14	3.4	218	6	130	11	11	14	3.4	218	6	130	11
6	105	25.7	223	8	141	17	101	24.7	225	9	144	18	206	50.4	224	8	143	18	18	206	50.4	224	8	143	18	18	206	50.4	224	8	143	18	18	206	50.4	224	8	143	18
7	35	8.6	228	9	147	15	34	8.3	233	9	159	19	69	16.9	230	9	153	18	19	69	16.9	230	9	153	18	19	69	16.9	230	9	153	18	19	69	16.9	230	9	153	18
8	28	6.8	233	8	161	17	12	2.9	231	10	152	23	40	9.8	233	9	159	19	19	40	9.8	233	9	159	19	19	40	9.8	233	9	159	19	19	40	9.8	233	9	159	19
9	28	6.8	238	9	168	15	24	5.9	241	8	183	24	52	12.7	239	9	175	21	21	52	12.7	239	9	175	21	21	52	12.7	239	9	175	21	21	52	12.7	239	9	175	21
10	10	2.4	243	9	179	18	8	2.0	244	9	190	20	18	4.4	244	9	184	19	19	18	4.4	244	9	184	19	19	18	4.4	244	9	184	19	19	18	4.4	244	9	184	19
11	5	1.2	237	11	170	24	1	0.2	236	NA	162	NA	6	1.5	237	10	169	22	22	6	1.5	237	10	169	22	22	6	1.5	237	10	169	22	22	6	1.5	237	10	169	22
12	0	0.0	NA	NA	NA	NA	2	0.5	246	8	166	16	2	0.5	246	8	166	16	16	2	0.5	246	8	166	16	16	2	0.5	246	8	166	16	16	2	0.5	246	8	166	16
13	1	0.2	245	NA	203	NA	0	0.0	NA	NA	NA	NA	1	0.2	245	NA	203	NA	NA	1	0.2	245	NA	203	NA	NA	1	0.2	245	NA	203	NA	NA	NA	NA	NA	NA	NA	
TOTAL	222	54.3	228	11	150	21	187	45.7	230	11	154	25	409	100.0	229	11	152	23	23	409	100.0	229	11	152	23	23	409	100.0	229	11	152	23	23	409	100.0	229	11	152	23
UNAGED	17	41.5	233	11	164	28	24	58.5	227	11	156	30	41	100.0	229	11	160	29	29	41	100.0	229	11	160	29	29	41	100.0	229	11	160	29	29	41	100.0	229	11	160	29

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Appendix H.30. Age, sex, and size composition of Pacific herring from the fall food and bait fishery, Prince William Sound, 1990.

SAMPLE LOCATION AND DATE	MALES											FEMALES											SEXES COMBINED										
	AGE			LENGTH			WEIGHT			NUMBER			PERCENT			LENGTH			WEIGHT			NUMBER			PERCENT			LENGTH			WEIGHT		
	NUMBER	PERCENT	MEAN	STD	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	NUMBER	PERCENT	MEAN	STD	NUMBER	PERCENT	MEAN	STD	NUMBER	PERCENT	MEAN	STD	NUMBER	PERCENT	MEAN	STD	NUMBER	PERCENT	MEAN	STD	
Knowles Head and Elrington Is. 4 October, 1990	2	141	40.6	172	9	72	13	84	24.2	172	9	71	13	237	68.3	172	9	71	13	237	68.3	172	9	71	13	237	68.3	172	9	71	13		
	3	14	4.0	172	13	73	17	13	3.7	178	17	82	23	28	8.1	174	15	76	21	28	8.1	174	15	76	21	28	8.1	174	15	76	21		
	4	10	2.9	183	11	87	19	7	2.0	187	15	91	20	18	5.2	184	13	87	20	18	5.2	184	13	87	20	18	5.2	184	13	87	20		
	5	6	1.7	201	12	109	21	8	2.3	205	5	130	13	14	4.0	203	8	121	19	14	4.0	203	8	121	19	14	4.0	203	8	121	19		
	6	17	4.9	197	11	108	18	24	6.9	205	7	120	14	41	11.8	202	10	115	17	41	11.8	202	10	115	17	41	11.8	202	10	115	17		
	7	2	0.6	202	4	106	11	2	0.6	213	2	140	2	4	1.2	207	7	123	20	4	1.2	207	7	123	20	4	1.2	207	7	123	20		
	8	1	0.3	204	NA	112	NA	1	0.3	215	NA	141	NA	2	0.6	210	8	127	21	2	0.6	210	8	127	21	2	0.6	210	8	127	21		
	9	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	10	1	0.3	197	NA	111	NA	0	0.0	NA	NA	NA	NA	1	0.3	197	NA	111	NA	1	0.3	197	NA	111	NA	1	0.3	197	NA	111	NA		
	11	1	0.3	211	NA	138	NA	0	0.0	NA	NA	NA	NA	1	0.3	211	NA	138	NA	1	0.3	211	NA	138	NA	1	0.3	211	NA	138	NA		
	12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	13	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	TOTAL	194	55.9	177	15	80	22	139	40.1	183	17	89	27	347	100.0	179	16	83	24	347	100.0	179	16	83	24	347	100.0	179	16	83	24		
UNAGED	25	58.1	176	18	77	23	16	37.2	179	17	83	27	43	100.0	177	17	79	24	43	100.0	177	17	79	24	43	100.0	177	17	79	24			
	2	162	39.3	161	10	57	13	137	33.3	162	10	57	12	310	75.2	161	10	57	12	310	75.2	161	10	57	12	310	75.2	161	10	57	12		
	3	14	3.4	170	11	72	13	12	2.9	169	14	68	17	26	6.3	170	12	70	15	26	6.3	170	12	70	15	26	6.3	170	12	70	15		
	4	8	1.9	190	17	100	33	11	2.7	203	14	115	25	19	4.6	197	16	108	29	19	4.6	197	16	108	29	19	4.6	197	16	108	29		
	5	3	0.7	200	10	108	14	5	1.2	204	5	118	13	8	1.9	202	7	114	14	8	1.9	202	7	114	14	8	1.9	202	7	114	14		
	6	4	1.0	203	8	120	17	4	1.0	207	8	130	11	8	1.9	205	8	125	14	8	1.9	205	8	125	14	8	1.9	205	8	125	14		
	7	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	8	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	9	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	10	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	11	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
	13	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA		
TOTAL	210	51.0	163	15	60	20	177	43.0	166	18	64	24	412	100.0	163	17	60	22	412	100.0	163	17	60	22	412	100.0	163	17	60	22			
UNAGED	17	44.7	164	23	64	31	17	44.7	160	13	57	14	38	100.0	159	19	57	24	38	100.0	159	19	57	24	38	100.0	159	19	57	24			

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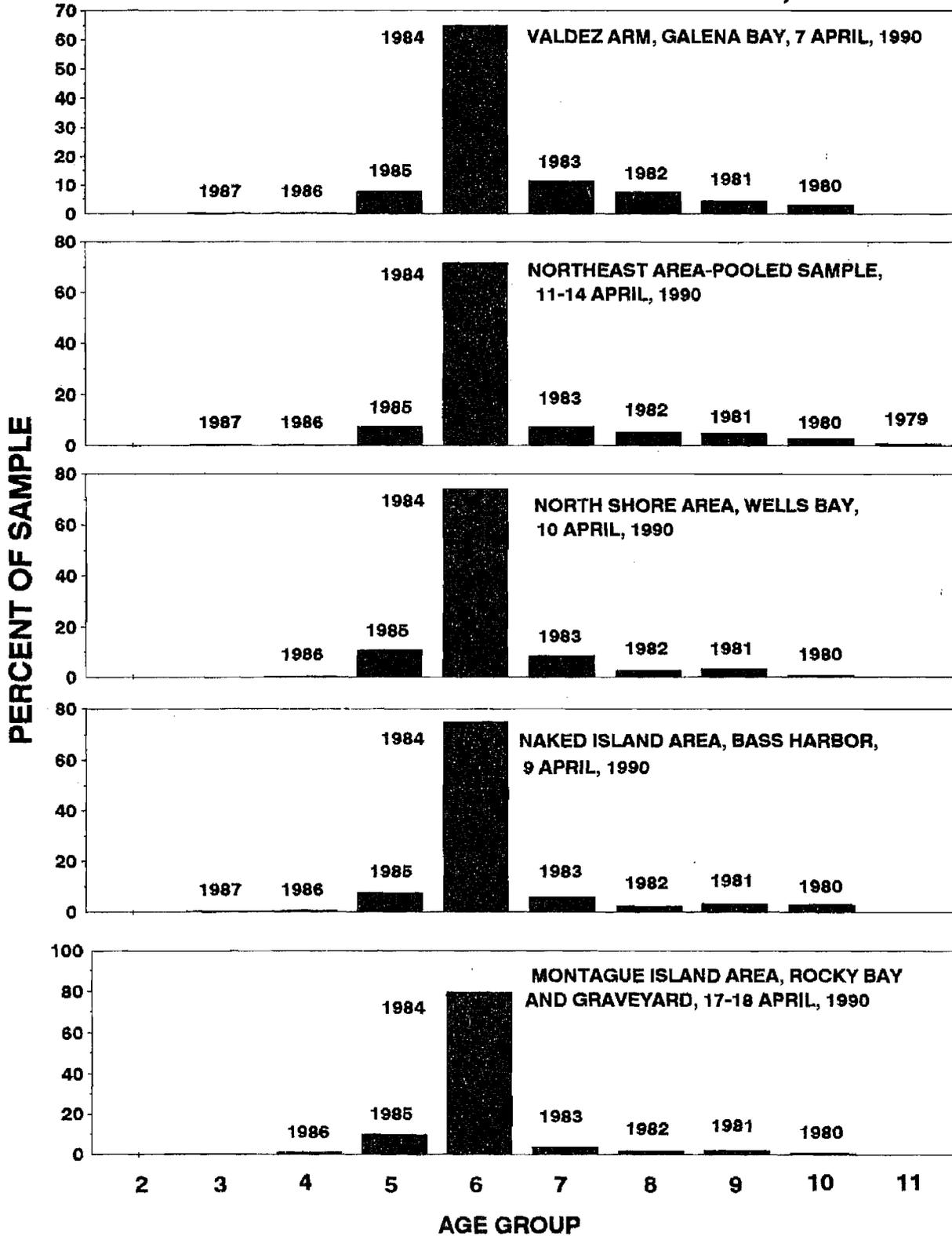
SAMPLE LOCATION AND DATE	MALES										FEMALES										SEXES COMBINED									
	AGE		LENGTH		WEIGHT		NUMBER	LENGTH		WEIGHT		NUMBER	LENGTH		WEIGHT		NUMBER	LENGTH		WEIGHT		NUMBER	LENGTH		WEIGHT					
	NUMBER	PERCENT	MEAN	STD	MEAN	STD		MEAN	STD	PERCENT	MEAN		STD	MEAN	STD	PERCENT		MEAN	STD	MEAN	STD		PERCENT	MEAN	STD	MEAN	STD	PERCENT	MEAN	STD
	2	17	4.7	182	8	87	13	5	1.4	201	47	83	12	22	6.1	186	23	86	13											
	3	9	2.5	198	8	110	13	11	3.1	196	7	106	13	20	5.6	197	7	108	13											
	4	5	1.4	209	8	132	14	8	2.2	206	9	132	19	13	3.6	207	9	132	17											
	5	66	18.3	208	6	132	12	45	12.5	209	15	129	13	111	30.8	208	11	130	13											
Green Island	6	93	25.8	209	6	137	14	86	23.9	208	12	135	14	179	49.7	209	9	136	14											
10 October, 1990	7	2	0.6	206	1	136	6	9	2.5	211	4	141	10	11	3.1	210	4	140	9											
	8	0	0.0	NA	NA	NA	NA	3	0.8	237	11	177	12	3	0.8	237	11	177	12											
	9	0	0.0	NA	NA	NA	NA	1	0.3	215	NA	150	NA	1	0.3	215	NA	150	NA											
	10	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	11	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	13	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
TOTAL	192	53.3	206	10	129	19	168	46.7	208	15	131	19	360	100.0	207	13	130	19												
UNAGED	32	64.0	209	9	133	23	18	36.0	205	23	133	16	50	100.0	207	15	133	20												
	2	35	8.9	175	10	75	14	13	3.3	175	9	74	13	48	12.2	175	10	75	14											
	3	15	3.8	190	12	99	16	9	2.3	194	5	102	10	24	6.1	192	10	100	14											
	4	17	4.3	195	11	102	16	10	2.5	199	5	112	14	27	6.8	196	9	106	16											
	5	53	13.4	202	6	122	15	46	11.6	207	8	129	19	99	25.1	205	7	125	18											
Green Island	6	85	21.5	206	8	132	17	90	22.8	210	9	136	20	175	44.3	208	9	134	19											
24 October, 1990	7	11	2.8	210	11	140	23	6	1.5	213	13	132	17	17	4.3	211	11	137	21											
	8	2	0.5	218	6	154	21	3	0.8	206	6	125	4	5	1.3	211	8	136	19											
	9	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	10	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	11	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
	13	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA											
TOTAL	218	55.2	198	14	116	27	177	44.8	205	13	126	25	395	100.0	201	14	121	26												
UNAGED	25	69.4	194	15	110	28	11	30.6	204	5	121	10	36	100.0	197	13	113	25												

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Appendix H.30. (page 3 of 3)

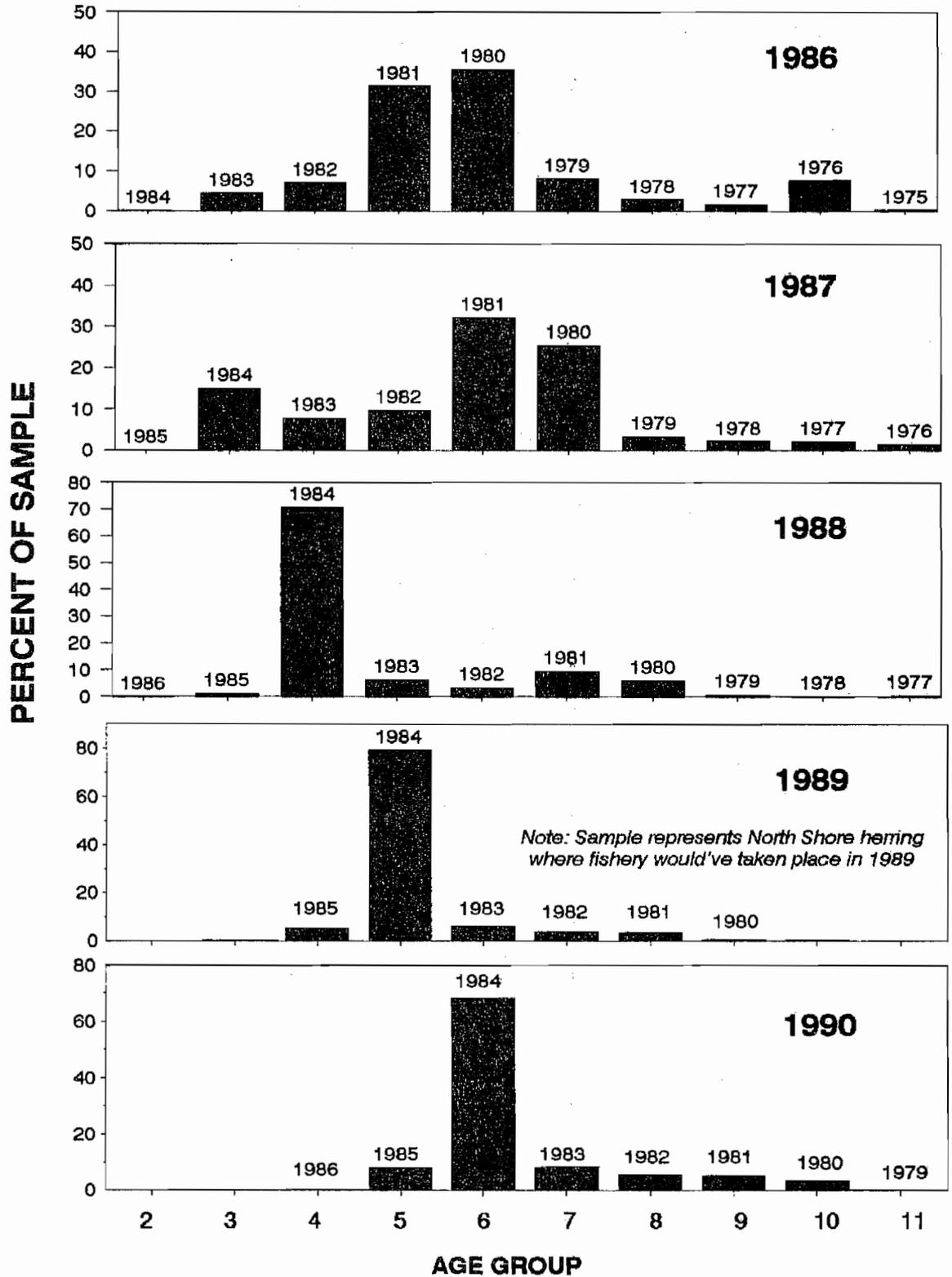
SAMPLE LOCATION AND DATE	MALES										FEMALES										SEXES COMBINED					
	AGE	NUMBER	PERCENT	MEAN	STD	LENGTH	WEIGHT	MEAN	STD	LENGTH	WEIGHT	MEAN	STD	LENGTH	WEIGHT	MEAN	STD	LENGTH	WEIGHT	MEAN	STD	LENGTH	WEIGHT	MEAN	STD	
2	131	31.2	167	10	66	13	112	26.7	169	8	66	13	285	67.9	167	9	64	13								
3	24	5.7	178	14	79	19	11	2.6	180	13	84	17	38	9.0	177	15	78	20								
4	14	3.3	188	10	88	16	8	1.9	193	11	95	17	23	5.5	189	11	90	16								
5	7	1.7	194	12	100	18	14	3.3	199	11	110	19	21	5.0	197	11	106	18								
6	14	3.3	206	10	127	24	14	3.3	198	22	121	12	28	6.7	202	17	124	19								
7	3	0.7	199	13	105	18	3	0.7	216	4	124	9	6	1.4	207	12	115	16								
8	3	0.7	208	9	109	33	2	0.5	232	26	172	70	5	1.2	217	19	134	54								
9	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA								
10	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA								
11	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA								
12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA								
13	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA								
TOTAL	199	47.4	175	16	76	23	164	39.0	177	18	80	27	420	100.0	173	17	74	25								
UNAGED	18	60.0	172	17	72	25	8	26.7	180	15	84	22	30	100.0	172	18	72	25								

HERRING PURSE SEINE TEST FISH, 1990



Appendix H.31. Percent contribution by age class in the herring test fishery, Prince William Sound, 1990.

HERRING PURSE SEINE SAC ROE



Appendix H.32. Percent contribution by age class in the purse seine herring sac roe fishery, Prince William Sound, 1986 - 1990.