PRINCE WILLIAM SOUND MANAGEMENT AREA
1991 ANNUAL FINFISH MANAGEMENT REPORT

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PRINCE WILLIAM SOUND SALMON AND HERRING FISHERIES

MANAGEMENT AREA DESCRIPTION

The Prince William Sound (PWS) 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 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 1991 season, 519 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 253 permits were active during the 1991 season.

Five herring fisheries occur in the area during the year. Management objectives for the herring fisheries are to target fisheries on a high quality segment of the biomass. All of the herring fisheries are managed by a guideline harvest level.

OVERVIEW OF AREA WIDE FISHERIES

The Prince William Sound Area commercial salmon harvest for 1991 was the second highest catch on record with 39.9 million fish harvested, all species combined (Appendix A.2.). The 1991 harvest includes 2.7 million pinks which were captured and discarded and 1.3 million pinks that were donated to the Soviet Union. The discarded and donated pink salmon were hatchery fish that were not utilized due to saturated markets.

Only the 1990 harvest of 46.6 million salmon exceeded the 1991 harvest (Appendix A.3., Appendix A.4.). The sizeable catch is attributed to the large hatchery pink salmon fry release of 1990 and average hatchery fry survival. Pink salmon composed 93% of the season's harvest and was followed in abundance by sockeye salmon 4%, coho salmon 1.6% and less than 1% each of chum and chinook salmon.

Wild stock sockeye and coho returns to the Copper and Bering River Districts provided above average catch and average escapement. The Coghill Lake sockeye salmon escapement was the third lowest on

record, although the sockeye escapement goal for Eshamy Lake was achieved. Early and middle run wild stock pink returns were weak, while the late run wild stock pink returned in greater abundance. The wild stock chum return was low throughout the summer. Hatchery coho and chum salmon did not return as forecast to the Sound's hatcheries.

The value of the combined commercial salmon harvest is estimated at $30 million, including hatchery sales (Appendix A.5.). The drift gill net catch is valued at $17.5 million, setting the average earnings for the 519 permit holders at $33,696. Seiners harvested $8.4 million worth of fish setting the average earnings for the 253 permit holders at $33,280. The set gill net harvest is valued at $1.5 million, making the average earnings for each of the 29 active permit holders approximately $51,793.

The value of all herring fisheries is estimated at $11.7 million. The sac roe seine fishery is valued at $7.15 million, setting the average earnings for the 104 permit holders at $68,787. The gill net sac roe fishery is valued at $0.45 million, setting the average earnings for the 24 permit holders at $18,550. The pound spawn-on-kelp fishery is valued at $2.9 million, setting the average earnings for the 126 permit holders at $22,857. The wild spawn-on-kelp fishery is valued at $0.17 million, setting the average earnings for the 48 permit holders at $3,587. The food and bait fishery is valued at $1.06 million, setting the average earnings of the 14 permit holders at $76,045.

1991 SEASON SUMMARY BY DISTRICT

COPPER RIVER DISTRICT

PRESEASON OUTLOOK AND HARVEST STRATEGY

The 1991 harvest forecast for the Copper River District was 41,000 chinook, 870,000 sockeye, and 247,000 coho salmon. The Gulkana Hatchery was expected to contribute 122,500 sockeye to the commercial catch; however, no smolt were tagged in 1987 and the smolt tagged in 1988 appeared in the catch as 4-year olds. The actual hatchery contribution cannot be verified until the predominate age class (age five) return in 1992. Chum and pink salmon are also present along with steelhead but make up less than 2 percent of the catch so they are not forecasted. During the February 1991 Board of Fisheries meeting, the board passed into regulation "gill nets with mesh size greater than six inches will not be allowed in the Copper River District prior to July 15, unless specified by emergency order in accordance with 5 AAC 24.360."

The early season management strategy in the Copper River District is based on actual catch and effort as compared to anticipated catch. The weekly anticipated catch is a percentage of the forecasted harvest. The percentage is based on the average weekly catch from 1971 - 1990, including only those years which have similar fishing patterns. This provides the most reliable method of evaluating early run strength prior to the installation of the sonar. Two evenly spaced 24-hour periods per week beginning 7:00 a.m. on Mondays and 7:00 p.m. on Thursdays are optimum; however, the fishing schedule is adjusted in-season as the situation dictates. Effort, tides and environmental conditions also enter into the 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 evident and are also considered when periods are scheduled. Due to numerous spawning systems in the lower Copper River Delta, an actual escapement enumeration is not obtained. An escapement index is estimated through weekly aerial surveys. The observed escapements are then compared to the anticipated weekly escapement which is an average of past years' (1971 - 1990) escapement observations.

Typically, the coho management strategy is implemented the first week of August. The strategy provides for a single fishing period per week but of longer duration than 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 size 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 the fisheries have been curtailed or closed early. To reduce over exploitation of coho returns early in the season, weekly fishing periods were reduced from 72 hours to 48 hours in 1989, from 12:00 noon Monday to 12:00 noon Wednesday. During the 1991 season, the strategy of one weekly period was discussed by the staff and was implemented early in the coho fishery. As the run progressed a strategy similar to the sockeye fishery of two periods per week was utilized. Modifications of fishing times during the coho salmon season occur based on escapement trends in the principal delta spawning streams.

SOCKEYE AND CHINOOK SALMON FISHERY

The harvest for the 1991 season was 1,206,811 sockeye, 28 percent above the forecast. The chinook harvest was 34,787, 15 percent below the anticipated.

The commercial season opened at 7:00 p.m. Thursday, May 16 for a 24-hour period. Action was taken to reduce the harvest of the early portion of the chinook run by delaying the first period, and opening the commercial fishery on Thursday, May 16, rather than Monday, May 13. The catch was 45,081 sockeye and 8,429 chinook salmon, with sockeye 15 percent above projected and chinook three times the projected. This high catch rate of chinook drew concern as to whether the chinook run was stronger than projected or, due to the low water level in the Copper River, the chinook were holding in the delta which is within the commercial fishing district. To minimize possible over escapement on the early portion of the sockeye run, two subsequent 24-hour periods occurred (Appendix B.1 and B.2) (For specific period openings and species catches refer to Appendix B.3). Following the fourth period the actual chinook harvest was within one percent of the projected harvest.

Sockeye also exhibited the same holding pattern as demonstrated by chinook salmon. Higher than anticipated harvest but lower than anticipated escapement, past the Miles Lake sonar, indicated that fish may be holding due to the low volume of water coming out of the Copper River and possibly due to lower than desired water temperatures. A more conservative approach was needed to ensure sufficient protection to early run stocks. Three 12-hour periods followed, with the third period extended for an additional 12-hours. With actual escapement estimates within eight percent of the anticipated (Appendix B.7 and B.8) and a continued increase expected, two 24-hour periods followed. By June 11, the upriver escapement past the Miles Lake sonar had dropped to 15 percent below the anticipated, while the commercial harvest was 25 percent above anticipated. This required a more conservative fishing schedule. Also at this time, the lower delta sockeye stocks became a factor in the commercial fishing

schedule and added conservation measures were needed. To allow for upriver and lower delta stock escapement, the typical 24-hour period was reduced to 12-hours on June 14.

By June 15, escapement past the Miles Lake sonar was within five percent of the anticipated and escapement into the lower delta systems (Appendix B.9) was within expectations; therefore, the original schedule of two 24-hour periods per week resumed until June 28. By June 29, escapement was above anticipated for both the upriver (9 percent) and lower delta stocks (16 percent), therefore the first weekly period was increased to 36 hours. This schedule continued until the second period was increased to 36 hours on July 11. On July 18, the second period was increased to 48 hours. This schedule remained in effect until August 8.

The Bendix side-scanning sonar counter was deployed in the Copper River near Miles Lake from May 21 until July 31, 1991. Species apportionment past the sonar is not one of the objectives of this project, due to sockeye making up an estimated 95 percent of the total run. Chinook salmon are present throughout late June and coho appear in late July. The migration time for salmon to travel from the Copper River District to the sonar site at Miles Lake is estimated at seven to nine days.

Escapement of sockeye salmon for the upper Copper River surpassed the minimum objective of 516,000 salmon, for a cumulative total of 579,435 salmon past the Miles Lake sonar through July 31. The escapement for the lower delta stocks also met the minimum objective of 89,000, for a total escapement index of 90,500 (Appendix B.10). In recent years 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. Increase in delta escapement is over compensated by surplus escapement upriver. 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. Observations during the 1991 season indicated the 12-hour periods during late May and early June may have reduced the harvest on the milling offshore delta stocks while allowing adequate fishing time on the migrating upriver stock component. This strategy may alleviate future district wide closures to ensure delta stock escapement.

COHO SALMON FISHERY

The management of the coho fishery began the week of August 4, with a 36 and a 48 hour period for that week. The harvest was 2,133 coho and the anticipated was 14,463. With an apparent weak run the fishery was closed the following week and did not reopen until August 19, for 48 hours. The catch from the August 19, period was again below the anticipated of 46,078, with an actual catch of 30,374 coho salmon. Prior to the August 19 commercial opening, the district had been closed for nine days. An above average catch was expected for the August 19, opening if the run was coming in as projected. An aerial survey was flown on August 21, which observed 686 coho, far below the 5,853 expected. Due to poor catch and escapement, the fishery remained closed the following week. Two aerial surveys were flown during the week of August 25, and both surveys indicated escapements were far below the anticipated (Appendix B.11). However, the second survey on August 30 showed a vast improvement from the August 27 survey, so the Copper and Bering River Districts opened for two 24-hour periods during the week of September 1, on expectations that escapements would continue to improve. The combined harvest for the two periods during the week of September 1, was 121,224 coho, which was 57 percent above the weekly anticipated. Escapement for the same week (September 1) was also above the anticipated by 37 percent. Due to heavy rains, not all spawning streams were enumerated and the

escapement, of streams surveyed, ranged from light to heavy. With both catch and escapement above anticipated, a schedule of two 48-hour periods was allowed for the next two weeks. For the remaining three weeks of the season, the fleet was placed on a 120-hour fishing period per week. The season closed October 12, due to lack of interest from the processors. The coho harvest was 385,086, 56 percent above the 10-year average.

The last aerial survey of the Copper and Bering River delta was on October 23. After that date a majority of the systems are ice covered. The final peak aerial survey index for the Copper River was 64,356, eleven percent above the anticipated.

BERING RIVER DISTRICT

PRESEASON OUTLOOK AND HARVEST STRATEGY

The Bering River District management strategy provides for a weekly commercial fishing schedule coinciding with the Copper River District. However, with no significant Bering River chinook salmon stocks and a later sockeye salmon run timing, the season opener is usually a month later than the Copper River District. Since 1988, the total run of sockeye (combined catch and escapement) for the Bering River systems has been below the historical escapement index. The sockeye run timing has a very short time frame, typically during the third week of June. Peak sockeye escapement estimates occur between the last week of June and the first week of July. This delayed assessment of escapement has not allowed managers the option to close the fishery until escapement shortfalls are observed. To help alleviate the recent trend of low escapement, the management plan for 1991 was for one 24-hour period on June 17, and then closure of the District unless escapements were within anticipated levels.

SOCKEYE SALMON FISHERY

The Bering River District opened June 17, with 26 fisherman harvesting 19 chinook, and 8,034 sockeye salmon. An aerial survey was conducted on June 14 and 8,330 sockeye were observed in the Bering Lake and river system. The anticipated escapement for that week was 825 sockeye. With escapement far above the anticipated, a continuation of the fishing schedule was allowed. Effort after the second period was minimal, with 46 deliveries reported during the following 15 periods (Appendix B.19). The 1991 catch of 19,181 sockeye was slightly below the preseason harvest forecast of 20,000 to 30,000 sockeye salmon (Appendix B.20). The actual escapement estimate for the Bering River system was 32,220 and the anticipated was 32,000 sockeye (Appendix B.21).

COHO SALMON FISHERY

The coho fishery is managed concurrently with the Copper River District and fishing effort did not occur until September 2, when 26 vessels participated. Effort remained high up to the September 30 period, when only 13 vessels fished. The commercial salmon season closed October 12, due to lack of interest. The cumulative harvest of 110,951 coho was near the anticipated harvest of 102,500 for the 1991 season (Appendix B.20).

The final 1991 escapement index was 31,300 coho salmon, 25 percent above the historical average (Appendix B.22). High turbid water in a majority of the streams limited survey conditions for the majority of the season.

COGHILL DISTRICT (prior to July 21)

PRESEASON OUTLOOK AND HARVEST STRATEGY

Prior to July 21, drift gillnet is the only legal gear type in the Coghill District. Starting July 21, both purse seine and drift gillnets are allowed. The management strategy prior to July 21, is based primarily upon the natural return of sockeye salmon at Coghill Lake and the enhanced return of chum salmon at the Noerenberg Hatchery.

The outlook for Coghill sockeyes was for a small return of 64.7 thousand fish. Since the escapement goal is 50 thousand fish, only 14.7 thousand were projected to be surplus to escapement. Due to the expected small return to Coghill Lake, a directed fishery on Coghill sockeyes was not anticipated. If the Coghill return materialized as forecast, the surplus was expected to be harvested incidentally to hatchery returns in the Esther Subdistrict and the Eshamy District. The early chum return to the Noerenberg Hatchery was forecast to be 1.3 million fish, of which approximately 0.912 million (70%) were available to the common property fishery.

Based on the sockeye and chum salmon forecasts, the Esther Subdistrict was scheduled to open in mid-June, for two 24-hour fishing periods per week. This plan was designed to allow wild stock sockeyes to reach Coghill Lake, allow the fleet to target early hatchery chums and provide the hatchery operator with corporate escapement. To alleviate congestion, openings would coincide with the Copper River District, whenever possible.

SEASON SUMMARY

The Esther Subdistrict opened on June 13, for 24-hours to target the hatchery return of chum salmon. The balance of the Coghill district remained closed to protect sockeye salmon returning to Coghill Lake. The harvest for the first period was 8,435 chum and 375 sockeye (Appendix C.1). By June 15, only 4% of the expected chum brood stock was collected. After reviewing catch information and the Noerenberg hatchery brood stock acquisition, the Esther subdistrict was closed. The closure of the Esther Subdistrict also reduced interception of Coghill sockeyes, where early escapement counts were less than expected.

Throughout June, hatchery chum and Coghill sockeye continued to perform well below expectations. The Esther Subdistrict remained closed for the balance of June and most of July. In late June chum brood stock collection began to increase, however, the shortfall of brood stock during early June required a continued closure. Sockeye escapement at Coghill Lake was less than expected throughout June and July. By late July brood stock acquisition was on target. The Esther Subdistrict opened to seiners and gill netters for a 24-hour period on July 22-23, to target chums excess to the hatchery's brood stock needs. The harvest was 18,410 pinks, 13,876 chums, and 3,067 sockeye.

Due to shortfalls in wild stock pink and chum escapement in the Coghill and Northwestern Districts, management priority for the Coghill District changed to wild stocks after the July 22-23 opening. Further discussion of this portion of the fishing season is provided in the section pertaining to the *General Purse Seine Districts*.

Sockeye escapements at the Coghill weir were extremely poor during June. To help track the sockeye return to Coghill, a test boat was dispatched to Port Wells to qualitatively assess the return. The test was conducted over the fourth of July weekend, when the Coghill run typically peaks. The vessel operator reported approximately 15,000 sockeye at Golden Lagoon. These sockeyes were remote released at Davis Lake in 1987. Davis Lake has barrier falls, thus the fish were unable to spawn; however, PWSAC was able to conduct a remote egg take at Golden Lagoon for smolt stocking to Coghill Lake. The weir was pulled on July 30, and the cumulative sockeye salmon escapement was only 9,752 fish, falling below the goal of 55,000 (Appendix C.4.). This year's Coghill Lake escapement is the third weakest on record since statehood (Appendix C.6.).

UNAKWIK DISTRICT

PRESEASON OUTLOOK AND HARVEST STRATEGY

The Unakwik District is the smallest in the management area. Both drift gill net and purse seine gear are legal gear types during all commercial fishing periods. This district was established for the management of sockeye returns to Miners and Cowpen Lakes. These runs are relatively small and no formal forecast is made. Escapement enumeration into both lake systems is via aerial survey, however water clarity is poor thus escapement indices are considered qualitative at best.

Historically this district was managed concurrently with the Coghill District, as the commercial catch from both areas cycle in a similar fashion. Based upon a request from the gill net fleet, the Department managed the Unakwik District independently in 1991. The management strategy for the Unakwik District was to allow two 24-hour periods per week coinciding with other gill net openings. Fishery performance, measured by catch/boat hour, along with anticipated catch and effort was evaluated against historic catch and effort levels.

SEASON SUMMARY

The Unakwik District opened on June 17, to a schedule of two 24-hours periods per week to target sockeye returns to Miners and Cowpen Lakes. No changes were made to the sockeye fishing schedule that extended until late July. Effort by period was comparable to historic levels. Commercial catch information indicated that the catch of sockeye per boat hour was within the historic range.

After the sockeye season the Unakwik District continued on the schedule of two 24-hour periods per week until the season closed on October 4. Effort was minimal and harvest was primarily pink salmon. There were no reported landings after mid-August. The harvest for 1991 was 133,367 pinks and 5,301 sockeye with minor amounts of chum, coho, and chinook. The sockeye harvest was below the 10-year average of 17,371 (Appendix C.10).

ESHAMY DISTRICT

PRESEASON OUTLOOK AND HARVEST STRATEGY

Both set and drift gill nets are legal gear for the Eshamy District. During the 1991 Board of Fisheries meeting a new regulation pertaining to set nets in the Main Bay Subdistrict was enacted. Beginning with the 1991 season, the inshore end of a set net or set net lead cannot be operated in more than two fathoms of water at low tide.

The forecasted return to the Main Bay hatchery was 397,300 chum and 173,100 sockeye salmon. With the conversion of this facility to sockeye production there were no chum brood stock requirements, however 5,000 sockeye brood stock were planned to be taken. The Eshamy District has wild stock sockeye (Eshamy Lake) and pink salmon throughout the District.

The management strategy for the Main Bay hatchery was to allow continuous fishing in the Main Bay Subdistrict, except for the Alternating Gear Zone (AGZ). The AGZ would be managed to allow for collection of sockeye brood stock. The initial strategy in the Crafton Island Subdistrict was two 24-hour periods coinciding with other gill net openings to reduce effort. Since Coghill stock sockeyes have an earlier run timing than Eshamy sockeyes, the Crafton Island Subdistrict was initially managed upon concerns of the Coghill stock. In mid-July management priority changes to Eshamy Lake sockeye and wild stock pinks and chums.

The strategy of two 24-hour periods per week in the Crafton Island Subdistrict and continuous fishing in the Main Bay Subdistrict is designed to help minimize the harvest of migrating sockeye and chum salmon and permit a high harvest rate on enhanced sockeyes and chums inside the Main Bay Subdistrict.

SEASON SUMMARY

The Main Bay Subdistrict opened to fishing on June 10, and was open to continuous seven day per week fishing (Appendix D.9.). During the second week of the fishery the AGZ was reduced to five days per week to assist in the collection of sockeye salmon brood stock.

By late June sockeye brood stock collection was below anticipated and the AGZ was closed on June 27. On July 14, when only 21% of the sockeye brood were taken, the closure was expanded to include the Terminal Harvest Area (THA) of Main Bay. Sockeyes milling in the AGZ were observed to back out of the AGZ and be captured in the THA. The THA reopened on July 18, when 66% of the brood stock were taken. On July 22, sockeye brood stock collection was complete and the AGZ was reopened to continuous fishing for the remainder of the season.

The Crafton Island subdistrict was opened to a schedule of two days per week beginning on June 10. This schedule continued for the remainder of June. During the first week of July only one period was allowed to help reduce interception of Coghill Lake sockeyes. To further reduce interception the 60 mesh depth restriction for gill nets was extended by emergency order from July 1, through July 22.

By July 16, only 10% of the anticipated Eshamy Lake escapement was achieved, and the Crafton Island Subdistrict was closed effective July 18, until further notice. Escapement throughout the remainder of July

was weak; however, during August escapement improved. To further aid escapement the eastern shoreline of Chenega Island, which is in the Southwestern District, was closed to seining from August 25 until August 29. By September 2, the escapement count was 36,500 and the Crafton Island Subdistrict opened with a weekly schedule of two 36-hour periods per week. By September 8, the escapement goal was achieved and the Crafton Island Subdistrict was opened to continuous fishing. The entire Eshamy District closed for the season on October 4. The Eshamy Lake sockeye escapement was 46,229 surpassing the goal of 40,000 (Appendix D.3.).

During the season it was discovered that set nets were placed within 500 yards of anadromous stream closures throughout the district. The stream closures in the Eshamy District were designed to protect wild stock salmon. Although these streams are documented as anadromous, most did not have regulatory markers. Markers were placed at all known anadromous streams in the district and markers were realigned if not at the prescribed distance. This action by the Department brought strong reaction from affected set netters. An emergency order was issued allowing commercial fishing in the Main Bay Subdistrict within the 500 yard closures from June 28 through July 7.

The harvest of sockeyes exceeded expectations with a catch of 480,262 although the catch of 251,577 chums was less than expected. The sockeye harvest, due to enhanced production, was far above the 10-year average harvest of 22,000 fish and the chum harvest, due to enhanced production, was approximately double the 10-year average harvest of 107,000 fish (Appendix D.2.). Information from the coded wire tag program indicates that a significant number of wild sockeyes and chums were caught in the Eshamy District but not destined for the Main Bay Hatchery.

GENERAL PURSE SEINE DISTRICTS

PRESEASON OUTLOOK AND HARVEST STRATEGY

The outlook for the general purse seine fishery was for a catch of 31.5 million pink salmon and 300 thousand chum salmon. Hatchery production was anticipated to account for 81% of the pink harvest and most of the chum harvest was expected from wild stocks.

Prior to the start of the 1991 season, the P.W.S. Salmon Harvest Task Force (SHTF) met numerous times to formulate a management plan. The management recommendations developed in 1990 were the basis for the 1991 plan. A new section focusing on front end cost recovery for PWSAC was also developed. After a great deal of public input and debate, the management recommendations were not unanimously adopted.

In February of 1991, the Alaska Board of Fisheries adopted the Prince William Sound Management and Salmon Enhancement Allocation Plan. Wild stock management is stated to have the highest management priority when determining fishery openings in the general waters of the Sound. The plan also created a migration corridor for wild stocks by establishing opening dates for the Southwestern District and Perry Island Subdistrict. In the Coghill District both opening and closing dates were established for seine gear. The plan also created the Perry Island Subdistrict, and made minor changes to the boundaries of the Northern and Northwestern Districts. As a result of these changes the department realigned several statistical reporting areas, established statistical reporting area 222-30, and deleted statistical reporting area 224-20.

Before the seine season apprehension was expressed by both fishermen and aquaculture associations concerning inadequate domestic processing capacity. As a result the State of Alaska, Department of Commerce and Economic Development conducted a study to determine the domestic processing capacity for the Sound.

SEASON SUMMARY

Aerial surveillance of pink and chum spawning systems in the Sound began in late June. The early surveys revealed a weak return of both pink and chum salmon in the Eastern and Northern districts. The weak escapement continued during the first week of July.

The Valdez Fisheries Development Association (VFDA) commenced cost recovery of pink salmon at Solomon Gulch hatchery and the Boulder Bay remote release site on June 21. Cost recovery, in terms of number of fish, tracked close to preseason expectations for the remainder of June. Management guidelines in the Solomon Gulch Hatchery annual management plan state that if wild stocks are weak then no directed harvest will occur until 40% of the sales harvest goal has been obtained.

Cost recovery harvests indicated that 40% of the fish anticipated for sales would be taken by July 2. Therefore the first commercial period of 12-hours was scheduled for Monday July 3, in Valdez Arm and the western half of Port Valdez. The waters of Boulder Bay did not open. Boulder Bay remained closed to allow for uninterrupted cost recovery, as the commercial fishery in Port Valdez would slow cost recovery at Solomon Gulch. To protect wild stocks, Galena, Jack and Sawmill Bays did not open. The Port of Valdez east of 146° 30.5' W. longitude remained closed to provide for hatchery cost recovery. The commercial harvest on July 3, was 0.5 million pinks.

The next two periods on July 8, and 11, were boycotted to protest the low price of $0.12/pound. After each boycotted period, the Special Harvest Area for the Solomon Gulch Facility was expanded to the western half of Port Valdez to allow VFDA to harvest those salmon bypassed by the commercial fishery.

Wild stocks continued to perform well below expectations. By mid-July in the Eastern District only 21% of the expected weekly salmon counts were observed in the streams and in the Northern District only 5% of the expected weekly stream counts were observed (Appendices E.6. and E.7.). With weak wild stock performance the VFDA return provided the only surplus for the commercial fishery.

The period scheduled for July 13, was partially boycotted and by July 15, most seiners had started fishing again. From July 17-24, four more periods were directed at the harvest of VFDA pinks. The area open to fishing during this period was directed away from Valdez Arm and conducted in the waters of Port Valdez and the waters of Boulder Bay to protect wild stocks.

After the VFDA return there was no harvestable surplus of pink salmon during late July and early August. This was due to a combination of weak wild stocks and low number of PWSAC pinks returning to the special harvest areas at all three PWSAC facilities. On July 31, run entry into the PWSAC Special Harvest Areas was approximately eight days behind the expected run entry schedule. The Department notified the industry that if wild stocks remained weak, fishing directed on PWSAC returns would be confined to the hatchery terminal harvest areas.

On August 3, the Department announced a fishing period of 24-hours for August 5, and the potential for an opener on August 8. The August 5 opening was confined to terminal harvest areas at the three pink hatcheries due to the weak wild stock performance. The intent of the opening was to provide more information on the magnitude of the hatchery return. The harvest was 1.4 million pinks.

The Department did not proceed with an opening on August 8 for several reasons. First, it was apparent that the run entry pattern was abnormal (as compared to preseason expectations) in terms of number of fish and timing. Through August 7, the common property harvest of PWSAC fish was 1.4 million and the expected harvest was 6.5 million. PWSAC's corporate escapement was 1.05 million and the expected was 2.77 million. Second, was the management mandate to provide 30% of the entire PWSAC run for corporate escapement. Both run entry into the special harvest areas and percent female (a measure of run completion) indicated the run was less than the preseason forecast. The opening on August 8, was waived to provide PWSAC with additional corporate escapement before the peak of the run.

The next period occurred on August 10, in the hatchery terminal areas. The harvest was 2.03 million pinks. The cumulative common property harvest of late run pinks was 3.4 million and corporate escapement was 1.9 million or 36% of the total run.

A Salmon Harvest Task Force meeting was called on August 11, at the request of several task force members. The meeting focused on concerns for a large buildup of hatchery pink salmon in the Sound and the status of wild stock escapement. As a result of that meeting, the Department announced a 12-hour opening for August 12. The Task Force asked that nonterminal fishing be allowed. The opening included the southern half of the Southwestern District, approximately one half of the Northern District and the Esther Subdistrict. The harvest for the period was 3.5 million pinks and the cumulative harvest of late run pinks was 7 million or approximately 74% common property contribution.

The large catch on August 12th maximized the available processing capacity and many fishermen either lost their markets or were placed on limits. PWSAC was unable to secure bids for most of the pinks in the Special Harvest Areas, however PWSAC continued harvesting to fulfill preseason sales commitments. On August 13th, PWSAC estimated that 1.2 million pinks were in the Special Harvest Areas and requested the Department to open those areas to the common property fishery.

Aerial surveys in mid-August showed improvement for wild stocks in most districts. Prior to the opening on August 12, no directed harvest had occurred on wild stocks. Wild stock escapement, up to this point in the season, represented the entire wild run, except for incidental take during the openings targeting on hatchery returns.

Due to maximization of processing capacity no fishery was scheduled for August 13, however a 12-hour period on August 14, occurred in the hatchery terminal harvest areas and special harvest areas. On August 15, the Port San Juan, Elrington, Esther Island and designated waters of Unakwik Inlet including the special harvest areas and sanctuaries were open to continuous fishing for the remainder of August. Beginning August 17, and continuing until August 23, fishing in the southern half of the Southwestern District occurred every other day. This strategy of 12-hours every other day in the cape area was preferred by processors for scheduling tenders and for quality concerns. The hatchery terminal areas were open continuously to allow maximum opportunity for those fishermen with markets.

Although PWSAC had fish available, there was reluctance on the part of the processors to purchase PWSAC fish. The potential existed for these fish to go unharvested. If this were to occur, a decline in quality would result such that they could not be marketed.

On August 19, PWSAC estimated that three million pinks were available in the special harvest areas. Fish were accumulating for approximately seven days. On August 19, PWSAC requested assistance from the State to help remove these fish from the SHA's. Removing pinks from the SHA's would help eliminate the large volume of mixed quality fish, entice processors to purchase fish in these areas once older fish were removed, improve fish quality for preseason sales, allow PWSAC to maintain their brood stock collection schedule, and at the Noerenberg hatchery permit the timely harvest of coho salmon. The State responded by providing funding for tenders while PWSAC provided contract seiners. The program began on August 22, and continued until September 13. The majority of the fish (2.8 million) were taken away from the hatcheries and discarded in deep water. The remainder were tendered to Cordova or Kodiak and canned for donation (not for resale) to the Soviet Union. Several fishermen also captured fish and distributed fresh fish to the general public.

Beginning August 25, the following areas were open to continuous commercial fishing; all waters of the Southwestern District, except the eastern shoreline of Chenega Island for the protection of sockeye salmon returning to Eshamy Lake, the Perry Island Subdistrict, the Northwestern and Southeastern Districts, the Esther Subdistrict and waters of Unakwik Inlet of the Northern District. Due to Board of Fisheries action, beginning August 25, seine gear was legal only in Lake and Quillion Bays of the Esther Subdistrict.

Due to further improvement in wild stock escapement the entire Sound was opened to continuous fishing on August 29, however the Unakwik and Eshamy Districts were managed for sockeye returns. To allow PWSAC to collect brood stock the special harvest areas were closed.

Due to concern for wild chum escapements the head of Port Valdez was closed effective August 31. The Sound remained open until October 4, when all districts in the Sound closed except for the Esther Subdistrict of the Coghill District. The Esther Subdistrict remained open for gill net harvest of surplus coho returning to the Noerenberg hatchery.

The 1991 pink return to the PWSAC facilities can be characterized as late and compressed. Initial run entry was delayed, however run entry was not prolonged on the later portion of the run. Fish movement into the hatchery areas was abnormal as the fish appeared to hold in nonterminal areas. As a consequence overall fish quality was poor, even though 67% of the harvest occurred in the Southwestern District. Average fish size was very small at 2.4 pounds and PWSAC brood stock fecundity was the lowest on record.

PWSAC fell short of their 1991 revenue goal. The aquaculture association received $1.127 million out of an expected $9.07 million from all species. The hatchery sold 2.74 million pinks, 11 thousand chum and 13 thousand coho for cost recovery (Appendix F.1., F.2, F.4). The brood stock goal was achieved for each specie and facility. Results from the coded wire tag project indicate that the total PWSAC pink return (common property and corporate escapement) was 25.9 million pinks.

By season's end the cumulative wild stock pink escapement was achieved in all districts except the Coghill District. For the entire season, the pink salmon wild escapement was 29 percent greater than the mean odd year index. Most of the pink escapement was achieved during the later portion of the run.

The chum salmon escapement was poor. All districts were below the mean index. For all districts combined, chum escapement was 31 percent below average for the season.

At the close of the season, 26.6 million pink salmon were harvested by the common property fishery or 72% of the combined VFDA and PWSAC return. An additional 5.96 million were taken by the PNP hatchery operators for cost recovery, 2.8 million were discarded at sea due to lack of markets and 1.3 million were donated to residents of Alaska and the Soviet Union. The 1991 pink salmon harvest, including discards and donations, was 37.1 million the second largest on record. The total pink return including commercial harvest, corporate escapement and wild stock escapement was 40.3 million.

1991 PRINCE WILLIAM SOUND AND COPPER RIVER SUBSISTENCE FISHERIES

Subsistence and personal use salmon harvests continue to be minor by comparison to the commercial salmon 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 Prince William Sound and the Copper River Delta commercial fishermen may withhold a portion of their commercial 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 Delta, Prince William Sound, Chenega and Tatitlek areas. Harvests are provided for these areas in Appendices G.1. through G.4..

UPPER COPPER RIVER SUBSISTENCE AND PERSONAL USE FISHERIES

SUBSISTENCE FISHERY

The 1991 Copper River salmon return was anticipated to be ample to allow unrestricted fishing for the subsistence fish wheel and dip net fishery. During the 1991 Board of Fisheries meeting, subsistence harvest was increased from 25,000 to 35,000 salmon. The fish wheel and dip net fishery opened June 1 to seven day per week fishing. By early June, sonar counts at Miles Lake tracked along anticipated performance curves indicating that the minimum escapement goal of 516,000 would be reached. There were 293 dip net and 418 fish wheel permits issued and the harvest is estimated from returned and unreturned permits at 43,621 salmon, mostly sockeye (Appendix G.4.). Subsistence permits issued in 1991 increased 75 percent over 1990 with dip net gear having the greatest increase.

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 from 1988 through 1991.

PERSONAL USE FISHERY

The personal use fishery was conducted in 1991, as in the last three 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 6,222 dip net permits were issued in 1991, representing a significant increase for dip net permits. The estimated harvest for the season was 85,763 salmon (Appendix G.4.), primarily sockeye (91%). The combined upper Copper River personal use and subsistence estimated catch of 129,384 fish ranks as the largest harvest.

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 1991, a total of nine permits were issued for Prince William Sound, but only two actually fished. The reported catch was two sockeye salmon (Appendices G.1.).

A total of 129 permits were issued for the Copper River flats, however only 72 of the 115 returned permits actually fished. The reported catch was 136 chinook, 830 sockeye, 38 coho and 5 other species (Appendix G.1 and G.2.).

EASTERN AND SOUTHWESTERN PRINCE WILLIAM SOUND FISHERIES

Residents of both Chenega Bay and Tatitlek are issued special subsistence use permits; however, in 1991 due to a court ruling all residents of Alaska were eligible for a subsistence permit in the Tatitlek or Chenega areas. The Chenega and Tatitlek subsistence permit program began in 1988. 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, 11 permits were issued, mainly to residents of Chenega Bay village. This was an increase of 4 over the 7 issued in 1990. Only 5 permits fished for a total catch of 638 fish. Sockeyes represented nearly 50 percent of the harvest with 345 sockeye taken (Appendix G.1).

In the Tatitlek area only 7 of the 17 permits issued actually fished in 1991. A total catch of 1,439 salmon, predominately coho, was reported in 1991. This is up from the 260 salmon harvested in 1990 (Appendix G.1).

1991 PRINCE WILLIAM SOUND HERRING FISHERIES

PRESEASON OUTLOOK AND HARVEST STRATEGY

There are five herring fisheries in the PWS management area. All target on what is treated as a single major stock of herring that spawns during the mid-April to early May period. During the spring season there are two sac roe fisheries and two spawn-on-kelp fisheries. A food and bait fishery occurs in the fall.
The allocation of the projected available surplus is regulated by "The Prince William Sound Herring Management Plan", 5 AAC 27.365. This plan provides for harvest rates of 0 to 20% when stock size is between 8,400 tons and 42,500 tons. The estimated spawning biomass for 1991 and the forecasted spawning biomass for 1992 are derived from the 1991 spawn deposition research project. This project has been conducted annually since 1988 and is important for stock assessment due to the difficulty of assessing total biomass from aerial surveys in Prince William Sound. Aerial surveys are useful inseason to locate areas of abundance, delineate harvest locations, and to map spawning sites.

For 1991, the spawning biomass was projected to be 96,800 tons and dominated by age seven fish. Since the spawning biomass was greater than 42,500 tons, the exploitation rate was set at the maximum 20%. Allocation of biomass by fishery for the 1990-91 management year (July 1 - June 30) was; seine sac roe 11,233 tons, gill net sac roe 657 tons, pound spawn-on-kelp 3,151 tons, wild spawn-on-kelp 1,547 tons. The 1991 food and bait guideline allocation of 3,956 tons was derived from the 1991-92 management year forecast of 121,342 tons.

The sac roe fisheries, seine and gill net, are limited entry. Purse seines can be 150 fathoms in length and 1000 meshes deep. Gill nets are limited to 100 fathoms in length and 120 meshes in depth. The sac roe fisheries are managed for a specific allocation. Management emphasis is placed upon test fishing to assess age composition and roe maturity to target a high quality product. Due to limited processing capacity for the large seine harvest, the Department notified the industry that an effort would be made to divide the harvest into several openings. Daily processing capacity was not an issue for the gill net fishery.

Spawn-on-kelp fisheries utilize native species of kelp (wild spawn-on-kelp fishery) and imported or native kelp suspended in a net impoundment (pound spawn-on-kelp fishery). Only the pound kelp fishery has effort limitation. The pound kelp fishery is usually the first spring herring fishery to open and continues for several weeks to facilitate seining, kelp placement and harvesting of spawn-on-kelp. The department uses a commissioner's permit to stipulate gear, production limit, and harvest requirements.

During the 1991 Board of Fisheries meeting, the management plan for the pound fishery was revised. Previously the quota was divided equally among all permit holders registered with the department. Each permit holder was allowed to harvest a specified amount of product by weight. That weight was the final product weight which is less than the raw weight (on grounds weight) due to shrinkage during processing. Problems arose due to the undetermined shrinkage rate and over harvest by some permit holders. The number of kelp blades placed into pounds was also regulated, but the number allocated to each permit holder was more than needed to reach individual quotas. The management plan adopted in 1991 allocates the guideline based on the goal of one ton of product for every 12.5 tons of herring allocated to this

fishery. That harvest quota is then distributed to each individual permit holder by a specified number of kelp blades.

The wild spawn-on-kelp fishery utilizing native kelp occurs after a major spawning event on marketable kelp. Considerations for this fishery are to conduct the fishery in an area receiving adequate egg coverage on marketable kelp and to ensure that harvesting does not denude an area of kelp.

The food-and-bait season is set by regulation from September 1 through January 31, however, industry concerns for product quality have delayed the season opening date. The current market demand is for crab and longline bait. Quality long line bait is a large fish with firm flesh and a high oil content. Oil content and bait quality improves later in the fall and winter. The larger fish begin to show and become vulnerable to purse seine gear later as well. The Department canvasses all potential processors and establishes an opening date by emergency order.

SAC ROE SEINE FISHERY

Aerial surveys to estimate biomass began on March 30. The sac roe seine fleet was placed on the standard 48-hour advance notice effective April 1. Aerial surveys in early April indicated the biomass increasing from 600 tons on April 1, to 11,500 tons on April 6. Herring were concentrated in the Valdez Arm - Tatitlek Narrows area. On April 7, the R/V Montague was stationed near the village of Tatitlek in anticipation of a sac roe seine opening. On April 8, the seine fleet was placed on two hour advance notice, while aerial surveys and test sets continued to assess the area for a fishery. On April 9, test fish samples indicated a range in average size of 138 to 154 grams and from 9.8 to 10.9% mature roe.

The first of three seine openings occurred from 4:00 to 4:30 p.m. on April 9, in the Port Fidalgo-Bidarka Point area. The harvest of 3,204 tons averaged 10.9% mature roe and 142 grams average weight. Aerial surveys on the morning of April 10, indicated a substantial quantity of herring remained and therefore a second opening occurred on April 10, from 12:00 to 12:30 p.m. in the Port Fidalgo-Tatitlek Narrows area. The seine fleet harvested 4,933 tons averaging 10.6% mature roe and 140 grams average weight. Approximately 3,000 tons remained on the 1991 seine allocation.

After the first two seine openings, aerial surveys indicated that the biomass in the Valdez Arm - Tatitlek area was not increasing. Surveys also indicated a substantial biomass at Montague Island. To allow herring to spawn in the Valdez-Tatitlek area and to provide herring for the pound spawn-on-kelp fishery the Department shifted assessment efforts to Montague Island on April 13. The seine fleet was placed on 6-hour advance notice.

From April 14 to 19 weather hampered aerial surveys. Test fishing continued each day at Montague Island. Results indicated that both juvenile and adult fish were present. The biomass in the Montague Island area was large. Due to poor visibility and the tendency for herring to remain several fathoms below the surface an accurate aerial survey estimate was not obtainable. Observation with sonar substantiated the large biomass. Processors indicated their desire for fish at least 120 grams and 10% mature roe. The Department obtained many test samples trying to isolate an area where the remaining 3,000 tons could be taken and also be acceptable to the processing industry. During the late afternoon of April 19, the large biomass of herring in Rocky Bay moved rapidly around the northern coast of Montague Island to the Stockdale-Chalmers area. Several quick test sets and an aerial survey indicated an acceptable

harvest area and an opportunity to conclude the 1991 seine harvest. The final seine opening occurred from 8:00 to 8:20 p.m. on April 19. The harvest was 3,786 tons with 9.9% mature roe and 123 grams average weight.

The 1991 seine sac roe harvest was 11,923 tons, averaging 10.5% mature roe. The harvest was 5% above the 11,300 ton allocation. The exvessel value of the fishery is estimated at $7.15 million. Of the 107 permit holders, 104 made at least one landing.

GILL NET SAC ROE FISHERY

The gill net sac roe fleet was placed on 24 hours advance notice April 5, at 12:00 noon after 3,160 tons of herring were observed in the Valdez/Tatitlek area. After the first two seine sac roe openings, it was apparent that spawning was too sporadic to proceed with an opening in the Northeast area. Further the lack of additional fish moving into the area shifted the focus of the fishery to Montague Island with the seine fleet. Purse seine test fishing from Montague Island indicated that herring were present in mixed age groups and of varying sizes and roe recoveries. Sonar surveys indicated that a large herring biomass remained in Rocky Bay. Test fishing by gill net vessels with various mesh sizes on April 17, demonstrated that gill net vessels were capable of selectively harvesting a marketable product. Additional test fishing in Rocky Bay the morning of April 18, confirmed those results. The gill net sac roe fishery opened at 10:30 a.m. April 18, and closed at 9:00 p.m. the same day in Rocky Bay. Although there was a large biomass in the area, CPUE (tons/boat hour) was lower than in 1990. This year's gill net fishery in Rocky Bay occurred in relatively clear water. In previous years, the fishery was conducted while spawn clouded the fishing area, perhaps due to the water clarity, CPUE was lower. Fishing time was extended twice; once for two hours and again for an additional four hours. The total gill net sac roe harvest was 742 tons with an approximate exvessel value of $445,200. Twenty-four permit holders made landings. The average weight was 158 grams and roe recovery averaged 11.06%.

SPAWN-ON-KELP IN POUNDS FISHERY

The 1991 fishery was confined to the traditional areas of Valdez Arm and Port Fidalgo. Galena Bay was once again the predominant location for pounds where 51 of the 126 permit holders located. The remaining permit holders located in Picnic Cove (20), Boulder Bay (10), Landlocked Bay (20), and the head of Port Fidalgo (25). The distribution of pounds this year can be attributed to the dispersed herring biomass.

Herring were first observed in Galena Bay (5 tons) on April 1, and increased to almost 2,500 tons by April 5. Samples of these fish along with herring collected in Jack Bay, Virgin Bay, and Landlocked Bay revealed age seven as the predominate class. On April 4, at 12:00 noon the pound fleet was placed on 24-hours advance notice. On April 5, at 6:00 p.m. the department announced an opening for the seining of herring for the introduction into pounds, effective at 12:00 noon Sunday April 7, until further notice. The open area included all waters of Valdez Arm and Port Fidalgo north of a line extending from Porcupine Point to Point Freemantle.

Pounds were spread throughout the opened area to a greater extent than in past seasons. Early in the season, distribution was similar to 1990 and herring were abundant from Galena Bay to Tatitlek Narrows. The herring moved into Galena Bay for only a few days and then moved south into Boulder Bay, Landlocked Bay and the head of Port Fidalgo. Possible reasons for this movement may be cold water and minimal sunny weather. Of the 126 active permits, six permits did not capture herring for introduction to pounds.

Seining of herring for the introduction to pounds was closed south of a line from Point Freemantle to Black Point from 3:00 p.m. April 9, to 6:00 a.m. April 10, and again from 11:00 a.m. to 6:00 p.m. on April 10. The closures were enacted to prevent conflicts between sac roe seiners and pound seiners and to aid enforcement efforts during the brief sac roe openings.

Macrocystis kelp from southeast Alaska began arriving in Valdez on April 6. Kelp arrivals continued through April 13, when all 126 permit holders had kelp on the grounds. The late arrival of kelp blades can be attributed to bad weather in southeast Alaska which prevented air transport of the product. The kelp was of a lower quality than in past years; thin long narrow blades were the norm, with an average weight of 122 grams. A late spring in southeast Alaska may have attributed to the young thin kelp blades that were harvested for this year's fishery.

Seining of herring proceeded slowly. Only 30 permit holders introduced herring into their pounds by April 10. By April 13, an additional 20 permit holders introduced herring, by the evening of April 14, a total of 86 permit holders had introduced herring. By April 21, sixteen permit holders were without fish. Additional herring entered the northern portion of the area on April 21, and by 12:00 noon April 23, when seining of herring for the introduction to pounds closed, all pounds still on the grounds had fish.

The harvest of spawn-on-kelp began on April 14, and by noon April 30, all pounds completed harvesting. The fishery was closed to the harvest of product at 12:00 noon April 30. The raw weight (harvest weight) of spawn-on-kelp was 202.4 tons and the final product weight after trimming and shrinkage was approximately 160 tons out of the initial allocation of 220 tons. The quality of this season's product was lower than in the past years, with only 32 percent of the product grade two or better. Approximately 78 percent of the product were grades two, three and four. Again this year "slippage" or "peelers" amounted to almost seven tons. The term "peelers" refers to product when the egg layers detach from the kelp blades during processing and grading. The fleet received an average of $9.00 per pound on the final processed weight. The value of this year's fishery was $2.88 million.

WILD HARVEST SPAWN-ON-KELP FISHERY

Herring spawn was first sighted April 1, in the eastern part of Prince William Sound and with the exception of only a few days, spawning was observed at some location until aerial surveys ended in mid-May. Spawning herring were so scattered throughout the Sound that it was difficult to identify an area with spawn deposition intense enough over a sufficient area to support a harvest. In some areas, for example Tatitlek, before enough cumulative spawn was available for a harvest, eggs eyed out and were no longer salable. Interest in the fishery was intense with 281 divers registered with the CFEC. As a result an opening targeting on small isolated pockets of spawn was not considered feasible because of the potential for wastage and concern for denuding an area of kelp.

Aerial surveys continued on a limited basis in May to document spawning activity. Spawning began south of Montague Point on May 5, and continued through May 7. This spawn was intermittent and continued for seven miles. It was, however, the heaviest concentration of spawn in the Sound this year. Department divers surveyed the area and found that most of the spawn was on unmarketable species of kelp and eelgrass but there were areas with marketable kelp, mostly sieve and hair. Although this is a relatively small amount of spawn it would provide a limited harvest. Because of the lateness of this spawn, fewer than the registered number of divers were expected to participate. The fishery opened for an eight hour period May 11, with 21 divers harvesting 8.4 tons of kelp. Marketable kelp of the traditional species (ribbon, hair and sieve) was scarce and garnered a poor price. However, a market for fucus kelp developed and fucus with good egg coverage was abundant in the area. Since fucus is mainly intertidal most divers abandoned their dive gear in favor of handpicking kelp on the beach at low tide. The area was opened for five more days, 16 hours per day. By May 16, more than half of the participants had left to fish salmon, one of the three buyers had already left and the major buyer was planning on leaving the next day. The harvest rate had declined as the availability of good quality product decreased. Herring eggs generally eye out between 10 and 15 days after deposition and the earliest spawn in the harvest area was already 11 days old. In light of these factors, the Department, the remaining divers and the buyer agreed that another tide would complete the fishery. One more seven hour period on May 17, concluded the wild spawn on kelp harvest for 1991. Over 99% of the harvest was fucus and the average per pound price was $0.80

The total harvest of 107.6 tons of product was less than the guideline allocation of 195 tons. The value of the fishery is estimated at $172,160 and 48 permit holders participated.

1991 FOOD-AND-BAIT FISHERY

The Prince William Sound herring food-and-bait season opened by emergency order October 1, 1991. The regulatory opening is September 1. Participating processors were canvassed and all wanted to postpone the opening. Several processors had stringent size requirements for specialized markets and would have preferred an opening date of November 1, however most were interested in buying herring for use as crab bait and needed to deliver their product by the end of October.

The area open included the Montague Herring District and the waters of the General Herring District west of 147° 0.0' W. longitude. By regulation only the General Herring District is open to this fishery and the harvest traditionally occurs near Knowles Head. However, during the 1990 fishery both the Montague District and the General District were open and there was a marked difference in the quality, size and age composition in samples from the two areas. Two year old herring predominated in the Knowles Head catch but the Montague fish were larger (130 grams) and older making ideal bait. In the spring of 1991, most of the spawning herring biomass was found in the Montague area. The closure of the eastern portion of the General Herring District was necessary to protect a small sub-stock of young herring. Opening the western portion of the General District and the Montague Herring District was justified as the majority of older, larger herring have been found here recently and this area had the potential of producing a catch of the highest quality.

The preliminary guideline harvest allocation, issued in September, was 4,283 tons. Because of good market conditions, interest in the fishery was greater than the past several years with 11 processors expressing interest and 10 actually buying herring. The final guideline allocation, based on the 1991

spawn deposition project (1991-92 management year) was issued in November after the fishery closed; The final guideline harvest level was 3,956 tons.

Fourteen fishermen participated this year; all used purse seine gear. The first delivery was reported October 3, and herring were landed each day until the season closed October 14. Catches of 200 to 300 tons per night were reported until approximately half the quota was reached on October 10. Fishermen then realized that they were able to successfully fish during the day as well as at night and began fishing around the clock. This was the first time bait herring were effectively fished during daylight hours. As a result, the daily catch rate escalated to over 700 tons per day. By October 13, 3,910 tons had been landed and it was expected that the guideline harvest level would be reached by midnight. The closure was announced at noon, but by 6:30 p.m. it was apparent that with poor weather and a reduced fleet of only six boats that the guideline harvest level would not be achieved. The season was extended an additional 9 hours and by the next morning it appeared the harvest goal would be reached. The season closed at 9:00 a.m. October 14.

All of the harvest came from the Montague/Green Island area. With a total catch of 4,258.5 tons and an average price of $250 per ton, the estimated value of the harvest is $1,064,625. The catch was predominately 4 year old herring. The proportion of 4 year old fish decreased from 96% of the herring sampled from the October 2 catch to 77% on October 14. Eight year old fish comprised 13% of the October 14 sample. The average herring weight increased from 95 grams on October 4 to 111 grams on October 14.

1991 STOCK ASSESSMENT

The 1991 herring spawning population was dominated by the 1984 year class, as expected, which returned as seven year olds. Seven year olds represented 54% to 79% of the test fishery and of the commercial fisheries (Appendices H.24. - H.29.).

The aerial survey program was conducted in 1991 from late March through mid May. Herring biomass and spawning activity was documented throughout the season, and is summarized in Appendix H.1 and H.13. The peak aerial biomass estimate was 42,765 tons with a majority of the biomass as recorded by air occurring in the Montague Island area (19,090 tons) and Tatitlek area (11,540 tons) (Appendix H.13.).

In contrast, the total spawning biomass was estimated from the diver survey at 117,143 short tons. Of that 74% of the biomass (86,681 tons), occurred in the Montague Island area and 25% (29,419 tons) occurred in the Northeast area (Appendix H.13.). The biomass estimate is plus or minus 29% of the true value 95% of the time, which is within 7% of the 1991 forecast. Historical biomass indices are listed in Appendices H.20. and H.21. for reference.

Shore mileage was recorded as 58.0 total linear miles as compared to 94.1 in 1990. Spawn mileage recorded by air was confirmed by skiff and diver surveys. Areas utilized for spawning changed slightly from 1990 to 1991, however there was a significant change in biomass distribution. There was no observed spawning in the Naked Island area and a decrease in biomass from the Northeast, and North Shore areas. A large increase in biomass occurred at Montague Island. The mileage and biomass by area is listed in Appendix H.13., with 49%, for a total of 28.5 miles, occurring in the Northeast area. Of the remaining areas, 42% or 24.4 miles of spawn occurred on Montague Island area, and 7% or 3.9 miles

of spawn in the Southeast area. The North Shore area received only 2% of the shoreline spawn mileage.

Overall egg deposition was twice as dense (biomass/mile) in 1991 than in 1990, with 2,000 tons of spawners per mile compared to 1,200 tons of spawners per mile in 1990. The northern shore of Montague Island received the majority of herring eggs. Spawn occurred both in the intertidal zone and to a depth of about 60 feet for an average of 3,550 tons of spawners per mile. In addition there were windrows of dead eggs along the shore line near Montague Point. The Northeast area was the only other area exhibiting a high density with an overall spawner density of 1,030 tons per mile. Densities were 200 tons/mile at the Southeast and North shore areas.

1992 HERRING SEASON OUTLOOK

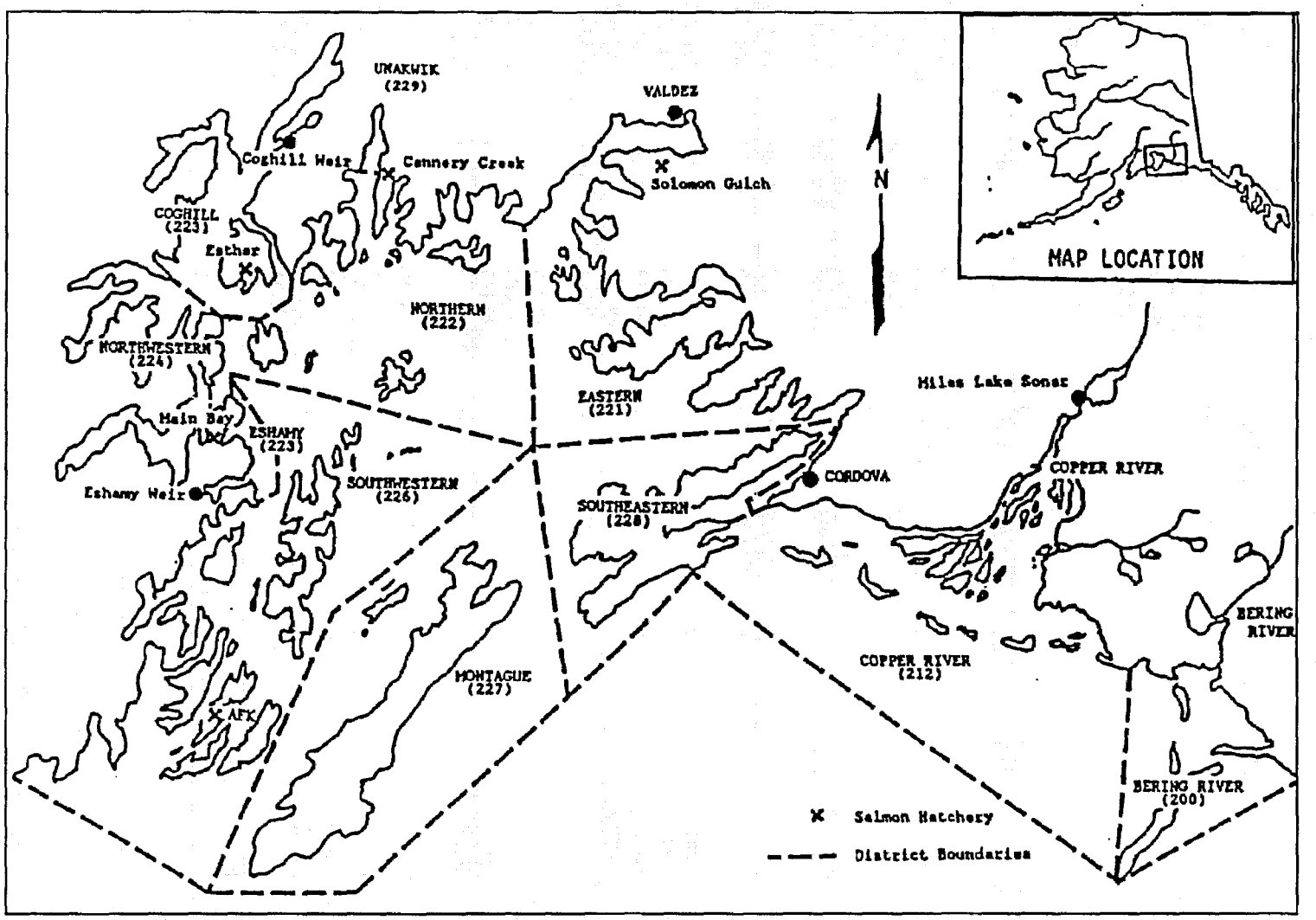
The forecasted spawning biomass for 1992 is 121,342.1 tons, the highest projection on record. The forecast is derived from the estimated spawning biomass in 1991, adjusted for growth, mortality and recruitment. One significant change in calculating the 1992 forecast was the assumption of a fixed natural mortality rate of 0.45 for all age classes. Previous forecasts utilized variable mortality rates, depending on age. The 1992 spawning biomass should be dominated by age-4 and age-8 herring. The mean size is expected to be 127 grams, an increase from the 1991 mean weight of 110 grams.

At the given stock size the maximum allowable harvest rate of 20% will be permitted for the 1991-1992 management year. The following allocations have been made to the five herring fisheries: 3,956 for the 1991 food-and-bait fishery; 1,941 tons of herring or 243 tons of spawn-on-kelp to be harvested by the wild spawn-on-kelp fishery, 3,446 tons or 276 tons of spawn-on-kelp to be harvested by the pound fishery, 14,100 tons of herring to be harvested by the sac roe seine fishery, and 825 tons to be harvested by the sac roe gill net fishery. The total guideline harvest allocation for the 1991-1992 management year is 24,268 tons of herring.

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, 1991.

District	Effort	Chinook	Sockeye	Coho	Pink	Chum	Total
Eastern	222	129	926	4,603	2,617,222	10,557	2,633,437
Northern	140	7	978	207	4,017,245	5,344	4,023,781
Unakwik	16	0	819	3	121,068	79	121,969
Coghill	108	11	1,562	621	1,980,074	11,519	1,993,787
Northwestern	0	0	0	0	0	0	0
Southwestern	225	9	14,419	7,905	17,849,425	4,572	17,876,330
Montague	0	0	0	0	0	0	0
Southeastern	0	0	0	0	0	0	0
Purse Seine	253	156	18,704	13,339	26,585,034	32,071	26,649,304
Bering River	96	28	19,181	110,951	4	195	130,359
Copper River	513	34,787	1,206,811	385,086	1,246	20,220	1,648,150
Unakwik	27	13	4,482	11	12,299	118	16,923
Coghill	210	92	3,888	78,363	231,501	34,223	348,067
Eshamy	273	107	296,234	468	44,516	202,183	543,508
Drift Gill Net	519	35,027	1,530,596	574,879	289,566	256,939	2,687,007
Eshamy	29	76	184,028	504	20,075	49,394	254,077
Set Gill Net	29	76	184,028	504	20,075	49,394	254,077
Solomon Gulch		0	14	39,395	3,220,450	1,973	3,261,832
Cannery Creek		0	0	0	765,430	0	765,430
Wally Noerenberg		0	0	13,230	880,513	11,498	905,241
Armin F. Koernig		0	0	0	1,089,168	0	1,089,168
Hatchery[a]		0	14	52,625	5,955,561	13,471	6,021,671
Northern	5	0	0	0	712,950	0	712,950
Coghill	13	0	0	0	1,731,085	0	1,731,085
Southwestern	6	0	0	0	329,135	0	329,135
Discarded Fish[b]	22	0	0	0	2,773,170	0	2,773,170
Ed. Permit[c]		95	981	506	26,139	155	27,876
Confiscated		1	200	1	4	289	495
Donated Catch[d]		0	0	0	1,322,432	0	1,322,432
ADF&G Test Fish		0	21	0	0	0	21
PWSAC Test Fish[e]		0	0	0	163,580	2	163,582
Total		96	1,202	507	1,512,155	446	1,514,406
Prince William Sound Total		35,355	1,734,544	641,854	37,135,561	352,321	39,899,635

[a] Hatchery sales for hatchery operating costs.

[b] Includes hatchery and CPF discarded catches.

[c] Cordova High School educational special use permits.

[d] Includes fish donated to the former USSR and local charities.

[e] PWSAC *surimi* feasibility study.

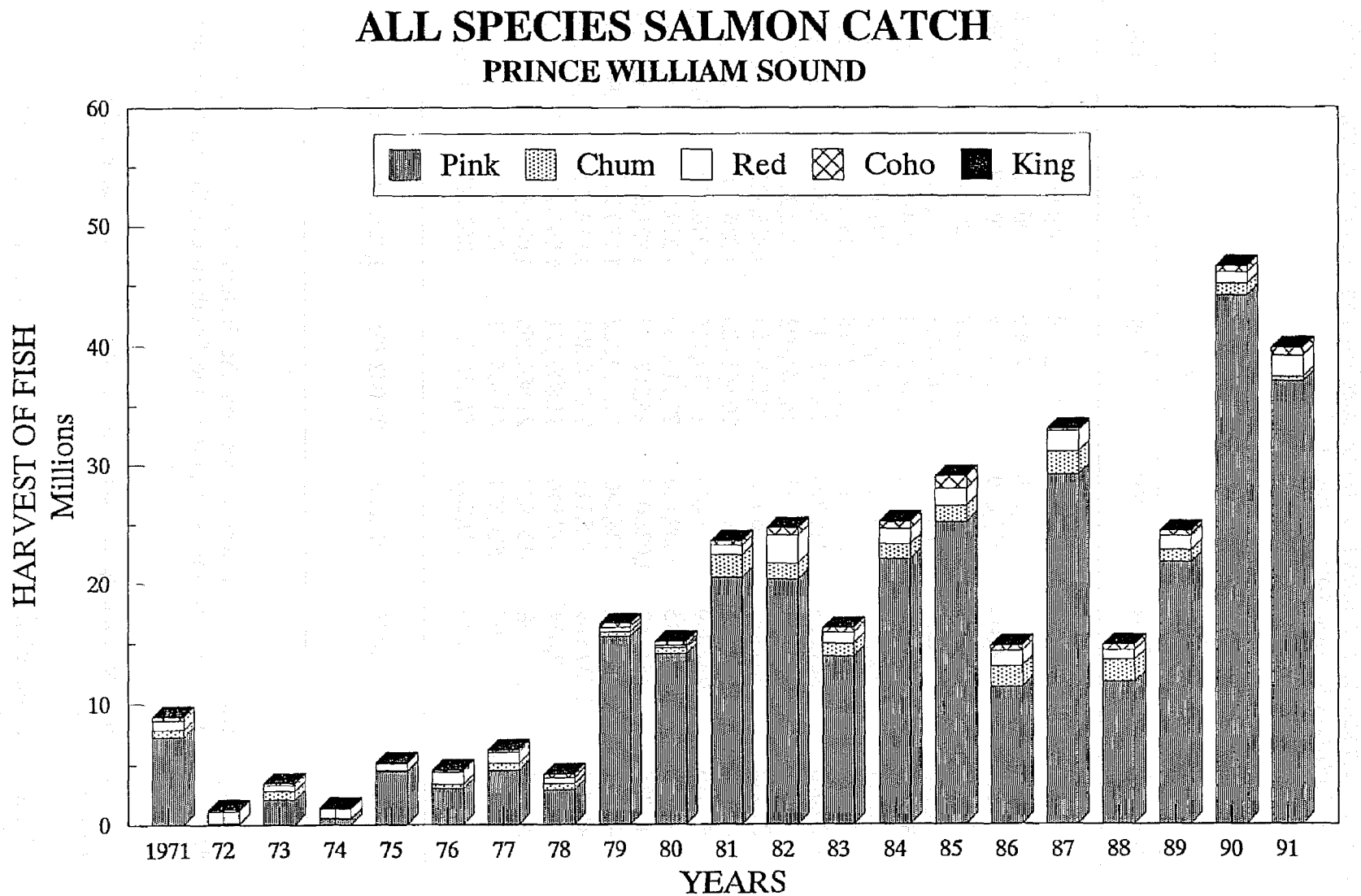
Appendix A.3. Commercial salmon harvest by species from all gear types, Prince William Sound, 1971 – 1991.[a]

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
1991[c]	35,355	1,734,544	641,854	37,135,561	352,321	39,899,635
Ten Year Average (1981–90)	37,604	1,270,456	504,856	22,082,335	1,425,799	25,321,051

[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.

[c] Includes confiscated and educational special use permits, hatchery sales harvests, and donated and discarded catches.



Appendix A.4. Commercial salmon harvest by species for all gear types combined, Prince William Sound, 1971 - 1991.

Appendix A.5. Mean price and estimated exvessel value of the commercial salmon harvest by gear type, Prince William Sound, 1991. [a]

PURSE SEINE

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	156	1,732	11.1	1.00	1,732.00
Sockeye	18,704	113,493	6.1	1.00	113,493.00
Coho	13,339	109,256	8.2	0.45	49,165.20
Pink	26,585,034	67,903,768	2.6	0.12	8,148,452.16
Chum	32,071	268,004	8.4	0.40	107,201.60
	26,649,304	68,396,253			$8,420,043.96

DRIFT GILL NET

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	35,027	794,142	22.7	1.65	1,310,334.30
Sockeye	1,530,596	9,232,196	6.0	1.28	11,817,210.88
Coho	574,879	5,120,596	8.9	0.65	3,328,387.40
Pink	289,566	868,947	3.0	0.12	104,273.64
Chum	256,939	2,320,259	9.0	0.40	928,103.60
	2,687,007	18,336,140			$17,488,309.82

SET GILL NET

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	76	1,156	15.2	1.00	1,156.00
Sockeye	184,028	1,015,918	5.5	1.28	1,300,375.04
Coho	504	3,610	7.2	0.45	1,624.50
Pink	20,075	63,221	3.2	0.12	7,586.52
Chum	49,394	478,178	9.7	0.40	191,271.20
	254,077	1,562,083			$1,502,013.26

HATCHERY SALES[b]

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook[c]	–	–	–	–	–
Sockeye[c]	14	86	6.1	–	–
Coho	52,625	289,595	5.5	0.75	216,146.00
Pink	5,955,561	14,663,764	2.5	0.18	2,573,773.00
Chum	13,471	108,645	8.1	0.13	14,609.00
	6,021,671	15,062,090			$2,804,528.00

OTHER GEAR[d]

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	96	2,245	23.4	1.00–1.65	3,699.05
Sockeye	1,202	7,535	6.3	1.00–1.28	9,638.92
Coho	507	4,566	9.0	0.45–0.65	2,966.70
Pink	26,143	66,429	2.5	0.12	7,971.48
Chum	446	4,296	9.6	0.40	1,718.40
	28,394	85,071			$25,994.55

Gear Type	Value of Catch	No. of Permits	Average Earnings
Purse Seine	8,420,043.96	253	$33,280.81
Drift Gill Net	17,488,309.82	519	$33,696.17
Set Gill Net	1,502,013.26	29	$51,793.56
Subtotal– Value of CPF Catch	$27,410,367.04		
Hatchery	$2,804,528.00		
Other Gear	$25,994.55		
GRAND TOTAL	$30,240,889.59		

[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, confiscated fish sales and ADF&G test fish.

Appendix A.6. Commercial salmon harvest and estimated value by gear type and district, Prince William Sound, 1991.

District	Permits	Landings	Numbers of Fish Chinook	Sockeye	Coho	Pink	Chum	Total	Estimated Value[a]
221 Eastern	222	891	129	926	4,603	2,617,222	10,557	2,633,437	902,408[b]
222 Northern	140	503	7	978	207	4,017,245	5,344	4,023,781	1,242,196[b]
229 Unakwik	16	17	0	819	3	121,068	79	121,969	40,588[b]
223 Coghill	108	244	11	1,562	621	1,980,074	11,519	1,993,787	676,432[b]
224 Northwestern	0	0	0	0	0	0	0	0	0[b]
226 Southwestern	225	1,741	9	14,419	7,905	17,849,425	4,572	17,876,330	5,558,420[b]
227 Montague	0	0	0	0	0	0	0	0	0[b]
228 Southeastern	0	0	0	0	0	0	0	0	0[b]
PURSE SEINE TOTAL	253	3,396	156	18,704	13,339	26,585,034	32,071	26,649,304	$8,420,044
200 Bering River	96	773	28	19,181	110,951	4	195	130,359	836,056
212 Copper River	513	13,033	34,787	1,206,811	385,086	1,246	20,220	1,648,150	13,045,950
229 Unakwik	27	62	13	4,482	11	12,299	118	16,923	41,355[c]
223 Coghill	210	2,202	92	3,888	78,363	231,501	34,223	348,067	639,177
225 Eshamy	273	4,993	107	296,234	468	44,516	202,183	543,508	2,925,772
DRIFT GILL NET TOTAL	519	21,063	35,027	1,530,596	574,879	289,566	256,939	2,687,007	$17,488,310
225 Eshamy	29	1,732	76	184,028	504	20,075	49,394	254,077	1,502,013
SET GILL NET TOTAL	29	1,732	76	184,028	504	20,075	49,394	254,077	$1,502,013
221 Solomon Gulch		205	0	14	39,395	3,220,450	1,973	3,261,832	1,677,238[d]
222 Cannery Creek		34	0	0	0	765,430	0	765,430	314,993[d]
223 Wally Noerenberg		47	0	0	13,230	880,513	11,498	905,241	192,291[d]
226 Armin F. Koernig		27	0	0	0	1,089,168	0	1,089,168	620,006[d]
HATCHERY SALES TOTAL		313	0	14	52,625	5,955,561	13,471	6,021,671	$2,804,528
All Educational Drift Gill Net		39	95	978	506	55	111	1,745	14,905[e]
All Educational Purse Seine		11	0	3	0	26,084	44	26,131	8,143[b]
EDUCATIONAL PERMIT TOTAL[f]		50	95	981	506	26,139	155	27,876	$23,048
222 Northern	5	18	0	0	0	712,950	0	712,950	0
223 Coghill	13	36	0	0	0	1,731,085	0	1,731,085	0
226 Southwestern	6	20	0	0	0	329,135	0	329,135	0
DISCARDED FISH TOTAL		74	0	0	0	2,773,170	0	2,773,170	0
Donated Catch	2	17	0	0	0	1,322,432	0	1,322,432	0
Surimi– Test Study	1	1	0	0	0	163,580	0	163,580	0
ADF&G Test Fish	1	1	0	21	0	0	2	23	186[e]
Confiscated		19	1	200	1	4	289	495	2,760[e]
MISC. TOTAL		38	1	221	1	1,486,016	291	1,486,530	$2,946
PRINCE WILLIAM SOUND GRAND TOTAL			35,355	1,734,544	641,854	37,135,561	352,321	39,899,635	$30,240,890

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 Used the Copper River drift gill net average price paid by species in estimating value.

f Cordova High School educational special use permit.

Appendix A.7. Average price paid to fishermen for salmon, Prince William Sound, 1982–1991.[a]

Species	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
King Salmon	1.40	1.05	1.30	1.65	1.45	1.75	2.23	2.25	2.24	
Copper/Bering districts										1.65
Prince William Sound										1.00
Sockeye Salmon	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	1.28
Bering River	0.80	0.85	0.95	1.10	1.65	1.90	3.00	2.30	2.13	1.28
Coghill/Unakwik districts			0.90	1.20	1.37	1.75	2.68	2.00	1.50	1.28
Eshamy			0.85	1.10	1.34	1.60	2.77	--	1.45	1.28
General Purse Seine					1.35	1.45	2.68	2.00	1.50	1.00
Coho Salmon										
Copper/Bering districts	0.86	0.75	1.10	0.85	0.94	0.93	2.35	0.60	0.97	0.65
Prince William Sound	0.40	0.30	1.10	0.40	0.46	0.55	1.86	0.70	0.97	0.45
Pink Salmon	0.23	0.24	0.26	0.22	0.23	0.40	0.79	0.35	0.30	0.12
Chum Salmon	0.38	0.24	0.26	0.29	0.33	0.39	0.73	0.35	0.70	0.40

[a]Based 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 1991 commercial salmon fishery by district and species, Prince William Sound. [a]

	COMMERCIAL HARVEST (1,000's of fish)									
	Chinook		Sockeye		Coho		Pink		Chum	
District	Point Estimate	Range	Point Estimate	Range	Point Estimate	Range	Point Estimate	Range	Point Estimate	Range
Copper River [b]	42	31 – 52	739	657 – 837	292	124 – 415				
Bering River [c]					120	0 – 225				
Coghill [d]			15	0 – 129						
Eshamy [e]										
General P.W.S. Districts			87	14 – 159	8	0 – 21	6,110	1,360 – 19,190	280	59 – 670
Total Wild Stock	42	31 – 52	841	671 – 1,125	420	0 – 667	6,110	1,360 – 19,190	280	59 – 670
Solomon Gulch					8		2,076	0 – 7,010	23	0 – 60
Boulder Bay							976	0 – 3,200		
Armin F. Koernig							4,479	330 – 8,900		
Wally Noerenberg					291	158 – 424	9,545	1,510 – 18,130	986	304 – 2,872
Cannery Creek							8,266	0 – 18,140		
Main Bay			163	146 – 180					397	98 – 697
Gulkana			115	88 – 137						
Total Hatchery			278	234 – 317	299	158 – 424	25,342	1,840 – 55,380	1,406	402 – 3,629
Total Hatchery and Wild	42	31 – 52	1,119	905 – 1,442	719	282 – 1,085	31,452	3,200 – 74,570	1,686	461 – 4,299

[a] Formal forecast procedures are used for estimating wild stock 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 10.4 million fish projected for harvest by hatcheries for cost recovery.

[b] Formalized forecast procedures are used for Copper River chinook and sockeye returns. Copper River coho catches are based on mean fishery performance adjusted by escapement levels and environmental conditions.

[c] Bering River coho harvest estimates are based on mean fishery performance adjusted by escapement levels and environmental conditions.

[d] Coghill sockeye returns are formally forecast 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.

[e] No 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, their location of operation, and type of product processed, Prince William Sound, 1991.

Executive Names, Address Location of Operations	Processor Code	Type of Product
Alaska's Best Seafoods P.O. Box 364 Cordova, AK 99574 Lew Cochran	F1403	Salmon
All Alaskan Seafoods 101 Marine Way Kodiak, AK 99615 Gary Taylor	F0222	Herring
Anderson Seafoods P.O. Box 87 Seward, AK 99664 William Brindle	F1255	Herring
Anpac, Inc. P.O. Box 92520 Anchorage, AK 99509 Sally Barber	F0281 F0800 F0284	Herring Salmon
Tim Cabana	C5000	Herring
Chugach Fisheries Inc. P.O. Box 120 Cordova, AK 99574 Steve Meuter	F0830	Salmon
Cook Inlet Processing P.O. Box 8163 Nikiski, AK 99635 Pat Hardina	F0186 F1155	Salmon
Copper River Fishermen's Coop. P.O. Box 90 Cordova, AK 99574 Mike Schomer	F0146	Salmon
Deep Creek Custom Packing P.O. Box 39229 Ninilchik, AK 99639 Jeff Berger	F1051	Salmon
Deep Sea Fisheries, Inc. 5305 Shilshole Ave., N.W. Suite 200 Seattle, WA 98107 Rick Petre	F0164	Salmon
Dragnet Fisheries Co., Inc. P.O. Box 3992 Kenai, AK 99661 Mike McCune	F0030	Herring

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Golden Age Fisheries 18 W. Mercer, Suite 400 Seattle, WA 98109 John Henderschedt	F1045 F1405	Salmon
Great Pacific Seafoods P.O. Box 710 Whittier, AK 99603 Nancy Davidson/Joe Hale	F1267	Salmon
Icicle Seafoods, Inc. P.O. Box 8 Seward, AK 99664 Jeff Poole/John Woodruff	F0133 F1142 F0134 F0135 F0137	Herring Salmon
Inlet Salmon P.O. Box 530 Kenai, AK 99611 Ellie Tikia	F1231	Salmon
John Cabot Company 1200 E. 70th Anchorage, AK 99518 Julie Lawrence	F0932 F0989	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/Jim Van Stone	F0815	Salmon
New West Fisheries, Inc. 601 W. Chestnut St. Bellingham, WA 98225 Jerry Thon	F0602	Herring
North Coast Seafood Processors 2801 N.W. Market Seattle, WA 98107 Joann Meloey	F0084	Herring
North Pacific Processors P.O. Box 1040 Cordova, AK 99574 Ken Roemhildt	F0232	Herring Salmon
Palisades Fisheries, Inc. 180 Nickerson, Suite #309 Seattle, WA 98109 Allan Chaffee/Gaye Mouser	F1254	Herring Salmon

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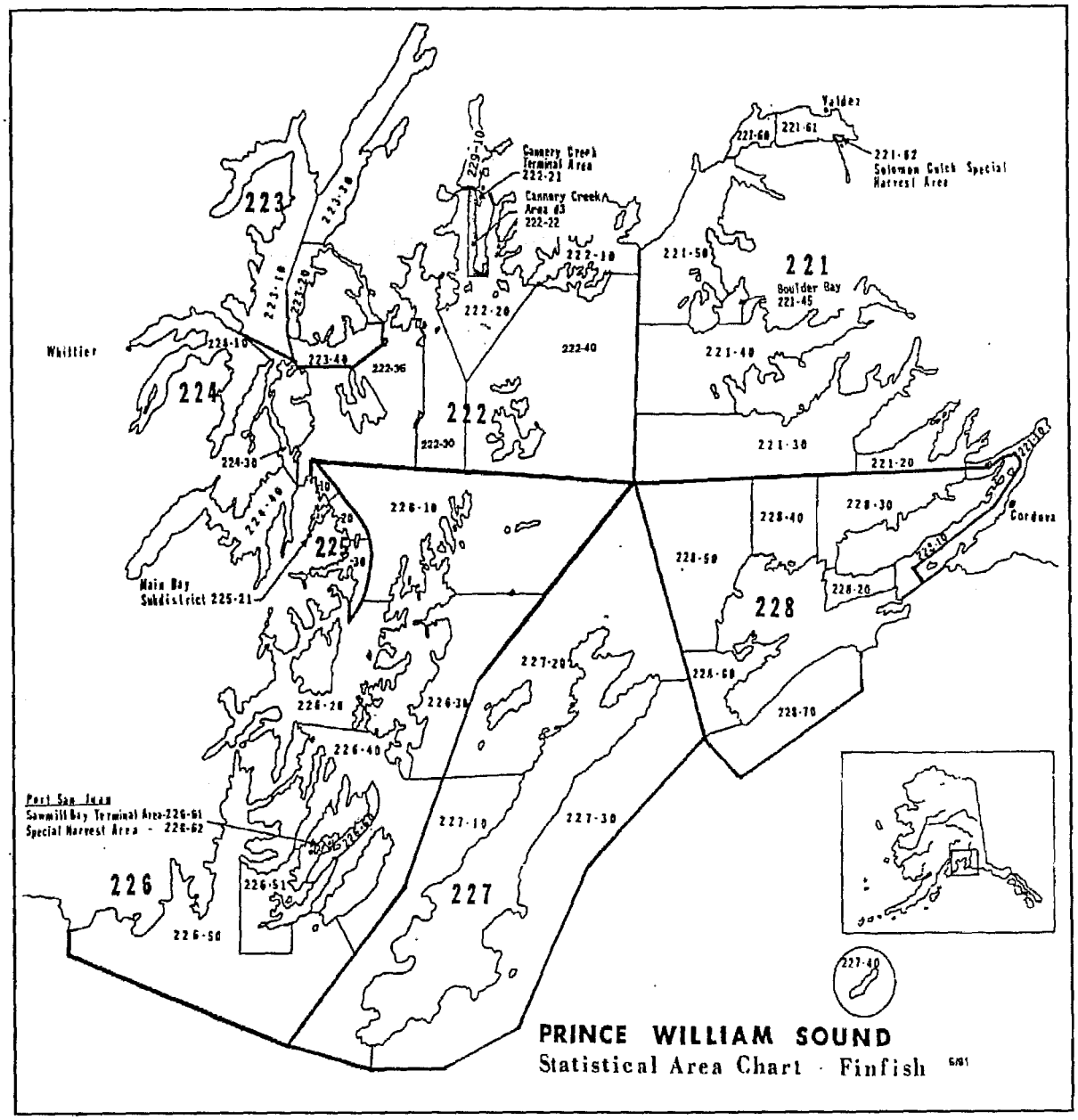
Pan Pacific Seafood 150 Nickerson, Suite #103 Seattle, WA 98103 Jannet Dezard	F0923	Herring
Peter Pan Seafoods, Inc. P.O. Box 1027 Valdez, AK 99686 Clyde Sterling/James Poor	F1041 F0142	Herring Salmon
Phoenix Fisheries, Inc. 800 Ocean Dock Road Anchorage, AK 99501 Perry Hendricks	F0597	Herring
Prime Alaska Fisheries 6135 Mike St. Anchorage, AK John McLean	F1113	Herring
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
Sahalee of Alaska P.O. Box 104174 Anchorage, AK 99510 Christa Lind	12366	Salmon
St. Elias Ocean Products, Inc. P.O. Box 548 Cordova, AK 99574 Bill Terhar	F0120	Herring Salmon
Sea Hawk Seafoods, Inc. P.O. Box 151 Valdez, AK 99686 Ray Cesarini	F0223	Salmon
Speculator Marine 3646 Casper Court Anchorage, AK 99502 Rick McCracken	F1381	Herring
Taylor Aquatic Enterprises P.O. Box 112241 Anchorage, AK 99511 Gary Taylor	F0131	Herring

– Continued –

10th & M Seafoods 1020 M St. Anchorage, AK 99501 Bill Nix	F0528	Salmon
Trident Seafoods Corp. 5303 Shilshole Ave. N.W. Seattle, WA 98107 Bart Easton	F0949	Herring
VFDA P.O. Box 125 Valdez, AK 99686 Paul McCullom	F1355	Salmon
Virgin Bay Kelp Co. P.O. Box 1724 Cordova, AK 99574 Steve Smith/Jeannine Buller	F1261	Herring
Wards Cove Packing Company P.O. Box 1710 Seward, AK 99664 William E. Brindle	F0270 F1379	Salmon
Western Alaska Fisheries, Inc. 1111 3rd Ave., Suite 1210 Seattle, WA 98101 Karleen Hepworth	F0320	Salmon
Whitney Foods P.O. Box 190429 Anchorage, AK 99519 Bruce Mitchell	F0827	Salmon
Woodbine Alaska Fish Co. P.O Box 218 Naknek, AK 99633 Virginia Busey	F0214	Herring Salmon



Appendix A.10 Map of the Prince William Sound area commercial fishing districts and statistical reporting areas, 1991.

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, 1991.

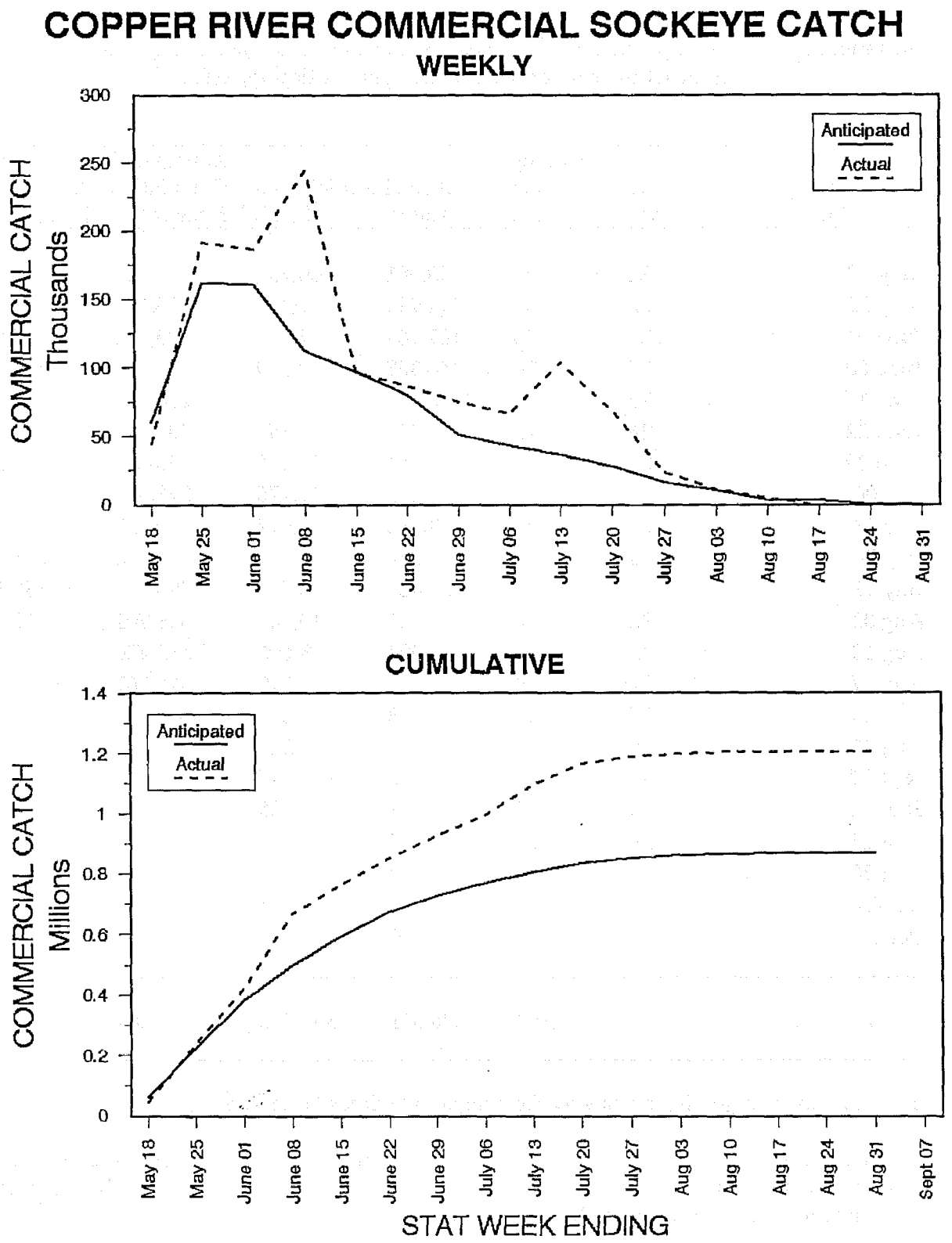
Week Ending Date	Stat. Week	Fishing Time (Hrs.)	Actual Catch	Anticipated Catch [a]	Anticipated Cumulative Escapement [b]	Actual Cumulative Escapement [c]
May 18	21	24	45,081	60,792	3,209	0
May 25	22	48	191,795	162,163	28,597	11,476
June 01	23	24	187,161	161,296	95,211	56,577
June 08	24	24	244,368	112,839	183,121	158,365
June 15	25	36	96,323	97,413	254,932	232,656
June 22	26	48	87,023	80,364	300,472	311,850
June 29	27	48	75,454	51,495	340,216	372,935
July 06	28	60	67,009	43,176	378,934	419,533
July 13	29	72	103,732	36,992	419,293	457,145
July 20	30	84	68,344	28,114	465,808	517,058
July 27	31	84	23,488	16,693	494,999	561,655
Aug 03	32	84	11,427	10,348	508,702	579,412 [d]
Aug 10	33	84	4,904	3,091	515,420	
Aug 17	34	0	0	3,399	516,267	
Aug 24	35	48	658	610		
Aug 31	36	0	0	213		
Sept 07	37	48	30	35		
Sept 14	38	96	7	25		
Sept 21	39	96	7	2		
Sept 28	40	120	0	5		
Oct 05	41	120	0	7		
Oct 12	42	120	0	0		
Season Total		1,368	1,206,811	869,072	516,267	579,412

a Based on average historic catches for comparable dates (1969–1990).

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

c Escapement estimate from sonar counters at Miles Lake.

d Miles Lake sonar operation ended 12:00 noon July 31.



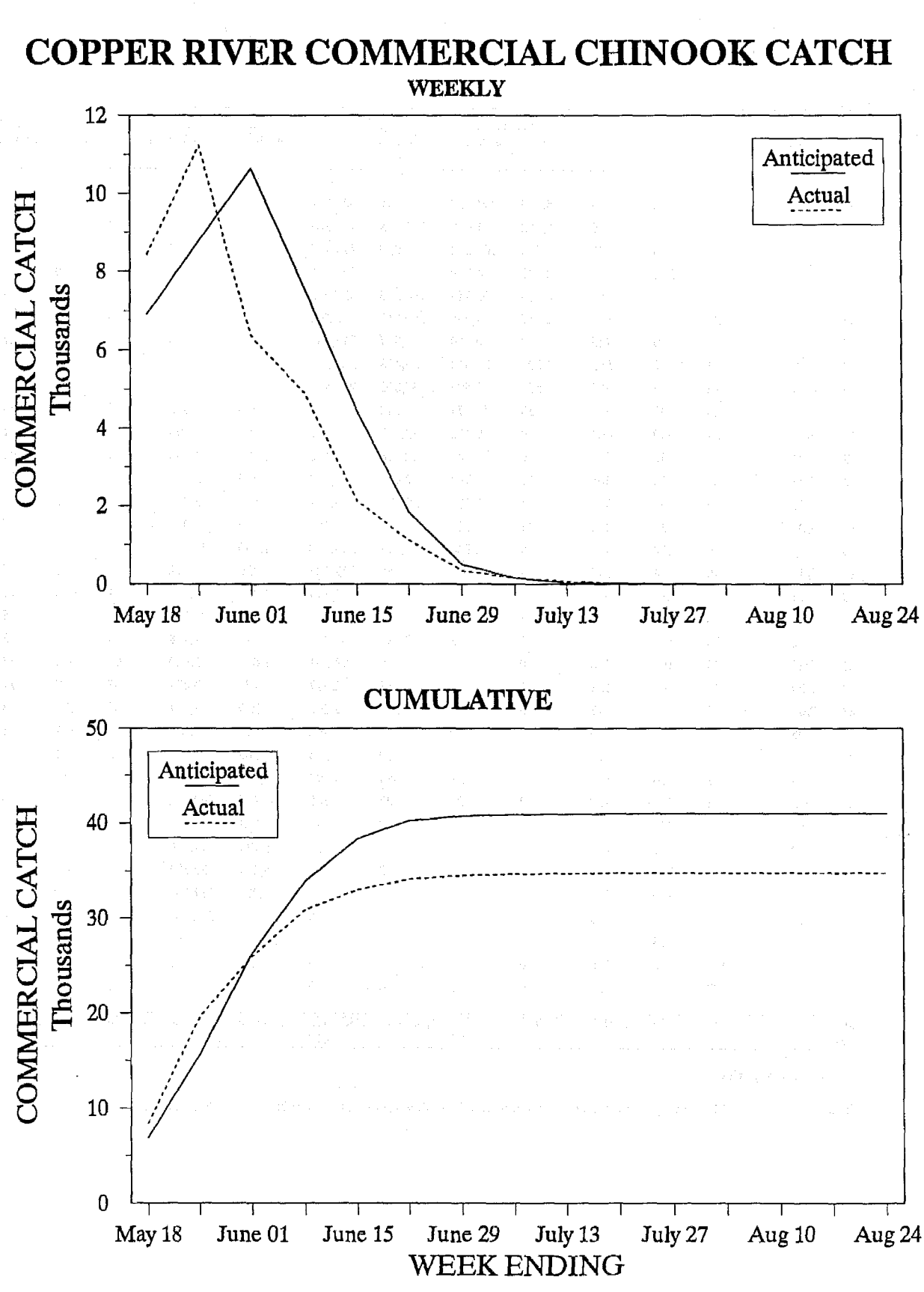
Appendix B.2. Anticipated and actual weekly and cumulative catches of sockeye salmon in the Copper River District gill net fishery, 1991.

Appendix B.3. Commercial salmon harvest by period in the Copper River District drift gill net fishery, 1991.

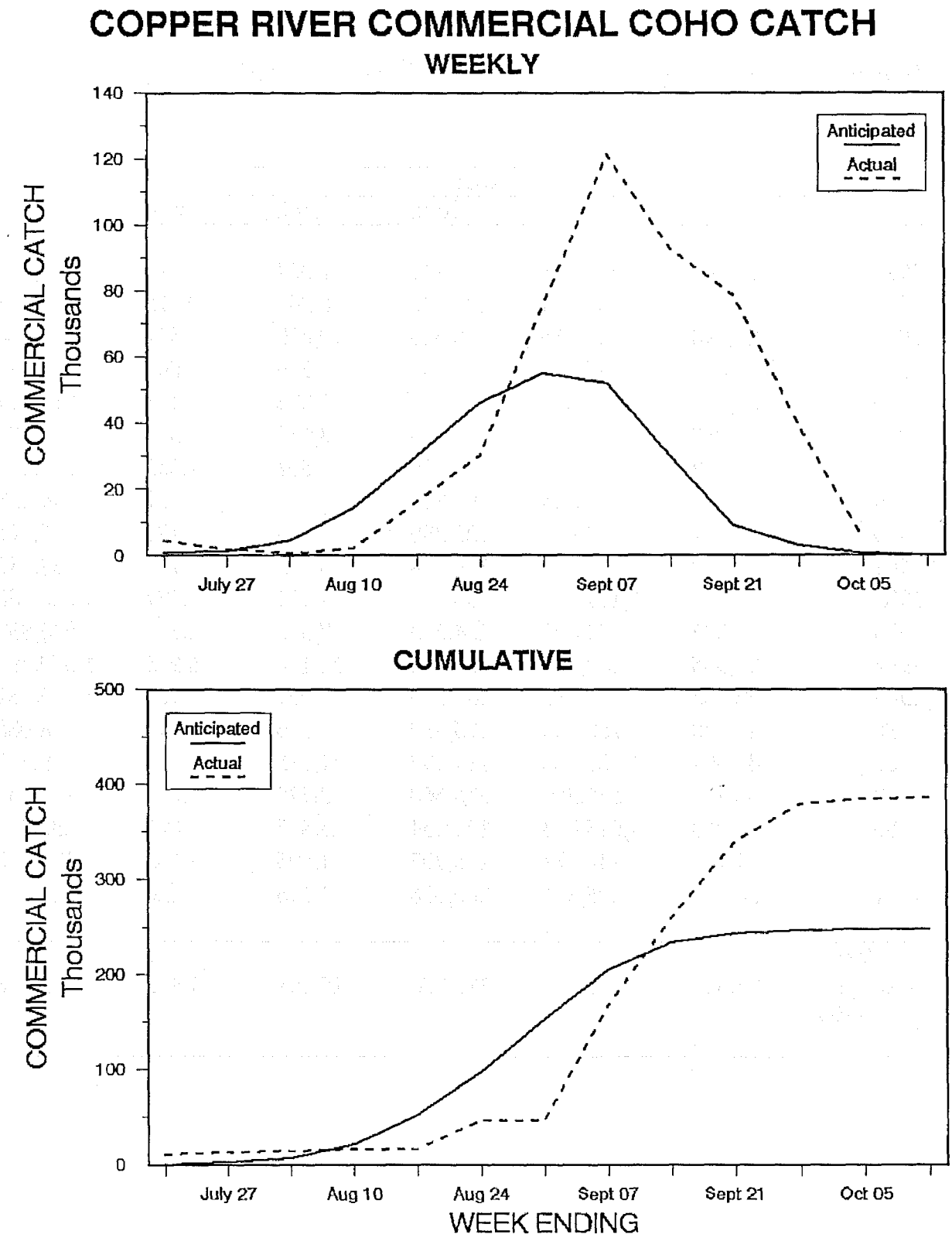
Period	Date[a,b]	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
01	5/16	24	446	605	8,429	194,202	45,081	282,348	0	0	0	0	2,048	13,450
02	5/20	24	479	756	6,652	151,089	114,765	715,381	4	23	0	0	756	5,190
03	5/23	24	476	635	4,580	100,018	77,030	474,476	0	0	0	0	364	2,453
04	5/27	12	341	381	2,037	44,379	52,805	323,411	0	0	0	0	11	73
05	5/31	12	479	584	4,306	98,349	134,356	827,793	0	0	0	0	409	2,918
06	6/03	24	495	818	2,757	64,965	150,811	926,506	9	71	0	0	1,787	11,264
07	6/06	24	490	715	2,148	50,110	93,557	573,548	13	78	1	4	4,327	28,314
08	6/10	24	427	585	1,594	36,818	60,458	369,593	15	108	1	4	2,983	19,116
09	6/14	12	366	384	538	12,597	35,865	217,994	2	14	2	6	333	2,375
10	6/17	24	299	396	650	15,371	43,540	263,937	213	1,513	15	52	778	5,065
11	6/20	24	309	407	469	9,422	43,483	267,312	207	1,503	2	9	2,151	15,107
12	6/24	24	256	340	216	4,940	32,778	198,480	1,688	11,900	133	436	2,404	15,330
13	6/27	24	230	308	135	3,194	42,676	257,670	793	5,726	24	61	556	4,024
14	7/01	36	233	369	111	1,986	39,673	239,517	515	3,718	38	117	502	3,424
15	7/04	24	235	272	44	817	27,336	166,399	400	3,032	34	103	347	2,053
16	7/08	36	228	405	56	948	57,577	349,168	1,890	13,897	40	132	85	697
17	7/11	36	204	347	16	295	46,155	279,323	829	6,542	40	120	57	441
18	7/15	36	230	317	15	199	30,963	184,319	1,896	14,918	191	673	214	1,302
19	7/18	48	234	400	17	242	37,381	223,433	2,602	20,743	291	1,007	55	339
20	7/22	36	148	168	1	37	7,340	44,341	190	1,488	34	101	3	15
21	7/25	48	168	248	0	0	16,148	98,951	1,652	12,989	108	323	13	93
22	7/29	36	109	128	3	92	7,057	42,377	473	3,424	57	159	11	92
23	8/01	48	42	47	0	0	4,370	26,291	259	2,021	55	159	4	38
24	8/05	36	102	120	4	70	3,734	22,442	624	4,673	62	181	11	59
25	8/08	48	71	79	2	15	1,170	6,954	1,509	11,261	113	291	10	70
26	8/19	48	270	509	4	58	658	4,293	30,374	246,024	5	16	1	7
27	9/02	24	235	422	2	29	22	148	62,903	562,762	0	0	0	0
28	9/05	24	259	409	0	0	8	48	58,321	493,131	0	0	0	0
29	9/09	48	220	418	1	6	4	31	56,771	494,446	0	0	0	0
30	9/12	48	227	375	0	0	3	21	36,381	332,326	0	0	0	0
31	9/16	48	126	200	0	0	6	44	41,821	387,996	0	0	0	0
32	9/19	48	192	370	0	0	1	6	36,888	352,503	0	0	0	0
33	9/23	120	138	389	0	0	0	0	39,409	385,360	0	0	0	0
34	9/30	120	83	106	0	0	0	0	5,268	50,352	0	0	0	0
35	10/07	120	16	21	0	0	0	0	1,167	11,538	0	0	0	0
Total		1,272	513	13,033	34,787	790,248	1,206,811	7,386,555	385,086	3,436,080	1,246	3,954	20,220	133,309
Average Weight						22.72		6.12		8.92		3.17		6.59

a Starting date of period.

b From 5/15 – 8/09 all Monday openers started at 7:00 a.m. and Thursday openers started at 7:00 p.m. After August 7, all periods begin at 12:00 noon.



Appendix B.4. Anticipated and actual weekly and cumulative catches of chinook salmon in the Copper River District drift gill net fishery, 1991.



Appendix B.5. **Anticipated and actual weekly and cumulative catches of coho salmon in the Copper River District drift gill net fishery, 1991.**

Appendix B.6. Commercial salmon catch by species in the Copper River District, 1972 – 1991.

Year	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
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
1991	34,787	1,206,811	385,086	1,246	20,220	1,648,150
Ten Year Average (1981–90)	36,383	852,845	313,398	15,461	7,492	1,225,578

Appendix B.7. Daily sockeye salmon escapement estimates at the Miles Lake sonar, 1991.

Date	Water Level [a]	Estimate North Bank	Estimate South Bank	Estimate Daily	Estimate Cumulative	Escapement Objective Daily	Escapement Objective Cumulative	Anticipated 0700	Anticipated Daily
21–May	129.32		1,087	1,087	1,087	2,458	10,263		
22–May	129.66		1,717	1,717	2,804	2,938	13,201		
23–May	130.25	310	2,851	3,161	5,965	3,868	17,069	446	1,529
24–May	131.09	184	2,281	2,465	8,430	5,344	22,413	629	2,157
25–May	131.80	230	2,816	3,046	11,476	6,184	28,597	665	2,280
26–May	132.32	236	3,038	3,274	14,750	7,610	36,207	923	3,165
27–May	132.58	223	3,670	3,893	18,643	9,246	45,453	1,198	4,107
28–May	132.92	109	3,280	3,389	22,032	10,509	55,962	814	2,791
29–May	133.05	372	3,561	3,933	25,965	8,884	64,846	1,032	3,538
30–May	133.08	481	3,936	4,417	30,382	9,647	74,493	716	2,455
31–May	133.14	541	8,821	9,362	39,744	10,304	84,797	1,736	5,952
01–Jun	132.90	950	15,883	16,833	56,577	10,414	95,211	4,310	14,777
02–Jun	132.60	757	20,394	21,151	77,728	11,750	106,961	5,135	17,606
03–Jun	132.27	586	17,222	17,808	95,536	11,169	118,130	4,201	14,403
04–Jun	132.26	961	13,596	14,557	110,093	12,128	130,258	5,080	17,417
05–Jun	132.48	527	18,146	18,673	128,766	13,720	143,978	4,795	16,440
06–Jun	132.60	786	10,902	11,688	140,454	13,096	157,074	3,489	11,962
07–Jun	132.79	122	8,318	8,440	148,894	12,563	169,637	1,864	6,391
08–Jun	133.05	162	9,309	9,471	158,365	13,484	183,121	2,582	8,853
09–Jun	133.20	219	11,446	11,665	170,030	12,885	196,006	2,799	9,597
10–Jun	133.14	227	8,338	8,565	178,595	11,739	207,745	3,256	11,163
11–Jun	133.56	120	7,984 [b]	8,104	186,699	10,923	218,668	1,207	4,138
12–Jun	134.10	77	12,611	12,688	199,387	10,100	228,768	3,513	12,045
13–Jun	134.70	195	8,871	9,066	208,453	9,218	237,986	3,764	12,905
14–Jun	135.53	158	9,078	9,236	217,689	8,558	246,544	2,428	8,325
15–Jun	136.26	132	14,835	14,967	232,656	8,388	254,932	3,870	13,269
16–Jun	137.05	126	14,241	14,367	247,023	8,096	263,028	4,248	14,565
17–Jun	137.78	34	10,095	10,129	257,152	8,057	271,085	2,406	8,249
18–Jun	138.11	24	11,027	11,051	268,203	6,404	277,489	3,058	10,485
19–Jun	137.94	192	12,729	12,921	281,124	5,685	283,174	2,947	10,104
20–Jun	137.95	338	13,808	14,146	295,270	5,828	289,002	4,701	16,118
21–Jun	139.54	144	8,606	8,750	304,020	5,534	294,536	2,590	8,880
22–Jun	141.55	142	7,688	7,830	311,850	5,936	300,472	2,241	7,683
23–Jun	143.35	193	6,165	6,358	318,208	6,660	307,132	1,943	6,662
24–Jun	144.42	301	5,662	5,963	324,171	6,424	313,556	1,576	5,403
25–Jun	144.44	366	7,294	7,660	331,831	5,881	319,437	2,383	8,170
26–Jun	143.80	187	9,313	9,500	341,331	5,376	324,813	2,741	9,398
27–Jun	143.18	61	10,294	10,355	351,686	5,403	330,216	2,336	8,009
28–Jun	142.95	163	10,647	10,810	362,496	4,972	335,188	3,644	12,494
29–Jun	143.25	90	10,349	10,439	372,935	5,028	340,216	2,793	9,576
30–Jun	143.63	95	9,018	9,113	382,048	5,433	345,649	2,654	9,099

–Continued–

Appendix B.7. (page 2 of 2).

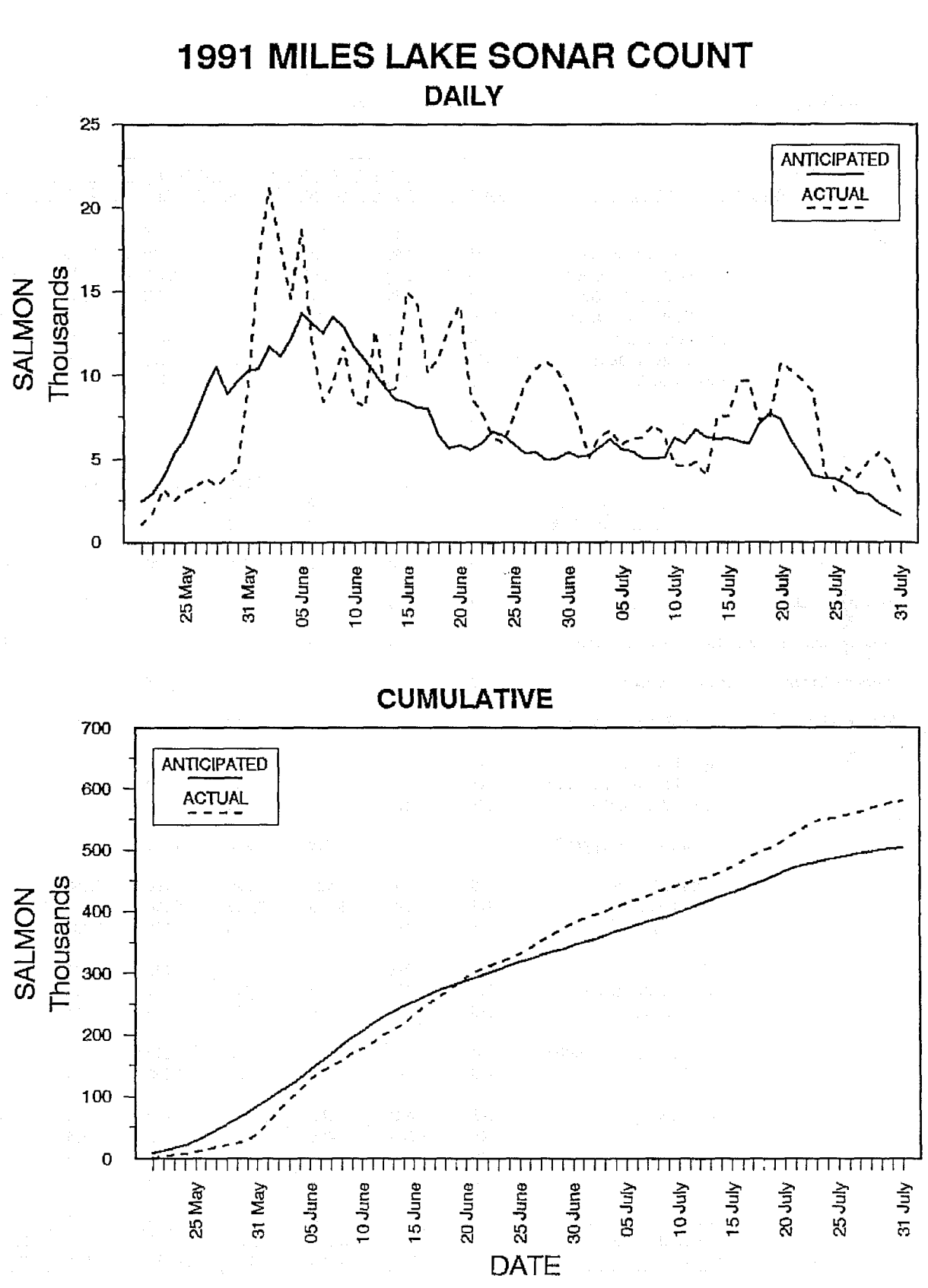
Date	Water Level [a]	Estimate North Bank	Estimate South Bank	Estimate Daily	Estimate Cumulative	Escapement Objective Daily	Escapement Objective Cumulative	Anticipated 0700	Anticipated Daily
01–Jul	143.92	120	7,183	7,303	389,351	5,132	350,781	2,807	9,624
02–Jul	144.02	139	4,970	5,109	394,460	5,239	356,020	1,583	5,427
03–Jul	143.60	129	6,206	6,335	400,795	5,705	361,725	1,677	5,750
04–Jul	143.57	156	6,524	6,680	407,475	6,157	367,882	1,610	5,520
05–Jul	142.83	135	5,710	5,845	413,320	5,583	373,465	1,837	6,298
06–Jul	141.85	78 [c]	6,135	6,213	419,533	5,469	378,934	2,023	6,936
07–Jul	141.29	178	6,044	6,222	425,755	5,051	383,985	1,121	3,843
08–Jul	141.33	203	6,866	7,069	432,824	5,014	388,999	1,703	5,839
09–Jul	141.79	185	6,268	6,453	439,277	5,066	394,065	1,796	6,158
10–Jul	142.67	132	4,478	4,610	443,887	6,240	400,305	1,195	4,097
11–Jul	141.79	128	4,349	4,477	448,364	5,974	406,279	1,192	4,087
12–Jul	141.21	138	4,680	4,818	453,182	6,733	413,012	1,376	4,718
13–Jul	140.88	114	3,855	3,969	457,151	6,281	419,293	1,187	4,070
14–Jul	140.83	215	7,283	7,498	464,649	6,202	425,495	1,394	4,779
15–Jul	140.60	216	7,334	7,550	472,199	6,216	431,711	1,825	6,257
16–Jul	140.48	277	9,394	9,671	481,870	6,040	437,751	3,686	12,638
17–Jul	140.95	277	9,391	9,668	491,538	5,875	443,626	2,894	9,922
18–Jul	140.61	210	7,130	7,340	498,878	7,103	450,729	2,439	8,362
19–Jul	139.44	215	7,298	7,513	506,391	7,763	458,492	1,706	5,849
20–Jul	138.35	306	10,375	10,681	517,072	7,316	465,808	3,143	10,776
21–Jul	138.17	294	9,974	10,268	527,340	6,093	471,901	3,370	11,554
22–Jul	138.68	278	9,424	9,702	537,042	5,068	476,969	2,975	10,200
23–Jul	139.14	258	8,759	9,017	546,059	3,985	480,954	2,346	8,043
24–Jul	140.10	122	4,123	4,245	550,304	3,829	484,783	992	3,401
25–Jul	140.65	88	2,978	3,066	553,370	3,823	488,606	678	2,325
26–Jul	140.97	127	4,295	4,422	557,792	3,476	492,082	894	3,065
27–Jul	140.92	111	3,773	3,884	561,676	2,917	494,999	893	3,062
28–Jul	140.75	137	4,656	4,793	566,469	2,896	497,895	1,054	3,614
29–Jul	140.50	153	5,201	5,354	571,823	2,385	500,280	975	3,343
30–Jul	140.32	135	4,576	4,711	576,534	1,967	502,247	1,015	3,480
31–Jul	139.94	83	2,818 [d]	2,901	579,435	1,610	503,857	918	3,147
Total		16,458	562,977	579,435					

a Feet above mean sea level.

b Went to permanent substrate.

c North bank pulled 12:00 noon. All counts after 12:00 noon July 6 are interpolated. North bank counts are derived from the average percent of North versus south bank counts of 2.93 percent.

d South bank pulled 12:00 noon. Numbers were expanded for a daily total.



Appendix B.8. **Anticipated and actual daily and cumulative salmon escapement estimates at Miles Lake sonar, 1991.**

Appendix B.9. Aerial escapement indices by date and location for sockeye salmon returning to the Copper River Delta, 1991.

Copper River Delta [a] System and Drainage	Survey System	Aerial Escapement Indices by Survey Date 07 June	14 June	19 June	25 June	02 July	10 July	26 July
Eyak River	Eyak River	0	15	NS	NS	NS	NS	NS
	West Shore Beaches	NS	150	100	340	940	7,400	4,900
	Middle Arm Beaches [b]	320 *	280	665	2,900 *	2,500	4,200	4,000
	North Shore Beaches	0	60	780	NC	NC	2,500	5,000
	Hatchery Creek Delta	0	6	25	100	100	300	1,000
	Hatchery Creek	0	0	35	30	400	900	400
	Power Creek Delta	NS	NS	20	NS	NS	350	1,000
	Power Creek	NS	NS	NS	NS	NS	10	50
Ibek Creek	Ibek Creek	NS	NS	NS	NS	NS	NS	NS
Alganik Slough	Alganik Slough	0	NS	NS	NS	NS	NS	NS
	McKinley Lake	NS	NS	NS	1,200	4,950	4,700	1,500
	Salmon Creek West Fork	0	0	0	0	0	0	1,000
	Salmon Creek East Fork	0	0	0	0	0	0	275
26/27 Mile Creek	26/27 Mile Creek	0	0	55	780	2,800	3,900 *	3,050
39 Mile Creek	39 Mile Creek	0	0	0	0	7	520	4,100
Goat Mountain Creek	Goat Mountain Creek	0	0	0	0	0	0	NC
Pleasent Creek	Pleasent Creek [b]	0	0	165	825 *	1,145 *	0	25
Martin River	Martin River – Lower	12	32	325	1,250	1,780	1,560	1,900 SP
	Ragged Point River	NS	0	0	0	0	0	3,100
	Ragged Point Lake Outlet	NS	NS	NS	NS	0	0	0
	Ragged Point Lake	NS	NS	NS	NS	0	0	0
	Martin River – Upper [b]	6	0	250	375	3,100	845 *	2,700 SP
	Martin Lake Outlet	NS	0	980	380	100	1,800 *	100
	Martin Lake	NS	NS	3,635	7,500	15,300	12,100 *	400
	Martin Lake Feeders	NS	NS	NS	NS	160	2,000 *	1,400
	Pothole River	NS	NS	0	NS	145	435 *	300
	Pothole Lake Outlet	NS	NS	0	NS	0	20 *	100
	Pothole Lake	NS	NS	0	NS	0	15 *	0
	Little Martin Lake Outlet	0	0	0	100	140	120	0
	Little Martin Lake	NS	NS	0	NC	1,050	2,060	1,800
	Tokun Springs	NS	NC	NC	460 *	450	400	200
	Tokun River	NS	1,200	420	420	915	1,025	500
	Tokun Lake Outlet	NS	0	600	0	1,950	0	200
	Tokun Lake	NS	NS	100	800	1,600	2,400	700
Martin River Slough	Martin River Slough	0	55	14	4,360	5,180 *	4,400	4,400
Copper River Aerial Survey Daily Total		338	1,798	8,169	21,820	44,712	53,960	44,100
Anticipated Escapement		0	1,886	4,388	18,294	24,428	37,905	43,778

–Continued–

Appendix B.9. (page 2 of 4).

Copper River Delta [a] System and Drainage	Survey System	Aerial Escapement Indices by Survey Date						
		06 Aug	21 Aug	27 Aug	30 Aug	03 Sept	06 Sept	13 Sept
Eyak River	Eyak River	NS	NS	NS	NS	NS	0	0
	West Shore Beaches	11,220	2,200 +	1,600 +	4,600 +*	4,200	5,200	1,400
	Middle Arm Beaches [b]	6,400	6,300	7,300	9,200 *	8,800	9,600	4,000
	North Shore Beaches	1,170	700	2,200	3,620 *	3,920	1,830	840
	Hatchery Creek Delta	3,100	2,400	3,200	3,700 *	3,100	2,900	2,000
	Hatchery Creek	440	1,300	1,300	1,400 +*	1,900	1,470	1,700
	Power Creek Delta	800	1,300	1,820	1,800 *	1,900	1,500	1,200
	Power Creek	60	120	90	70 *	115	90	200
Ibek Creek	Ibek Creek	NS	30	80	95	120	45	100
Alganik Slough	Alganik Slough	NS	NS	NS	NS	NS	NS	NS
	McKinley Lake	2,000 *	950	1,100	NS	NS	1,500	430
	Salmon Creek West Fork	3,000 *	2,030	2,160	NS	NS	1,200	360
	Salmon Creek East Fork	330 *	320	458	NS	NS	120	220
26/27 Mile Creek	26/27 Mile Creek	720	65	25	45	20	40	20
39 Mile Creek	39 Mile Creek	4,360	4,370	4,900	4,300	5,340 *	3,850	2,230
Goat Mountain Creek	Goat Mountain Creek	2	15	0	NS	0	NC	5
Pleasent Creek	Pleasent Creek [b]	0	0	0	NS	NS	NS	0
Martin River	Martin River – Lower	1,100	120	0	0	0	0	0
	Ragged Point River	3,400	1,500	1,900 *	800	NS	300	400
	Ragged Point Lake Outlet	450	300	400 *	300	NS	800	600
	Ragged Point Lake	1,100	3,800	3,600 *	4,800	NS	2,600	4,100
	Martin River – Upper [b]	80	40	255	1,200 *	650	600	150 +
	Martin Lake Outlet	170	0	55	780	210	500	NC
	Martin Lake	220	0	0	650	300	NC	NC
	Martin Lake Feeders	1,050	0	0	0	0	0	0
	Pothole River	180	30	0	100 *	0	10	200
	Pothole Lake Outlet	0	0	10 +	200 *	200	NC	0
	Pothole Lake	40	0	1,300 +	4,430 *	1,100 +	2,200 +	1,400
	Little Martin Lake Outlet	0	0	0	0	120	200	400
	Little Martin Lake	1,100	5,100	11,700 *	9,950	6,500 +	4,260	4,500
	Tokun Springs	380	0	20	130	0	NC	0
	Tokun River	560	840	600	1,500 *	NS	600	340
	Tokun Lake Outlet	600	300	300	100 *	NS	0	0
	Tokun Lake	1,000	2,200	4,200	3,900 *	NS	1,520	1,260
Martin River Slough	Martin River Slough	1,300	145	52	105	NS	83	10
Copper River Aerial Survey Daily Total		46,332	36,475	50,625	57,775	38,495	43,018	28,065
Anticipated Escapement Index		53,595	42,293	45,833	45,455	31,280	29,687	29,398

–Continued–

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Copper River Delta [a] System and Drainage	Survey System	Survey Dates 20 Sept	23 Oct	Estimated Escapement Site [c]	system [d]	anticipated
Eyak River	Eyak River	0	0	0	27,610	13,260
	West Shore Beaches	3,100	0	4,600		
	Middle Arm Beaches [b]	3,300	400	12,420		
	North Shore Beaches	1,300	0	3,620		
	Hatchery Creek Delta	1,400	0	3,700		
	Hatchery Creek	1,700	380	1,400		
	Power Creek Delta	300	0	1,800		
	Power Creek	210	150	70		
Ibek Creek	Ibek Creek	0	30	120	120	
Alganik Slough	Alganik Slough	NS	NS	0	5,330	14,432
	McKinley Lake	800	0	2,000		
	Salmon Creek West Fork	225	0	3,000		
	Salmon Creek East Fork	80	0	330		
26/27 Mile Creek	26/27 Mile Creek	15	NS	3,900	3,900	3,741
39 Mile Creek	39 Mile Creek	1,735	0	5,340	5,340	9,812
Goat Mountain Creek	Goat Mountain Creek	20 *	0	20	20	1,100
Pleasent Creek	Pleasent Creek [b]	NS	0	1,495 [e]	1,495	867
Martin River	Martin River – Lower	0	0	0		29,958
	Ragged Point River	100	0	1,900	5,900	
	Ragged Point Lake Outlet	0	0	400		
	Ragged Point Lake	2,300	100	3,600		
	Martin River – Upper [b]	300 +	500	2,045	2,045	
	Martin Lake Outlet	60 +	NC	1,800	10,700 [f]	
	Martin Lake	2	800	12,100		
	Martin Lake Feeders	1,030 +	0	2,000		
	Pothole River	90	60	535	5,200	
	Pothole Lake Outlet	300	0	220		
	Pothole Lake	1,600	1,100	4,445		
	Little Martin Lake Outlet	0	0	11,700	11,700	
	Little Martin Lake	4,700	10	460	5,960	9,584
	Tokun Springs	0	0	1,500		
	Tokun River	110	0	100		
	Tokun Lake Outlet	0	0	3,900		
	Tokun Lake	1,390	800	5,180	5,180	6,775
Martin River Slough	Martin River Slough	10	0			
Copper River Aerial Survey Daily Total		26,177	4,330		90,500	
Anticipated Escapement Index		21,393	NA			89,529

–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 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 abbrevations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate 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 sites. Aerial counts from more then one day may be astricted and used in the escapement estimate if the surveyor indicates that these counts represented different fish.

c The escapement estimates for each site is in the astricted 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

e The aerial survey on 6/25 had 475 sockeye in Pleasant Cr. 3, which was counted the following week. Those fish were included on the survey conducted 7/02.

f The Pothole Lake system escapement was subtracted from sockeye observed in Martin Lake.

Appendix B.10. Copper River and Bering River area sockeye salmon escapement estimates, 1982 – 1991.[a]

Stream/Lake[b]	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Eyak Lake	11,700	8,900	11,690	11,025	2,960	7,420	6,775	4,110	8,270	20,640
Hatchery Creek	1,800	2,000	3,700	850	650	1,975	1,225	1,150	2,800	5,100
Power Creek	300	200	500	muddy	0	0	350	0	205	1,870
Ibek Creek	0	0	0	25	0	0	0	120	160	120
McKinley Lake	9,500	12,000	15,000	19,000	12,000	10,300	9,700	6,300	1,400	2,000
Salmon Creek	13,500	8,500	11,000	8,000	900	2	100	630	2,000	3,330
26/27 Mile Creek	5,500	8,000	7,500	6,500	2,030	4,100	2,105	3,020	3,360	3,900
39 Mile Creek	13,000	13,000	17,000	27,000	9,500	6,100	3,620	7,420	5,000	5,340
Goat Mountain	3,000	100	1,500	150	600	1,000	220	3,150	420	20
Pleasant Creek	muddy	muddy	7,400	2,500	1,000	1	460	990	3,190	1,495
Martin River	1,000	3,650	5,000	0	2,875	1,480	0	0	350	2,045
Ragged Pt. R./Lake	13,500	10,000	8,950	18,500	3,900	4,100	2,060	4,420	8,950	5,900
Martin Lake	14,820	17,600	35,350	20,500	11,200	6,010	6,440	7,850	11,250	10,700
Pothole Lake	1,230	6,500	6,000	1,500	2,200	910	2,785	1,550	2,190	5,200
L. Martin Lake	6,020	6,400	10,500	11,000	1,500	3,320	2,200	3,030	5,700	11,700
Tokun Lake/River[c]	2,400	7,900	13,250	7,400	16,000	8,080	12,160	4,950	4,200	5,960
Martin River Slough	9,500	11,000	14,500	8,100	7,980	5,900	3,115	3,010	13,900	5,180
Copper Delta Total	106,770	115,750	168,840	142,050	75,295	60,698	53,315	51,700	73,345	90,500
Upper Copper R.[d]	467,306	545,724	536,806	436,313	509,275	483,478	488,398	607,869	581,859	579,412
Copper R. Dist. Tot.	574,076	661,474	705,646	578,363	584,570	544,176	541,713	659,569	655,204	669,912
Bering River/Lake			29,000	15,700	13,200	19,200	11,450	14,330	16,325	26,480
Shepherd Creek			14,500	8,000	3,600	4,100	950	340	1,260	3,400
Stillwater Cr.			3,500	100	1,350	2,000	100	250	700	1,200
Kushtaka Lake			1,500	500	825	1,225	480	1,530	256	880
Katalla River							350	6,850	1,200	260
Bering R. Area Tot.			48,500	24,300	18,975	26,525	13,330	23,300	19,741	32,220
Copper/Bering Total			754,146	602,663	603,545	570,701	555,043	682,869	674,945	702,132

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 estimates across years, however in years prior to 1984, different methodology was used and discrepancies may be found when cross references 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 Tokun Lake for 1983, 1984 and 1985 are 7,645, 28,041,and 10,993 respectively.

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, 1991.

Copper River Delta [a] System and Drainage	Survey System	Aerial Escapement Indices by Survey Date 21 Aug	27 Aug	30 Aug	03 Sept	06 Sept	13 Sept	20 Sept	23 Oct
Eyak River	Eyak River	NS	NS	NS	NS	6,200 *	600 +	1,350	195
	West Shore Beaches	12	465	200	1,000	970 *	200 +	2,300	940
	Middle Arm Beaches	200	0	0	0	0	0	300	0
	North Shore Beaches	0	0	0	0	0	0	550	100
	Hatchery Creek Delta	0	0	0	0	0	0	800	900
	Hatchery Creek	0	0	0	0	0	0	75	800
	Power Creek Delta	0	0	0	0	0	0	1,200	900
	Power Creek	0	0	0	0	0	0	300	2,700
Ibek Creek	Ibek Creek	180	1,460	1,630	3,420	6,500	6,100	13,540 *	11,800
Scott River	Scott River	NC	NC	15	NS	150	NC	NC	500 *
	Elsner River	NC	0	0	0	0	0	0	0
	Scott Lake	0	0	0	0	20	0	0	200 *
Alganik Slough	Alganik Slough	NS	NS	NS	NS	NS	NS	NS	NS
	18/20 Mile Creek	12	23	90	220	2,570	4,200 *	3,300	780
	McKinley Lake	0	0	60	NS	200	400	800	100 *
	Salmon Creek West Fork	0	0	NS	NS	0	100	90	200 *
	Salmon Creek East Fork	0	0	NS	NS	0	0	0	1,570 *
26/27 Mile Creek	26/27 Mile Creek	0	15	8	30	46	15	300 *	NS
39 Mile Creek	39 Mile Creek	60	170	200	300	450	1,500	960 +	2,100 +*
Goat Mountain Creek	Goat Mountain Creek	120	90	50 +	20	20	430	760	1,900 +*
Pleasent Creek	Pleasent Creek	2	0	NS	NS	NS	0	NS	6 *
Martin River	Martin River – Lower	20	894	2,120	3,425	920	1,300 +	1,900 +	100 *
	Ragged Point River	0	6	10	15	61	85	140	450 *
	Ragged Point Lake Outlet	0	0	0	NS	0	0	0	0
	Ragged Point Lake	0	0	0	NS	0	0	0	0
	Martin River – Upper	65	180	1,600	820	7,300	5,600 +	6,200 +	1,500 *
	Martin Lake Outlet	0	220	310	1,200	600	NC	200 +	NC
	Martin Lake	0	0	640	0	0	NC	NC	1,100 *
	Martin Lake Feeders	0	0	30	0	300	200	15	400 *
	Pothole River	0	0	110	70	40	60	160	1,700 *
	Pothole Lake Outlet	0	0	0	0	NC	0	0	1,500 *
	Pothole Lake	0	0	0	0	0	0	0	2,800 *
	Little Martin Lake Outlet	0	0	0	0	7,020	11,360 *	9,600	7,900
	Little Martin Lake	0	0	0	0	0	0	1,100	2
	Tokun Springs	15	74	320	300	NC	220	1,220	800 *
	Tokun River	0	0	40	40	0	126	240	1,900 *
	Tokun Lake Outlet	0	0	0	NS	0	0	0	0 *
	Tokun Lake	0	0	0	NS	0	0	0	100 *
Martin River Slough	Martin River Slough	0	175	1,270	NS	4,323	8,860 *	7,780	6,580
Copper River Aerial Survey Daily Total		686	3,772	8,703	10,860	37,690	41,356	55,180	52,523
Anticipated Escapement [b]		5,853	17,924	17,924	13,410	23,442	30,089	42,260	NA

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Copper River Delta [a] System and Drainage	Survey System	Estimated Escapement Site [c]	System [d]	Anticipated
Eyak River	Eyak River	6,200	7,170	7,145
	West Shore Beaches	970		
	Middle Arm Beaches			
	North Shore Beaches			
	Hatchery Creek Delta			
	Hatchery Creek			
	Power Creek Delta			
	Power Creek			
Ibek Creek	Ibek Creek	13,540	13,540	5,781
Scott River	Scott River	500	700	
	Elsner River	0		
	Scott Lake	200		
Alganik Slough	Alganik Slough	NS	6,070	4,307
	18/20 Mile Creek	4,200		
	McKinley Lake	100		
	Salmon Creek West Fork	200		
	Salmon Creek East Fork	1,570		
26/27 Mile Creek	26/27 Mile Creek	300	300	427
39 Mile Creek	39 Mile Creek	2,100	2,100	4,352
Goat Mountain Creek	Goat Mountain Creek	1,900	1,900	1,042
Pleasent Creek	Pleasent Creek	6	6	
Martin River	Martin River – Lower	100	1,600	5,760
	Ragged Point River	450	450	2,361
	Ragged Point Lake Outlet	0		
	Ragged Point Lake	0		
	Martin River – Upper	1,500		
	Martin Lake Outlet	NC	1,500	3,249
	Martin Lake	1,100		
	Martin Lake Feeders	400		
	Pothole River	1,700	6,000	1,852
	Pothole Lake Outlet	1,500		
	Pothole Lake	2,800		
	Little Martin Lake Outlet	11,360	11,360	3,958
	Little Martin Lake			
	Tokun Springs	800	2,800	1,221
	Tokun River	1,900		
	Tokun Lake Outlet	0		
	Tokun Lake	100		
Martin River Slough	Martin River Slough	8,860	8,860	11,077
Copper River Aerial Survey Total			64,356	52,532

–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 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 abbrevations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate 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).

c For systems not flown on any given survey the expected for that system was subtracted from the total anticipated for that survey.

b The escapement estimates for each site is in the astricted 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, 1982 – 1991. [a]

Stream/Lake [b]	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Eyak Lake	7,000	14,600	6,500	1,400	2,550	2,800	3,250	1,925	5,775	7,170
Hatchery Creek	125	1,000	1,750	7,010	400	850	100	400	1,940	0
Power Creek	1,500	1,000	1,900	1,800	0	4,800	350	0	650	0
Ibek Creek	1,100	4,200	9,700	8,500	4,200	3,100	2,400	4,330	3,950	13,540
Scott River							1,060	510	1,105	700
Alganik Slough							1,075	1,000	630	4,200
McKinley Lake	500	5,000	500	4,300	1,600	10	170	800	375	100
Salmon Creek	4,650	6,500	850	7,000	200	0	1,925	1,990	1,970	1,770
26/27 Mile	50	0	350	300	60	350	105	810	860	300
39 Mile	2,000	6,500	8,000	8,000	5,800	2,800	1,390	2,150	2,230	2,100
Goat Mountain	50		600	4,000	100	520	1,500	2,500	1,340	1,900
Pleasant Cr.	400	350	1,100	1,500	0	250	110	961	1	6
Martin River	7,500	3,100	4,000	11,500	4,820	3,060	3,400	470	400	1,600
Ragged Pt. River/Lk.	2,550	525	650	1,500	30	3,330	1,080	3,600	820	450
Martin Lake	9,000	6,100	4,700	9,100	275	70	145	590	320	1,500
Pothole Lake			900	8,500	640	70	350	1,300	2,670	6,000
Little Martin Lake	150	1,125	7,000	4,100	275	560	4,500	7,200	7,400	11,360
Tokun River/Lake	2,400	350	525	1,900	490	495	600	2,870	2,250	2,800
Martin River Slough	1,350	9,700	15,500	26,000	4,350	3,400	4,110	7,960	7,700	8,860
Copper Delta Total	40,325	60,050	64,525	106,410	25,790	26,465	27,620	41,366	42,386	64,356
Katalla R.	11,500	4,800	7,000	14,000	1,800	1,600	560	1,220	2,960	4,000
Bering Lake	8,000	4,000	2,000	18,000	1,350	900	2,350	1,000	2,040	12,300
Dick Creek	5,500	7,100	5,500	5,000	350	50	105	570	1,500	1,220
Shepard Cr.				1,500	10	45	70	70	100	NS
Nichawak R.	5,000	800	1,000	3,500	1,700	250	3,670	2,550	2,900	2,560
Gandil R.				4,500				1,410	910	1,460
Controller Bay			4,500	34,000	4,210	2,740	4,660	9,000	14,390	9,760
Bering Area Total	30,000	16,700	20,000	80,500	9,420	5,585	11,415	15,835	24,800	31,300
Copper/Bering Total	70,325	76,750	84,525	186,910	35,210	32,050	39,345	57,201	67,186	95,656

a The escapement figures in this table are based on peak aerial survey estimates 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 estimates 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 prevent 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, 1981 – 1991.[a]

Location	Yearly Survey Indices											10 Year Average
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1981–90
Fish Lake	8,800	22,560	5,500	10,950	3,750	8,750	9,530	6,800	6,700	3,600	4,350	8,694
Bad Crossing #1&2	15,000	4,550	2,000	760	1,125	5,300	2,575	2,075	3,025	6,050	2,625	4,246
Suslota Lake	300	1,800	5,600	700	2,200	1,300	970	550	525	750	210	1,470
Dickey Lake	20	410	135	105	290	43	360	57	28	28	56	148
Keg Creek	320	495	620	2,505	825	200	400	360	1,450	160	95	734
Mahlo Creek	1,800	3,300	2,400	4,300	575	1,750	2,350	3,900	4,600	2,600	3,750	2,758
St. Anne Creek	4,700	8,800	9,700	10,300	1,250	4,600	6,980	6,100	3,100	1,700	4,700	5,723
Fish Cr.–Mentasta	10,500	1,700	900	900	1,800	1,100	250	650	1,500	1,000	1,050	2,030
Swede Lake	450	1,400	550	2,400	250	385	113	230	275	120	110	617
Tana River	290	1,100	2,485	3,665	1,145	1,825	472	2,034	245	89	750	1,335
Mentasta Lake	7,400	3,250	6,800	4,850	3,850	2,850	1,800	4,300	3,270	2,900	1,550	4,127
Tanada Lake	5,300	3,880	4,300	9,100	5,900	3,960	4,950	2,100	2,550	1,650	1,725	4,369
Salmon Creek	250	850	1,550	1,350	575	300	1,150	700	425	350	350	750
Paxson Inlt–Mud Cr	2,200	1,150	7,500	15,700	7,500	7,000	4,250	6,350	3,200	2,850	4,800	5,770
Mud Creek and Lake	810	1,900	470	270	200	70	0	150	0	35	100	391
Mendeltna Creek	4,830	400	2,850	1,900	2,300	3,325	2,275	1,550	2,000	3,700	3,050	2,513
Paxson Lake Outlet	1,500	3,800	3,300	4,100	3,600	1,810	5,100	3,200	900	1,350	2,300	2,866
Mud Cr.– Summit L.	3,400	17,400	5,700	9,600	8,150	3,375	9,050	15,400	6,800	2,950	9,625	8,183
Long Lake	1,325	1,700	5,600	1,360	590	1,300	1,225	1,125	1,225	1,950	1,919 [b]	1,740
Tonsina Lake	1,725	1,700	2,850	975	290	350	740	650	2,450	1,450	770 [b]	1,318
Totals	70,920	82,145	70,810	85,790	46,165	49,593	54,540	58,281	44,268	35,282	43,885	59,779

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 corresponed 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.

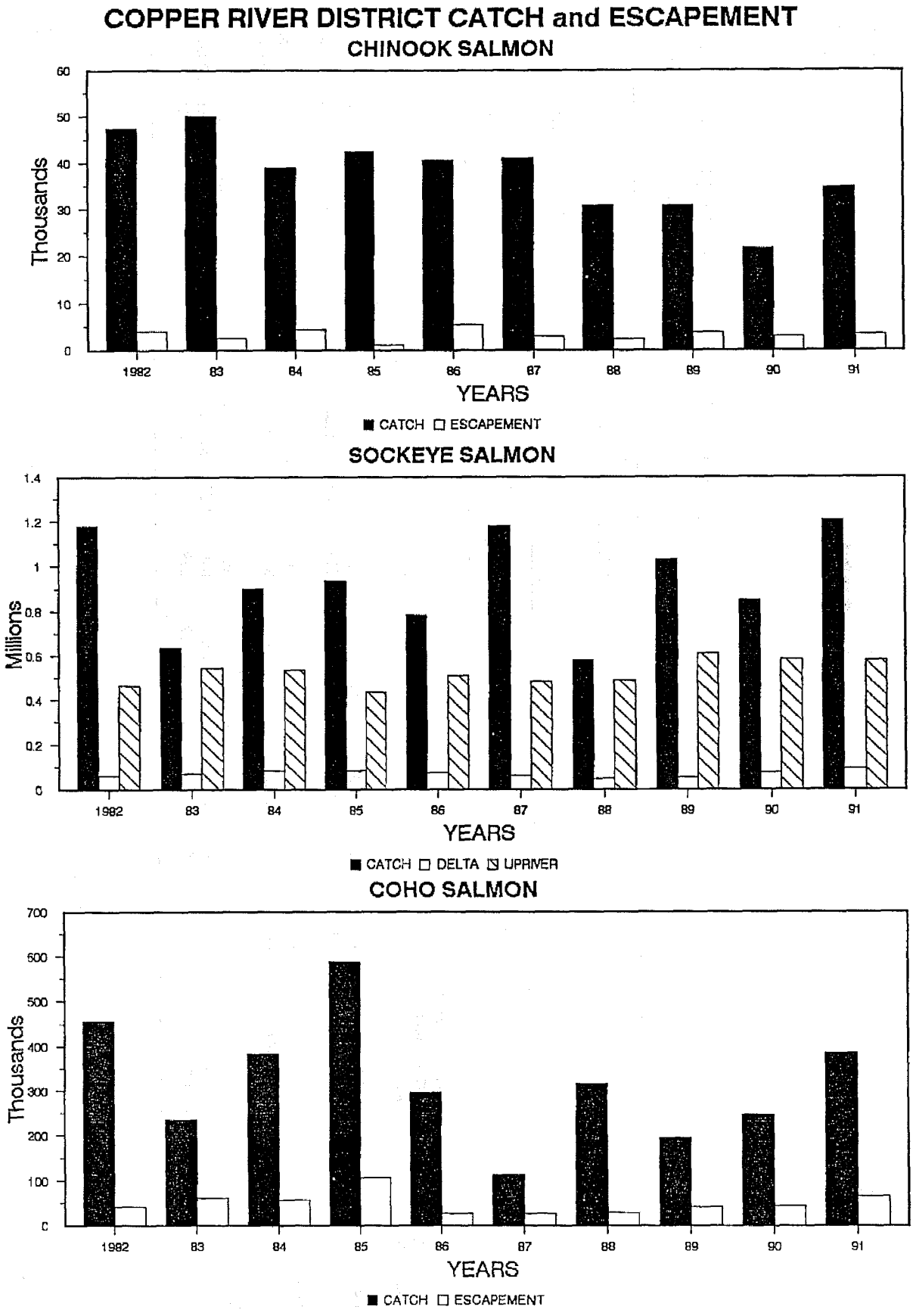
b No survey flown, counts are the historical average.

Appendix B.14. Aerial survey indices of chinook salmon escapement to the Copper River drainage, 1981 – 1991. [a]

Location	Yearly Survey Indices											10 Year Average 1981 – 1990
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	
East Fork Chistochina	120	1,260	575	577	360	618	764	684	740	615	865	631
Gulkana River	754 [b]	1,656	931	2,189	321	3,182	1,228	967	1,993	1,356	1,303	1,325
Mendeltna Creek	51	70	12	26	26	76	10	17	185	320	305	79
Kiana Creek	191	200	166	382	91	328	80	249	344	411	520	244
St. Anne Creek	19	35	87	89	15	182	192	62	90	42	115	81
Manker Creek	23	49	141	264	22	251	141	115	165	41	101	121
Grayling Creek	107	127	287	279	58	224	112	161	72	49	151	148
Little Tonsina River	191	440	330	568	203	424	247	75	65	57	54	260
Indian River	20 [b]	179	41	17	14	29 [b]	33	0	3	15	18	29
Total Survey Index	1,476	4,016	2,570	4,391	1,110	5,314	2,807	2,330	3,657	2,906	3,432	3,058

a The escapement figures in this table are based on peak aerial survey estimates and weir counts from a majority of the known 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.



Appendix B.15. Chinook, sockeye and coho salmon catch and escapement in the Copper River District, 1982 - 1991.

Appendix B.16 Estimated age and sex composition of sockeye salmon commercial harvest in the Copper River District drift gill net fishery, 1991.

		Brood Year and Age Group												
		1989	1988		1987			1986			1985		1984	
		0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	0.6	Total
Strata Combined:	05/16 - 09/21													
Sampling Dates:	05/17 - 08/06													
Sample Size:	4,695													
Female	Percent of Sample	0.0	0.1	0.0	4.3	4.4	0.0	0.1	34.8	0.1	0.1	2.3	0.0	46.4
	Number in Catch	0	1,310	186	51,860	53,547	517	845	420,203	1,661	1,474	27,423	481	559,508
Male	Percent of Sample	0.1	0.3	0.2	6.0	5.7	0.0	0.1	37.4	0.4	0.5	2.8	0.0	53.5
	Number in Catch	796	3,369	2,729	72,259	69,286	373	705	450,800	4,532	6,617	33,794	0	645,261
Total	Percent of Sample	0.1	0.4	0.2	10.3	10.2	0.1	0.1	72.3	0.5	0.7	5.1	0.0	100.0
	Number in Catch	796	4,679	2,915	124,379	123,126	890	1,551	872,493	6,193	8,092	61,217	481	1,206,811
	Standard Error	323	1,145	724	6,111	5,569	519	607	8,874	1,330	1,774	4,472	481	

Appendix B.17. Estimated age and sex composition of the chinook salmon commercial harvest in the Copper River District drift gill net fishery, 1991.

		Brood Year and Age Group															
		1989	1988		1987			1986			1985			1984		1983	
		0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	1.5	2.4	2.5	Total
Strata Combined:	05/16 - 09/11																
Sampling Dates:	05/17 - 06/22																
Sample Size:	1,596																
Female	Percent of Sample	0.0	0.1	0.0	0.3	0.8	0.0	0.4	34.8	0.1	17.1	0.8	0.0	0.4	0.6	0.0	55.4
	Number in Catch	0	42	9	88	264	0	127	12,093	51	5,964	284	9	135	202	0	19,267
Male	Percent of Sample	0.0	0.1	0.2	0.2	2.5	0.1	0.2	21.1	0.3	16.9	0.7	0.0	0.6	0.6	0.1	43.6
	Number in Catch	9	38	78	86	865	33	69	7,346	114	5,862	238	0	204	215	24	15,180
Total	Percent of Sample	0.0	0.2	0.2	0.5	3.3	0.1	0.6	56.5	0.5	34.3	1.5	0.0	1.0	1.2	0.1	100.0
	Number in Catch	9	80	87	173	1,139	42	197	19,642	164	11,930	522	9	353	417	24	34,787
	Standard Error.	9	35	33	62	113	21	81	468	40	452	106	9	96	102	24	

Appendix B.18. Estimated age and sex composition of the coho salmon commercial harvest in the Copper River District commercial drift gill net fishery, 1991.

		Brood Year and Age Group					
		1989	1988	1987		1986	
		0.1	1.1	1.2	2.1	3.1	Total
Strata Combined:	05/20 – 10/12						
Sampling Dates:	08/06 – 09/18						
Sample Size:	1,298						
Female	Percent of Sample	0.0	21.6	0.0	24.9	0.8	47.3
	Number in Catch	0	83,035	0	95,918	3,243	182,196
Male	Percent of Sample	0.0	23.4	0.1	28.4	0.7	52.7
	Number in Catch	84	89,970	437	109,439	2,875	202,806
Total	Percent of Sample	0.0	44.9	0.1	53.3	1.6	100.0
	Number in Catch	84	173,005	437	205,441	6,119	385,086
	Standard Error	84	6,215	437	6,252	1,615	

Appendix B.19. Commercial salmon harvest by period in the Bering River District drift gill net fishery, 1991.

Period	Date [ab]	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Number	Pound	Number	Pound	Number	Pound	Number	Pound	Number	Pound
1	6/17	24	26	42	19	387	8,034	47,989	0	0	0	0	2	13
2	6/20	24	22	31	6	139	5,285	32,297	7	37	0	0	97	518
3	6/24	24	13	20	0	0	2,236	13,809	45	291	0	0	51	255
4	6/27	24	6	10	0	0	1,313	7,835	21	157	4	9	44	218
5	7/01	36	6	9	1	22	1,408	8,522	14	108	0	0	1	6
6	7/04	24	3	3	1	30	370	2,097	0	0	0	0	0	0
7	7/08	36	2	2	0	0	360	2,164	0	0	0	0	0	0
8	7/11	36	2	2	0	0	175	1,056	0	0	0	0	0	0
9	7/15	36	0	0	0	0	0	0	0	0	0	0	0	0
10	7/18	48	0	0	0	0	0	0	0	0	0	0	0	0
11	7/22	36	0	0	0	0	0	0	0	0	0	0	0	0
12	7/25	48	0	0	0	0	0	0	0	0	0	0	0	0
13	7/29	36	0	0	0	0	0	0	0	0	0	0	0	0
14	8/01	48	0	0	0	0	0	0	0	0	0	0	0	0
15	8/05	36	0	0	0	0	0	0	0	0	0	0	0	0
16	8/08	48	0	0	0	0	0	0	0	0	0	0	0	0
17	8/19	48	0	0	0	0	0	0	0	0	0	0	0	0
18	9/02	24	26	42	0	0	0	0	8,038	78,594	0	0	0	0
19	9/05	24	42	49	0	0	0	0	17,276	167,354	0	0	0	0
20	9/09	48	40	132	1	18	0	0	25,754	249,070	0	0	0	0
21	9/12	48	69	137	0	0	0	0	17,732	161,925	0	0	0	0
22	9/16	48	45	88	0	0	0	0	17,168	168,357	0	0	0	0
23	9/19	48	43	106	0	0	0	0	12,804	118,140	0	0	0	0
24	9/23	120	33	88	0	0	0	0	11,605	107,694	0	0	0	0
25	9/30	120	13	15	0	0	0	0	487	4,401	0	0	0	0
26	10/07	120	0	0	0	0	0	0	0	0	0	0	0	0
Total		1,212	96	776	28	596	19,181	115,769	110,951	1,056,128	4	9	195	1,010
Average Weight (lbs)						21.29		6.04		9.52		2.25		5.18

a For starting times of specific openings refer to Appendix B.26

b Starting date of period.

Appendix B.20. Commercial salmon catch by species in the Bering River District, 1972–1991.

Year	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
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
1991	28	19,181	110,951	4	195	130,359
Ten Year Average (1981–90)	183	54,354	126,707	1,140	4,374	186,759

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, 1991.

Bering River Delta [a]		Aerial Escapement Indicies by Survey Date						
System and Drainage	Survey System	14 June	19 June	25 June	02 July	10 July	26 July	06 Aug
Bering River	Bering River	5,210	11,400	3,500	1,770 *	3,700	400 +	250
	Bering Lake	3,120	8,830	23,680	24,710 *	15,330	12,700	1,295
	Dick Creek	NS	0	0	0	3,010	11,100	21,940
	Shepherd Creek – Lagoon	NC	0	NC	350 +	3,400 +*	600	0
	Shepherd Creek	NS	NS	0	NS	NS	0	1,460
	Carbon Creek	NS	NS	0	NS	NS	300	1,000
	Maxwell Creek	NS	NS	NS	NS	NS	0	0
	Trout Creek	NS	NS	NS	NS	NS	0	0
	Clear Creek	NS	NS	NS	NS	NS	300	1,200 *
	Kushtaka Lake	NS	NS	NS	NS	NS	0	480 *
	Shockum Creek	NS	NS	NS	NS	NS	50	400 *
Kattalla River	Katalla River	0	0	50	80	NC	2,800 SP	220
Bering River Aerial Survey Daily Index		8,330	20,230	27,230	26,910	25,440	28,250	28,245
Anticipated Escapement Index		825	1,833	6,840	13,832	21,614	21,672	18,894

Bering River Delta [a]		Aerial Escapement Indicies by Survey Date					
System and Drainage	Survey System	21 Aug	27 Aug	30 Aug	06 Sept	13 Sept	20 Sept
Bering River	Bering River	NC	NS	0	NC	NC	NC
	Bering Lake	100	30	800	72	0	0
	Dick Creek	2,500	1,100	2,300	490	440	95
	Shepherd Creek – Lagoon	NC	NS	NS	NS	NS	NS
	Shepherd Creek	250	NS	NS	NS	NS	NS
	Carbon Creek	330	NS	NS	NS	NS	NS
	Maxwell Creek	NS	NS	NS	NS	NS	NS
	Trout Creek	0	NS	NS	NS	NS	NS
	Clear Creek	30	NS	NS	NS	NS	NS
	Kushtaka Lake	220	175	NS	NS	NS	NS
	Shockum Creek	200	0	NS	NS	NS	NS
Kattalla River	Katalla River	15	110	260 *	NC	0	0
Bering River Aerial Survey Daily Index		3,645	1,415	3,360	562	440	95
Anticipated Escapement Index		5,071	1,351	1,351	964	49	13

–Continued–

Appendix B.21 (page 2 of 2).

Bering River Delta [a] System and Drainage	Survey System	Estimated Escapement Site [b]	System [c]	Anticipated
Bering River	Bering River	1,770	26,480	21,833
	Bering Lake	24,710		
	Dick Creek	0		
	Shepherd Creek – Lagoon	3,400	3,400	6,600
	Shepherd Creek	0		
	Carbon Creek	0		
	Maxwell Creek	0		
	Trout Creek	0	0	
	Clear Creek	1,200	1,200	1,655
	Kushtaka Lake	480	880	1,786
	Shockum Creek	400		
Kattalla River	Katalla River	260	260	
Bering River Aerial Survey Daily Index			32,220	31,874

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 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 abbrevations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate 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 astricted 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, 1991.

Bering River Delta [a]		Aerial Escapement Indicies by Survey Date						
System and Drainage	Survey System	21 Aug	27 Aug	30 Aug	06 Sept	13 Sept	20 Sept	23 Oct
Bering River	Bering River [b]	0	87	400	375	400	2,300 *	381
	Bering Lake	0	0	400	3,300	2,900 +	10,000 *	3,340
	Dick Creek	0	0	150	0	500	1,220 *	1,970
	Shepherd Creek – Lagoon	NC	NS	NS	NS	NS	NS	NS
	Shepherd Creek	0	NS	NS	NS	NS	NS	NS
	Carbon Creek	0	NS	NS	NS	NS	NS	NS
	Maxwell Creek	NS	NS	NS	NS	NS	NS	NS
Kattalla River	Katalla River	10	680	1,280	NC	3,545 +	4,000 *	400
Lower Bering River	Gandil River	0	0	0	143	660 +	830	1,460 *
	Nichawak River	12	10	175	570 +	2,020 +	2,560 *	1,200
Controller Bay	Campbell River	0	0	0	0	0	0	NS
	Edwards River	0	60	32	706	3,300	5,720 *	NS
	Okalee River	0	0 +	5 +	1,100 +	2,600 +	3,345 +*	NS
	Other Clear Streams	0	0	0	5	680	695 *	NS
Bering River Aerial Survey Daily Index		22	837	2,442	6,199	16,605	30,670	8,751
Anticipated Escapement Index		1,786	7,508	7,508	7,826	20,804	17,618	NA

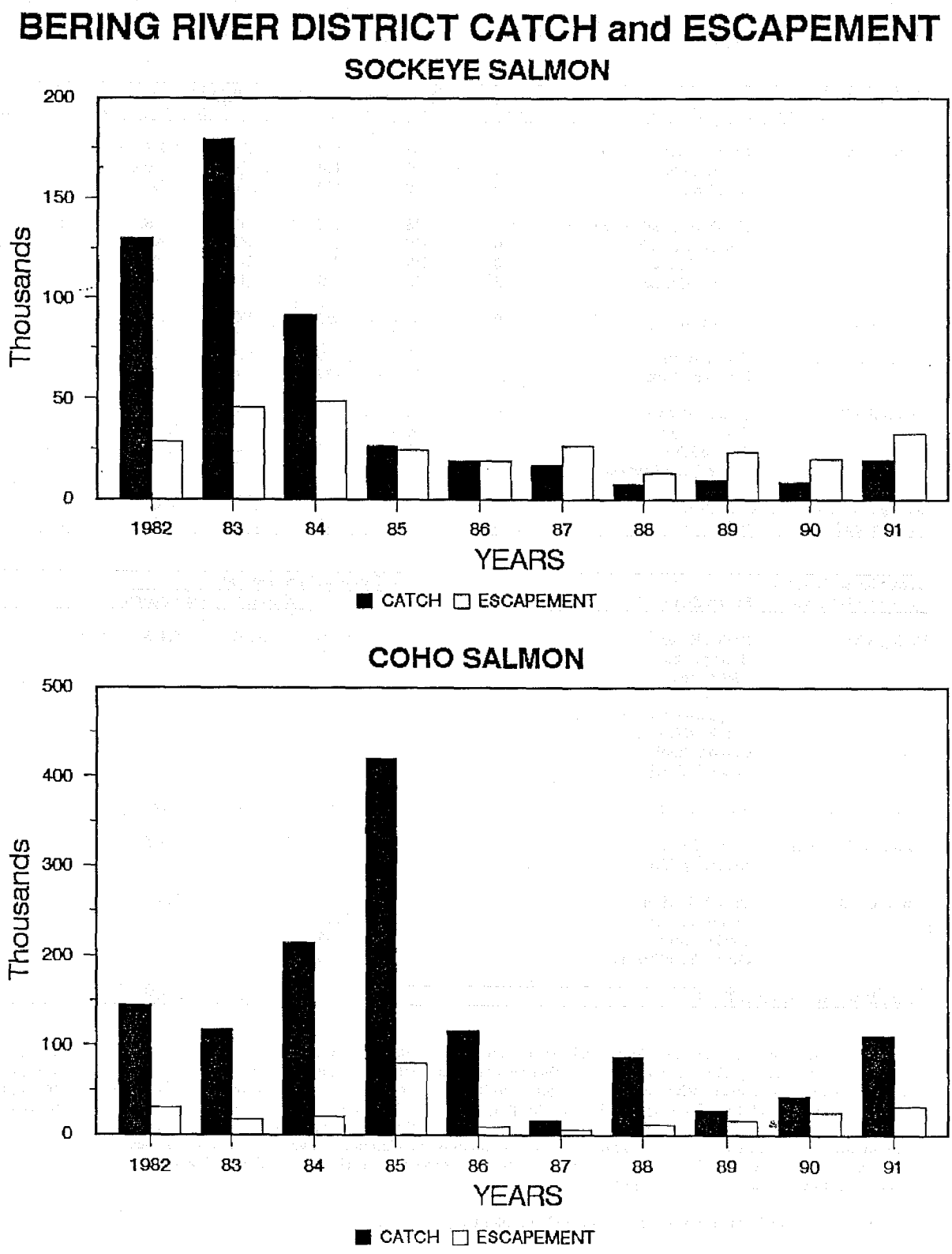
Bering River Delta [a]		Estimated Escapement		
System and Drainage	Survey System	Site [c]	System [d]	Anticipated
Bering River	Bering River [b]	2,300	13,520	5,413
	Bering Lake	10,000		
	Dick Creek	1,220		
	Shepherd Creek – Lagoon	NS		
	Shepherd Creek	NS		
	Carbon Creek	NS		
	Maxwell Creek	NS		
Kattalla River	Katalla River	4,000	4,000	5,131
Lower Bering River	Gandil River	1,460	4,020	2,445
	Nichawak River	2,560		
Controller Bay	Campbell River	0	9,760	7,815
	Edwards River	5,720		
	Okalee River	3,345		
	Other Clear Streams	695		
Bering River Aerial Survey Total			31,300	20,804

a The survey sites represent most of the known coho 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 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 abbrevations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate 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 coho observed in the Don Miller Hill tributaries.

c The escapement estimates for each site is in the astricted 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



Appendix B.23. Sockeye and coho salmon catch and escapement in the Bering River Delta, 1982 - 1991.

Appendix B.24. Estimated age and sex composition of sockeye salmon harvested in the Bering River District commercial drift gill net fishery, 1991.

		Brood Year and Age Group								
		1988	1987			1986		1985		
		0.2	0.3	1.2	0.4	1.3	2.2	1.4	2.3	Total
Stratum Dates:	06/17 – 07/13									
Sampling Dates:	06/18									
Sample Size:	520									
Female	Percent of Sample	1.0	4.2	8.1	0.0	43.1	0.0	0.2	0.6	57.1
	Number in Catch	184	812	1,549	0	8,263	0	37	111	10,955
Male	Percent of Sample	1.3	4.2	11.5	0.2	24.6	0.2	0.4	0.2	42.7
	Number in Catch	258	812	2,213	37	4,721	37	74	37	8,189
Total	Percent of Sample	2.3	8.5	19.6	0.2	67.9	0.2	0.6	0.8	100.0
	Number in Catch	443	1,623	3,762	37	13,021	37	111	148	19,181
	Standard Error	126	234	334	37	393	37	64	74	

Appendix B.25. Estimated age and sex composition of coho salmon harvested in the Bering River District commercial drift gill net fishery, 1991.

		Brood Year and Age Group			
		1988	1987	1986	
		1.1	2.1	3.1	Total
Stratum Dates:	06/17 – 10/05				
Sampling Date:	09/20				
Sample Size:	374				
Female	Percent of Sample	20.1	34.5	0.3	54.8
	Number in Catch	22,144	38,088	295	60,528
Male	Percent of Sample	17.9	25.9	0.5	44.4
	Number in Catch	19,782	28,640	591	49,013
Total	Percent of Sample	38.0	61.2	0.8	100.0
	Number in Catch	41,927	67,614	886	110,427
	Standard Error	2,775	2,786	510	

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, 1991.

Bering River (200)			Copper River (212)			
Periods	Dates	Hours Fished	Periods	Dates	Hours Fished	Emergency Orders Issued
			1	5/16 - 5/17	24	[a] 2-F-E-16-91
			2	5/20 - 5/21	24	2-F-E-18-91
			3	5/23 - 5/24	24	2-F-E-19-91
			4	5/27	12	2-F-E-20-91
			5	5/31	12	2-F-E-21-91
			6	6/03	12	2-F-E-22-91
				6/03 - 6/04	12	[b] 2-F-E-23-91
			7	6/06 - 6/07	24	2-F-E-24-91
			8	6/10 - 6/11	24	2-F-E-27-91
			9	6/14 - 6/14	12	2-F-E-30-91
1	6/17 - 6/18	24	11	6/17 - 6/18	24	2-F-E-32-91
2	6/20 - 6/21	24	12	6/20 - 6/21	24	2-F-E-33-91
3	6/24 - 6/25	24	13	6/24 - 6/25	24	2-F-E-35-91
4	6/27 - 6/28	24	14	6/27 - 6/28	24	[c] 2-F-E-36-91
5	7/01 - 7/02	36	15	7/01 - 7/02	36	
6	7/04 - 7/05	24	16	7/04 - 7/05	24	
8	7/08 - 7/09	36	17	7/08 - 7/09	36	
9	7/11 - 8/13	36	18	7/11 - 7/13	36	[d] 2-F-E-42-91
10	7/15 - 7/16	36	19	7/15 - 7/16	36	
11	7/18 - 8/20	48	20	7/18 - 7/20	48	[e] 2-F-E-47-91
12	7/22 - 7/23	36	21	7/22 - 7/23	36	
13	7/25 - 7/27	48	22	7/25 - 7/27	48	
14	7/29 - 7/30	36	23	7/29 - 7/30	36	
15	8/01 - 8/03	48	24	8/01 - 8/03	48	
16	8/05 - 8/06	36	25	8/05 - 8/06	36	
17	8/08 - 8/10	48	26	8/08 - 8/10	48	[f] 2-F-E-53-91
18	8/19 - 8/21	48	27	8/19 - 8/21	48	2-F-E-60-91
19	9/02 - 9/03	24	28	9/02 - 9/03	24	2-F-E-65-91
20	9/05 9/06	24	29	9/05 - 9/06	24	2-F-E-66-91
21	9/09 - 9/11	48	30	9/09 - 9/11	48	2-F-E-68-91
22	9/12 - 9/14	48	31	9/12 - 9/14	48	2-F-E-69-91
23	9/16 - 9/18	48	32	9/16 - 9/18	48	2-F-E-70-91
24	9/19 - 9/21	48	33	9/19 - 9/21	48	
25	9/23 - 9/28	120	34	9/23 - 9/28	120	2-F-E-71-91
26	9/30 -10/05	120	35	9/30 -10/05	120	2-F-E-73-91
27	10/07 -10/12	120	36	10/07 -10/12	120	2-F-E-74-91
						[g] 2-F-E-76-91

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 begining 7:00 p.m. Thursday to 7:00 p.m. Friday. For periods of 12-hours in duration, the beginning time will be 7:00 a.m.

b The Copper River District was extended for 12 hours from 7:00 p.m. Monday to 7:00 a.m Tuesday.

c 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.

-Continued-

d Until further notice, the Copper River and Bering River districts will be open for two 36-hour fishing periods per week. The schedule will be from 7:00 p.m. Thursday to 7:00 a.m. Saturday and from 7:00 a.m. Monday to 7:00 p.m. Tuesday.

e Until further notice, the Copper and Bering River Districts will be on a schedule of two periods per week, from 7:00 a.m. Monday to 7:00 p.m. Tuesday and from 7:00 p.m. Thursday to 7:00 p.m. Saturday.

f All fishing periods on or after August 7 in the Copper and Bering River Districts will begin at 12:00 noon.

g This announcement offically closes the Copper and Bering River Districts to commercial fishing for the 1991 season.

APPENDIX C

COGHILL AND UNAKWIK DISTRICTS

Appendix C.1. Commercial salmon harvest by statistical week in the Coghill District commercial drift gill net and purse seine fisheries, P.W.S., 1991. The statistical weeks listed are those with active fishing participation.

Date[a]	Stat Week	Permits	Landings	Chinook Numbers	Chinook Pounds	Sockeye Numbers	Sockeye Pounds	Coho Numbers	Coho Pounds	Pink Numbers	Pink Pounds	Chum Numbers	Chum Pounds
GEAR: DRIFT GILL NET													
06/15[b]	24	82	124	68	1,224	375	2,376	0	0	6	20	8,435	70,146
07/27[b]	30	97	156	8	110	1,948	11,603	290	2,289	3,080	12,159	11,587	105,727
08/10[b]	32	79	174	8	79	477	2,853	402	3,218	39,183	118,705	6,582	55,998
08/17[b,c]	33	66	157	5	25	406	2,419	289	2,261	63,051	218,447	3,150	27,187
08/24	34	53	188	3	38	182	1,127	1,031	7,540	78,456	212,409	2,690	22,718
08/31[d]	35	83	302	0	0	192	1,246	9,072	68,610	45,420	115,698	1,364	10,594
09/07	36	71	361	0	0	284	1,828	17,170	138,268	1,744	4,760	281	2,244
09/14	37	80	295	0	0	20	115	17,650	142,866	561	1,404	125	1,029
09/21[e]	38	67	243	0	0	3	19	15,843	125,576	0	0	8	66
09/28	39	50	193	0	0	1	4	16,223	130,879	0	0	1	6
10/05	40	8	9	0	0	0	0	393	3,460	0	0	0	0
Total		210	2,202	92	1,476	3,888	23,590	78,363	624,967	231,501	683,602	34,223	295,715
Average Weight					16.04		6.07		7.98		2.95		8.64
GEAR: PURSE SEINE													
07/27[b]	30	27	29	7	75	1,119	6,777	65	439	15,330	44,646	2,289	19,722
08/10[b]	32	75	92	2	28	235	1,319	202	1,598	583,112	1,502,774	4,967	41,981
08/17[b,c]	33	41	99	1	12	203	1,337	283	1,614	1,131,315	2,997,450	3,509	29,981
08/24	34	14	23	1	6	5	24	71	640	233,517	628,818	740	5,806
08/31[d]	35	1	1	0	0	0	0	0	0	16,800	42,000	14	111
Total		108	244	11	121	1,562	9,457	621	4,291	1,980,074	5,215,688	11,519	97,601
Average Weight					11.00		6.05		6.91		2.63		8.47
Combined Total		318	2,446	103	1,597	5,450	33,047	78,984	629,258	2,211,575	5,899,290	45,742	393,316
Average Weight					15.50		6.06		7.97		2.67		8.60

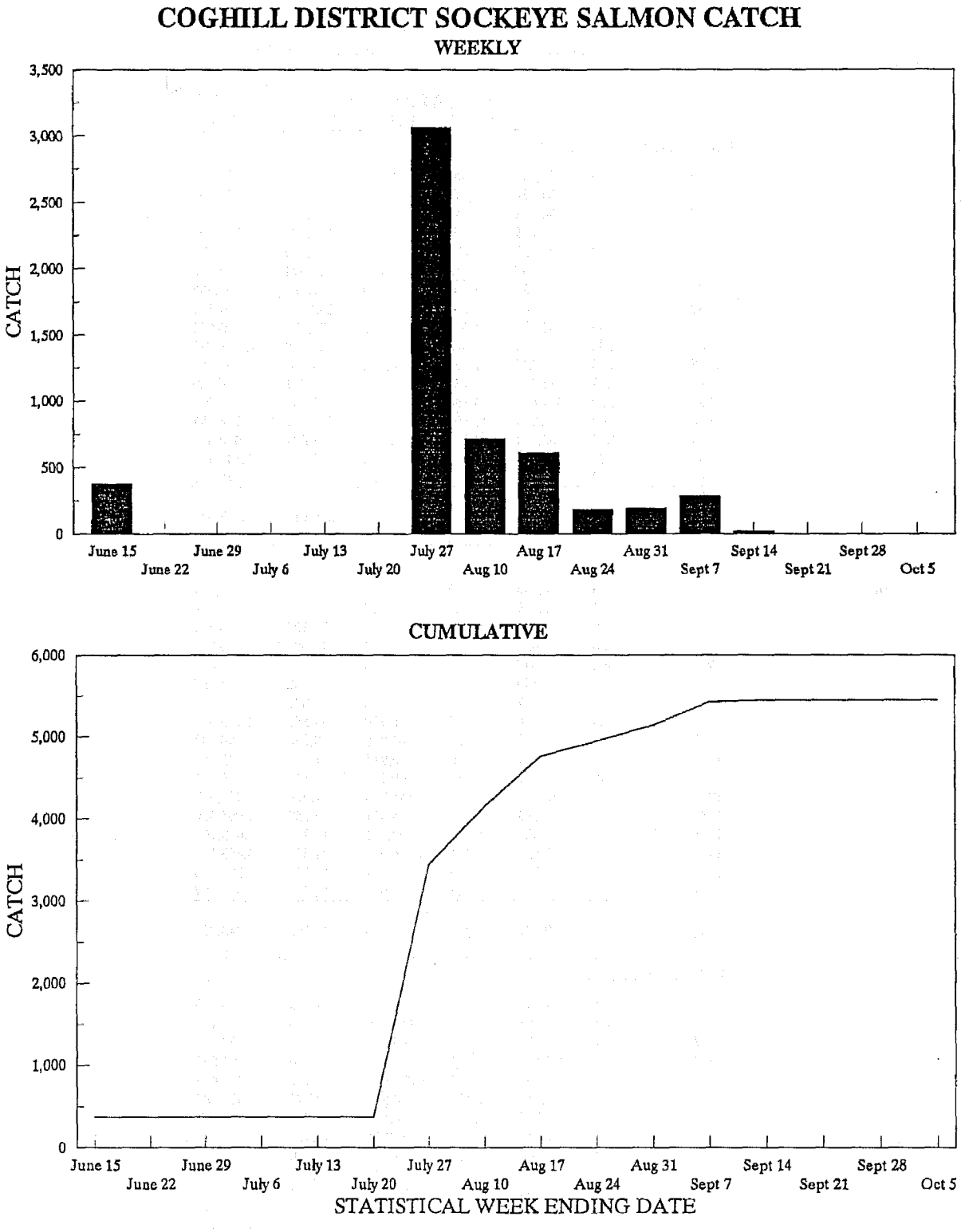
[a]Statistical week ending date.

[b]Only the Esther subdistrict was open to fishing.

[c]The Esther subdistrict was opened to continuous fishing until further notice at 8:00 p.m., Thursday, August 15.

[d]The entire Coghill District was opened to continuous fishing at 8:00 a.m., Thursday, August 29.

[e]The Esther subdistrict and the waters of Lake and Quillian bays were closed for 48 hours from 12:00 noon Friday, Sept. 20 until 12:00 noon Sunday, Sept. 22. The entire Coghill district was reopened to continuous fishing until the season closed at 12:00 noon Saturday, Oct. 12.



Appendix C.2. Weekly and cumulative sockeye salmon catches in the Coghill District, 1991. No directed commercial harvest was projected for 1991.

Appendix C.3. Commercial salmon catch by species in the Coghill District, Prince William Sound, 1975 – 1991.

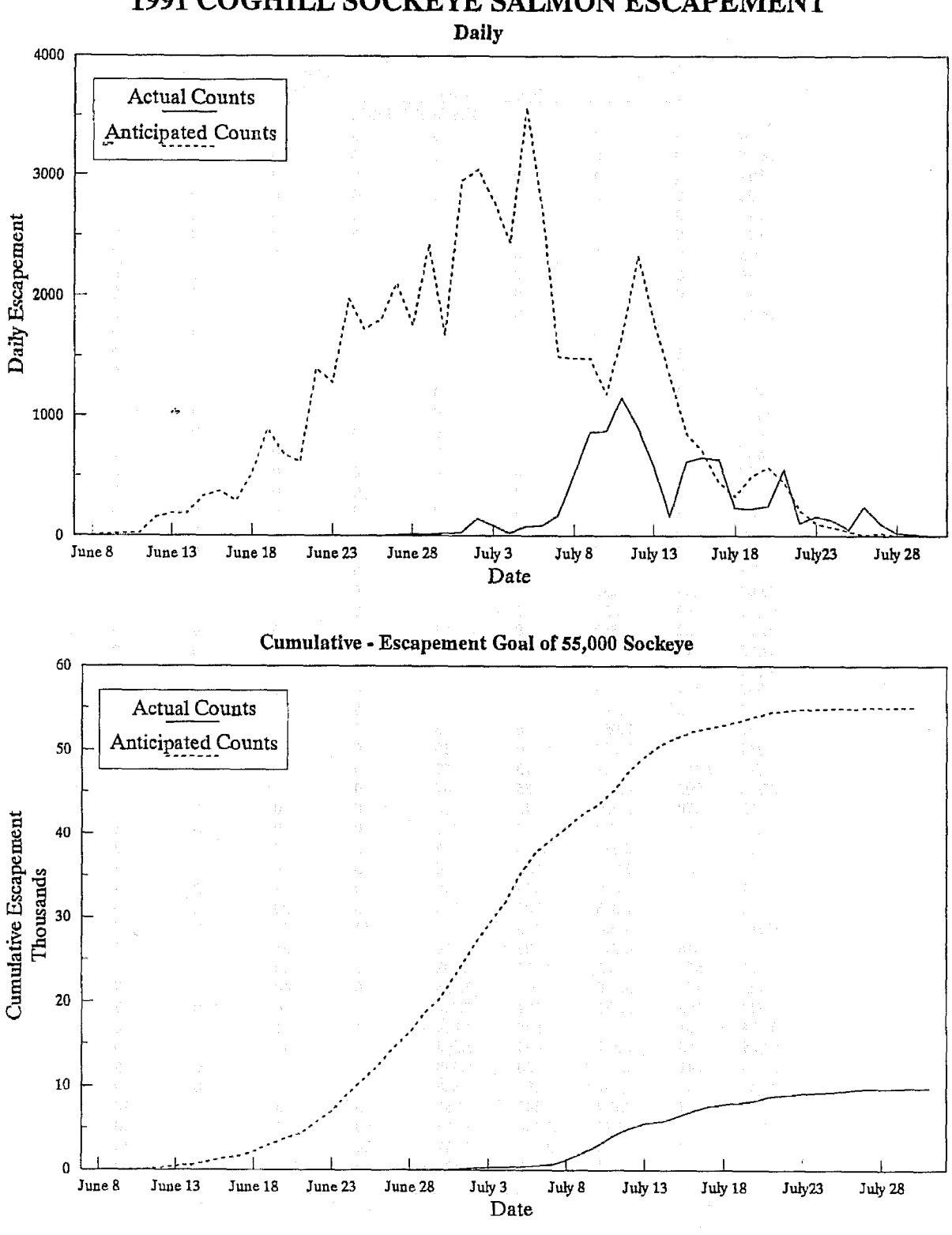
	CATCH BY SPECIES					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
GEAR: DRIFT GILL NET						
1975	525	142,864	357	99,492	32,438	275,676
1976	102	54,334	72	53,219	89,170	196,897
1977	124	154,342	49	332,859	127,476	614,850
1978	469	193,899	64	49,527	110,679	354,638
1979	543	75,753	1,837	259,372	56,916	394,421
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	11,988	128,605	1,907,510	301,209	2,349,438
1991	92	3,888	78,363	231,501	34,223	348,067
Ten Year Average (1981–90)	336	246,296	26,876	692,583	250,919	1,217,011
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
1991	11	1,562	621	1,980,074	11,519	1,993,787
Ten Year Average (1981–90)	48	9,177	6,930	785,596	42,202	843,953
COMBINED GEARS						
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
1991	103	5,450	78,984	2,211,575	45,742	2,341,854
Ten Year Average (1981–90)	383	255,473	33,806	1,478,180	293,121	2,060,964

Appendix C.4. Daily salmon escapement through the Coghill River weir, Prince William Sound, 1991.

	Sockeye[a]		Pink[b]		Chum		Chinook	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
06/08				WEIR INSTALLED				
06/09	0	0	0	0	0	0	0	0
06/10	0	0	0	0	0	0	0	0
06/11	0	0	0	0	0	0	0	0
06/12	0	0	0	0	0	0	0	0
06/13	0	0	0	0	0	0	0	0
06/14	0	0	0	0	0	0	0	0
06/15	0	0	0	0	0	0	0	0
06/16	0	0	0	0	0	0	0	0
06/17	0	0	0	0	0	0	0	0
06/18	0	0	0	0	0	0	0	0
06/19	0	0	0	0	0	0	0	0
06/20	1	1	0	0	0	0	0	0
06/21	2	3	0	0	0	0	0	0
06/22	0	3	0	0	0	0	0	0
06/23	0	3	0	0	0	0	0	0
06/24	1	4	0	0	0	0	0	0
06/25	0	4	0	0	0	0	0	0
06/26	2	6	0	0	0	0	0	0
06/27	9	15	0	0	0	0	0	0
06/28	17	32	0	0	0	0	0	0
06/29	16	48	0	0	0	0	0	0
06/30	20	68	0	0	0	0	0	0
07/01	24	92	1	1	0	0	0	0
07/02	145	237	1	2	0	0	0	0
07/03	90	327	1	3	0	0	0	0
07/04	22	349	0	3	0	0	0	0
07/05	78	427	0	3	0	0	0	0
07/06	86	513	2	5	0	0	0	0
07/07	167	680	2	7	0	0	0	0
07/08	513	1,193	0	7	0	0	1	1
07/09	862	2,055	6	13	0	0	0	1
07/10	874	2,929	6	19	0	0	0	1
07/11	1,152	4,081	13	32	0	0	0	1
07/12	908	4,989	35	67	0	0	0	1
07/13	570	5,559	13	80	0	0	0	1
07/14	163	5,722	23	103	0	0	0	1
07/15	621	6,343	210	313	3	3	1	2
07/16	653	6,996	233	546	5	8	0	2
07/17	643	7,639	153	699	9	17	2	4
07/18	231	7,870	287	986	3	20	2	6
07/19	228	8,098	155	1,141	11	31	0	6
07/20	246	8,344	237	1,378	4	35	1	7
07/21	559	8,903	1,024	2,402	5	40	0	7
07/22	105	9,008	923	3,325	0	40	0	7
07/23	163	9,171	571	3,896	0	40	0	7
07/24	131	9,302	948	4,844	1	41	1	8
07/25	55	9,357	464	5,308	1	42	1	9
07/26	241	9,598	330	5,638	8	50	0	9
07/27	103	9,701	200	5,838	0	50	0	9
07/28	28	9,729	843	6,681	3	53	1	10
07/29	16	9,745	1,494	8,175	50	103	0	10
07/30	7	9,752	2,326	10,501	24	127	0	10
07/31	0	9,752	2,631	13,132	0	127	0	10
Total	9,752		13,132		127		10	

[a]Count includes 10 jacks.

[b]Count may be incomplete. The Coghill weir is designed to prohibit the passage of sockeye salmon and because of their smaller size some pink salmon are able to pass uncounted.



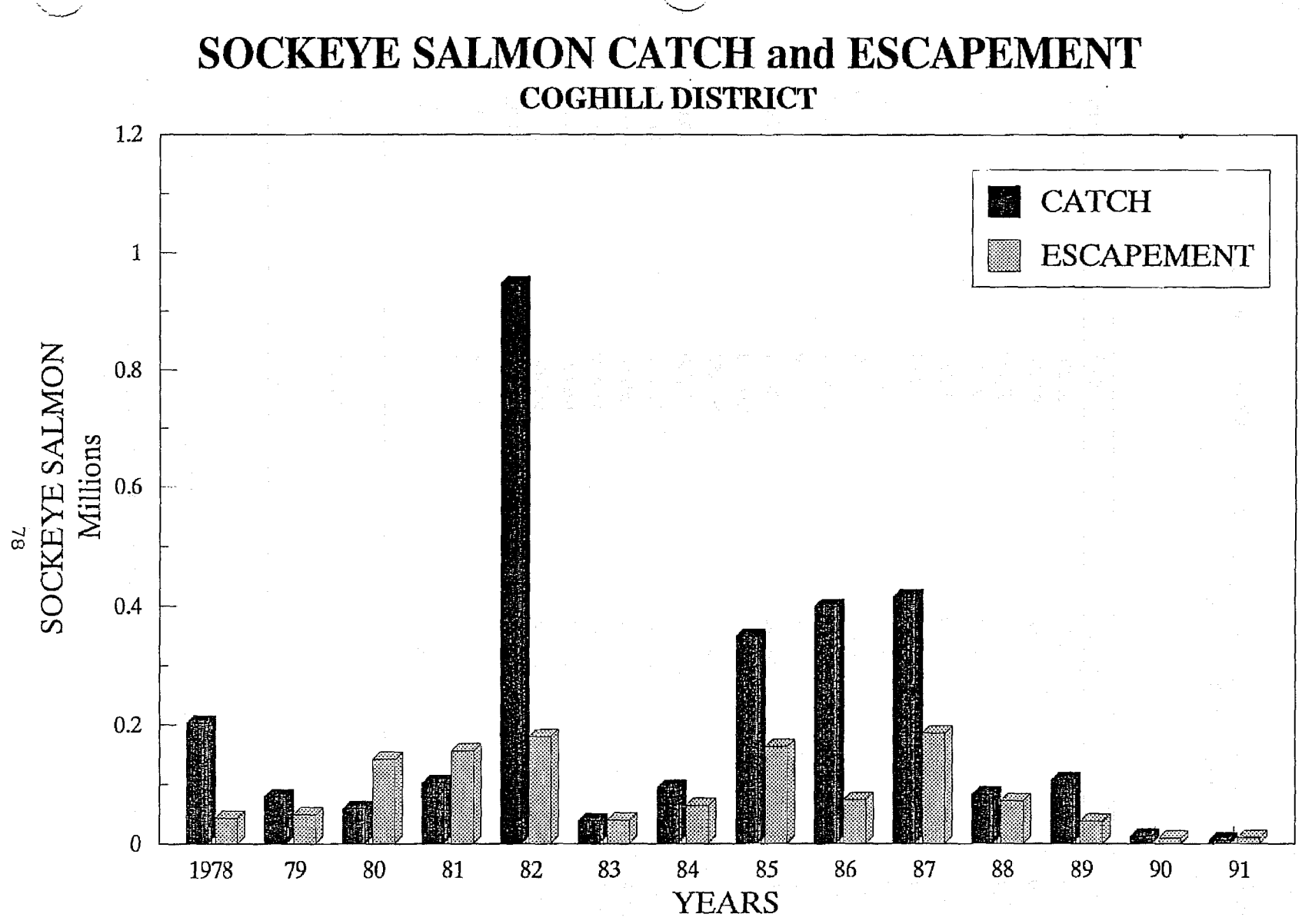
Appendix C.5. Anticipated and actual daily and cumulative sockeye salmon escapement at the Coghill weir, Prince William Sound, 1991.

Appendix C.6. Salmon escapement by species in the Coghill District, Prince WIlliam Sound, 1969 – 1991.

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
1991	9,752	98,580	6,070
20 Year Average (1971–1990)	71,544	177,358	25,537

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.



Appendix C.7. Sockeye salmon catch and escapement in the Coghill District, Prince William Sound, 1978 - 1991.

Appendix C.8. Estimated age and sex composition of the sockeye salmon escapement past the Coghill River weir, 1991.

		Brood Year and Age Group								
		1988		1987		1986		1985	1984	
		0.2	1.1	0.3	1.2	1.3	2.2	2.3	3.3	Total
Strata Combined:	06/20 – 07/27									
Sampling Dates:	07/01 – 07/26									
Sample Size:	1,413									
Female	Percent of Sample	0.2	0.0	0.4	4.6	36.8	0.2	2.1	0.0	44.2
	Number in Escapemei	16	0	35	443	3,566	19	204	4	4,287
Male	Percent of Sample	0.2	0.1	1.0	5.9	46.9	0.2	1.6	0.0	55.8
	Number in Escapemei	17	11	94	572	4,548	20	152	0	5,414
Total	Percent of Sample	0.3	0.1	1.3	10.5	83.6	0.4	3.7	0.0	100.0
	Number in Escapemei	32	11	129	1,015	8,114	40	356	4	9,701
	Standard Error	15	11	33	87	103	16	47	4	

Appendix C.9. Commercial salmon harvest by statistical week in the Unakwik District drift gill net and purse seine fisheries, P.W.S., 1991. The statistical weeks listed are for those that registered active fishing participation. For a listing of all fishing periods see Appendix C.12. [a]

				Chinook		Sockeye		Coho		Pink		Chum	
Date[b]	Stat Week	Permits	Landings	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
GEAR: DRIFT GILL NET													
06/22	25	8	13	1	12	666	4,352	0	0	0	0	0	0
06/29	26	11	13	0	0	758	4,829	0	0	1	4	0	0
07/06	27	4	5	6	68	531	3,715	0	0	2	8	23	161
07/13	28	8	16	2	34	1,977	12,471	0	0	1	3	9	90
07/20	29	4	8	3	28	357	2,424	0	0	6	29	26	259
07/27	30	1	1	1	7	97	548	0	0	0	0	44	157
08/03	31	1	1	0	0	21	120	0	0	4	14	0	0
08/10	32	2	3	0	0	54	324	2	20	431	1,294	11	100
08/17	33	2	2	0	0	21	105	9	60	11,854	29,997	5	30
Total		27	62	13	149	4,482	28,888	11	80	12,299	31,349	118	797
Average Weight					11.46		6.45		7.27		2.55		6.75
GEAR: PURSE SEINE													
07/13	28	1	2	0	0	332	2,184	0	0	0	0	0	0
08/10	32	14	14	0	0	484	2,628	0	0	118,044	286,934	36	292
08/17	33	1	1	0	0	3	11	3	18	3,024	9,072	43	298
Total		16	17	0	0	819	4,823	3	18	121,068	296,006	79	590
Average Weight							5.89		6.00		2.44		7.47
Combined Total		43	79	13	149	5,301	33,711	14	98	133,367	327,355	197	1,387
Average Weight					11.46		6.36		7.00		2.45		7.04

[a] The Unakwik District was opened on June 17 to two 24–hour periods per week. The weekly schedule was 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] Statistical week ending date.

Appendix C.10. Commercial salmon catch by species in the Unakwik District, Prince William Sound, 1975 – 1991.

Year	CATCH BY SPECIES Chinook	Sockeye	Coho	Pink	Chum	Total
GEAR : DRIFT GILL NET						
1975	4	11,922	0	84	70	12,080
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	10,386
1991	13	4,482	11	12,299	118	16,923
Ten Year Average (1981–90)	9	17,256	18	10,187	2,017	29,487
GEAR: PURSE SEINE						
1975 [a]						
1976	0	7	0	8,526	225	8,758
1977 [a]						0
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]						
1991	0	819	3	121,068	79	121,969
Ten Year Average (1981–90)	0	163	2	63,233	8,299	71,696
COMBINED GEARS						
1975	4	11,922	0	84	70	12,080
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	10,386
1991	13	5,301	14	133,367	197	138,892
Ten Year Average (1981–90)	9	17,371	19	54,450	7,826	79,674

[a] No catch recorded.

Appendix C.11. Estimated age and sex composition of sockeye salmon harvested in the Unakwik District commercial catch and sockeye salmon escapement to Miners Lake, Prince William Sound, 1991. Commercial catches include both drift gill net and purse seine.

		Brood Year and Age Group						
		1987		1986		1985		
		0.3	1.2	1.3	2.2	1.4	2.3	Total
COMMERICAL CATCH								
Stratum Dates:	06/16 - 08/24							
Sampling Dates:	06/22							
Sample Size:	329							
Female	Percent of Sample	0.3	0.9	29.2	0.0	0.3	0.6	31.3
	Number in Catch	16	48	1,547	0	16	32	1,660
Male	Percent of Sample	0.3	3.3	59.6	0.6	0.3	4.6	68.7
	Number in Catch	16	177	3,158	32	16	242	3,641
Total	Percent of Sample	0.6	4.3	88.8	0.6	0.6	5.2	100.0
	Number in Catch	32	226	4,705	32	32	274	5,301
	Standard Error	23	59	92	23	23	65	

		Brood Year and Age Group						
		1988	1987		1986		1985	
		1.1	1.2	2.1	1.3	2.2	2.3	Total
ESCAPEMENT TO MINERS LAKE[a]								
Stratum Dates:	07/13 - 09/14							
Sampling Dates:	08/09 - 08/11							
Sample Size:	340							
Female	Percent of Sample	0.0	2.6	0.0	47.1	0.0	2.9	52.6
	Number in Escapemei	0	54	0	960	0	60	1,074
Male	Percent of Sample	1.5	5.6	0.3	38.5	0.3	1.2	47.4
	Number in Escapemei	30	114	6	786	6	24	966
Total	Percent of Sample	1.5	8.2	0.3	85.6	0.3	4.1	100.0
	Number in Escapemei	30	168	6	1,746	6	84	2,040
	Standard Error	13	30	6	39	6	22	

[a] The escapement estimate is based on the peak count from periodic aerial surveys and represents an unknown fraction of the actual escapement.

Appendix C.12. Summary of periods, dates, hours open, and emergency orders issued for the commercial salmon fisheries in the Coghill and Unakwik districts, Prince William Sound, 1991.

Unakwik (229)			Coghill (223)			Emergency Orders Issued
Periods	Dates	Hours Open	Periods	Dates	Hours Open	
			1	6/13 – 6/14	24	2-F-E-26-91[a]
1	6/17 – 6/18	24				2-F-E-29-91[b]
						2-F-E-31-91[c]
2	6/20 – 6/21	24				2-F-E-34-91[d]
3	6/24 – 6/25	24				
4	6/27 – 6/28	24				2-F-E-37-91[e]
5	7/01 – 7/02	24				
6	7/04 – 7/05	24				
7	7/08 – 7/09	24				
8	7/11 – 7/12	24				
9	7/15 – 7/16	24				
10	7/18 – 7/19	24				
11	7/22 – 7/23	24	2	7/22 – 7/23	24	2-F-E-50-91[f]
12	7/25 – 7/26	24				
13	7/29 – 7/30	24				
14	8/01 – 8/02	24				
15	8/05 – 8/06	24	3	8/05 – 8/06	24	2-F-E-54-91[g]
16	8/08 – 8/09	24				
			4	8/10	12	2-F-E-55-91[h]
			5	8/12	12	2-F-E-56-91[h]
17	8/12 – 8/13	24				[i]
			6	8/14	12	2-F-E-57-91[h]
			7	8/15 – 8/17	64	2-F-E-58-91[j]
18	8/15 – 8/16	24				
19	8/19 – 8/20	24	8	8/18 – 8/24	168	
20	8/22 – 8/23	24				
21	8/26 – 8/27	24	9	8/25 – 8/31	168	2-F-E-64-91[k]
22	8/29 – 8/30	24				
23	9/02 – 9/03	24	10	9/01 – 9/07	168	
24	9/05 – 9/06	24				
25	9/09 – 9/10	24	11	9/08 – 9/14	168	
26	9/12 – 9/13	24				
			12	9/15 – 9/21	132	2-F-E-72-91[l]
27	9/16 – 9/17	24				
28	9/19 – 9/20	24				
29	9/23 – 9/24	24	13	9/22 – 9/28	156	
30	9/26 – 9/27	24				
			14–15	9/29 – 10/12	324	2-F-E-76-91[m]
31	9/30 – 10/01	24				
32	10/03 – 10/04	24				2-F-E-75-91[n]

–continued–

[a] The season was officially open beginning 8:00 p.m. on Thursday, June 13. 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] The Unakwik District opened to a weekly fishing 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.

[c] This emergency order reduced the weekly fishing schedule in the Esther Subdistrict to allow for increased brood stock collection at the Noerenberg hatchery. The 24 hour fishing period scheduled for Monday, June 17 did not occur.

[d] This emergency order eliminated the 24 hour fishing period that was scheduled for Thursday, June 20, in the Esther Subdistrict of the Coghill District. The Esther Subdistrict was closed until further notice to allow for increased brood stock collection at the Wally Noerenberg Hatchery.

[e] This emergency order established that gill nets with a mesh size of less than eight inches may not be more than 60 meshes in depth, and gill nets with a mesh size of eight inches or more may not be more than 40 meshes in depth.

[f] The Esther Subdistrict was open for a 24 hour period beginning at 8:00 a.m., Monday, July 22, and continuing until 8:00 a.m. Tuesday, July 23. The 60 mesh depth restriction was recinded for both the Coghill and Unakwik districts effective at 8:00 a.m. Monday, July 22, until further notice.

[g] Both the Unakwik District and Esther Subdistrict were open for 24 hours.

h The Esther Subdistrict was opened for 12 hours.

[i] The Unakwik District remained open after Tuesday, August 13, to the scheduled two 24 hour fishing periods per week, although there were no deliveries after Aug. 12.

[j] The Esther Subdistrict was opened for 12 hours on Thursday, August 15. The opening was then extended for continuous fishing until further notice.

[k] The entire Coghill District was opened to continuous fishing until further notice.

[l] The Esther Subdistrict was closed for 48 hours effective 12:00 noon, Friday, September 20 and reopened at 12:00 noon, Sunday, September 22.

[m] The Coghill District was closed for the season at 8:00 p.m. Oct. 12.

[n] The Unakwik District was closed for the season at 8:00 p.m. Oct. 4.

APPENDIX D

ESHAMY DISTRICT

Appendix D.1. Commercial salmon harvest by statistical week in the Eshamy District commercial drift gill net and set gill net fisheries, P.W.S., 1991. The statistical weeks listed are those with active fishing participation.

Date[a]	Stat Week	Permits	Landings	Chinook Numbers	Chinook Pounds	Sockeye Numbers	Sockeye Pounds	Coho Numbers	Coho Pounds	Pink Numbers	Pink Pounds	Chum Numbers	Chum Pounds
GEAR: DRIFT GILL NET													
06/15[b]	24	84	274	29	454	547	3,491	0	0	4	12	13,820	135,095
06/22[c]	25	148	650	39	669	11,712	73,917	3	14	157	616	46,595	417,181
06/29[d,e]	26	235	1,224	15	230	54,733	328,434	9	47	289	1,057	67,735	630,381
07/06[f]	27	220	890	8	118	60,311	358,279	7	57	267	995	26,818	258,455
07/13[g]	28	205	1,064	11	153	93,251	553,171	118	958	3,211	11,599	35,463	337,162
07/20[h]	29	164	486	1	10	26,743	154,959	47	399	2,285	8,026	7,489	71,617
07/27[h]	30	73	212	2	22	31,026	152,828	9	90	2,314	8,365	2,778	27,088
08/03	31	21	67	0	0	14,329	32,073	3	30	1,282	4,034	481	4,265
08/10	32	24	45	0	0	2,383	12,631	8	61	3,387	10,515	493	3,918
08/17	33	36	77	2	17	1,135	7,197	172	856	31,320	104,814	506	4,215
09/07[i,k]	36	4	5	0	0	64	414	92	829	0	0	5	51
Total		273	4,993	107	1,673	296,234	1,677,394	468	3,341	44,516	150,033	202,183	1,889,428
Average Weight					15.64		5.66		7.14		3.37		9.35
GEAR: SET GILL NET													
06/15[b]	24	28	164	32	479	450	2,799	1	3	0	0	4,230	42,919
06/22[c]	25	29	229	29	456	5,467	33,658	0	0	7	24	8,558	82,534
06/29[d,e]	26	29	256	5	81	19,419	116,673	3	24	18	71	10,564	107,465
07/06[f]	27	29	242	4	53	33,578	194,463	17	174	44	168	10,234	98,597
07/13[g]	28	27	268	2	35	51,177	292,527	7	60	273	893	9,560	90,453
07/20[h]	29	25	212	2	29	32,045	179,356	306	1,866	1,722	5,583	3,063	27,849
07/27[h]	30	18	164	2	23	28,813	137,165	1	12	4,459	13,888	1,546	14,428
08/03	31	14	63	0	0	8,537	31,986	1	9	3,303	10,179	791	6,698
08/10	32	10	63	0	0	2,684	14,560	4	27	4,445	12,745	592	4,987
08/17	33	9	54	0	0	1,371	8,934	2	15	5,804	19,670	254	2,233
09/07[i]	36	4	9	0	0	317	2,538	98	853	0	0	2	15
09/14[j]	37	2	6	0	0	107	869	60	530	0	0	0	0
09/21[k]	38	1	2	0	0	63	390	4	37	0	0	0	0
Total		29	1,732	76	1,156	184,028	1,015,918	504	3,610	20,075	63,221	49,394	478,178
Average Weight					15.21		5.52		7.16		3.15		9.68
Combined Total		302	6,725	183	2,829	480,262	2,693,312	972	6,951	64,591	213,254	251,577	2,367,606
Average Weight					15.46		5.61		7.15		3.30		9.41

[a] Statistical week ending date.

[b] The Main Bay Subdistrict was opened at 8:00 a.m. on June 10 to continuous fishing until further notice. The Alternating Gear Zone was open to 5-days per week fishing from 8:00 a.m. Monday until 8:00 a.m. Saturday. The Crafton Island Subdistrict opened to a weekly schedule of a two 24-hour fishing periods per week lasting 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.

[c] The fishing schedule for the Alternating Gear Zone was extended from 8:00 a.m. Monday June 10 until 7:59 a.m. Monday June 17 but resumed the five day per week schedule on June 17.

[d] The Alternating Gear Zone was closed effective 8:00 a.m. Thursday, June 27.

[e] From 12:00 noon Friday, June 28, and continuing until 11:59 p.m. July 7, all waters of the Main Bay Subdistrict were open including the 500 yard anadromous stream closures.

[f] The Crafton Island Subdistrict was closed effective Thurday, July 4.

[g] The Crafton Island Subdistrict was reopened to the weekly schedule of two 24-hour periods per week beginning at 8:00 a.m. Monday, July 8.

[h] The Terminal Harvest Area was closed at 8:00 a.m. Sunday, July 14 and opened again at 8:00 a.m. July 18. The 60 mesh depth restriction was rescinded at 8:00 a.m. Monday, July 22.

[i] The Crafton Island Subdistrict was opened to a fishing schedule of two 36-hour periods per week beginning at 8:00 a.m. Monday, September 2 and continuing until 8:00 p.m. Tuesday. The second period was from 8:00 a.m. Thursday until 8:00 p.m. Friday.

[j] Effective 8:00 a.m. Sunday, September 8, the Crafton Island Subdistrict was opened to continuous fishing.

[k] Effective 8:00 p.m. Friday, October 4, the entire Eshamy District was closed for the season.

Appendix D.2. Commercial salmon catch by species in the Eshamy District, Prince William Sound, 1977 – 1991.

Year [a]	CATCH BY SPECIES Chinook	Sockeye	Coho	Pink	Chum	Total
GEAR: 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
1991						
Ten Year Average (1981–90)	31	12,795	237	136,166	71,122	220,351
GEAR: 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
1991	76	184,028	504	20,075	49,394	254,077
Ten Year Average (1981–90)	29	8,993	203	165,464	35,385	210,073
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
1991	183	480,262	972	64,591	251,577	797,585
Ten Year Average (1981–90)	60	21,787	440	301,630	106,507	430,424

[a] Fishing was closed during the following years: 1975, 1976, 1978, 1979, 1981 and 1982.

[b] Fishing was closed due to oil contamination on the beaches.

Appendix D.3. Daily salmon escapement through the Eshamy Lake weir, Prince William Sound, 1991.

	Sockeye[a]		Pink[b]		Chum		Coho	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
06/26	2	2	0	0	0	0	0	0
06/27	0	2	0	0	0	0	0	0
06/28	0	2	0	0	0	0	0	0
06/29	0	2	0	0	0	0	0	0
06/30	0	2	0	0	0	0	0	0
07/01	1	3	0	0	0	0	0	0
07/02	0	3	0	0	0	0	0	0
07/03	1	4	0	0	0	0	0	0
07/04	43	47	0	0	0	0	0	0
07/05	29	76	0	0	0	0	0	0
07/06	30	106	0	0	1	1	0	0
07/07	31	137	0	0	0	1	0	0
07/08	22	159	0	0	0	1	0	0
07/09	21	180	0	0	0	1	0	0
07/10	20	200	0	0	0	1	0	0
07/11	42	242	0	0	0	1	0	0
07/12	49	291	0	0	0	1	0	0
07/13	78	369	0	0	0	1	0	0
07/14	45	414	1	1	0	1	0	0
07/15	0	414	0	1	0	1	0	0
07/16	75	489	0	1	0	1	0	0
07/17	40	529	0	1	0	1	0	0
07/18	36	565	1	2	0	1	0	0
07/19	191	756	0	2	0	1	0	0
07/20	57	813	1	3	0	1	0	0
07/21	168	981	0	3	0	1	0	0
07/22	82	1,063	1	4	0	1	0	0
07/23	112	1,175	7	11	0	1	0	0
07/24	502	1,677	7	18	1	2	0	0
07/25	451	2,128	7	25	0	2	0	0
07/26	439	2,567	6	31	0	2	0	0
07/27	285	2,852	12	43	0	2	0	0
07/28	371	3,223	9	52	0	2	0	0
07/29	40	3,263	1	53	0	2	0	0
07/30	477	3,740	13	66	0	2	0	0
07/31	1,012	4,752	135	201	1	3	0	0
08/01	1,203	5,955	168	369	0	3	1	1
08/02	976	6,931	82	451	0	3	0	1
08/03	1,167	8,098	97	548	1	4	0	1
08/04	968	9,066	39	587	1	5	0	1
08/05	437	9,503	36	623	0	5	1	2
08/06	967	10,470	68	691	0	5	0	2
08/07	654	11,124	151	842	1	6	0	2
08/08	932	12,056	154	996	0	6	0	2
08/09	1,011	13,067	237	1,233	0	6	1	3
08/10	355	13,422	88	1,321	0	6	1	4
08/11	422	13,844	193	1,514	0	6	0	4
08/12	550	14,394	176	1,690	0	6	0	4
08/13	448	14,842	474	2,164	0	6	0	4
08/14	3,544	18,386	323	2,487	0	6	4	8
08/15	1,410	19,796	206	2,693	0	6	1	9
08/16	1,704	21,500	466	3,159	0	6	4	13
08/17	3,278	24,778	597	3,756	0	6	15	28
08/18	2,396	27,174	1,144	4,900	0	6	33	61
08/19	2,230	29,404	892	5,792	0	6	25	86
08/20	1,253	30,657	1,172	6,964	0	6	8	94
08/21	1,091	31,748	724	7,688	0	6	1	95
08/22	164	31,912	884	8,572	0	6	1	96
08/23	524	32,436	2,506	11,078	1	7	1	97
08/24	569	33,005	1,453	12,531	1	8	0	97

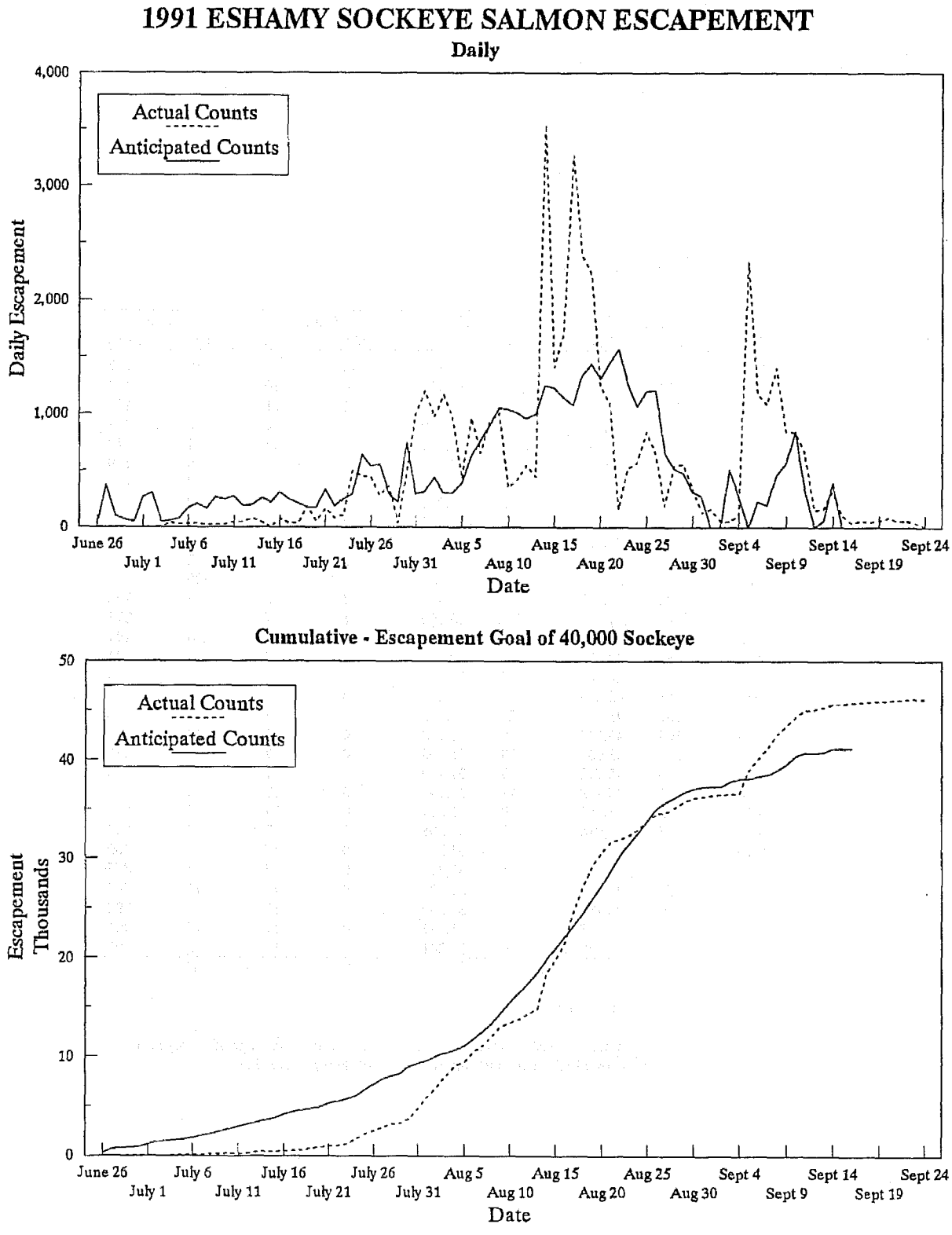
–continued–

Appendix D.3. (page 2 of 2)

	Sockeye[a]		Pink[b]		Chum		Coho	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
08/25	844	33,849	2,367	14,898	2	10	10	107
08/26	655	34,504	1,532	16,430	0	10	8	115
08/27	191	34,695	1,134	17,564	1	11	1	116
08/28	544	35,239	1,116	18,680	1	12	2	118
08/29	559	35,798	1,551	20,231	0	12	1	119
08/30	348	36,146	2,271	22,502	0	12	0	119
08/31	136	36,282	1,593	24,095	0	12	0	119
09/01	161	36,443	855	24,950	0	12	0	119
09/02	57	36,500	612	25,562	0	12	0	119
09/03	54	36,554	1,344	26,906	1	13	0	119
09/04	109	36,663	962	27,868	0	13	2	121
09/05	2,343	39,006	871	28,739	1	14	123	244
09/06	1,182	40,188	674	29,413	2	16	18	262
09/07	1,085	41,273	783	30,196	1	17	13	275
09/08	1,405	42,678	324	30,520	0	17	219	494
09/09	850	43,528	277	30,797	0	17	130	624
09/10	840	44,368	125	30,922	0	17	106	730
09/11	658	45,026	155	31,077	0	17	65	795
09/12	151	45,177	55	31,132	0	17	17	812
09/13	169	45,346	15	31,147	0	17	14	826
09/14	322	45,668	18	31,165	0	17	19	845
09/15	104	45,772	15	31,180	0	17	5	850
09/16	37	45,809	11	31,191	0	17	2	852
09/17	59	45,868	10	31,201	0	17	7	859
09/18	48	45,916	7	31,208	0	17	4	863
09/19	61	45,977	5	31,213	0	17	6	869
09/20	88	46,065	5	31,218	0	17	6	875
09/21	58	46,123	9	31,227	0	17	11	886
09/22	60	46,183	5	31,232	0	17	4	890
09/23	40	46,223	9	31,241	0	17	14	904
09/24	6	46,229	0	31,241	0	17	3	907
Totals	46,229		31,241		17		907	

[a]Count includes 681 sockeye jacks.

[b]Count may be incomplete. The Eshamy weir is designed to prohibit the passage of sockeye salmon and some pink salmon are able to pass uncounted because of their smaller size.



Appendix D.4. Anticipated and actual daily and cumulative sockeye salmon escapement at the Eshamy weir, Prince William Sound, 1991.

Appendix D.5. Salmon escapement by species at the Eshamy weir, Prince William Sound, 1967 – 1991.

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	1	57,106 [g]	0	6,283	210	63,600
1990		14,191 [h]	43	2,209	5	16,448
1991	2	46,229 [i]	907	31,241	17	78,396
20 Year Average (1971–1990)	1	18,673	145	5,142	23	22,866

[a]Incidental passage of salmon other than sockeye were not recorded for each year.

[b]Probably inaccurate because of holes in weir. Actual escapement is estimated to be at least 3,000.

[c]Assuming the run was 90 percent complete, an additional 2,600 sockeye are estimated to have escaped following weir removal.

[d]An estimated 270 sockeye below the weir when pulled is included in the total count.

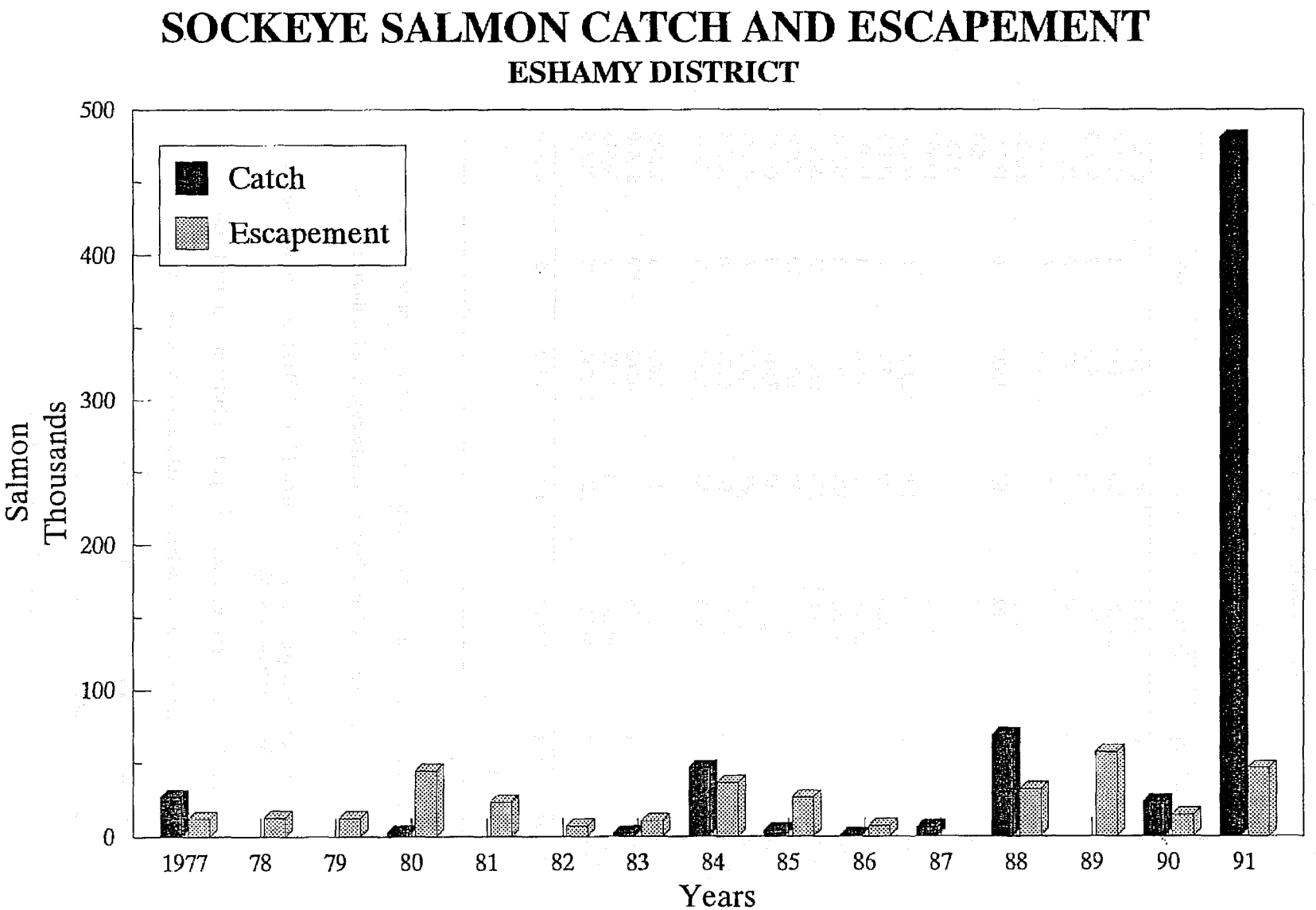
[e]An estimated 25 sockeye below the weir at removal are included in the total count.

[f] The Eshamy weir was not in operation during 1987.

[g]Total does not include 126 jacks counted through.

[h]Total does not include 286 sockeye jacks counted through.

[i]Count includes 681 jacks.



Appendix D.6. Sockeye salmon catch and escapement, Eshamy District, Prince William Sound, 1977 - 1991.

Appendix D.7. Estimated age and sex composition of sockeye salmon harvested in the Eshamy District common property commercial gill net fisheries, Prince William Sound, 1991.

		Brood Year and Age Group										
		1989		1988		1987		1986		1985		
		0.1	1.0	0.2	1.1	0.3	1.2	1.3	2.2	1.4	2.3	Total
Stratum Dates: 06/09 – 07/20 Sampling Dates: 06/15 – 07/19 Sample Size: 2,348												
Female	Percent of Sample	0.0	0.0	2.5	0.1	0.1	35.9	3.2	0.2	0.0	0.1	42.1
	Number in Catch	0	0	9,620	332	498	139,652	12,439	829	166	332	163,867
Male	Percent of Sample	0.0	0.0	0.8	0.8	0.0	40.2	2.3	0.1	0.0	0.2	44.5
	Number in Catch	0	0	2,985	3,151	0	156,735	9,122	498	0	829	173,321
Total	Percent of Sample	0.0	0.0	3.4	1.0	0.1	88.7	6.0	0.3	0.0	0.3	100.0
	Number in Catch	0	0	13,434	3,981	498	345,315	23,386	1,327	166	1,327	389,433
	Standard Error	0	0	1,467	809	287	2,548	1,910	468	166	468	
Stratum Dates: 07/21 – 09/07 Sampling Dates: 07/25 – 07/31 Sample Size: 746												
Female	Percent of Sample	2.0	0.1	2.8	11.0	0.1	18.2	0.3	0.0	0.0	0.0	34.6
	Number in Catch	1,826	122	2,557	9,984	122	16,559	244	0	0	0	31,413
Male	Percent of Sample	10.1	0.8	1.1	44.5	0.1	7.9	0.8	0.1	0.0	0.0	65.4
	Number in Catch	9,132	731	974	40,423	122	7,184	731	122	0	0	59,416
Total	Percent of Sample	12.1	0.9	3.9	55.5	0.3	26.1	1.1	0.1	0.0	0.0	100.0
	Number in Catch	10,958	852	3,531	50,406	244	23,742	974	122	0	0	90,829
	Standard Error	1,084	321	643	1,654	172	1,462	343	122	0	0	
Strata Combined: 06/09 – 09/07 Sampling Dates: 06/15 – 07/31 Sample Size: 3,094												
Female	Percent of Sample	0.4	0.0	2.5	2.1	0.1	32.5	2.6	0.2	0.0	0.1	40.7
	Number in Catch	1,826	122	12,177	10,316	619	156,211	12,683	829	166	332	195,280
Male	Percent of Sample	1.9	0.2	0.8	9.1	0.0	34.1	2.1	0.1	0.0	0.2	48.5
	Number in Catch	9,132	731	3,959	43,574	122	163,919	9,853	619	0	829	232,737
Total	Percent of Sample	2.3	0.2	3.5	11.3	0.2	76.8	5.1	0.3	0.0	0.3	100.0
	Number in Catch	10,958	852	16,965	54,387	741	369,057	24,360	1,449	166	1,327	480,262
	Standard Error	1,084	321	1,602	1,841	335	2,938	1,940	484	166	468	

Appendix D.8 Estimated age and sex composition of the sockeye salmon escapement through the weir at the head of Eshamy Lagoon and the estimated age composition of the Main Bay Hatchery brood stock, 1991.

			Brood Year and Age Group								
			1989	1988		1987		1986		1985	
			0.1	0.2	1.1	1.2	2.1	1.3	2.2	2.3	Total
ESHAMY ESCAPEMENT											
Strata Combined:	07/03 –	09/24									
Sampling Dates:	07/21 –	08/28									
Sample Size:	1,552										
Female	Percent of Sample		0.0	0.1	0.0	42.9	0.0	3.9	4.2	0.9	51.9
	Number in Escapement		0	31	0	19,838	0	1,789	1,919	425	24,002
Male	Percent of Sample		0.1	0.1	1.0	38.4	0.4	3.6	4.0	0.5	48.1
	Number in Escapement		53	53	476	17,728	191	1,646	1,864	210	22,224
Total	Percent of Sample		0.1	0.2	1.0	81.3	0.4	7.4	8.2	1.4	100.0
	Number in Escapement		53	85	476	37,566	191	3,435	3,783	636	46,226
	Standard Error		53	62	148	468	97	205	391	91	
MAIN BAY BROOD STOCK[a,b]											
Strata Combined:	07/13 –	09/09									
Sampling Dates:	07/13 –	09/09									
Sample Size:	1167[d]										
Total	Percent of Sample		0.0	0.0	83.7	16.3	0.0	0.0	0.0	0.0	100.0
	Number in Escapement		0	0	24,693	4,821	0	0	0	0	29,514
	Standard Error[e]		0	0	0	0	0	0	0	0	

[a]Main Bay brood stock age composition was determined from preliminary coded–wire tag contributions by brood year.

[b]Not included in the escapement total are 5,000 jacks and 300 adults that Prince William Sound Aquaculture Association estimated to remain in the bay.

[c]Sample size is the number of coded–wire tags recovered.

[e]The standard error is zero because essentially all fish in the escapement were examined for coded–wire tags.

Appendix D.9. Summary of periods, dates, hours open, and emergency orders issued for the commercial salmon fisheries in the Eshamy District, Prince William Sound, 1991.

Main Bay Subdistrict (225–21)			Alternating Gear Zone (of the Main Bay Subdistrict)			Crafton Island Subdistrict (225–10, 20, 30)			Emergency Orders Issued
Periods	Dates	Hours Open	Periods	Dates	Hours Open	Periods	Dates	Hours Open	
1	6/10 – 6/15	136	1	6/10 – 6/15	136	1	6/10 – 6/11	24	2–F–E–26–91 [a]
						2	6/13 – 6/14	24	
2	6/16 – 6/22	168	2	6/16 – 6/22	144				2–F–E–29–91 [b]
						3	6/17 – 6/18	24	
						4	6/20 – 6/21	24	
			3	6/24 – 6/27	72				2–F–E–37–91 [c]
3	6/23 – 6/29	168							2–F–E–38–91 [d]
						5	6/24 – 6/25	24	
						6	6/27 – 6/28	24	
4	6/30 – 7/06	168							
5	7/07 – 7/13	168				7	7/01 – 7/02	24	2–F–E–40–91 [e]
						8	7/08 – 7/09	24	2–F–E–41–91 [f]
						9	7/11 – 7/12	24	
6	7/14 – 7/20	168							2–F–E–45–91 [g]
						10	7/15 – 7/16	24	
7–17	7/21 – 10/04	1,816							2–F–E–48–91 [g]
			7–17	7/22 – 10/04	1,784				2–F–E–50–91 [g]
						11	9/02 – 9/03	36	2–F–E–64–91 [h]
						12	9/05 – 9/06	36	
						13–16	9/08 – 10/04	632	2–F–E–68–91 [i]
									2–F–E–75–91 [j]

[a] The Main Bay Subdistrict was opened at 8:00 a.m. on June 10 to continuous fishing until further notice. The Alternating Gear Zone was open to 5–days per week fishing from 8:00 a.m. Monday until 8:00 a.m. Saturday. The Crafton Island Subdistrict opened to a weekly schedule of a two 24–hour fishing periods per week lasting 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] The fishing schedule for the Alternating Gear Zone was extended from 8:00 a.m. Monday June 10 until 7:59 a.m. Monday June 17 but resumed the five day per week schedule on June 17.

[c] The Alternating Gear Zone was closed effective 8:00 a.m. Thursday, June 27.

[d] From 12:00 noon Friday, June 28, and continuing until 11:59 p.m. July 7, all waters of the Main Bay Subdistrict were open including the 500 yard anadromous stream closures.

[e] The Crafton Island Subdistrict was closed effective Thursday, July 4.

[f] The Crafton Island Subdistrict was reopened to the weekly schedule of two 24–hour periods per week beginning at 8:00 a.m. Monday, July 8.

[g] The Terminal Harvest Area was closed at 8:00 a.m. Sunday, July 14 and opened again at 8:00 a.m. July 18. The 60 mesh depth restriction was rescinded at 8:00 a.m. Monday, July 22. The AGZ reopened to continuous fishing at 8:00 a.m., Monday, July 22.

[h] The Crafton Island Subdistrict was opened to a fishing schedule of two 36–hour periods per week beginning at 8:00 a.m. Monday, September 2 and continuing until 8:00 p.m. Tuesday. The second period was from 8:00 a.m. Thursday until 8:00 p.m. Friday.

[i] Effective 8:00 a.m. Sunday, September 8, the Crafton Island Subdistrict was opened to continuous fishing.

[j] Effective 8:00 p.m. Friday, October 4, the entire Eshamy District was closed for the season.

APPENDIX E

PRINCE WILLIAM SOUND

PURSE SEINE DISTRICTS

Appendix E.1. Prince William Sound commercial purse seine salmon harvest by day, 1991. Includes the common property commercial catch of salmon from all districts open to purse seines: Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague, and Southeastern districts.

Catch Date	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
			Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
07/03[a]	187	191	82	859	306	1,829	57	405	498,440	1,352,039	4,078	28,031
07/08[a,b]	–	–	0	0	161	962	0	0	0	0	0	0
07/09	–	–	0	0	171	1,222	0	0	0	0	0	0
07/11[a]	–	–	0	0	0	0	0	0	5,114	14,320	0	0
07/13[a]	25	33	5	76	99	580	5	28	396,315	1,043,560	758	6,978
07/15[a]	103	103	11	157	235	1,352	16	115	380,319	1,006,107	1,792	16,352
07/17[c]	152	154	5	75	58	357	9	63	376,662	994,597	493	4,383
07/20[d]	155	158	17	190	95	625	14	86	389,521	1,040,685	737	6,747
07/22[c,d,e]	145	150	4	58	331	2,049	18	137	472,718	1,290,550	1,281	11,419
07/23[e]	13	13	7	75	873	5,219	53	343	10,685	30,931	1,515	13,129
07/24[c,d]	103	103	2	15	43	289	20	135	102,544	293,674	644	5,663
08/05[f,g]	123	126	1	5	453	2,622	61	496	519,697	1,401,855	1,761	14,585
08/06[f,g]	180	186	3	31	999	5,979	247	2,027	869,037	2,253,301	3,527	30,031
08/09	14	14	0	0	484	2,628	0	0	118,044	286,934	36	292
08/10[f,g]	244	267	4	50	1,232	7,297	268	2,086	2,030,952	5,166,411	3,738	31,748
08/12[g,h,i]	235	328	4	45	2,845	17,678	1,028	7,608	3,541,080	9,075,954	3,856	34,191
08/13	–	–	0	0	3	11	3	18	3,024	9,072	43	298
08/14[j,k]	116	151	1	16	572	3,729	139	1,079	1,569,283	4,038,019	817	7,094
08/15[j,l]	211	280	2	21	2,536	15,359	598	4,729	3,704,746	9,666,111	1,645	14,089
08/16	35	50	0	0	303	1,767	82	480	431,883	1,133,883	118	846
08/17[l]	137	149	0	0	698	4,443	230	1,838	1,629,077	4,086,317	833	6,539
08/18	95	105	1	6	631	3,785	258	1,917	1,162,219	2,890,502	766	5,416
08/19[l]	163	186	1	5	1,144	6,920	518	4,018	1,976,832	5,034,139	765	5,979
08/20	89	102	0	0	360	2,296	307	2,586	1,058,719	2,651,168	235	1,803
08/21[l]	133	151	0	0	943	5,672	947	7,672	1,534,516	3,765,528	251	1,842
08/22	90	101	0	0	503	3,110	759	6,167	905,720	2,180,797	192	1,475
08/23[l]	110	132	1	8	802	4,943	675	5,732	1,194,654	3,024,904	278	2,292
08/24	36	40	1	7	642	3,903	888	6,630	449,885	1,132,096	143	1,115
08/25[m]	35	38	0	0	470	2,704	594	4,932	443,345	1,066,491	159	1,238
08/26	22	25	1	5	140	859	278	2,239	260,890	617,127	14	127
08/27	17	19	0	0	251	1,484	411	3,513	246,500	619,380	27	214
08/28	11	11	0	0	121	740	294	2,427	174,663	424,724	12	104
08/29[n]	10	14	0	0	192	1,036	212	1,873	125,278	305,949	299	2,401
08/30	3	4	2	22	3	16	1,291	11,631	2,628	6,538	1,019	9,434
08/31	–	–	0	0	0	0	55	500	0	0	5	40
09/01	5	5	1	6	4	24	2,576	21,891	42	98	173	1,564
09/02	–	–	0	0	0	0	20	180	0	0	5	44
09/03	–	–	0	0	1	4	408	3,675	2	7	56	501
Total	253	3,389	156	1,732	18,704	113,493	13,339	109,256	26,585,034	67,903,768	32,071	268,004
Average Weight				11.10		6.07		8.19		2.55		8.36

–Continued–

[a] Open waters included Valdez Arm north of 60°57.6' N. lat., and the waters of Port Valdez west of 146°30.5' W. long., excluding the following: all waters: of Jack Bay east of a line from 61° 02.15' N. lat., 146° 39.65' W. long. to 61° 03.0' N. lat., 146° 39.1' W. long.,; all waters of Galena Bay east of a line from Rocky Point at 60° 57.6' N. lat., 146° 45.0" W. long. to 60 58.1' N. lat., 146° 43.1' W. long.; all waters of Sawmill Bay west of a line from 61° 02.6' N. lat., 146° 46.90' W. long. to 61° 02.6' N. lat, 146° 45.9' W. long.

[b] There was a 12 hour period scheduled for Monday, July 8. Due to a fishery boycott no landings were reported for that date for the Eastern District. The Unakwik District was opened on June 17 to two 24–hour periods per week. The weekly schedule was 8:00 a.m Monday until 8:00 a.m. Tuesday and from 8:00 p.m. Thursday until 8:00 p.m Friday.

[c] Open waters included Port Valdez east of a line from Entrance Point to Potatoe Point excluding all closed waters in 5 AAC 24. 350 (14), all 500 yard anadromous stream closures, and the VFDA Special Harvest Area at Solomon Gulch.

[d] A portion of Port Valdez and all waters of Boulder Bay inside of a line from a point at 60° 51.75' N. lat., 146° 39.65' W. long. to a point at 60° 50.95' N. lat., 146° 38.0' W. longitude were open to fishing.

[e] Open waters included the Esther Subdistrict except for the Special Harvest Area in Lake Bay and all anadromous stream closures.

[f] Open waters included all waters of Unakwik Inlet north of a line from a point located on the east shore at 60°54.5' N. latitude to a point on the west shore 60°54.1' north latitude, and south of a line from a point on the east shore at 60°59.5' N. lat., 147°31.5 W. longitude to a point on the west shore at 60°57.5' N. latitude, 147°36.5' W. longitude. Excluding all 500 yard anadromous stream closures. Open waters included the Port San Juan Subdistrict excluding the closed waters of Sawmill Bay, the A.F.K Special Harvest Area, and all 500 yard anadromous stream closures.

[g] Open waters included the Esther Subdistrict excluding all waters of Lake and Quillion Bays inside of a line from Hodgkin Point to Esther Light and all 500 yard anadromous stream closures.

[h] Open waters included all waters of the Northern District excluding the Perry Island Subdistrict, the waters of Unakwik Inlet north of a line from 60°54.5' N. lat., to 60°54.1' N. lat., the waters of Eaglek Bay north of a line from 60°50.7' N. lat., 147°40.15' W. longitude, to 60°50.6' N. lat. 147°44.45' W. long. and the remaining waters of the Northern District north of 60°55.0'N. latitude.

[i] Open waters included the Southwestern District south of the latitude of 60°15.5' N. lat. (Dual Head) excluding the Elrington Subdistrict and the Port San Juan Subdistrict and all regulatory closed waters.

[j] Open waters included all waters of Unakwik Inlet north of a line from a point located on the west shore at 60°54.5' N. latitude to a point on the west shore at 60°54.1 north latitude, and south of a line from a point on the east shore at 60°01.0 N lat., 147°33.0 W. longitude to a point on the west shore at 60°57.7 N latitude, 147°36.5 W. longitude. On 8/15/1991 at 8:00 p.m. this area was opened to continuous fishing. Waters within 50 feet of the Cannery Creek Hatchery barrier seine were closed. Open waters included all waters of the Esther Subdistrict including all waters of Lake and Quillion Bays. On 8/15 these waters were open to continuous fishing. Waters within 50 feet of the barrier seine in Lake Bay were closed.

[k] Open waters included the Port San Juan Subdistrict and Elrington Subdistrict including waters of Sawmill Bay except that commercial fishing was closed within 50 feet of the hatchery brood stock barrier seine.

[l] Open waters on 8/15, 8/17, 8/19, 8/21, and 8/23 included the Southwestern District south of the latitude of 60° 15.7' N. latitude (Dual Head) including the Elrington Subdistrict and the Port San Juan Subdistrict. This included the waters of Sawmill Bay except that commercial fishing was closed within 50 feet of the hatchery barrier seine. Effective at 8:00 p.m. on 8/15 all waters of the Port San Juan Subdistrict and Elrington Subdistrict including waters of Sawmill Bay were open to continuous fishing until further notice.

[m] Open waters included the Southwestern District including the A.F.K. hatchery special harvest area and sanctuary, except waters within 50 feet of the barrier seine and 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 148° 04.0' W. longitude, 60° 16.5' N. latitude to the northernmost tip of Chenega Island at 148° 0.0' W. longitude, 60°23.3' N. latitude and waters within one nautical mile of the mainland shore from the southern boundary of the Eshamy District to 148° 0.0' W. longitude. Effective 8:00 a.m. Sunday, August 25, all waters were open in the Eastern District (excluding the waters of Port Valdez east of 146° 30.5' W. long.) to continuous fishing until further notice.

[n] On 8/29 in the Esther Subdistrict: the Special Harvest Area was closed to fishing, the Sanctuary area remained open until closed to purse seines at 12:00 noon September 22. Effective 8:00 a.m. August 29, and continuing until further notice the Northern District excluding the Cannery Creek Special Harvest Area was opened to continuous fishing.

Appendix E.2. Commercial salmon harvest by species, all gear and districts combined, Prince William Sound, 1971 – 1991.[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	13,909,755
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
1991	445	507,815	145,311	37,134,311	331,906	38,119,788
Ten Year Average (1981–90)	810	361,465	64,525	22,055,012	1,411,279	23,893,090

[a] Includes purse seine, drift gill net and set gill net catches from all P.W.S. fishing districts; Eastern, Northern, Unakwik, Coghill, Northwestern, Eshamy, Southwestern, Montague and Southeastern. Also includes hatchery sales harvests, confiscated fish, donated and discarded fish catch, the surimi study fish, and the educational special use permit catches.

[b] General purse seine season closed.

Appendix E.3. Commercial pink salmon harvest for all gear types, by district, Prince William Sound, 1969–1991. 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, discarded, donated, educational, confiscated and test fish harvests.

	DISTRICT								
Year	Eastern	Northern	Coghill	Northwestern	Eshamy	Southwestern	Montague	Southeastern	Total
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	146,778	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	118,467	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	77,104	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	1,347,413	4,160,925	15,333,312
1980	3,140,134	1,271,177	134,876	306,109	0	7,507,776	950	1,271,389	13,632,411
1981	4,797,583	1,194,621	34,155	46,874		10,371,220	278,879	3,221,268	19,944,600
1982	2,959,601	2,331,903	1,000,524	520,972	3,997	10,801,771	6,444	747,116	18,372,328
1983	2,430,063	1,021,345	273,131	714,522		5,957,068	158,241	1,482,013	12,036,383
1984	4,525,029	2,194,904	996,483	1,412,822	544,082	10,197,349	11,587	1,245,042	21,127,298
1985	6,715,143	1,002,872	523,773	527,132	58,183	10,843,752	1,448,809	2,733,562	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	955,988	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	[c]	[c]	[c]	73,177	13,795,415
1990	7,970,364	5,482,585	2,692,788	891,444	534,951	17,811,479	10,658	12,325	35,406,594
1991	2,617,222	4,150,612	2,211,575	0	64,591	17,849,425	0	0	26,893,425
10 year Average (1981–90)	4,248,329	2,334,355	1,417,157	533,913	225,438	9,111,054	253,204	1,061,954	19,089,675

[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. Commercial catch and aerial escapement indices for pink and chum salmon by district, Prince William Sound, 1991.

PINK SALMON (ODD CYCLE)

District	Odd Cycle Desired Escapement Range			1965–89 Mean Index	Observed Escapement Index[a]	Deviation From Mean
Eastern	379,895	–	464,316	422,105	474,380	12.4%
Northern/Unakwik	115,540	–	141,216	128,378	165,930	29.3%
Coghill	160,063	–	195,633	177,848	98,580	−44.6%
Northwestern	75,040	–	91,716	83,378	101,320	21.5%
Eshamy	5,085	–	6,215	5,650	18,800	232.7%
Southwestern	104,557	–	127,791	116,174	197,095	69.7%
Montague	146,180	–	178,664	162,422	247,890	52.6%
Southeastern	299,803	–	366,425	333,114	533,170	60.1%
Total	1,286,162	–	1,571,976	1,429,069	1,837,165	28.6%

CHUM SALMON

District	Desired Escapement Range			1965–90 Mean Index	Observed Escapement Index[a]	Deviation From Mean
Eastern	85,195	–	104,127	94,661	86,360	−8.8%
Northern/Unakwik	39,398	–	48,153	43,775	19,080	−56.4%
Coghill	20,028	–	24,478	22,253	6,070	−72.7%
Northwestern	12,518	–	15,300	13,909	8,960	−35.6%
Eshamy	26	–	32	29	0	−100.0%
Southwestern	1,619	–	1,979	1,799	2,800	55.6%
Montague	2,530	–	3,092	2,811	925	−67.1%
Southeastern	14,689	–	17,953	16,321	9,203	−43.6%
Total	176,002	–	215,114	195,558	133,398	−31.8%

[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 – 1991. Historical data revised in 1989.

	PINK SALMON ESCAPEMENTS[a]									Hatchery		Common Property	
Year	Eastern	Northern	Coghill	Northwest	Eshamy	Southwest	Montague	Southeastern	Total	Sales	Brood	Catch[b]	Total Run[c]
1965	257,853	59,820	91,584	159,011	9,340	65,380	77,042	255,926	975,956			2,460,471	3,436,427
66	544,980	288,710	135,440	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	2,780,073	4,203,792
79	642,220	200,730	70,980	124,020	0	231,300	219,400	728,630	2,217,280	223,761	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	270,745	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	379,178	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	563,431	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	458,513	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	358,806	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	28,254,589
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	12,771,529
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	31,544,627
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	13,126,476
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	24,152,769
1990	443,660	131,580	49,110	115,870	17,870	150,100	113,572	304,090	1,325,852	8,732,658	1,158,160	35,430,821	46,647,491
91	474,380	165,930	98,580	101,320	18,800	197,095	247,890	533,170	1,837,165	5,955,561	1,317,761	31,178,750	40,289,237
EVEN CYCLE AVG. (1966–88)													
AVG.	471,595	206,947	136,124	133,885	8,919	144,880	73,281	244,249	1,419,880	1,935,404	473,122	9,524,556	12,277,729
ODD CYCLE AVG. (1965–89)													
Avg.	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

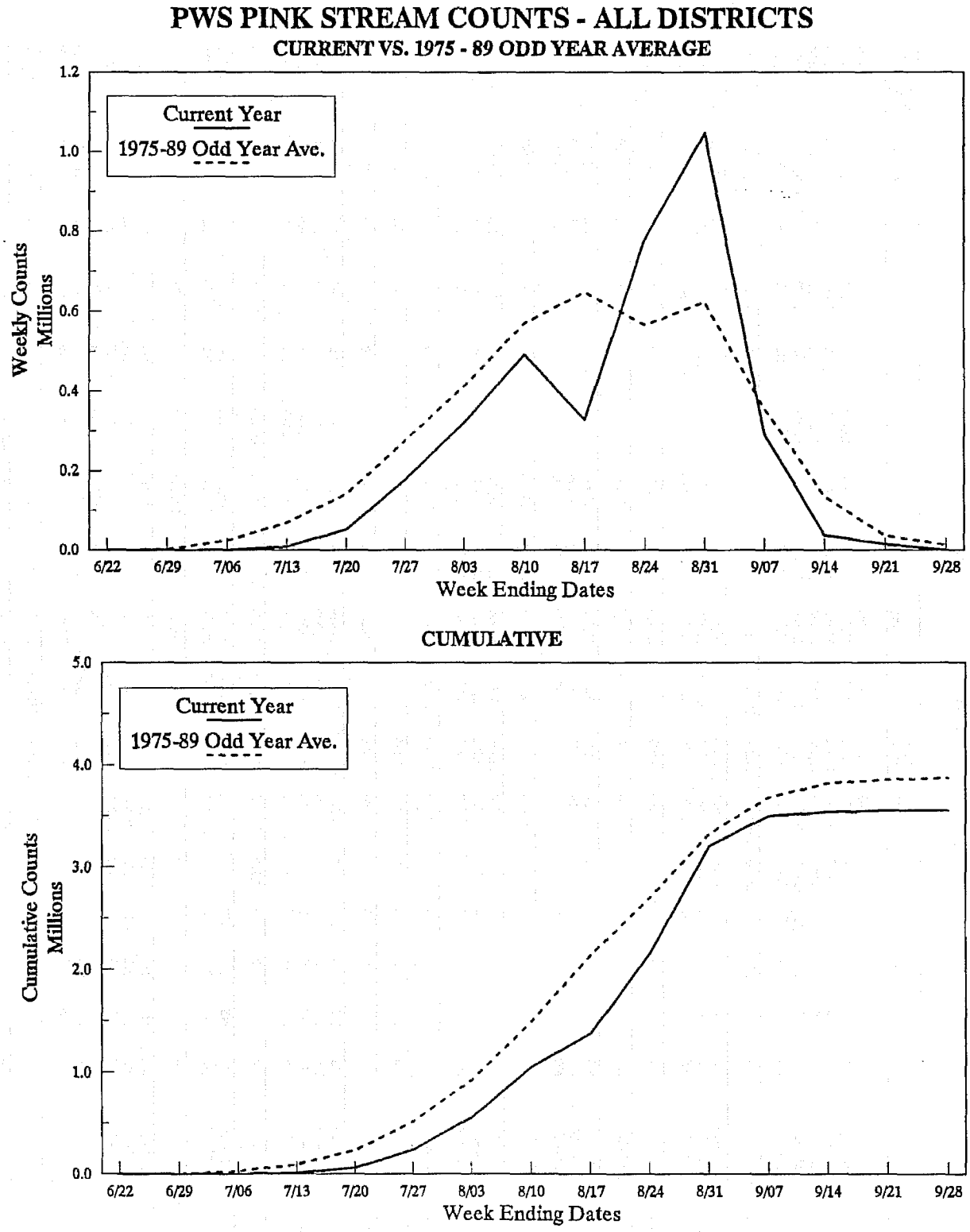
[a]Coghill and Northwestern escapement figures correspond to current district boundaries.

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

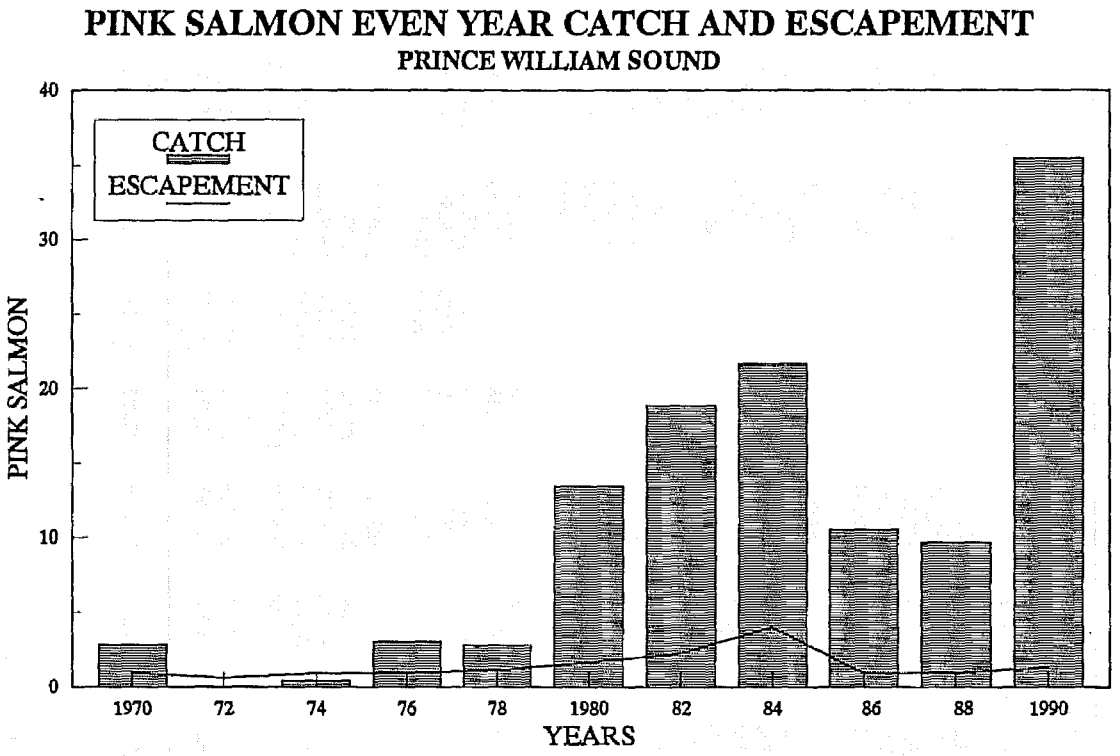
[c]Represents the sum of the commercial catch, hatchery sales and brood, plus the escapement index. Does not account for wild stock escapement into non–index streams.

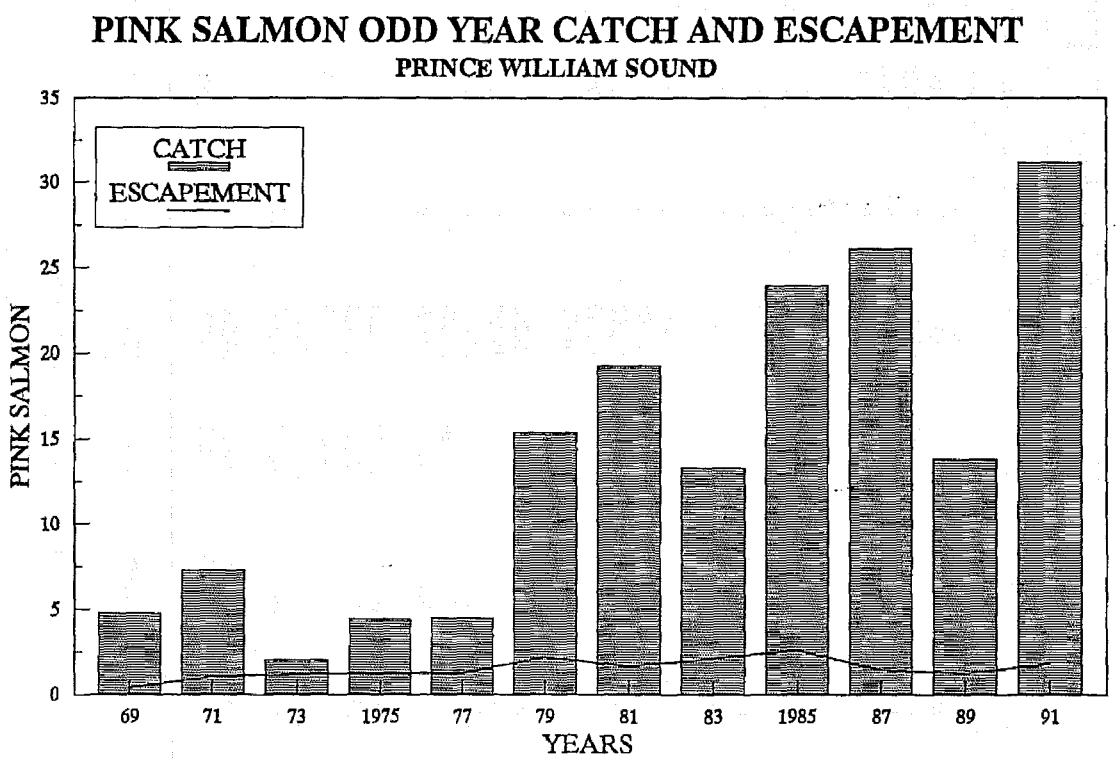
Appendix E.6. Weekly aerial estimates of pink salmon escapement by statistical area, Prince William Sound, 1991.

Survey Location	Subdistrict	Week Ending Dates 6/22	6/29	7/06	7/13	7/20	7/27	8/03	8/10	8/17	8/24	8/31	9/07	9/14	9/21	9/28	TOTAL	ADJ. STREAM TOTAL
Orca Inlet	221–10	NS	0	0	0	490	1,105	590	4,233	1,400	900	6,375	1,585	NS	0	NS	16,678	8,940
Simpson/Sheep	221–20	0	0	0	810	620	5,530	8,640	19,350	13,780	21,300	21,700	39,700	NS	1,200	NS	132,630	62,820
Gravina	221–30	0	0	600	1,040	8,615	20,220	17,810	54,975	34,100	31,600	36,650	56,800	NS	1,910	NS	264,320	118,510
Fidalgo	221–40	0	0	0	5,972	14,980	46,970	27,330	49,825	25,340	23,400	29,600	64,500	NS	595	NS	288,512	132,550
Valdez Arm	221–50	0	0	140	1,130	13,650	31,570	21,580	66,200	26,180	39,600	45,000	60,925	NS	7,570	NS	313,545	143,710
Port Valdez	221–60	NS	0	0	170	2,450	4,135	1,270	5,075	1,110	1,300	740	1,000	NS	0	NS	17,250	7,850
Eastern District TOTAL		0	0	740	9,122	40,805	109,530	77,220	199,658	101,910	118,100	140,065	224,510	0	11,275	0	1,032,935	474,380
Columbia/Long	222–10	0	0	0	0	1,650	2,960	5,230	8,425	6,220	11,350	14,600	12,355	NS	15	NS	62,805	28,220
Wells/Unakwik	222–20	0	0	0	0	900	9,180	6,570	23,676	19,395	19,725	64,925	5,470	20,380	0	NS	170,221	93,990
Eaglek	222–30	NS	NS	0	400	500	4,000	25	7,560	6,725	25,200	33,900	NS	4,465	NS	NS	82,775	43,360
Northern District TOTAL		0	0	0	400	3,050	16,140	11,825	39,661	32,340	56,275	113,425	17,825	24,845	15	0	315,801	165,570
Unakwik District (229) TOTAL		NS	0	0	0	0	0	0	160	NS	0	300	NS	NS	NS	NS	460	360
W. Port Wells	223–10	NS	NS	0	0	0	150	6,025	9,375	16,652	28,250	33,750	NS	3,075	NS	NS	97,277	55,870
Esther Passage	223–20	NS	NS	0	0	0	10	60	390	0	1,000	4,500	NS	990	NS	NS	6,950	4,500
E. Port Wells	223–30	NS	NS	0	0	0	300	0	29,520	15,600	8,900	37,500	NS	120	NS	NS	91,940	38,210
Coghill District TOTAL		0	0	0	0	0	460	6,085	39,285	32,252	38,150	75,750	0	4,185	0	0	196,167	98,580
Passage/Cochrane	224–10	NS	NS	0	12	280	700	11,750	17,800	15,960	15,600	22,575	NS	3,845	NS	NS	88,522	43,650
Culross Pass	224–30	NS	NS	0	0	420	400	3,550	5,900	6,510	20,700	17,400	NS	2,790	NS	NS	57,670	27,880
Nellie Juan	224–40	NS	NS	0	0	0	2,040	5,920	7,930	15,300	12,680	15,550	NS	2,025	NS	NS	61,445	29,790
Northwestern District TOTAL		0	0	0	12	700	3,140	21,220	31,630	37,770	48,980	55,525	0	8,660	0	0	207,637	101,320
Eshamy	225–30	NS	NS	NS	NS	0	200	1,170	950	3,200	12,500	16,000	8,300	NS	NS	NS	42,320	18,800
Eshamy District TOTAL		0	0	0	0	0	200	1,170	950	3,200	12,500	16,000	8,300	0	0	0	42,320	18,800
Chenega	226–20	NS	NS	NS	NS	2,950	7,325	30,730	25,840	25,910	97,450	92,580	15,350	NS	NS	NS	298,135	133,025
Knight Island	226–30	NS	NS	NS	NS	0	0	1,500	1,800	1,300	5,000	6,000	1,200	NS	NS	NS	16,800	7,620
Bainbridge/Latouche	226–40	NS	NS	NS	NS	0	200	3,135	1,450	5,785	32,300	33,700	21,600	NS	NS	NS	98,170	45,750
Port Bainbridge	226–50	NS	NS	NS	NS	100	900	5,500	3,100	0	9,000	6,000	2,000	NS	NS	NS	26,600	10,700
Southwestern District TOTAL		0	0	0	0	3,050	8,425	40,865	32,190	32,995	143,750	138,280	40,150	0	0	0	439,705	197,095
S. Montague	227–10	NS	NS	NS	NS	0	NS	18,575	20,050	21,860	30,200	80,210	NS	NS	1,090	NS	171,985	112,340
N. Montague	227–20	NS	NS	NS	NS	0	125	10,735	18,365	28,520	46,390	111,911	NS	NS	947	NS	216,993	135,550
Montague District TOTAL		0	0	0	0	0	125	29,310	38,415	50,380	76,590	192,121	0	0	2,037	0	388,978	247,890
S. Hawkins	228–10	NS	NS	NS	0	150	1,050	700	0	NS	NS	11,000	NS	NS	0	NS	12,900	11,000
Cutoff	228–20	NS	NS	NS	NS	175	10,500	23,200	27,450	9,600	39,200	36,150	NS	NS	11	NS	146,286	72,850
N. Hawkins	228–30	NS	NS	NS	0	200	1,210	9,600	15,150	NS	63,900	86,000	1,800	NS	245	NS	178,105	106,090
Double Bay	228–40	NS	NS	NS	50	230	4,632	19,600	13,800	NS	28,100	31,000	NS	NS	20	NS	97,432	51,840
Johnstone	228–50	NS	NS	NS	NS	3,700	6,000	16,700	19,500	NS	34,000	31,500	NS	NS	135	NS	111,535	67,790
Etches	228–60	NS	NS	NS	NS	700	14,525	62,050	34,100	28,500	122,310	120,150	NS	NS	1,800	NS	384,135	223,600
Southeastern District TOTAL		0	0	0	50	5,155	37,917	131,850	110,000	38,100	287,510	315,800	1,800	0	2,211	0	930,393	533,170
TOTAL OF 8 DISTRICTS		0	0	740	9,584	52,760	175,937	319,545	491,949	328,947	781,855	1,047,266	292,585	37,690	15,538	0	3,554,396	1,837,165



Appendix E.7. Current year and historical weekly pink salmon escapement performance of index spawning streams, Prince William Sound, 1991.





Appendix E.8. Pink salmon catch and escapement, even years (1970 - 1990) and odd years (1969 - 1991), Prince William Sound.

Appendix E.9. Chum salmon harvests and escapement indices, including hatchery sales harvests and brood stock, Prince William Sound, 1965 – 1991.

	CHUM SALMON ESCAPEMENTS[a]									Hatchery		Common Property	
Year	Eastern	Northern	Coghill	Northwestern	Eshamy	Southwestern	Montague	Southeastern	Total	Sales	Brood	Catch[b]	Total Run[c]
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	142,560			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	55,510	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	86,200	1,335,368	1,707,068
83	143,800	85,720	61,410	31,660	340	3,170	0	21,410	347,510	0	44,000	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	26,460	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
91	86,360	19,080	6,070	8,960	0	2,800	925	9,203	133,398	13,471	114,814	318,435	580,118
1965–90 AVG	94,661	43,775	22,253	13,909	29	1,799	2,811	16,321	195,559	20,807	50,152	741,114	962,836

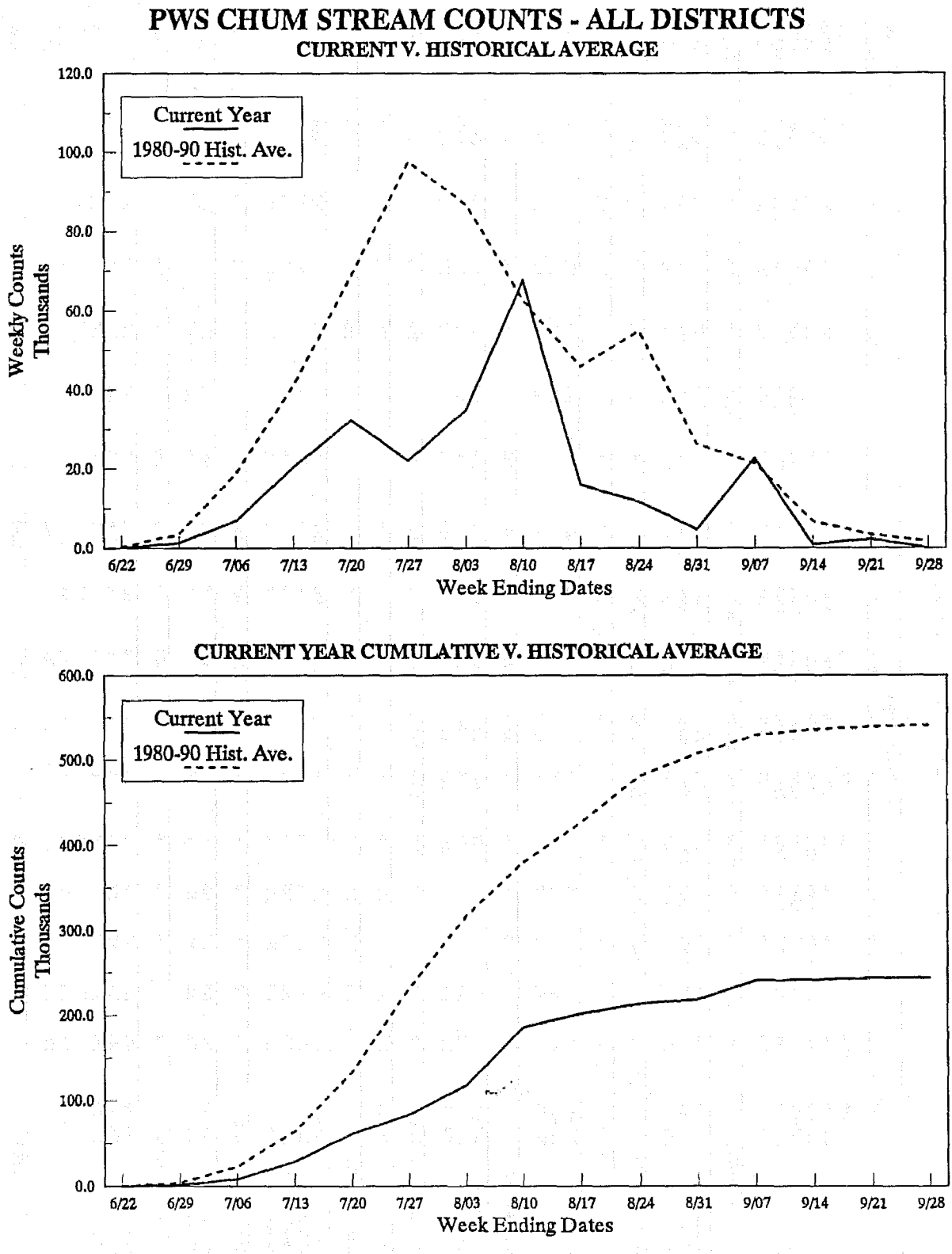
[a]Coghill and Northwestern escapement figures correspond to current district boundaries.

[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.

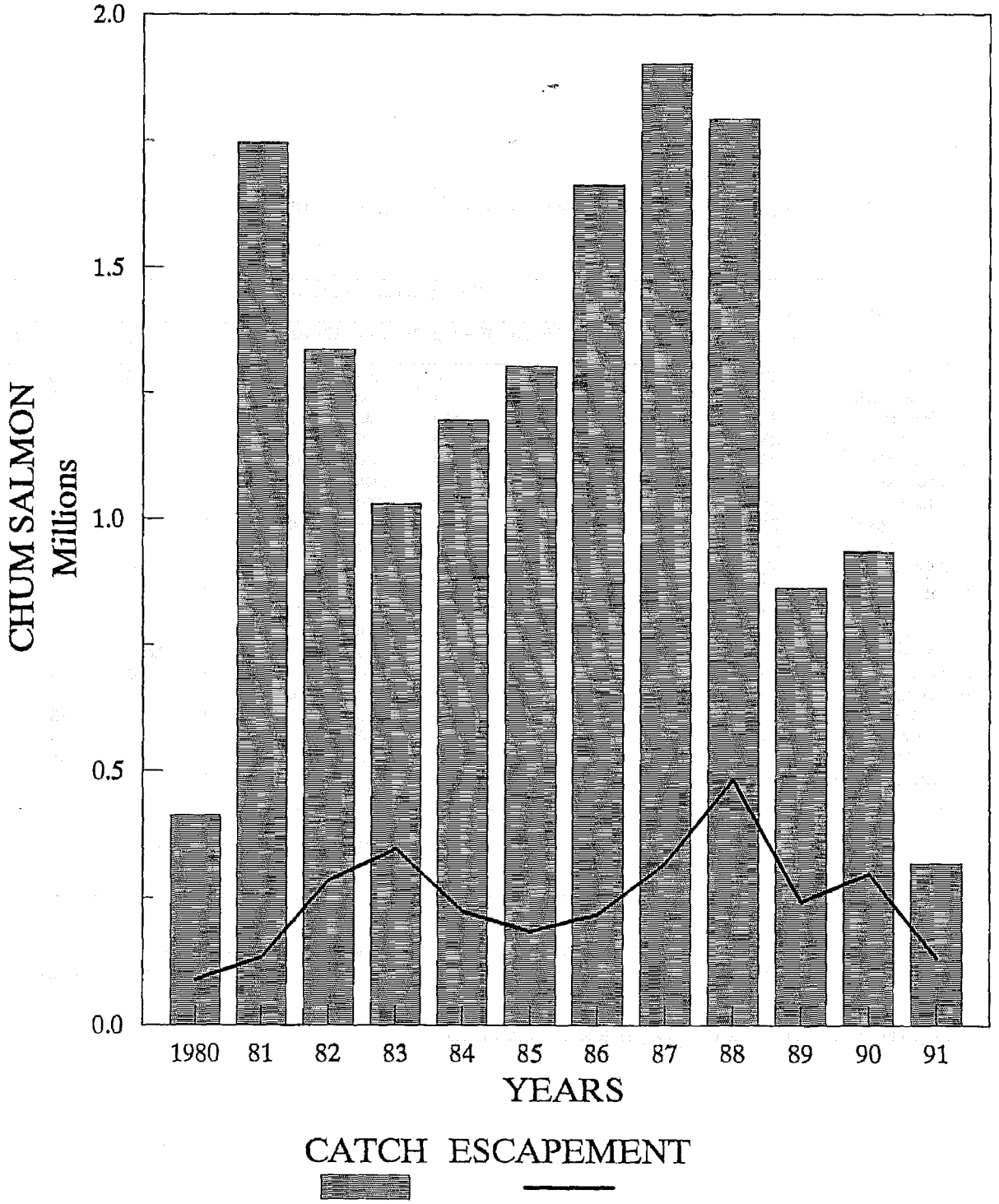
Appendix E.10. Weekly aerial estimates of chum salmon escapement by statistical area, Prince William Sound, 1991.

Survey Location	Subdistrict	Week Ending Dates 6/22	6/29	7/06	7/13	7/20	7/27	8/03	8/10	8/17	8/24	8/31	9/07	9/14	9/21	9/28	TOTAL	ADJ. STREAM TOTAL
Orca Inlet	221–10	NS	0	0	0	30	75	0	30	40	0	100	50	NS	0	NS	325	200
Simpson/Sheep	221–20	0	0	0	0	630	1500	940	2500	1400	150	0	25	NS	27	NS	7,172	3,730
Gravina	221–30	60	600	4,010	9,900	11,250	4,600	5,020	4,125	5,600	2,100	0	300	NS	25	NS	47,590	20,970
Fidalgo	221–40	0	0	0	1,500	4,700	6,100	7,580	31,000	2,100	1,800	1,000	19,300	NS	1,325	NS	76,405	43,010
Valdez Arm	221–50	50	600	990	4,410	7,400	3,900	6,100	4,600	1,300	0	300	2,050	NS	370	NSD	32,070	17,110
Port Valdez	221–60	NS	0	0	70	0	30	610	40	300	0	0	475	NS	551	NS	2,076	1,340
Eastern District TOTAL		110	1,200	5,000	15,880	24,010	16,205	20,250	42,295	10,740	4,050	1,400	22,200	0	2,298	0	165,638	86,360
Columbia/Long	222–10	0	0	0	850	2,050	900	2,400	1,750	600	0	700	450	NS	0	NS	9,700	4,660
Wells/Unakwik	222–20	0	50	2,001	3,450	5,300	2,400	1,535	1,620	2,900	700	0	0	400	0	NS	20,356	9,590
Eaglek	222–30	NS	NS	0	400	400	500	2,400	1,200	100	1,730	1,000	NS	0	NS	BS	7,730	4,830
Northern District TOTAL		0	50	2,001	4,700	7,750	3,800	6,335	4,570	3,600	2,430	1,700	450	400	0	0	37,786	19,080
Unakwik District (229) TOTAL		NS	0	0	0	0	0	0	0	NS	0	0	NS	NS	NS	NS	0	0
W. Port Wells	223–10	NS	NS	0	0	0	0	215	560	275	650	500	NS	360	NS	NS	2,560	1,730
Esther Passage	223–20	NS	NS	0	0	0	0	0	0	0	0	0	NS	0	NS	NS	0	0
E. Port Wells	223–30	NS	NS	0	0	0	0	3,300	2,200	0	400	0	NS	0	NS	NS	5,900	4,340
Coghill District TOTAL		0	0	0	0	0	0	3,515	2,760	275	1,050	500	0	360	0	0	8,460	6,070
Passage/Cochrane	224–10	NS	NS	0	4	77	650	2,200	4,070	900	400	500	NS	150	NS	NS	8,951	5,610
Culross Pass	224–30	NS	NS	0	0	40	0	700	750	0	0	0	NS	0	NS	NS	1,490	1,050
Nellie Juan	224–40	NS	NS	0	0	240	360	1,050	2,220	0	550	0	NS	0	NS	NS	4,420	2,300
Northwestern District TOTAL		0	0	0	4	357	1,010	3,950	7,040	900	950	500	0	150	0	0	14,861	8,960
Eshamy	225–30	NS	NS	NS	NS	0	0	0	0	0	0	0	0	NS	NS	NS	0	0
Eshamy District TOTAL		NS	NS	NS	NS	0	0	0	0	0	0	0	0	NS	NS	NS	0	0
Chenega	226–20	NS	NS	NS	NS	0	0	0	1,520	500	2,100	0	0	NS	NS	NS	4,120	2,800
Knight Island	226–30	NS	NS	NS	NS	0	0	0	0	0	0	0	0	NS	NS	NS	0	0
Bainbridge/Latouche	226–40	NS	NS	NS	NS	0	0	0	0	0	0	0	0	NS	NS	NS	0	0
Port Bainbridge	226–50	NS	NS	NS	NS	0	0	0	0	0	0	0	0	NS	NS	NS	0	0
Southwestern District TOTAL		0	0	0	0	0	0	0	1,520	500	2,100	0	0	0	0	0	4,120	2,800
S. Montague	227–10	NS	NS	NS	NS	0	NS	50	850	0	0	100	NS	NS	0	NS	1,000	900
N. Montague	227–20	NS	NS	NS	NS	0	0	25	0	0	0	0	NS	NS	0	NS	25	25
Montague District TOTAL		0	0	0	0	0	0	75	850	0	0	100	0	0	0	0	1,025	925
S. Hawkins	228–10	NS	NS	NS	0	0	0	0	0	NS	NS	0	NS	NS	0	NS	0	0
Cutoff	228–20	NS	NS	NS	NS	0	0	0	0	0	0	0	NS	NS	0	NS	0	0
N. Hawkins	228–30	NS	NS	NS	0	0	0	0	0	NS	0	0	0	NS	0	NS	0	0
Double Bay	228–40	NS	NS	NS	0	0	0	0	0	NS	0	0	NS	NS	0	NS	0	0
Johnstone	228–50	NS	NS	NS	NS	103	0	0	1,200	NS	0	0	NS	NS	0	NS	1,303	1,203
Etches	228–60	NS	NS	NS	NS	162	1,000	750	7,500	0	1,200	500	NS	NS	70	NS	11,182	8,000
Southeastern District TOTAL		0	0	0	0	265	1,000	750	8,700	0	1,200	500	0	0	70	0	12,485	9,203
TOTAL OF 8 DISTRICTS		110	1,250	7,001	20,584	32,382	22,015	34,875	67,735	16,015	11,780	4,700	22,650	910	2,368	0	244,375	133,398



Appendix E.11. Current year and historical weekly chum salmon escapement performance from index spawning streams, Prince William Sound, 1991.

CHUM SALMON CATCH AND ESCAPEMENT
PRINCE WILLIAM SOUND



Appendix E.12. Chum salmon catch and escapement, Prince William Sound, 1980 - 1991.

Appendix E.13. Sockeye salmon escapement counts from selected systems, Prince William Sound, 1991.[a]

Stream Name	Stream Number	Weekly Count (week ending dates)									
		13–Jul	20–Jul	27–Jul	03–Aug	10–Aug	17–Aug	24–Aug	31–Aug	07–Sep	14–Sep
Robe River	137	0	350	350	0	NS	110	NS	NS	NS	NS
Crooked Creek	145	0	0	0	0	0	90	0	0	0	NS
Billy's Hole	218	0	450	900	600	25	1,250	400	5	0	NS
Wells River	234	0	1	0	0	0	0	0	0	0	NS
Cowpen Lake	242	40	0	0	200	1,800	NS	0	0	NS	NC
Miners Lake	244	450	150	500	2,000	2,040	NS	450	1,200	NS	115
Red Lake	300	325	0	0	420	350	50	400	0	NS	0
Golden Lagoon[b]	310	0	0	0	5,000	2,200	3,000	0	50	NS	0
Hobo Creek	417	0	0	0	0	0	0	0	0	NS	0
Mill Creek	421	0	0	0	0	500	0	0	0	NS	0
Halferty Creek	454	0	0	0	0	280	0	0	0	NS	120
Cochrane Creek	461	0	0	0	0	0	0	0	0	NS	0
Shrode Lake	476	0	0	0	380	1,700	1,075	250	2,000	NS	1,320
Jackpot Lakes	608	NS	0	0	25	0	0	250	2,850	5	NS
Jackson Creek	613	NS	0	0	0	400	0	0	0	0	NS
Bainbridge	630	NS	0	0	0	0	1,600	200	30	0	NS
Point Creek	702	NS	50	NS	0	0	0	0	0	NS	NS
Cabin Creek	747	NS	NS	0	0	0	0	0	0	NS	NS
Udall Creek	770	NS	NS	0	0	0	0	0	0	NS	NS
Pautzke Creek	775	NS	NS	0	0	0	0	0	0	NS	NS
Total		815	1,001	1,750	8,625	9,295	7,175	1,950	6,135	5	1,555

[a]Counts 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.

[b]Believed to be returns from hatchery sockeye released into Davis Lake.

Appendix E.14. Estimated age and sex composition of Prince William Sound chum salmon commercial catches by district, 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	
		0.2	0.3	0.4	0.5	Total
EASTERN DISTRICT PURSE SEINE						
Stratum Dates:	06/03 – 09/07					
Sampling Dates:	07/18					
Sample Size:	99					
Female	Percent of Sample	0.0	30.3	25.3	5.1	60.6
	Number in Catch	0	793,084	660,904	132,181	1,586,168
Male	Percent of Sample	1.0	22.2	13.1	3.0	39.4
	Number in Catch	26,436	581,595	343,670	79,308	1,031,010
Total	Percent of Sample	1.0	52.5	38.4	8.1	100.0
	Number in Catch	26,436	1,374,679	1,004,573	211,489	2,617,178
	Standard Error	26,436	132,019	128,571	72,053	
COGHILL DISTRICT PURSE SEINE AND GILL NET						
Strata Combined:	06/09 – 09/28					
Sampling Dates:	08/04 – 08/14					
Sample Size:	586					
Female	Percent of Sample	0.0	29.8	29.7	0.0	59.5
	Number in Catch	59	68,992	68,721	25	137,798
Male	Percent of Sample	0.4	15.7	23.8	0.5	40.5
	Number in Catch	1,029	36,435	55,176	1,046	93,686
Total	Percent of Sample	0.5	45.5	53.5	0.5	100.0
	Number in Catch	1,088	105,436	123,905	1,071	231,501
	Standard Error	1,029	7,652	7,663	1,029	
ESHAMY DISTRICT GILL NET						
Strata Combined:	06/03 – 09/07					
Sampling Dates:	07/18 – 07/31					
Sample Size:	1,941					
Female	Percent of Sample	0.2	12.1	47.8	1.0	61.2
	Number in Catch	440	30,554	120,330	2,554	153,878
Male	Percent of Sample	0.0	4.2	33.4	1.1	38.7
	Number in Catch	0	10,470	84,093	2,695	97,259
Total	Percent of Sample	0.2	16.3	81.4	2.1	100.0
	Number in Catch	440	41,024	204,864	5,249	251,577
	Standard Error	311	2,503	2,614	887	
SOUTHWEST DISTRICT PURSE SEINE						
Stratum Dates:	08/04 – 08/31					
Sampling Dates:	08/13 – 08/14					
Sample Size:	119					
Female	Percent of Sample	5.0	30.3	34.5	0.8	70.6
	Number in Catch	231	1,383	1,575	38	3,227
Male	Percent of Sample	0.0	11.8	16.8	0.8	29.4
	Number in Catch	0	538	768	38	1,345
Total	Percent of Sample	5.0	42.0	51.3	1.7	100.0
	Number in Catch	231	1,921	2,344	77	4,572
	Standard Error	92	208	210	54	

Appendix E.15. Summary of periods, dates, hours open, and emergency orders issued by district, for the commercial purse seine salmon fishery, Prince William Sound, 1991. A district is included as open if a portion of that district is open. See Appendix C.12. for Unakwik District openings.

Eastern (221)		Northern (222)		Coghill (223)		Northwestern (224)		Southwestern (226)		Montague (227)		Southeastern (228)		Emergency Orders Issued
Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	
7/03	12 [a]													2-F-E-39-91
7/08	12 [b]													2-F-E-41-91
7/11	12 [b]													2-F-E-43-91
7/13	12 [b]													2-F-E-44-91
7/15	12 [b]													2-F-E-45-91
7/17	12 [c]													2-F-E-46-91
7/20	12 [d]													2-F-E-48-91
7/22	12 [d]			7/22 – 7/23	24 [e]									2-F-E-50-91
7/24	12 [d]													2-F-E-52-91
		8/05 – 8/06	24 [f]	8/05 – 8/06	24 [f]			8/05 – 8/06	24 [f]					2-F-E-54-91
		8/10	12 [f]	8/10	12 [f]			8/10	12 [f]					2-F-E-55-91
		8/12	12 [g]	8/12	12 [g]			8/12	12 [g]					2-F-E-56-91
		8/14	12 [h]	8/14	12 [h]			8/14	12 [h]					2-F-E-57-91
		8/15 – 8/25	240 [i]	8/15 – 8/25	240 [i]			8/15 – 8/25	240 [i]					2-F-E-58-91
								8/17	– [j]					2-F-E-59-91
								8/19	– [j]					2-F-E-59-91
								8/21	– [j]					2-F-E-61-91
								8/23	– [j]					2-F-E-61-91
		8/25 – 8/29	96 [k]	8/25 – 9/20	628 [l]	8/25 – 10/04	968 [k]	8/25 – 8/29	96 [k]			8/25 – 10/04	968 [k]	2-F-E-62-91
8/29 – 10/04	872 [m,o]							8/29 – 10/04	872 [m,o]	8/29 – 10/04	872 [m,o]			2-F-E-64-91
		8/29 – 10/04	872 [m,n,o]											2-F-E-72-91
														2-F-E-75-91

[a] The season was officially open for a 12 hour period from 8 a.m. until 8 p.m., Wednesday, July 03. Open waters included a portion of both Valdez Arm and Port Valdez.

[b] Only portions of both Valdez Arm and Port Valdez were open beginning at 8:00 a.m. and continuing until 8:00 p.m.

[c] Port Valdez was open for a 12-hour period beginning at 8:00 a.m. and continuing until 8:00 p.m.

[d] Only portions of Port Valdez and Boulder Bay were open from 8:00 a.m. until 8:00 p.m.

[e] The Esther Subdistrict was open for a 24-hour period beginning at 8:00 a.m., July 22.

[f] Fishing was open in the Port San Juan Subdistrict and the Esther Subdistrict. Unakwik Inlet was open north of a line from a point located on the east shore at 60° 54.5' N. latitude, to a point on the west shore at 60° 54.1' N. latitude, and south of a line from a point on the east shore at 60° 59.5' N. latitude, 147° 31.5' W. longitude to a point on the west shore at 60° 57.5' N. latitude, 147° 36.5' W. longitude, excluding the hatchery special harvest areas and sanctuaries.

-continued-

[g] The Esther Subdistrict was open. In the Northern District all waters were open, excluding Unakwik Inlet north of a line from 60° 54.5' N. latitude, the waters of Eaglek Bay north of a line from 60° 50.7' N. latitude, 147° 40.15' W. longitude, to 60° 50.6' N. latitude, 147° 44.45' W. longitude, the Perry Island Subdistrict and all remaining waters of the Northern District north of 60° 55.0' N. latitude. All waters in the Southwestern District south of the latitude of Dual Head were open excluding the Port San Juan Subdistrict and the Elrington Subdistrict.

[h] Waters open included the Port San Juan Subdistrict, the Elrington Subdistrict, the Esther Subdistrict, the following described waters of Unakwik Inlet, and the A.F.K., Noerenberg, and Cannery Creek Special Harvest Areas and Sanctuaries. Waters within 50 feet of the hatchery barrier seines were closed. The waters of Unakwik Inlet were open north of a line from a point located on the east shore at 60° 54.5' N. latitude to a point on the west shore at 60° 54.1' N. latitude, and south of a line from a point on the east shore at 61° 01.0' N. latitude, 147° 33.0' W. longitude to a point on the west shore at 60° 57.5' N. latitude, 147° 36.5' W. longitude, excluding waters within 50 feet of the hatchery barrier seine.

[i] The areas open on August 14 were extended to continuous fishing until further notice.

[j] In the Southwestern District, waters were open south of 60° 15.7' N. latitude for 12 hour periods from 8:00 a.m. until 8:00 p.m.

[k] Fishing was open in all waters of the Southwestern District, excluding the eastern shoreline of Chenega Island, the Northwestern District and Southeastern Districts, the Perry Island Subdistrict, the previously described waters of Unakwik Inlet (h), and the Esther Subdistrict, including the hatchery special harvest areas and sanctuaries to continuous fishing until further notice.

[l] Only the Wally Noerenberg Hatchery sanctuary remained open to purse seine gear in the Coghill District and it was closed to purse seine fishing on Sept. 20 by E.O. # 2-F-E-72-91.

[m] The Eastern District, excluding the waters of Port Valdez east of 146 30.5' W. Longitude, and the Montague District were opened to continuous fishing until further notice. The Wally Noerenberg, A.F.K., and Cannery Creek SHA's were closed, however the sanctuaries remained open. All waters of the Southwestern District, including the Chenega shoreline were open.

[n] The Perry Island Subdistrict was closed for 48 hours, from 12:00 noon, Sept. 20 to 12:00 noon, Sept. 22.

[o] All purse seine districts closed for the season at 8:00 p.m., Oct. 4.

APPENDIX F

HATCHERY RETURNS

Appendix F.1. Daily salmon sales harvests, discarded and donated catches, sex ratios, and revenue at the Wally Noerenberg Hatchery, 1991. Revenue, brood stock, and sex ratio data provided by the Prince William Sound Aquaculture Corporation.

	HATCHERY HARVESTS IN NUMBERS OF FISH						Revenue		Pink Salmon
	Pinks			Chum	Coho	Pounds	(Inseason Estimate)		%
Date	Sales	Donated	Discarded	Sales	Sales	Sold	Daily	Cumulative	Female
07/27	18,955			906		49,587	$7,202	$7,202	5.7%
07/29	11,804			866		32,461	$4,869	$12,071	6.4%
07/30	28,053			1507		73,472	$0	$12,071	10.0%
07/31	7,149			518		19,005	$15,550	$27,621	10.0%
08/01	12,882			0		27,052	$5,339	$32,960	10.0%
08/02	59,265			2180		147,610	$25,688	$58,648	12.0%
08/03	51,953			923		126,695	$25,061	$83,709	12.0%
08/04	33,631			1160		85,611	$13,254	$96,963	13.5%
08/05	12,420			0		29,808	$5,142	$102,105	
08/06	32,313			147		75,540	$12,117	$114,222	13.1%
08/07	42,953			164		100,104	$7,825	$122,047	14.7%
08/08	58,869			682		136,405	$32,756	$154,803	15.0%
08/09	29,780			240		75,795	$12,319	$167,122	16.6%
08/10	62,452			276		152,179	$24,531	$191,653	18.4%
08/11	83,503			460		195,653	$31,745	$223,398	22.6%
08/12	60,032			264		143,275	$23,229	$246,627	20.5%
08/13	83,202			303		188,617	$30,019	$276,646	26.2%
08/14	82,249			692		194,639	$31,115	$307,761	26.9%
08/15	49,527			46		114,279	$17,795	$325,556	35.1%
08/16	45,668			164		112,391	$15,464	$341,020	35.1%
08/17	13,853					34,632	$4,156	$345,176	38.3%
08/18				Pink & Chum					
08/19				Total Pounds Sold =		2,114,810			38.0%
08/20									
08/21									43.2%
08/23			218,993						56.8%
08/24		125,486	418,607						43.1%
08/25		239,668	519,490						50.6%
08/26		224,786	150,024						56.0%
08/27		245,192							67.0%
08/28		271,693							67.9%
08/29									73.5%
08/30		84,684	36,892		294	1,426	$1,070	$346,246	73.6%
08/31		4,000	36,280		447	2,662	$2,015	$348,261	80.0%
09/03			85,314						
09/04			85,282		1,222	6,479	$4,535	$352,796	64.3%
09/05			412		1,798	8,808	$6,606	$359,402	
09/06		16,000	144,531		2,645	11,374	$7,962	$367,364	
09/07					1,110	8,882	$5,773	$373,137	
09/09			28,382		2,709	12,736	$8,278	$381,415	
09/11		4,133							
09/12			5,572		2,705	13,797	$9,106	$390,521	
09/16					300	1,328	$996	$391,517	
				Pounds of Coho Sold =		67,492			
Totals	880,513	1,215,642	1,729,779	11,498	13,230		$391,517		

	Pink	Chum	Coho
Average Weights:	2.4	8.08	5.1
Average Price/Lb.:	$0.163	$0.163	$0.687

BROOD STOCK SUMMARY:	PINK	EARLY CHUM	LATE CHUM	COHO
Fish spawned at hatchery	213,385	80,136	234	1,115
Green/bad/excessed	223,843	26,157	46	171
Eggtake mortality	15,875	2,586	134	33
Total available brood stock	453,103	108,879	414	53,690
Fish estimated remaining in brood pond	500	3,000	0	3,750
Fish estimated remaining in bay	25,000	21,600	312	0
Estimated unseen mortality	45,000	2,000	70	200
Estimated creek spawners	5,000	200	0	100

Appendix F.2. Daily salmon sales harvests, discarded and donated catches, sex ratios, and revenue at the Armin F. Koernig Hatchery, 1991. Revenue, brood stock, and sex ratio data provided by the Prince William Sound Aquaculture Corporation.

	HATCHERY HARVESTS IN NUMBERS OF FISH				Revenue		Pink Salmon
	Pinks			Pounds	(Inseason Estimates)		%
Date	Sales	Donated	Discarded	Sold	Daily	Cumulative	Female
07/28	28,221			65,472	$9,821	$9,821	7.0%
07/29	0			0	$0	$9,821	
07/30	26,305			57,871	$10,608	$20,429	9.7%
07/31	0			0	$0	$20,429	9.7%
08/01	0			0	$0	$20,429	
08/02	0			0	$0	$20,429	
08/03	54,079			129,790	$27,243	$47,672	17.8%
08/04	45,940			110,256	$16,538	$64,210	11.4%
08/05	79,119			0	$28,483	$92,693	13.4%
08/06	0			189,886	$0	$92,693	
08/07	113,662			261,862	$25,920	$118,613	16.8%
08/08	99,206			228,173	$62,240	$180,853	22.8%
08/09	113,323			271,974	$42,409	$223,262	26.7%
08/10	83,833			185,480	$28,094	$251,356	24.4%
08/11	49,367			123,417	$18,513	$269,869	31.5%
08/12	76,616			191,540	$30,949	$300,818	30.7%
08/13	112,220			274,793	$41,219	$342,037	35.4%
08/14	54,760			131,425	$19,714	$361,751	33.4%
08/15	53,936			134,839	$20,226	$381,977	41.4%
08/16	0			0	$0	$381,977	
08/17	43,685			99,223	$16,217	$398,194	45.0%
08/18	30,482			76,206	$13,146	$411,340	47.5%
08/19	24,414			59,564	$9,481	$420,821	43.0%
08/20							
08/21							
08/22			35,746				
08/23			228,245				59.7%
08/24		44,883					59.7%
08/25		61,907					
08/26							
08/27							56.1%
08/28							65.5%
Totals	1,089,168	106,790	263,991	2,591,771	$420,821		

Average Weight: 2.41 pounds
Average Price/Lb.: $0.162

BROOD STOCK SUMMARY:

Spawned at hatchery	134,716
Excessed	60,978
Green/overripe	42,803
Fishway/system mortality	6,092
Total available brood stock	244,589
Estimated diversion chammel mortality	30,000
Estimated unseen mortality	49,128
Fish estimated remaining in bay	87,500
Fish estimated remaining behind barrier seine	35,000

Appendix F.3. Daily pink salmon sales harvests, sex ratios, and revenue at the Solomon Gulch Hatchery, 1991. Revenue, sex ratios and brood stock data provided by Valdez Fisheries Development Association.

	FISH SALES										
	Solomon Gulch Pinks			Boulder Bay Pinks			Solomon Gulch Coho			Revenue	
Date	Daily	Cumulative	% Female	Daily	Cumulative	% Female	Daily	Cumulative	Pounds Sold	Daily	Cumulative
06/21	49,836	49,836	10.3%	0	0	90.0%			123,583	$35,570	$35,570
06/22	86,558	136,394	10.1%	46,779	46,779	12.0%			366,961	$91,344	$126,914
06/23	71,690	208,084	10.8%	22,326	69,105	11.0%			246,727	$47,618	$174,532
06/24	212,701	420,785	18.1%	49,168	118,273	20.0%			681,249	$130,696	$305,228
06/25	100,363	521,148	15.4%	68,118	186,391	21.5%			423,265	$74,334	$379,562
06/26	88,950	610,098	25.6%	0	186,391	19.0%			220,390	$45,722	$425,284
06/27	135,134	745,232	24.6%	36,220	222,611	24.0%			432,034	$60,122	$485,406
06/28	83,741	828,973	26.4%	37,134	259,745	23.0%			312,385	$54,345	$539,751
06/29	0	828,973	24.4%	10,490	270,235	26.6%			24,128	$17,983	$557,734
06/30	20,813	849,786	27.2%	61,661	331,896	25.0%			209,102	$27,691	$585,425
07/01	74,837	924,623	22.9%	21,538	353,434	22.5%			261,675	$81,014	$666,439
07/02	113,758	1,038,381	27.2%	74,577	428,011	26.5%			514,336	$67,254	$733,693
07/03	0	1,038,381		33,903	461,914	35.0%			91,542	$16,477	$750,170
07/04	0	1,038,381		47,779	509,693	36.3%			123,757	$22,149	$772,319
07/05	34,553	1,072,934	26.8%	55,039	564,732	37.0%			225,129	$39,498	$811,817
07/06	28,306	1,101,240	27.8%	51,654	616,386	33.1%			199,340	$38,877	$850,694
07/07	0	1,101,240		63,853	680,239	38.7%			171,562	$31,796	$882,490
07/08	0	1,101,240		32,794	713,033	43.0%			89,036	$18,693	$901,183
07/09	223,125	1,324,365	31.0%	58,699	771,732	47.0%			681,938	$151,418	$1,052,601
07/10	60,177	1,384,542		51,803	823,535	44.0%	1	1	317,037	$42,298	$1,094,899
07/11	54,017	1,438,559		0	840,272		0	1	132,850	9716	$1,104,615
07/12	349,544	1,788,103	40.8%	16,737	854,423		0	1	893,026	$191,498	$1,296,113
07/13	14,350	1,802,453		14,151	884,571		0	1	71,933	$0	$1,296,113
07/14	427,755	2,230,208	40.9%	30,148	884,571		0	1	1,133,063	$191,932	$1,488,045
07/15	0	2,230,208		0	884,571		0	1	0	$0	$1,488,045
07/16	56,810	2,287,018		0	884,571		0	1	149,980	$27,746	$1,515,791
07/17	0	2,287,018		0	884,571		0	1	0	$0	$1,515,791
07/18	0	2,287,018		48,861	933,432		0	1	131,925	$21,095	$1,536,886
08/05							366	367	2,482	$0	$1,536,886
08/15							66	433	336	$336	$1,537,222
08/16							61	494	256	$256	$1,537,478
08/21							5,454	5,948	24,621	$19,728	$1,557,206
08/23							4,563	10,511	20,491	$16,393	$1,573,599
08/27							1,982	12,493	9,872	$24,353	$1,597,952
08/28							3,544	16,037	20,555	$17,677	$1,615,629
08/29							4,280	20,317	25,918	$23,562	$1,639,191
09/03							3,135	23,452	19,350	$18,383	$1,657,574
09/04							1,871	25,323	11,799	$11,209	$1,668,783
09/06							4,810	30,133	28,824	$29,202	$1,697,985
09/07							122	30,255	797	$757	$1,698,742
09/09							56	30,311	289	$298	$1,699,040
09/10							5,951	36,262	36,596	$40,198	$1,739,238
09/11							45	36,307	306	$306	$1,739,544
09/12							63	36,370	336	$336	$1,739,880
09/13							1,450	37,820	9,456	$7,246	$1,747,126
09/14							63	37,883	333	$333	$1,747,459
09/16							708	38,591	4,180	$4,403	$1,751,862
09/17							56	38,647	296	$296	$1,752,158
09/19							486	39,133	3,310	$8,838	$1,760,996
09/20							51	39,184	320	$320	$1,761,316
09/24							70	39,254	373	$403	$1,761,719
09/27							141	39,395	990	$373	$1,762,092
Totals	2,287,018			933,432			39,395		8,227,953	$1,762,092	

Average Pink Weight: 2.64 pounds
Average Coho Weight: 5.64 pounds

Average price/pound for pinks = $0.187
Average price/pound for coho = $1.014

BROOD STOCK SUMMARY:

Spawned at hatchery	180,287
Green/overripe	14,614
System mortalities/excessed	80,218
Total available brood stock	275,119

Appendix F.4. Daily salmon sales harvests, discarded and donated catches, sex ratios, and revenue at the Cannery Creek Hatchery, 1991. Revenue, brood stock, and sex ratio data provided by the Prince William Sound Aquaculture Corporation.

	HATCHERY HARVESTS IN NUMBERS OF FISH						
	Pinks			Pounds	Revenue		Pink Salmon %
Date	Sales	Donated	Discarded	Sold	Daily	Cumulative	Female
07/28	28,120			67,488	$10,494	$10,494	7.0%
07/29	8,976			22,440	$3,366	$13,860	8.1%
07/30	17,931			44,828	$0	$13,860	6.9%
07/31	36,338			83,578	$26,891	$40,751	10.9%
08/01	17,229			42,155	$3,299	$44,050	40.0%
08/02	79,106			184,859	$35,721	$79,771	15.0%
08/03	43,589			110,825	$4,714	$84,485	19.0%
08/04	26,734			62,170	$29,560	$114,045	16.0%
08/05	6,918			18,680	$2,802	$116,847	13.0%
08/06	0			0	$0	$116,847	13.0%
08/07	0			0	$0	$116,847	
08/08	97,500			245,424	$41,146	$157,993	20.0%
08/09	172,802			400,414	$68,885	$226,878	23.0%
08/10	15,775			37,860	$5,679	$232,557	23.0%
08/11	88,133			205,453	$33,974	$266,531	30.0%
08/12	69,016			155,055	$27,333	$293,864	32.0%
08/13	12,500			30,000	$4,500	$298,364	37.0%
08/14	17,816			42,760	$6,414	$304,778	40.0%
08/15	15,525			37,260	$5,589	$310,367	36.0%
08/16	11,422			30,840	$4,626	$314,993	40.0%
08/17							
08/18							
08/19							47.0%
08/20							57.0%
08/21							
08/22							
08/23			175,923				57.0%
08/24			173,893				62.0%
08/25			160,589				
08/26			182,881				64.0%
08/27							
08/28							58.0%
Totals	765,430	0	693,286	1,822,089	$314,993		

Average Weight: 2.39 pounds
Average Price/Lb.: $0.173

BROOD STOCK SUMMARY:

Spawned at hatchery	159,420
Excessed	117,660
Green/bad mortality	22,340
Eggtake mortality	45,530
Total available brood stock	344,950
Estimated unseen motality	5,100
Estimated stream spawners	122,500

Appendix F.5. Sales harvests of salmon by species from private nonprofit hatcheries, Prince William Sound, 1978 – 1991.[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
1991[e]	AFK, SG, WNH, CC	52,625	5,955,561	13,471	6,021,657
TOTAL		134,412	33,255,839	244,163	33,634,414

[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]Hatcheries: AFK = Armin F. Koernig (PWSAC) (formerly Port San Juan Hatchery)
E = Esther Hatchery (PWSAC), renamed WNH in 1989
SG = Solomon Gulch Hatchery (VFDA)
N = NERKA Inc.
CC = Cannery Creek (PWSAC)
WHN = Wally Noerenberg Hatchery (PWSAC) (formerly Esther Hatchery)
MB = Main Bay (PWSAC) (formerly operated by 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, 1991.

Pink salmon returns to P.W.S. hatcheries.[a]

Hatchery	1990 Fry Release (millions)	1991 Forecast Return	Estimated Total Return	Marine Survival	Estimated C.P.F. Comm Catch[e]	Sales Harvest[b]	Escmt. and Brood[c]	Eggs Taken (millions)
Solomon Gulch[d]	122.2	6,120,000	5,704,182	4.7%	2,547,393	3,220,450	275,119	203.0
A. F. Koernig	113.8	6,460,000	5,147,754	4.5%	4,247,905	1,089,168	244,589	127.1
Wally Noerenberg	233.6	13,610,000	12,053,511	5.2%	10,608,695	880,513	453,103	113.2
Cannery Creek	143.7	10,680,000	8,663,434	6.0%	7,696,792	765,430	344,950	153.7
Main Bay	0.0	0	0		0	0	0	0
Total Pink	613.3	36,870,000	31,568,881		25,100,785	5,955,561	1,317,761	597.0

Chum salmon returns to P.W.S. hatcheries.[a]

Hatchery	1991 Forecast Return	Estimated Total Return	Estimated C.P.F. Comm Catch	Sales Harvest[b]	Escmt. and Brood[c]	Eggs Taken (millions)
Solomon Gulch	48,600	--- NO ESTIMATES MADE ---		1,973	5,521	3.1
A. F. Koernig	0	--- NO ESTIMATES MADE ---		0	0	0
Wally Noerenberg[f]	1,401,900	--- NO ESTIMATES MADE ---		11,498	109,293	113.5
Cannery Creek	0	--- NO ESTIMATES MADE ---		0	0	0
Main Bay	397,300	137,130	135,043	0	0	0
Total Chum	1,847,800	137,130	135,043	13,471	114,814	116.6

[a]Contribution estimates of pink and chum salmon from PWS hatcheries are based on analysis of CWT recoveries and location of catch as reported on fish tickets. Preliminary information.

[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. Does not include watershed spawners, unseen mortalities or fish remaining in bay.

[d]Includes Boulder Bay remote release.

[e]Includes donated and discarded catches.

[f]Includes both early and late chum returns.

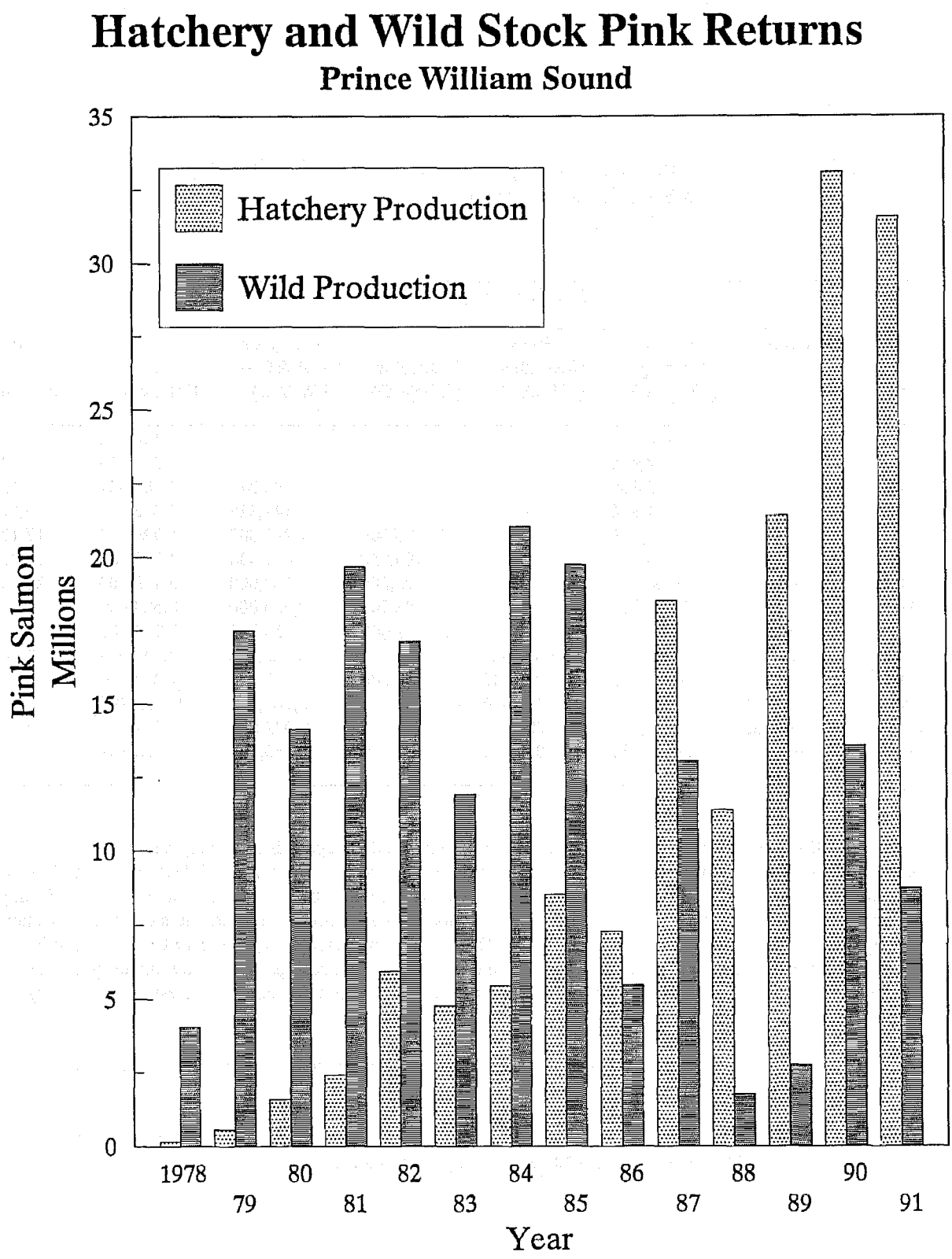
Appendix F.7. Estimated total hatchery and wild stock production of pink salmon, Prince William Sound, 1978 to 1991.[a]

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	–	2,949,090	33,097,795	13,549,696
1991	5,704,182	5,147,754	12,053,511	0	8,663,434	31,568,881	8,720,356

[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 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, and estimated common property fishery interception.

[c]Total wild stock return represents the estimated wild stock catch plus the aerial escapement index. 1991 wild stock component = 6,883,191 catch plus 1,837,165 escapement index.



Appendix F.8. Estimated total pink salmon returns to hatcheries and wild stock systems, Prince William Sound, 1978 - 1991.

APPENDIX G

SUBSISTENCE AND PERSONAL USE FISHERIES

Appendix G.1. Subsistence salmon harvest by species and gear type, Prince William Sound, 1991.

Area	Permits Issued	Permits Fished	Gear [a] Type	Chinook	Sockeye	Coho	Other [b]	Total
	8	2	D.G.N.	0	2	0	0	2
Prince William Sound	0	0	P.S.	0	0	0	0	0
	1	0	S.N.	0	0	0	0	0
P.W.S. TOTAL	9	2		0	2	0	0	2
Copper River Flats	129	72	D.G.N.	136	830	38	5	1,009
Upper Copper River	293	293	D.N.	148	4,772	157	0	5,077
	418	418	F.W.	1,058	29,097	58	42	30,213
Tatitlek [c]	17	7	MX.	0	107	984	348	1,439
Southwestern [c]	11	5	MX.	3	345	42	248	638
Total	877	797		1,345	35,153	1,279	643	38,378

[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 approximately 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, 1965–1991

Year	Total Issued	Permits Issued				Catch			
		Unused	Unsuccessful	Successful	Total	Chinook	Sockeye	Coho	Total
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 [a]
1983	87	42	4	27	73	79	107	57	254 [b]
1984	118	47	14	43	104	68	324	135	549 [c]
1985	94	27	9	58	94	88	261	83	433 [d]
1986	88	28	9	48	85	86	348	47	481 [e]
1987	95	50	5	34	89	49	359	14	510 [f]
1988	114	40	17	40	97	59	226	42	440 [g]
1989	75	32	2	30	64	56	339	51	454 [h]
1990	88	38	0	38	76	60	469	82	611
1991	129	43	11	61	115	136	830	38	1,009 [i]

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
i Includes 2 Whitefish and 3 Dolly Varden

Appendix G.3. Salmon catch and effort in the Prince William Sound subsistence fishery, 1960 – 1991.

	Permits		Catch						
Year	Issued	Returned	Chinook	Sockeye	Coho	Pink	Chum	Unknown	Total
1960	50		1	139	505	1,292	75	150	2,162
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
1991	9	5	0	2	0	0	0	0	2

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 – 1991.

	Permits Issued			Reported Catch			Reported Catch by Species			Total Catch	
Year	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	28,599	32,468
1973 [c]	3,840	305	4,145	16,407	10,943	27,350	1,846	27,350	51	29,247	29,248
1974 [d]	3,305	288	3,593	15,143	7,657	22,800	1,141	22,800	163	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	46	5,677	67,241	747	67,988	2,594	63,793	1,446	67,833	70,478
s&p	5,726	357	6,083	69,944	28,689	98,633	3,198	93,740	1,533	98,471	102,768
1991 s	293	418	711	5,347	30,255	35,602	1,206	34,139	215	35,560	43,621
p	6,222	0	6,222	81,189	0	81,189	3,902	73,929	3,297	81,128	85,763
s&p	6,515	418	6,933	86,536	30,255	116,791	5,108	108,068	3,512	116,688	129,384

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.

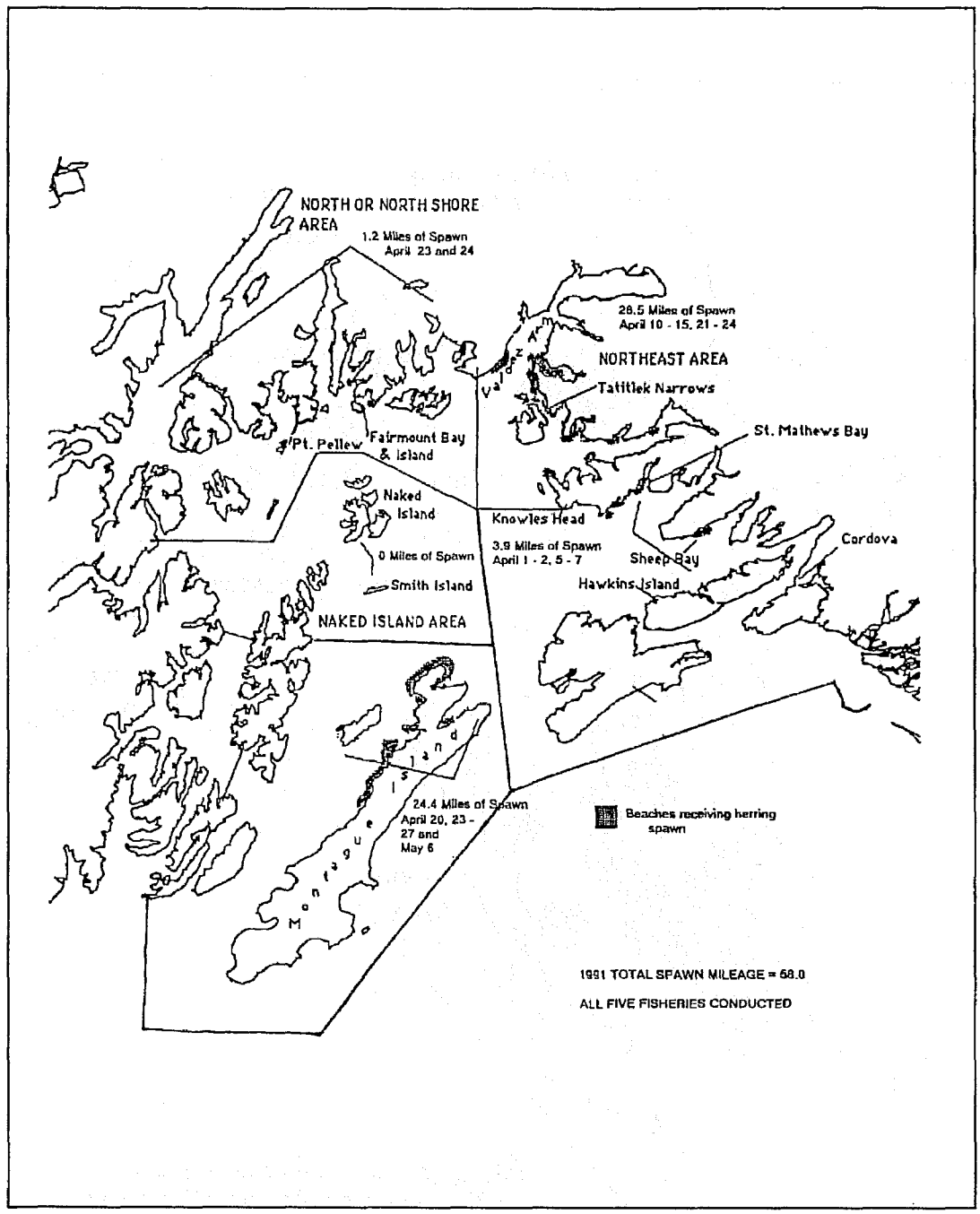
s = subsstence

p = personal use

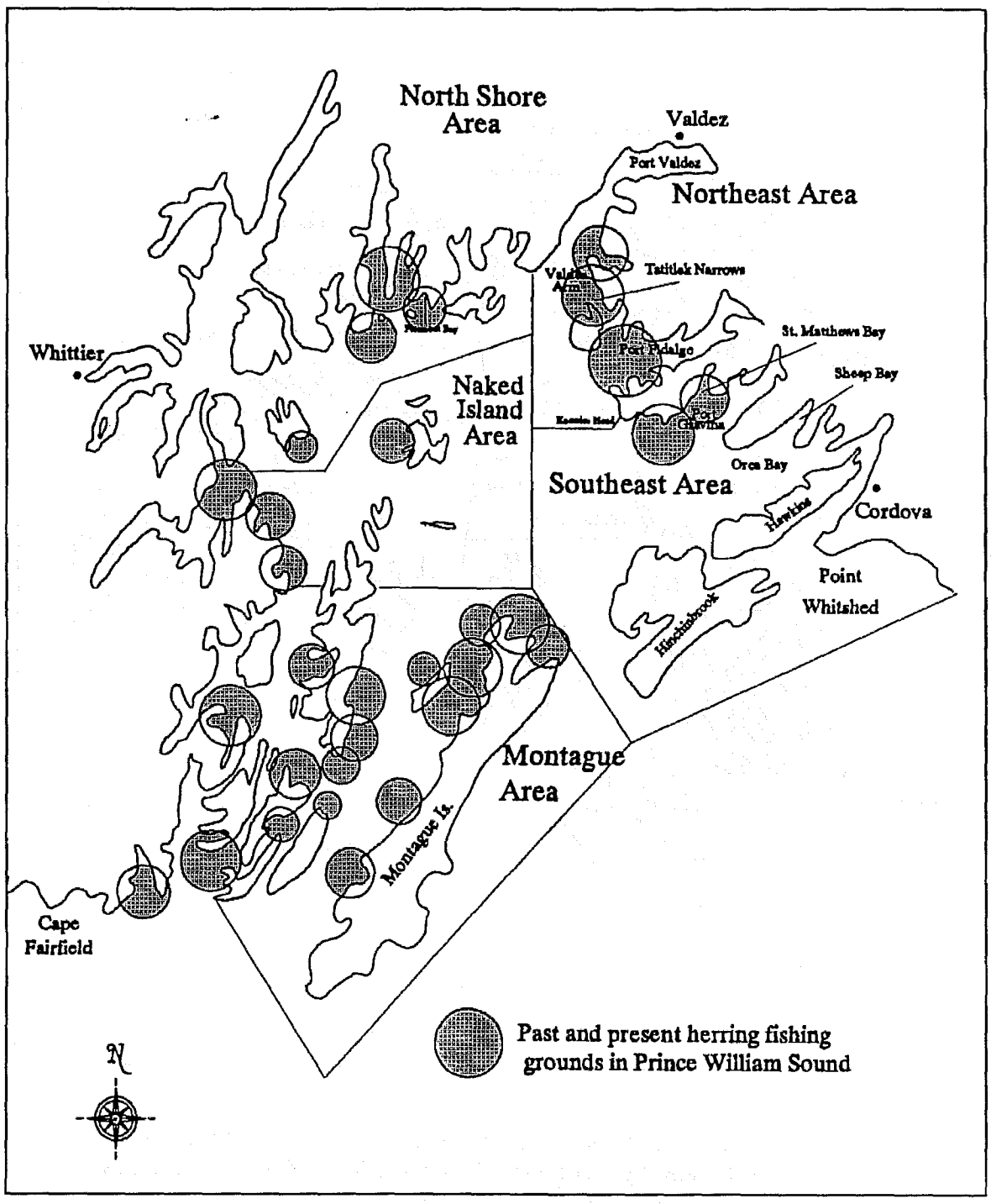
s&p = total catch

APPENDIX H

HERRING FISHERIES



Appendix H.1. Miles and dates of herring spawn in Prince William Sound in 1991, delineated by aerial and skiff surveys in the five major areas used in the spawn deposition biomass estimate.



Appendix H.2. Historic herring fishing grounds in Prince William Sound from 1914 to the present time.

Appendix H.3. Commercial herring harvest summary with fishing locations and effort by gear type, Prince William Sound, 1991.

Fishery	Fishing Information				Harvest (tons)	
	Area	Date	Duration	Effort	Spawn on Kelp	Pacific Herring
1991 Food and Bait Fishery						
	Montague	01 Oct – 14 Oct		14 boats		4,258.5
	Total					4,258.5
1991 Sac Roe and Spawn on Kelp Fisheries						
Sac Roe Purse Seine	Northeast	09 April	30 min	76 boats		3,203.7
	Northeast	10 April	30 min	82 boats		4,841.3
	Northeast Test Fish – ADF&G					92.2
	Montague	19 April	20 min	73 boats		3,785.8
	Total		80 min	104 boats		11,923.0
Sac Roe Gill Net	Montague	18 April	10.5 h	24 boats		742.0
	Total		10.5 h	24 boats		742.0
Wild Spawn–on–Kelp[a]	Montague	11–17 May	95.0 h	48 divers	107.6	860.8[b]
	Total		95.0 h	48 divers	107.6	860.8[b]
Pound Spawn–on–Kelp[c]	Northeast	07–23 April		119 permits	202.4	2,530.0[d]
	Total				202.4	2,530.0[d]
1991 Harvest and Equivalent Use					310.0	19,453.5

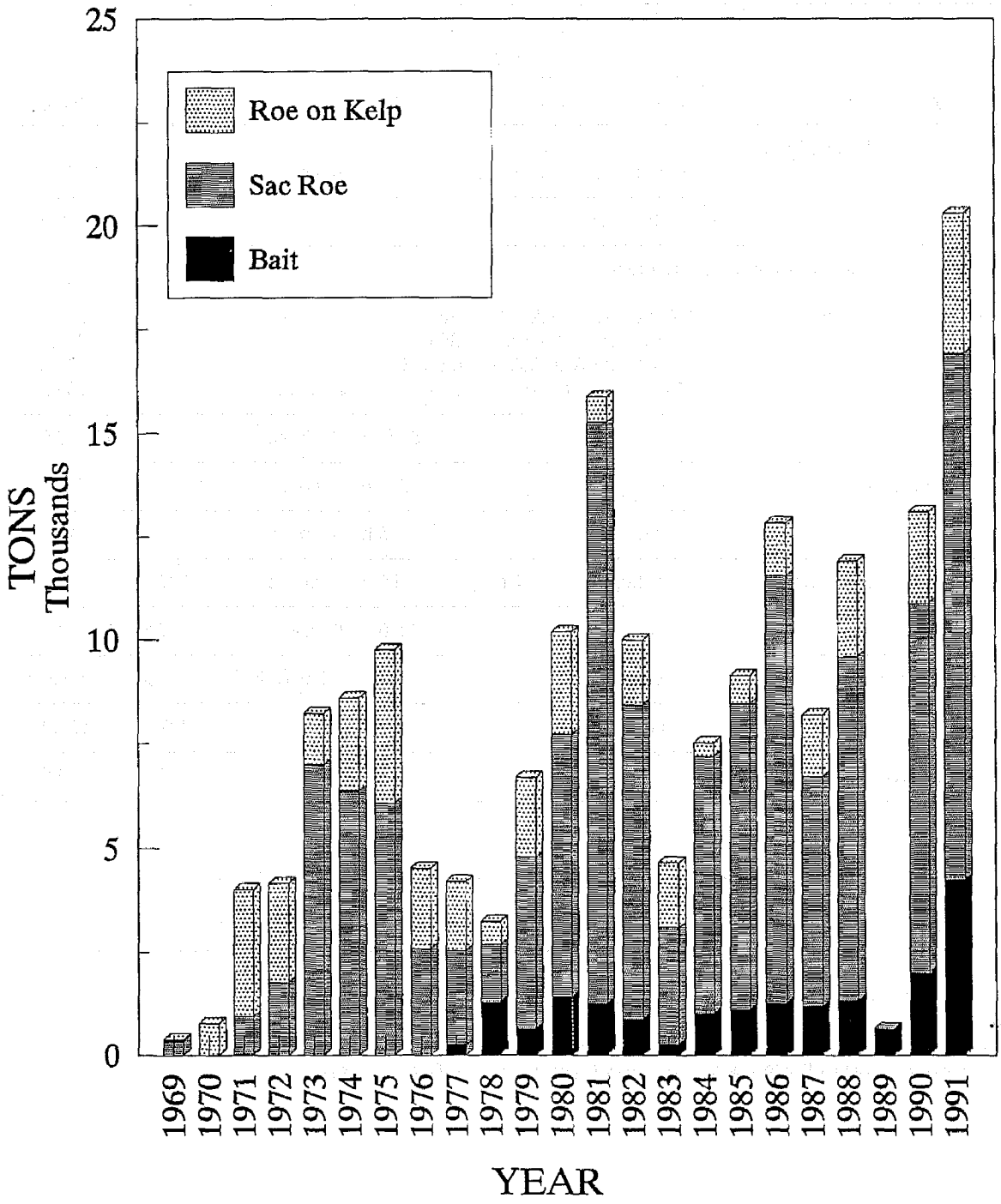
[a] The harvest by divers of naturally occurring herring spawn on native kelp species in Prince William Sound.

[b] The equivalent harvest of herring due to the removal of reproductive capacity from the population based on the assumption that the average herring spawn recovery is 10%, and 80% of the spawn on kelp harvest weight consists of eggs.

[c] The harvest of herring spawn–on–kelp produced in net pens or pounds.

[d] The 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 one ton of spawn on kelp.

ALL FISHERIES HERRING HARVEST
PRINCE WILLIAM SOUND



Appendix H.4. Commercial herring harvest by fishery, Prince William Sound, 1969 - 1991.

Appendix H.5. Herring sac roe seine and gill net fishery effort, anticipated and actual harvest, Prince William Sound, 1969 – 1991.

	Seine Fishery							Gillnet Fishery							Combined Fisheries
Year	Seine Fishery Opening Dates	Hours	Effort (Boats)	CPUE Tons/Boat Hr.	Anticipated Harvest[a]	Harvest (Tons)	Estimated Roe %	Gillnet Fishery Opening Dates	Hours	Effort (Boats)	CPUE Tons/Boat Hr.	Anticipated Harvest[a]	Harvest (Tons)	Estimated 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		4/10 – 04/17		3			3.8		6,372.0
1975	4/15 – 4/22	14	76	5.72		6,081.5			14						6,081.5
1976	5/08 & 6/01	13	66	3.01		2,584.5			13						2,584.5
1977	4/09 – 4/10	38	60	1.00		2,282.9		4/09 – 04/10	38	1	0.04		1.6		2,284.5
1978	4/17 – 4/21[b]	106	75	0.17		1,329.6		4/17 – 04/21	106	38	0.02		61.7		1,391.3
1979	4/07 – 4/19	215.5	89	0.22		4,138.6		CLOSED							4,138.6
1980	4/01 – 4/09	162	74	0.50		6,043.2		4/17 – 5/05		16			264.5		6,307.7
1981	4/01 – 4/09	60	101	2.27		13,770.6		4/16 – 4/18	53	18	0.25		234.6		14,005.2
1982	4/23	2	104	34.37		7,148.3	10 – 14%	4/24 – 4/26	54	18	0.41		393.9	12 – 15%	7,542.2
1983	4/13	1	103[c]	26.45		2,724.2	11.0%	4/21 – 4/22	24	22	0.20		105.4	11.0%	2,829.6
1984	4/14	3	105[d]	18.53	5,000	5,836.9	10 – 11%	4/18 – 4/22	59	24	0.24	250	342.9	8 – 14%	6,179.8
1985	4/28 – 4/29	4	103[e]	16.81	5,000	6,924.8	10 – 12%	4/29 – 5/01	34	21	0.58	250	413.3	10 – 12%	7,338.1
1986	4/17	3	105	31.20	5 – 7,000	9,828.1	11.0%	4/24 – 4/28	90	25	0.20	3 – 400	448.6	11.4%	10,276.7
1987	4/08 – 4/09	1.5	96	34.60	3 – 5,000	4,982.2	10.0%	4/10 – 4/11	24	25	0.89	2 – 300	533.3	9.5%	5,515.5
1988	4/21 – 4/22	2	105	37.60	4 – 5,000	7,895.9	10.5%	4/23	5.5	24	2.71	275	358.1	10.0%	8,254.0
1989	CLOSED				6,400			CLOSED				375			0.0
1990	04/12	0.3	96	290.35	6,038	8,362.1	10.0%	04/13	4	24	5.26	353	505.4	10.6%	8867.5
1991	4/09, 4/10, & 4/19	13	104	85.32	11,232.6	11,923.0	10.5%[f]	04/18	10.5	24	2.94	657.3	742.0	11.06%	12,665.0

[a]Anticipated harvest figures based on pre season harvest outlook projections.

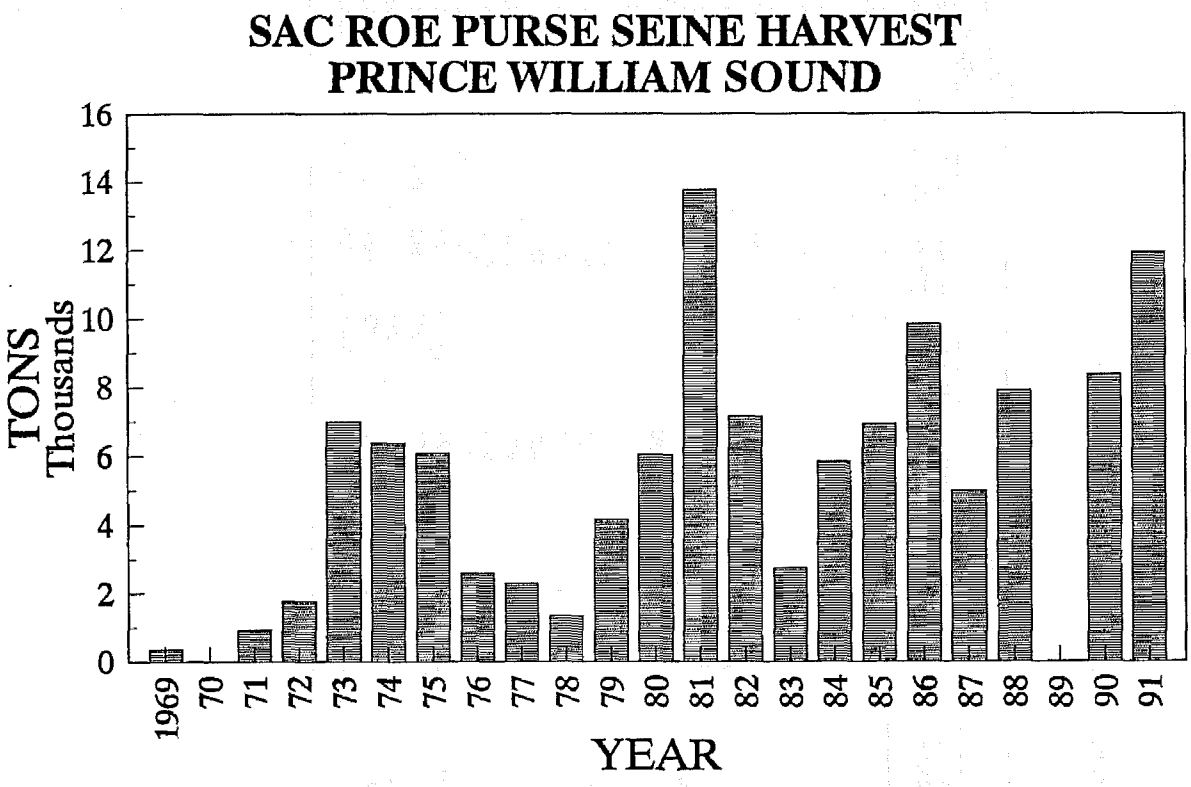
[b]An addition opening was scheduled on 6/14 for 6 hours, but resulted in no harvest.

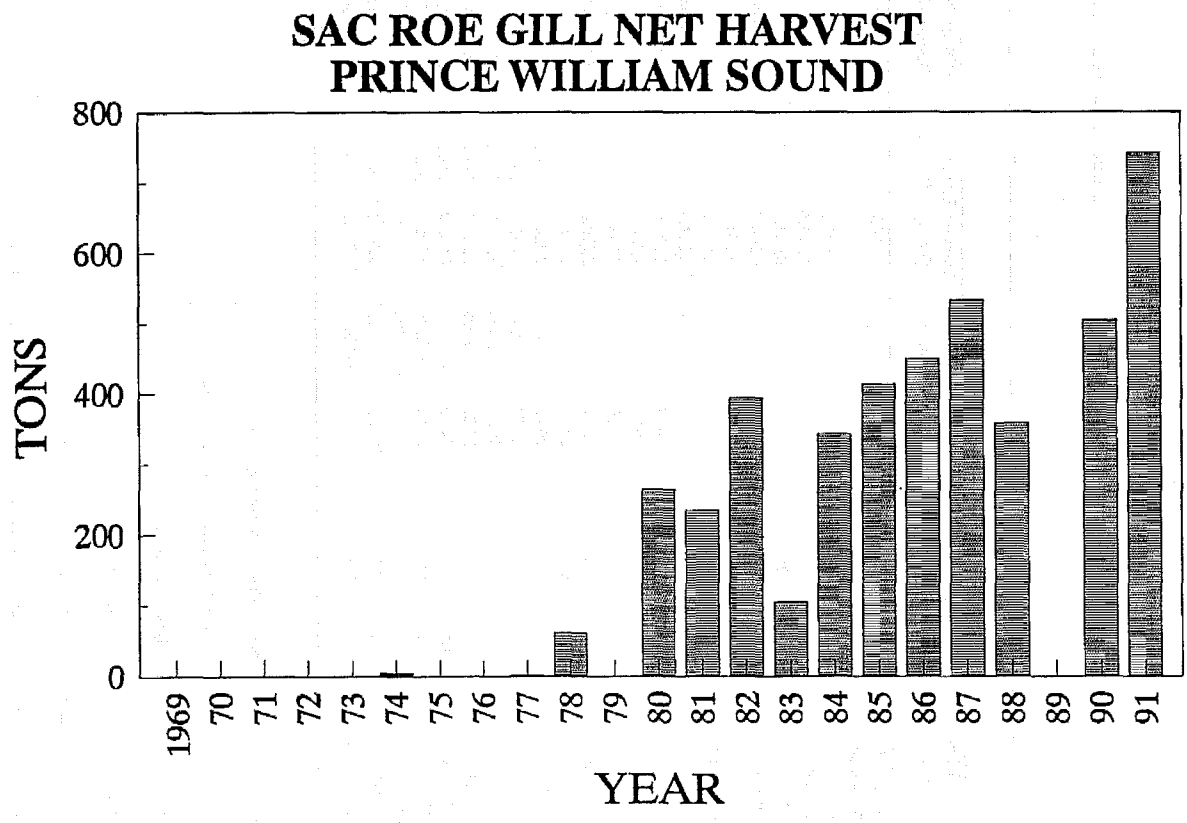
[c]103 boats participating but only 72 actually made deliveries.

[d]105 boats participating but only 101 actually made deliveries.

[e]103 boats participating; 62 made deliveries at Montague and 90 made deliveries in the Northern District.

[f]This total includes a test fishing set made by the Department for aerial surveycalibration (92.2 tons total)





Appendix H.6. Herring sac roe seine and gill net harvests, Prince William Sound, 1969 - 1991.

Appendix H.7. Herring eggs on kelp harvests from natural spawning, Prince William Sound, 1969 – 1991.

Year	Fishery Dates	Hours	Effort (Divers)	HARVEST BY KELP SPECIES and GROUND PRICE (per pound)								Harvest		Herring Utilized[b]
				Ribbon		Sieve		Hair		Other		Pounds[a]	Tons	Tons
				%	$	%	$	%	$	%	$			
1969	5/18–5/31		3	NO INFORMATION AVAILABLE								5,300	2.7	21.2
1970	4/19–6/06		29	NO INFORMATION AVAILABLE								190,300	95.2	761.2
1971	4/18–5/15		34	NO INFORMATION AVAILABLE								769,300	384.7	3,077.2
1972	4/30–5/20		397	NO INFORMATION AVAILABLE								599,300	299.7	2,397.2
1973	4/23–5/26		176	NO INFORMATION AVAILABLE								306,300	153.2	1,225.2
1974	4/22–5/04		166	Mostly Ribbon – Some Sieve and Hair $0.60–0.75								552,100	276.1	2,208.4
1975	4/25–5/10		437	NO INFORMATION AVAILABLE								917,100	458.6	3,668.4
1976	4/21– ?		357	NO INFORMATION AVAILABLE								484,900	242.5	1,939.6
1977	4/27–12/31		164	NO INFORMATION AVAILABLE								417,000	208.5	1,668.0
1978	4/20–4/30		66	23%	N/A	50%	N/A	27%	N/A			140,900	70.5	563.6
1979	4/25–5/03		198	NO INFORMATION AVAILABLE								473,200	236.6	1,892.8
1980	4/23–4/30	10	469	60%	$1.25	40%	$.085					612,300	306.2	2,449.2
1981	4/25	12	214	38%	$1.25	60%	$0.85	2%	$0.60			122,400	61.2	489.6
1982	5/05–5/08	73	151	83%	$1.42	11%	$0.95	6%	$0.74			309,600	154.8	1,238.4
1983	4/27	12	186	51%	$2.00–2.45	35%	$1.50–1.70	1%	$1.00–1.25	13%[c]	$3.00	303,200	151.6	1,212.8
1984	SEASON CLOSED		225[d]	NO HARVEST										
1985	5/06 & 5/08	20	95	51%	$1.25	49%	$0.50					41,300	20.7	165.2
1986	4/30–5/03	86	29	97%	$1.75	Remainder Sieve and Hair $0.80						95,200	47.6	380.8
1987	4/15–4/17	44	60	90%	$1.70		$0.85[e]		$0.80[e]			176,400	88.2	705.6
1988	4/29 & 4/30	12	158	64%	$1.50	24%	$0.75–1.00	12%	$0.75–1.00			193,200	96.6	772.8
1989	SEASON CLOSED			NO HARVEST									0	
1990	4/21–4/22	16	134	37%	$0.99	6%	$0.52	57%	$0.88			237,600	118.8	950.4
1991	4/11–4/17	95	48							100%[f]	$0.75–0.85	215,200	107.6	860.8

[a]Rounded to nearest 100 pounds.

[b]Indicates 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.

[c]Macrocystis

[d]Permits issued.

[e]The remaining 10% of the harvest consisted of sieve and hair.

[f]Fucus spp.

Appendix H.8. Herring eggs on kelp produced in pounds, Prince William Sound, 1979 – 1991.

Year	Fishery Dates[a]	Permits Issued[b]	Pounds Built[c]	Producing Pounds[d]	Average Blade Weight (lbs)	Blades Per Permit Holder	Herring Utilized (Tons)[e]	Ribbon Tons	Macrocystis Tons	Total[f] Tons	Allocation in Tons
1979		2	0								
1980	4/14	14	4	2			17	0.9	0.4	1.3	
1981	4/14	18	18	7			121	8.6	1.1	9.7	16
1982	4/29–5/10	25	20	18			319	25.1	0.5	25.5	26
1983	4/30–5/04	47	38	26			347	17.7	10.1	27.7	26
1984	4/24–5/08	65	45	37			315	6.4	18.8	25.2	26
1985	4/25–5/07	81	59	50			502	12.1	28.1	40.1	40
1986	4/21–4/28	104	82	81			903	0	72.2	72.2	60
1987	4/10–4/21	111	111	108			765	0	61.2	61.2	70
1988	4/12–4/23	122	122	119			1,550	0	124.0	124.0	85
1989	SEASON CLOSED										
1990	4/11–4/26	128	128	122			1,264	0	101.1	101.1	118
1991	4/07–4/20	126	126	119	0.27	1,200	2,530	0	202.4	202.4	220

[a]Dates that the fishery was opened to seine herring for placement into pounds.

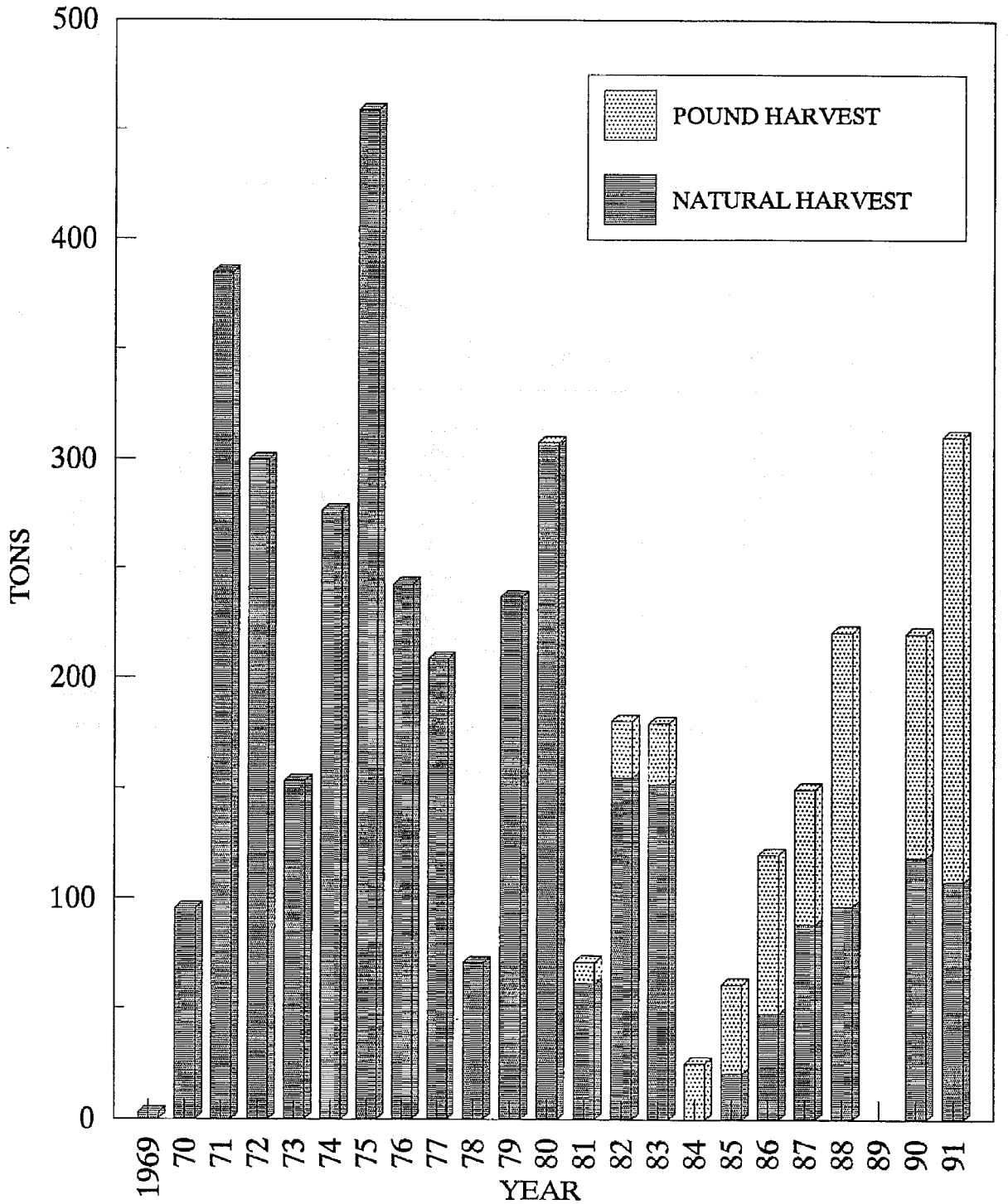
[b]Permits issued to applicants on register prior to the March 1 deadline.

[c]Number of individual pounds constructed by the April 1 deadline, and consequently the number of individuals receiving an equal allocation of the guideline harvest.

[d]Number 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 did not produce roe on kelp product.

[e]The 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.

[f]Production figures represent processed weights as reported on fish tickets.



Appendix H.9. Herring spawn on kelp harvest, Prince William Sound, 1969 - 1991.

Appendix H.10. Daily commercial herring food and bait harvest as reported on fish tickets, Prince William Sound, 1991.

Year	Date	Effort	Landings	Harvest[a] lbs.	Harvest[a] Tons	Cumulative Harvest lbs.	Cumulative Harvest Tons
1991	10/03	–	6	380,926	190.5	380,926	190.5
"	10/04	6	6	652,561	326.3	1,033,487	516.8
"	10/05	–	–	201,200	100.6	1,234,687	617.4
"	10/06	–	–	285,739	142.9	1,520,426	760.3
"	10/07	5	6	432,777	216.4	1,953,203	976.7
"	10/08	5	8	537,373	268.7	2,490,576	1245.4
"	10/09	–	5	401,392	200.7	2,891,968	1446.1
"	10/10	10	11	845,430	422.7	3,737,398	1868.8
"	10/11	9	13	1,707,056	853.5	5,444,454	2722.3
"	10/12	7	9	1,089,850	544.9	6,534,304	3267.2
"	10/13	5	6	555,662	277.8	7,089,966	3545.0
"	10/14	7	9	1,426,955	713.5	8,516,921	4258.5
Totals		14	85	8,516,921	4258.5		

[a]Effort was concentrated in the vicinity of Green Island. Differences in pounds and tons due to rounding.

Appendix H.11. Commercial herring bait and food harvests in short tons, Prince WIlliam Sound, 1970 – 1991.

	Seine		Pair Trawl		Mid–Water Trawl		Otter Trawl		
Year[a]	Effort	Harvest Tons	Effort	Harvest Tons	Effort	Harvest Tons	Effort	Harvest Tons	Total 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	1,955.2			–	60.8			2,016.0
1991[m]	14	4,258.5							4,258.5

[a]No harvest in years not listed.

[b]Starting 1977 bait herring season includes portions of two calendar years, unless closed by E.O.

[c]Fishery opened by emergency order on October 16,1979 and extended on January 7, 1980. Deliveries made through March 2.

[d]Fishery season opened by emergency order September 15,1979, closed Dec. 31, 1979, and reopened by emergency order from Feb. 16 – 28, 1980.

[e]Fishing season opened by regulation on September 15,1980 and closed by emergency order on November 7,1980.

[f]Fishing season opened by regulation on September 15,1981 and closed by emergency order on September 30,1981.

[g]Fishing season opened by regulation on September 1,1985 and closed by emergency order on February 15,1986.

[h]Fishing season opened by regulation on September 1,1986 and closed by emergency order on October 24,1986.

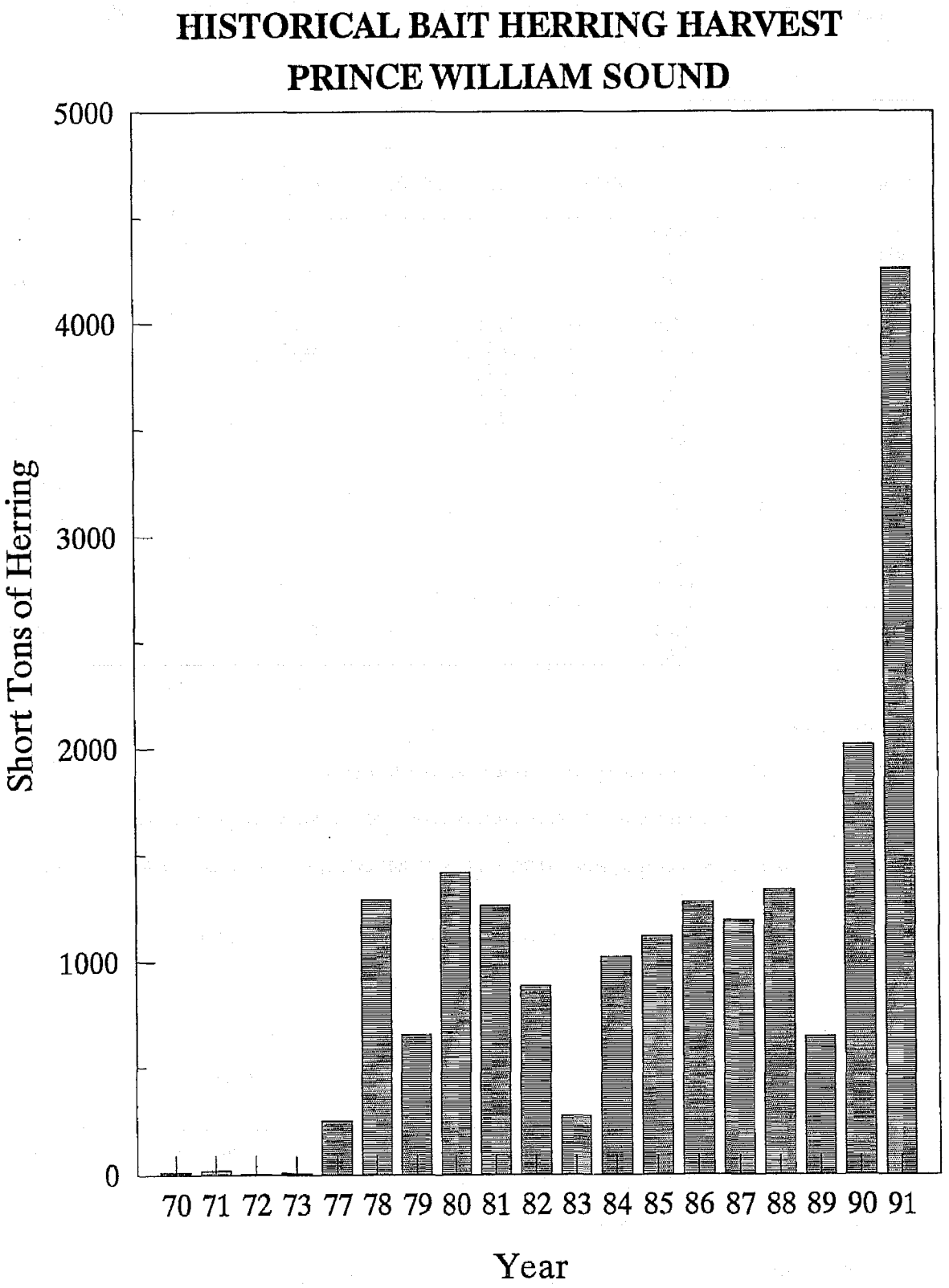
[i]Fishing season opened by regulation on September 1, 1987 in the General District. The Northern and Eastern Herring Districts opened on September 23. The season was then closed by emergency order on October 6 for a period of five weeks, reopened on November 9, and closed for the duration of the 1987–88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

[j]Fishery open from November 1 until November 5.

[k]Fishery opened by regulation from November 1, 1989 and closed by regulation on January 31, 1990.

[l]Fishery open from Sept. 21 until Nov. 24. The Montague area was open from Sept. 24 until Nov. 24.

[m]Fishery open from Oct. 1 until Oct. 14 in the Montague area only.



Appendix H.12. Food and bait herring harvests, Prince William Sound, 1970 - 1991.

Appendix H.13. Peak aerial survey herring biomass, spawn deposition biomass estimates, and miles of spawn by area, Prince William Sound, 1991.

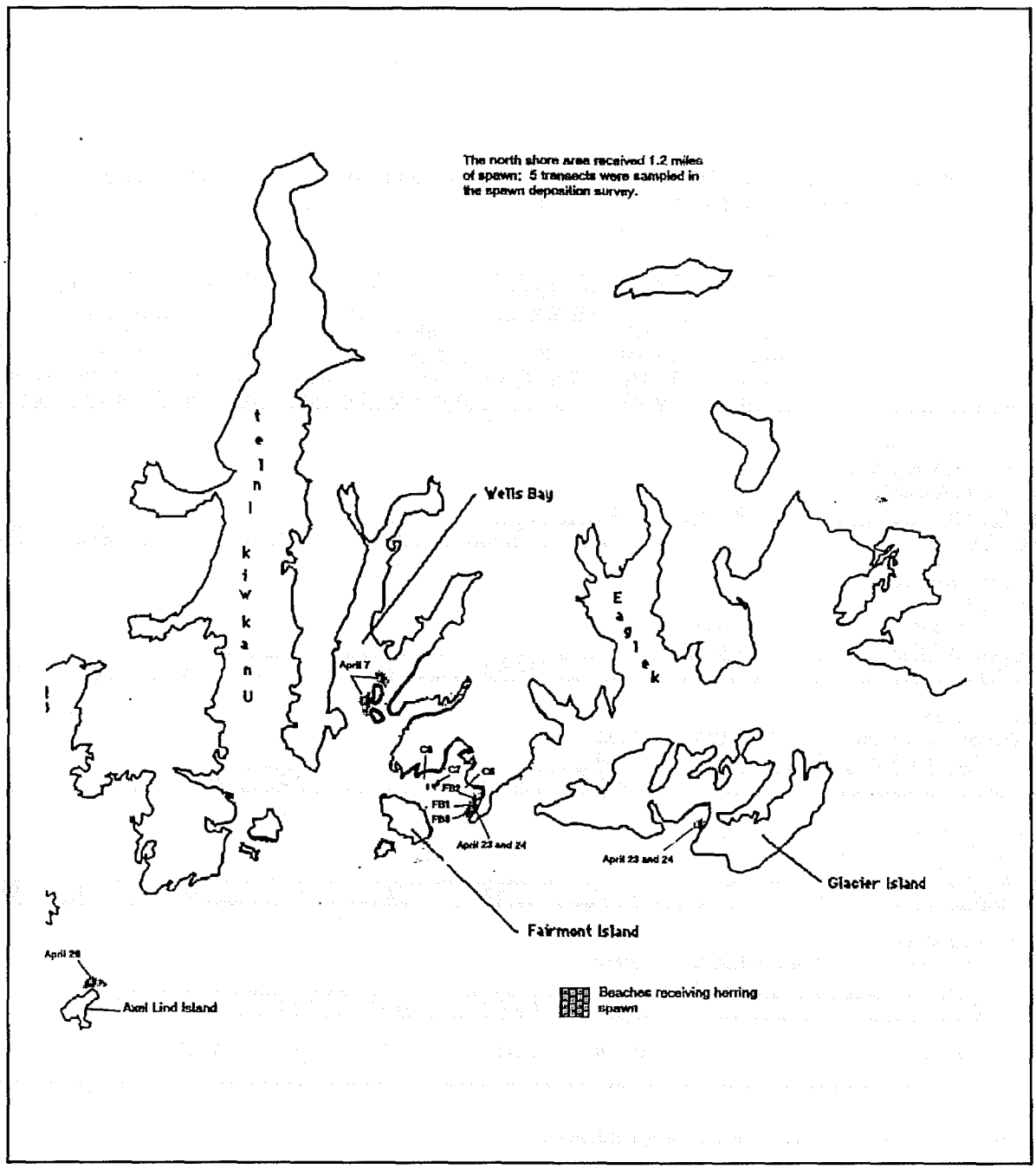
Survey Area	Peak Aerial Survey Date	Spawning Biomass Estimates: Peak Aerial Survey (tons)	Spawning Biomass Estimates: Spawn Deposition (tons)	Mile–days of Spawning[a]	Miles of Spawning[b]	Biomass of Herring per Mile (tons): Aerial Survey Estimate	Biomass of Herring per Mile (tons): Spawn Deposition Estimate	Biomass Ratio[d]
Southeast–shore area								
Simpson and Sheep Bays								
Hinchinbrook Island								
Port Gravina	4/02 & 4/29	340.0						
Area Total		340.0	789.9	5.9	3.9	87.2	202.6	2.32
Northeast–shore area								
Port Fidalgo	4/09 & 4/26	5,870.0						
Tatitlek Narrows	4/09 & 4/26	11,540.0						
Valdez Arm & Port Valdez	4/06 & 4/27	3,480.0						
Area Total		20,890.0	29,418.9	24.6	28.5	733.0	1,032.2	1.41
North–shore area								
Pt. Freemantle–Granite Pt.	3/30 & 4/26	720.0						
Granite Pt. Esther Pass	3/30, 4/07, & 4/24	1,245.0						
Area Total		1,965.0	253.6	1.8	1.2	1,637.5	211.3	0.13
Naked Island area								
Naked Island	4/25	480.0						
Knight Island		0.0						
Area Total		480.0	0.0	0.0	0.0	0.0	0.0	0.00
Montague Island area								
Montague Island	4/06,4/11,4/24, &	19,090.0						
Green Island	4/09	[c]						
Area Total		19,090.0	86,680.9	33.0	24.4	782.4	3,552.5	4.54
Total – All Areas		42,765.0	117,143.3	65.2	58.0	737.3	2,019.7	2.74

[a]The mile–days of spawning are measured and mapped during aerial surveys.

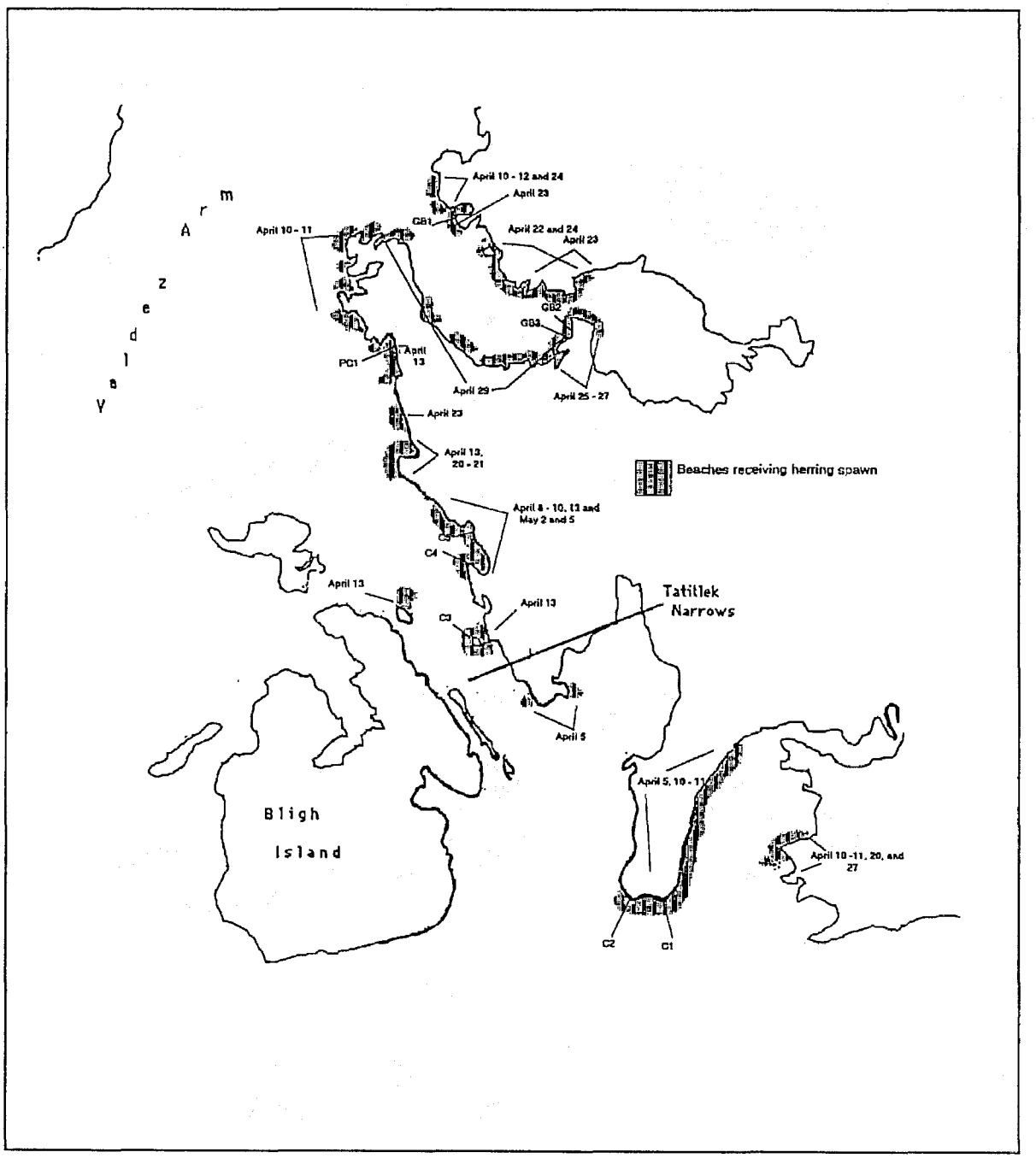
[b]The miles of spawning are measured during the spawn deposition surveys. The miles of spawning will usually be smaller than the mile – days of spawning. However, there are instances when the miles of spawning may exceed the mile–days of spawning. This usually occurs because aerial surveys are not flown every day in all areas of Prince William Sound.

[c]The peak aerial estimate for Green Island is included in the Montague totals.

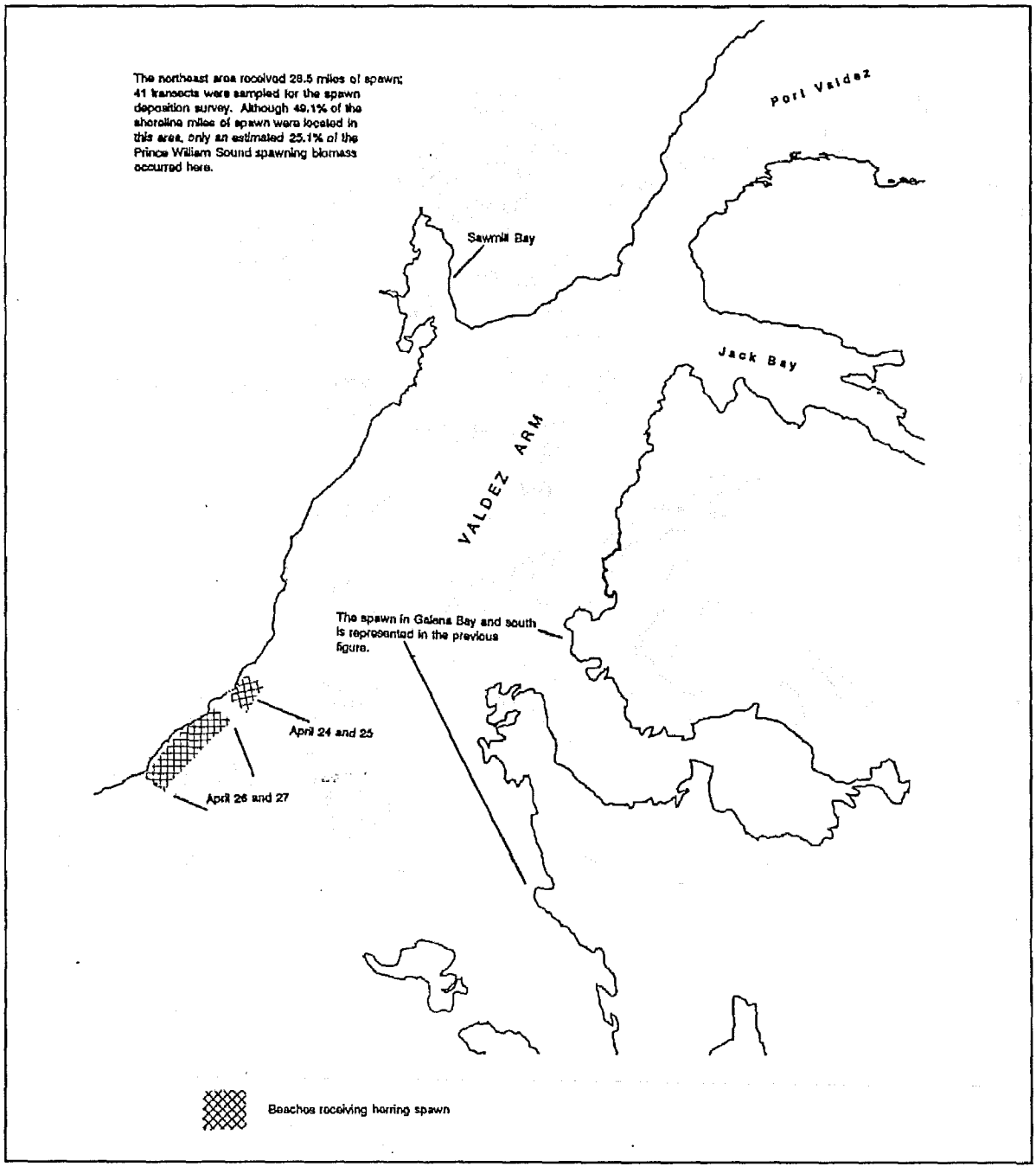
[d]The biomass ratio is the spawn deposition biomass estimate over the peak aerial survey estimate.



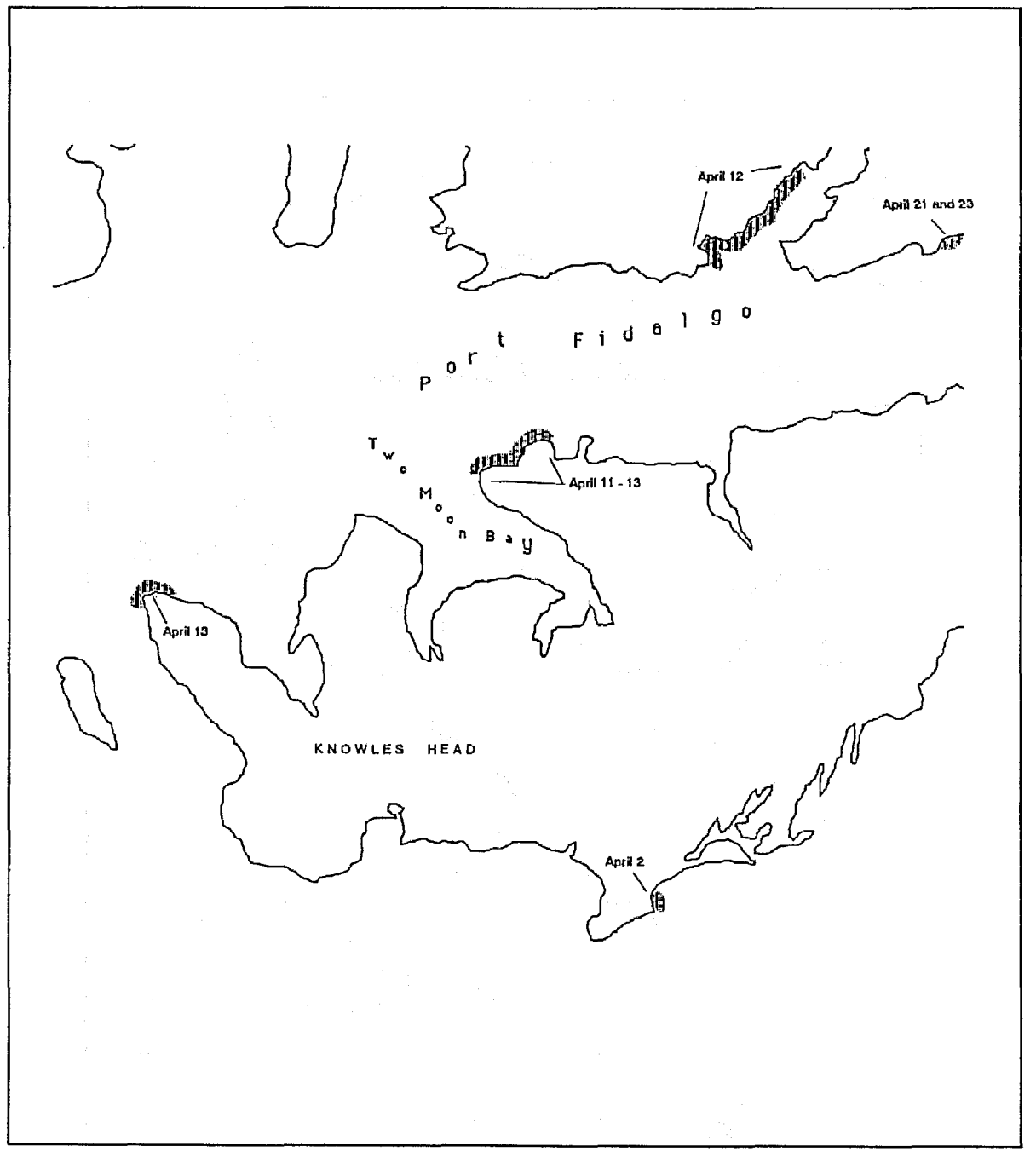
Appendix H.14. Herring spawn and spawning dates in the North Shore area in 1991 and study sites for herring research.



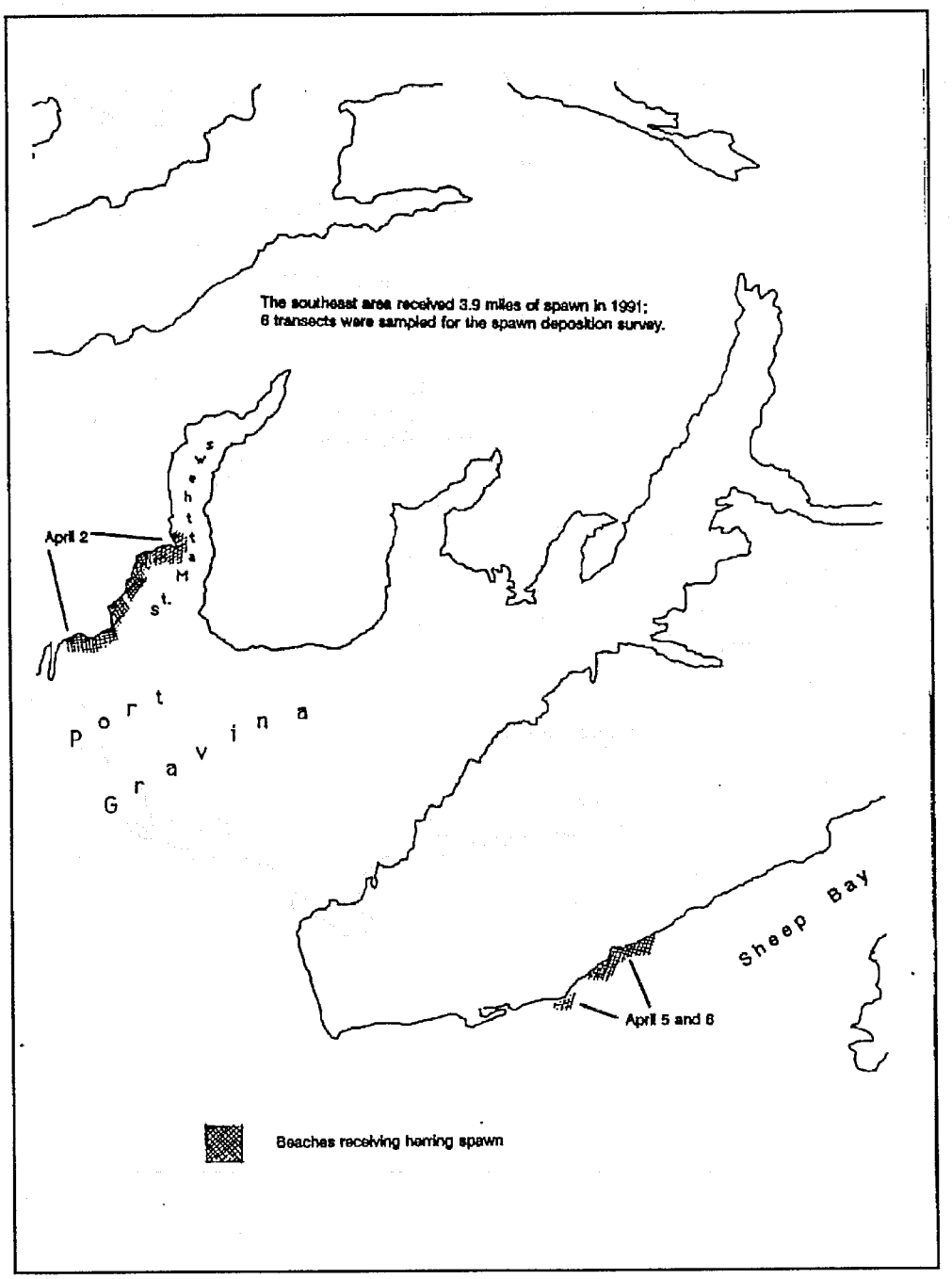
Appendix H.15. Herring spawn and spawning dates in the Northeast area in 1991 and study sites for herring research.



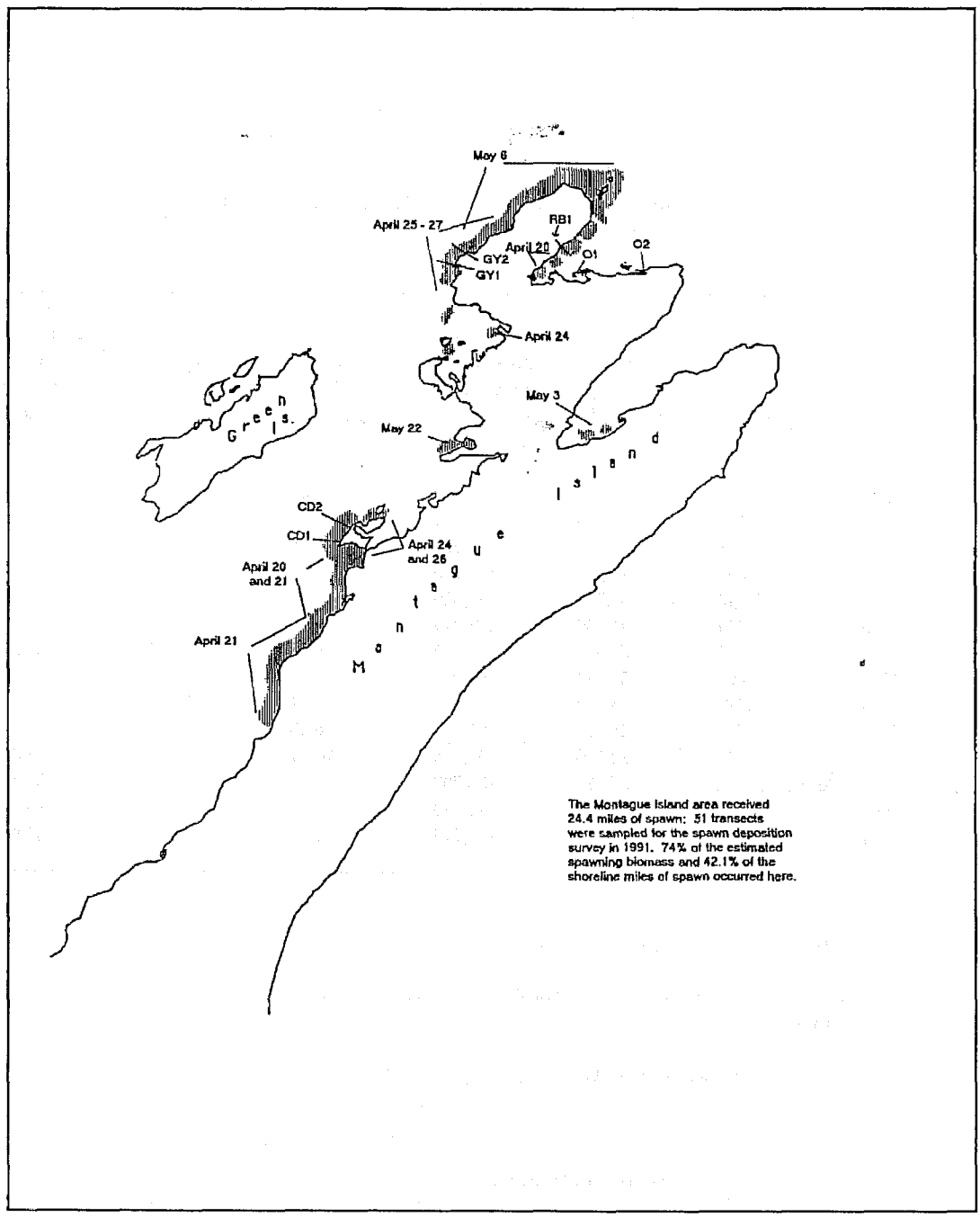
Appendix H.16. Herring spawn and spawning dates in the Valdez Arm section of the Northeast area in 1991.



Appendix H.17. Herring spawn and spawning dates in the Port Fidalgo section of the Northeast area and in the Knowles Head section of the Southeast area in 1991.



Appendix H.18. Herring spawn and spawning dates in the Port Gravina and Sheep Bay sections of the Southeast area in 1991.



Appendix H.19. Herring spawn and spawning dates in the Montague Island area and herring research study sites in 1991.

Appendix H.20. Annual herring biomass indices, Prince William Sound, 1978 – 1991.

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	36,540	28.7	36.3	
1979	4,139	42,100	107,390	54.5	73.2	
1980	6,308	62,110	122,050	50.5	73.9	
1981	14,005	77,810	161,690	85.3	140.1	
1982	7,542	68,790	97,620	49.0	65.1	
1983	2,830	41,850	107,710	67.4	99.8	22,000
1984	6,180	58,870	158,760	60.1	86.8	79,710
1985	7,494	20,830	60,954	101.2	149.5	
1986	10,277	15,180	54,820	72.4	152.3	
1987	5,516	26,580	52,192	65.3	155.9	
1988	8,254	34,270	67,175	166.3	236.9	59,310
1989	Season Closed	56,915	186,708	98.4	185.8	57,580
1990	8,867	57,900	145,013	94.1	144.4	114,998
1991	11,923	42,765	141,375	58.0	65.2	117,143

[a]Represents the combined seine and gillnet sac roe harvest in short tons.

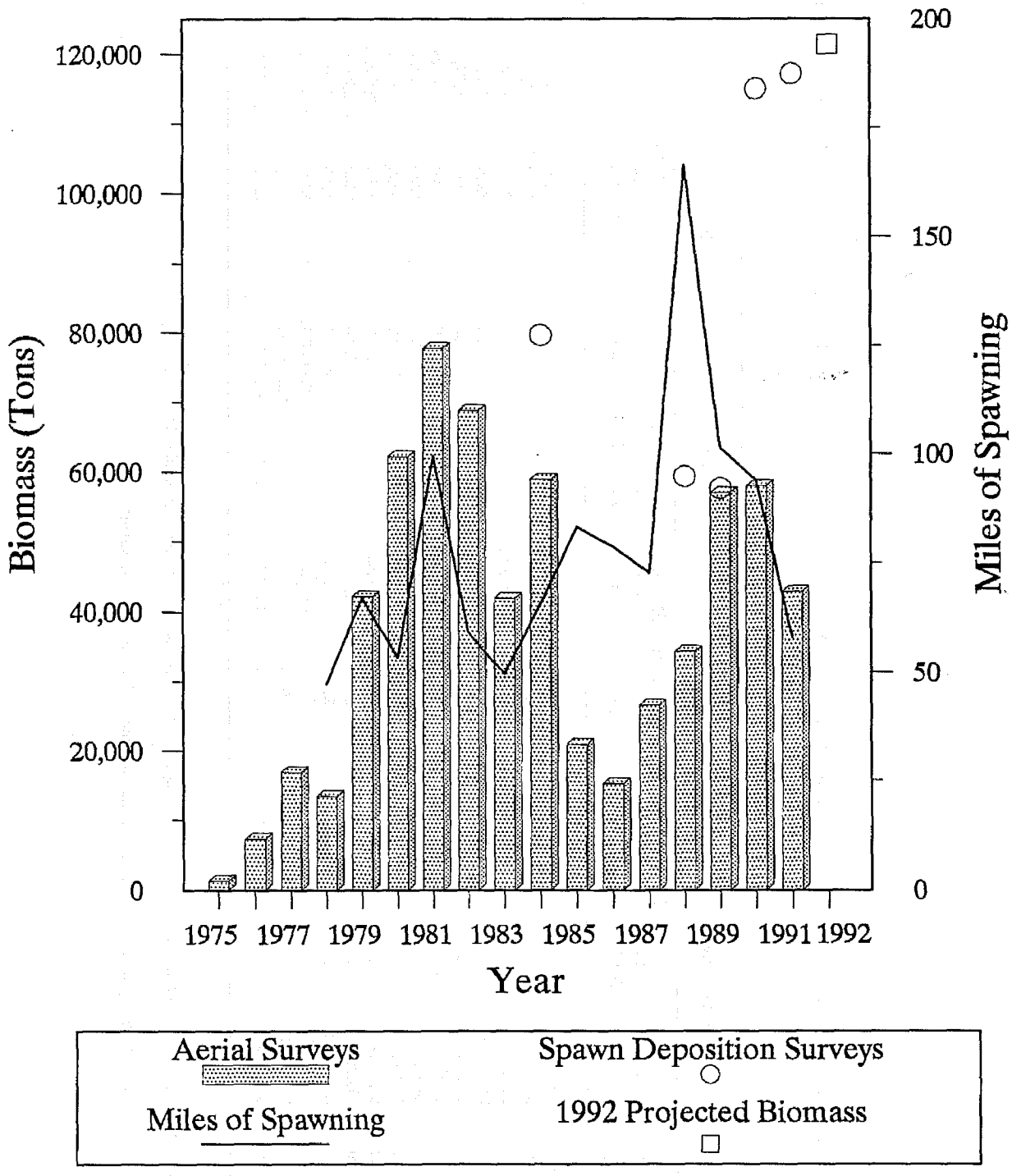
[b]Largest single day aerial estimate of herring biomass in short tons. Peak estimates for different areas (ie Valdez Arm vs. Montague) may occur on different days.

[c]The sum of all daily aerial biomass estimates for a given year.

[d]Total linear miles of spawn.

[e]The sum of the daily observed linear miles of herring spawn.

[f]Estimates are made from underwater surveys of spawn deposition; 1983 is a partial estimate of the spawning biomass, while 1984, and 1988–1991 estimates are of the entire spawning biomass.



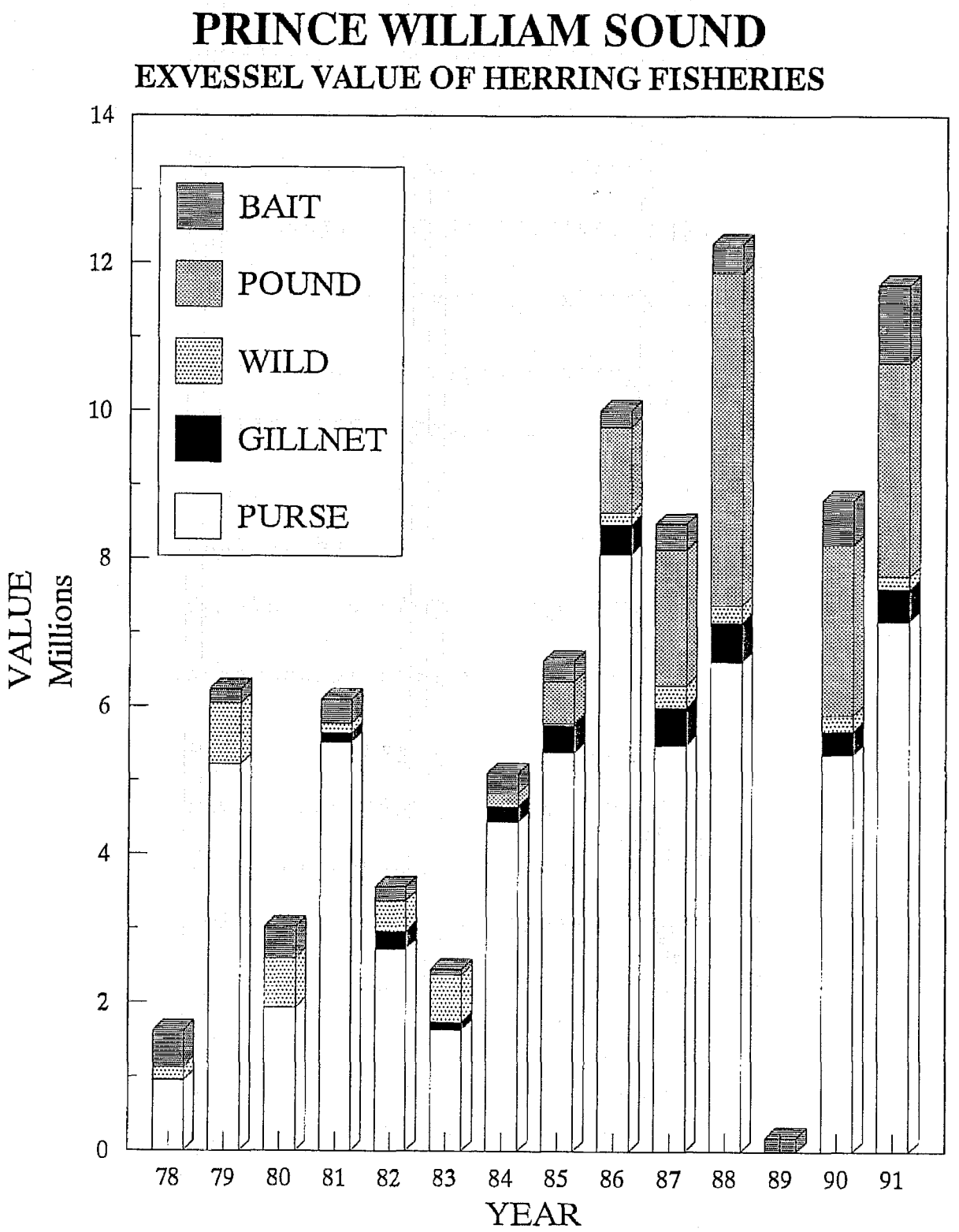
Appendix H.21. Annual herring biomass indices, Prince William Sound, 1975 - 1991.

Appendix H.22. Mean price and estimated exvessel value of the commercial herring harvest by gear type, Prince William Sound,1978 – 1991.[a]

	Sac Roe Fisheries				Roe on Kelp Fisheries				Food and Bait Fishery		
	Purse Seine		Gillnet		Wild Harvest		Pounding		Mixed Gear		
Year	Price per ton	Total Value	Price per ton	Total Value	Price per pound	Total Value	Price per pound	Total Value	Price per ton	Total Value[b]	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	$667,080		$0	$300	$424,800	$3,025,640
1981	$400	$5,508,000	$580	$135,720	$1.00	$122,000		$0	$260	$328,120	$6,093,840
1982	$380	$2,716,240	$640	$251,520	$1.29	$397,320		$0	$220	$194,260	$3,559,340
1983	$600	$1,634,400	$1,040	$109,200	$2.10	$634,200		$0	$260	$70,980	$2,448,780
1984	$760	$4,435,360	$640	$218,880	NO HARVEST		$3.50	$176,439	$260	$265,460	$5,096,139
1985	$760	$5,380,800	$900	$371,700	$0.48	$19,200	$7.09	$569,058	$250	$279,500	$6,620,258
1986	$820	$8,058,960	$920	$412,160	$1.70	$159,800	$8.00	$1,155,200	$180	$229,680	$10,015,800
1987	$1,100	$5,480,200	$960	$511,680	$1.70	$299,200	$15.00	$1,836,000	$300	$356,700	$8,483,780
1988	$840	$6,600,000	$1,400	$537,000	$1.20	$232,000	$18.00	$4,500,000	$300	$400,590	$12,236,500
1989	SEASON CLOSED		SEASON CLOSED		SEASON CLOSE		SEASON CLOSED		$300	$193,830	$193,830
1990	$640	$5,351,744	$640	$323,456	$0.90	$213,840	$11.40	$2,305,080	$300	$605,130	$8,799,250
1991	$600	$7,153,800	$600	$445,200	$0.80	$172,160	$9.00	$2,880,000	$250	$1,064,625	$11,715,785

[a]Value of harvest and price per ton are estimates based on verbal reports from processors and fishermen obtained post season.

[b]The price per pound for roe on kelp in pounds is based on the final product weight, not harvest weight.



Appendix H.23. Annual exvessel value of commercial herring fisheries, Prince William Sound, 1978 - 1991.

Appendix H.24. Age, sex and size composition of Pacific herring sampled from the spring purse seine sac roe fishery, Prince William Sound, 1991.

Sample Date		MALES						FEMALES						SEXES COMBINED					
				LENGTH		WEIGHT				LENGTH		WEIGHT				LENGTH		WEIGHT	
	AGE	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD
	2	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA
	3	13	3.0	183	7	79	13	5	1.2	174	17	77	7	18	4.2	180	11	78	12
	4	5	1.2	196	5	85	17	4	0.9	201	6	103	9	9	2.1	198	6	93	16
Northeast Shore	5	2	0.5	218	15	111	11	3	0.7	204	6	114	6	5	1.2	210	11	113	7
Port Fidalgo and	6	14	3.3	216	12	133	17	20	4.7	216	9	132	14	34	7.9	216	10	132	15
Tatitlek Narrows	7	155	36.0	219	12	140	16	142	33.0	220	14	145	22	297	69.1	219	13	142	19
Purse Seine Sac Roe	8	13	3.0	229	11	156	24	15	3.5	224	8	142	23	28	6.5	226	10	149	24
Commercial Catch	9	6	1.4	236	14	178	35	7	1.6	237	15	198	27	13	3.0	237	14	189	32
09 April, 1991	10	12	2.8	239	12	177	22	9	2.1	240	12	180	24	21	4.9	239	11	178	22
	11	3	0.7	246	4	174	39	2	0.5	232	15	172	35	5	1.2	240	11	173	33
	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		223	51.9	219	16	139	27	207	48.1	220	16	144	28	430	100.0	219	16	141.3	28
UNAGED		9	45.0	203	34	136	25	11	55.0	222	14	149	27	20	100.0	213	26	143	26
	2	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA
	3	20	3.2	182	25	80	34	12	1.9	187	20	95	54	32	5.1	184	23	86	42
	4	3	0.5	192	21	90	24	5	0.8	201	12	109	17	8	1.3	198	15	102	20
Northeast Shore	5	4	0.6	208	7	139	41	6	0.9	217	6	133	14	10	1.6	213	8	136	26
Tatitlek Narrows,	6	19	3.0	207	16	118	25	32	5.1	218	8	137	19	51	8.1	214	12	130	23
Fidalgo and Two Moon	7	192	30.4	219	12	141	20	230	36.4	221	16	148	21	422	66.8	220	14	145	21
Purse Seine Sac Roe	8	25	4.0	224	10	154	18	14	2.2	231	10	172	25	39	6.2	227	10	161	22
Commercial Catch	9	19	3.0	229	12	159	25	11	1.7	238	10	175	15	30	4.7	232	12	165	23
10 April, 1991	10	12	1.9	239	8	184	18	21	3.3	240	11	183	23	33	5.2	239	10	183	21
	11	4	0.6	242	7	185	17	1	0.2	240	NA	205	NA	5	0.8	241	6	189	17
	12	1	0.2	239	NA	187	NA	0	0.0	NA	NA	NA	NA	1	0.2	239	NA	187	NA
	13	1	0.2	254	NA	223	NA	0	0.0	NA	NA	NA	NA	1	0.2	254	NA	223	NA
TOTAL		300	47.5	218	18	140	31	332	52.5	221	17	149	28	632	100.0	219	18	144.3	30
UNAGED		18	41.9	216	12	137	22	25	58.1	224	14	152	23	43	100.0	221	13	146	23

§a'Indicates dominant age class.

–Continued–

Appendix H.24. (page 2 of 2)

Sample Date		MALES						FEMALES						SEXES COMBINED					
				LENGTH		WEIGHT				LENGTH		WEIGHT				LENGTH		WEIGHT	
	AGE	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD
	2	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	1	0.2	142	NA	35	NA
	3	81	18.8	174	9	66	11	26	6.0	176	12	69	15	109	25.3	174	10	67	12
	4	5	1.2	186	12	80	16	6	1.4	187	10	84	13	11	2.6	187	10	82	13
Montague Area	5	2	0.5	206	5	104	6	0	0.0	NA	NA	NA	NA	2	0.5	206	5	104	6
Stockdale Harbor	6	17	3.9	214	13	118	19	24	5.6	216	9	136	24	41	9.5	215	11	128	23
Purse Seine Sac Roe	7	126	29.2	216	9	134	18	108	25.1	218	12	143	17	234	54.3	217	11	138	18
19 April, 1991	8	10	2.3	224	10	148	17	4	0.9	211	5	132	7	14	3.2	221	11	143	17
	9	7	1.6	228	13	150	14	4	0.9	227	16	169	28	11	2.6	227	13	157	21
	10	2	0.5	226	25	150	45	4	0.9	235	13	161	30	6	1.4	232	16	157	31
	11	0	0.0	NA	NA	NA	NA	1	0.2	250	NA	198	NA	1	0.2	250	NA	198	NA
	12	0	0.0	NA	NA	NA	NA	1	0.2	242	NA	186	NA	1	0.2	242	NA	186	NA
	13	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA
TOTAL		250	58.0	202	22	111	36	178	41.3	211	20	131	34	431	100.0	206	22	118.5	37
UNAGED		10	55.6	203	16	107	28	8	44.4	204	23	111	30	18	100.0	204	19	109	28

*Indicates dominant age class.

Appendix H.25. Age, sex and size composition of Pacific herring sampled from the spring gill net sac roe fishery, Prince William Sound, 1991.[a]

Sample Date	MALES							FEMALES							SEXES COMBINED					
				LENGTH		WEIGHT				LENGTH		WEIGHT					LENGTH		WEIGHT	
	AGE	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD	
	2	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	
	3	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	
	4	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	
Montague Area	5	0	0.0	NA	NA	NA	NA	4	1.0	228	5	149	15	4	1.0	228	5	149	15	
Rocky Bay	6	15	3.6	217	29	150	12	10	2.4	223	9	147	12	25	6.0	219	23	149	12	
Gill Net Sac Roe	7	152	36.5	227	7	154	12	179	42.9	228	13	159	14	331	79.4	228	10	157	14	
18 April, 1991	8	15	3.6	233	9	163	21	7	1.7	225	32	173	16	22	5.3	230	19	166	20	
	9	12	2.9	237	13	171	22	8	1.9	242	9	177	20	20	4.8	239	12	174	21	
	10	5	1.2	237	11	164	28	8	1.9	245	12	176	33	13	3.1	242	12	172	31	
	11	1	0.2	250	NA	210	NA	1	0.2	252	NA	178	NA	2	0.5	251	1	194	23	
	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		200	48.0	228	12	156	15	217	52.0	229	14	160	16	417	100.0	228	13	158.3	16	
UNAGED		9	27.3	231	9	157	17	24	72.7	230	10	157	15	33	100.0	230	10	157	15	

*Indicates dominant age class.

Appendix H.26. Age, sex and size composition of Pacific herring sampled from the spring roe on kelp in pounds fishery, Prince William Sound, 1991.[a]

		MALES						FEMALES						SEXES COMBINED					
				LENGTH		WEIGHT				LENGTH		WEIGHT				LENGTH		WEIGHT	
Date	AGE	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD
	2	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA
	3	41	3.3	185	11	80	20	22	1.8	186	8	84	16	63	5.0	185	10	81	18
	4	8	0.6	211	16	117	29	9	0.7	188	29	98	13	17	1.4	198	26	107	23
Northeast Shore	5	7	0.6	207	11	112	17	9	0.7	210	9	122	22	16	1.3	209	10	118	20
Picnic Cove and	6	49	3.9	211	7	122	17	53	4.2	217	9	130	17	102	8.2	214	8	126	17
Boulder, Galena,	7	406	32.5	219	10	135	19	482	38.6	222	11	145	19	888	71.0	220	11	141	20
and Landlocked Bays.	8	30	2.4	223	11	147	26	37	3.0	226	20	154	26	67	5.4	224	16	151	26
Pound Fishery	9	20	1.6	235	12	165	24	18	1.4	233	13	168	27	38	3.0	234	13	166	25
04 April, 1991	10	16	1.3	232	9	173	21	17	1.4	245	10	195	21	33	2.6	239	12	184	24
07 April, 1991	11	14	1.1	237	10	180	23	9	0.7	237	8	171	29	23	1.8	237	9	176	25
	12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA
	13	3	0.2	246	13	209	27	0	0.0	NA	NA	NA	NA	3	0.2	246	13	209	27
TOTAL		594	47.5	217	14	134	28	656	52.5	221	15	144	26	1,250	100.0	219	15	139	27
UNAGED		57	54.8	221	14	139	27	47	45.2	222	10	145	23	104	100.0	221	13	142	25
	2	1	0.2	173	NA	58	NA	0	0.0	NA	NA	NA	NA	1	0.2	173	NA	58	NA
	3	23	5.3	181	8	65	8	11	2.6	176	12	68	15	34	7.9	179	9	66	11
	4	4	0.9	190	13	77	18	0	0.0	NA	NA	NA	NA	4	0.9	190	13	77	18
Northeast Shore	5	3	0.7	208	6	106	14	3	0.7	214	5	115	25	6	1.4	211	6	110	19
Galena Bay	6	17	4.0	215	10	120	24	16	3.7	219	7	125	13	33	7.7	217	9	123	19
Pound Fish	7	173	40.2	219	8	124	16	117	27.2	222	8	137	19	290	67.4	220	8	129	19
24 April, 1991	8	12	2.8	227	8	134	18	14	3.3	228	9	148	25	26	6.0	228	9	141	23
	9	8	1.9	235	8	156	23	7	1.6	234	7	162	33	15	3.5	235	8	159	27
	10	8	1.9	235	14	151	27	6	1.4	241	8	164	22	14	3.3	238	12	157	25
	11	2	0.5	228	22	127	44	4	0.9	233	9	165	34	6	1.4	231	12	152	38
	12	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA	0	0.0	NA	NA	NA	NA
	13	1	0.2	257	NA	185	NA	0	0.0	NA	NA	NA	NA	1	0.2	257	NA	185	NA
TOTAL		252	58.6	216	16	120	27	178	41.4	221	15	135	28	430	100.0	218	15	125.9	28
UNAGED		6	30.0	224	5	128	6	14	70.0	223	8	139	30	20	100.0	224	7	135	26

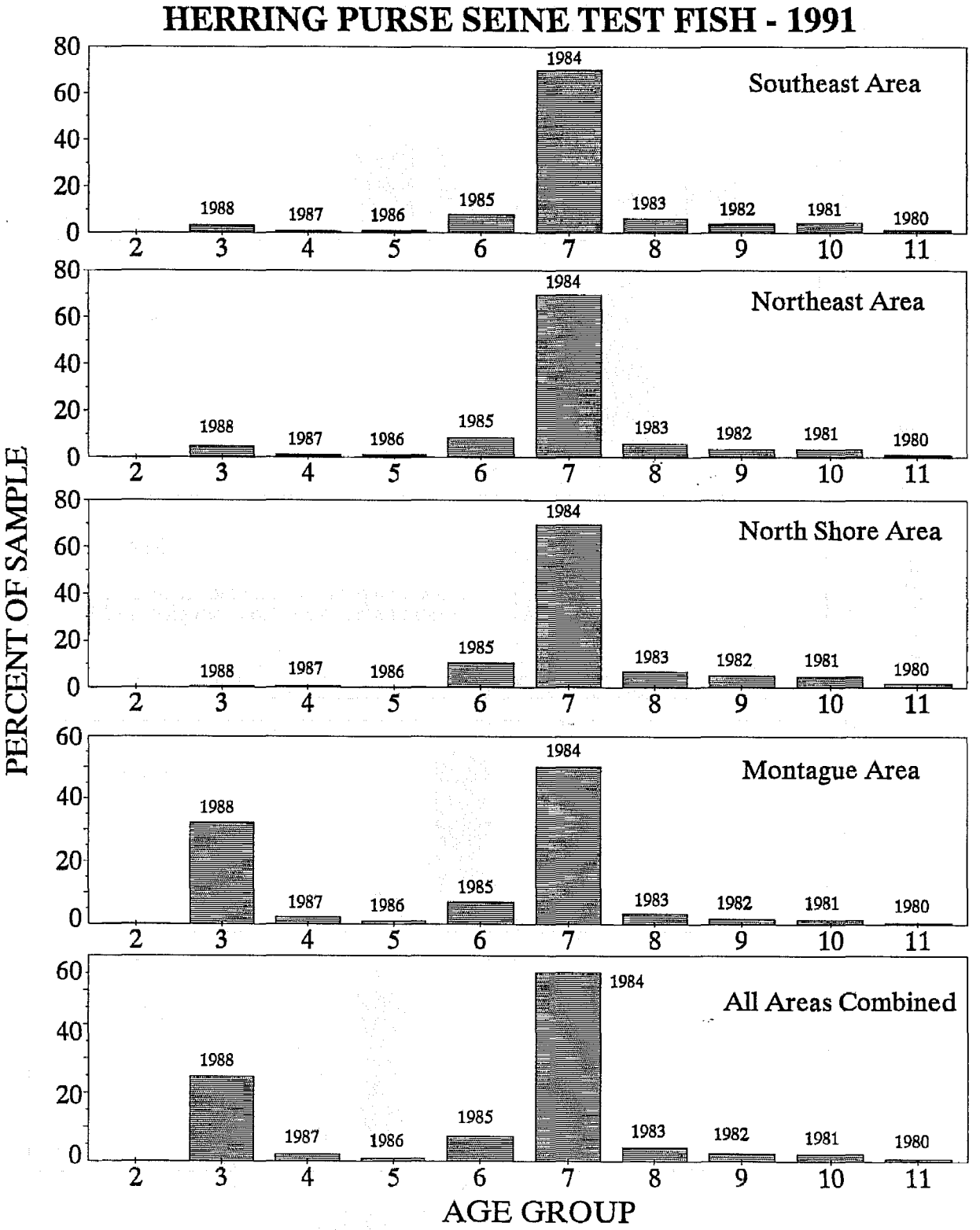
[a] Indicates dominant age class.

Appendix H.27. Age sex, and size composition of Pacific herring sampled from the fall commercial food and bait fishery, Prince William Sound, 1991.[a]

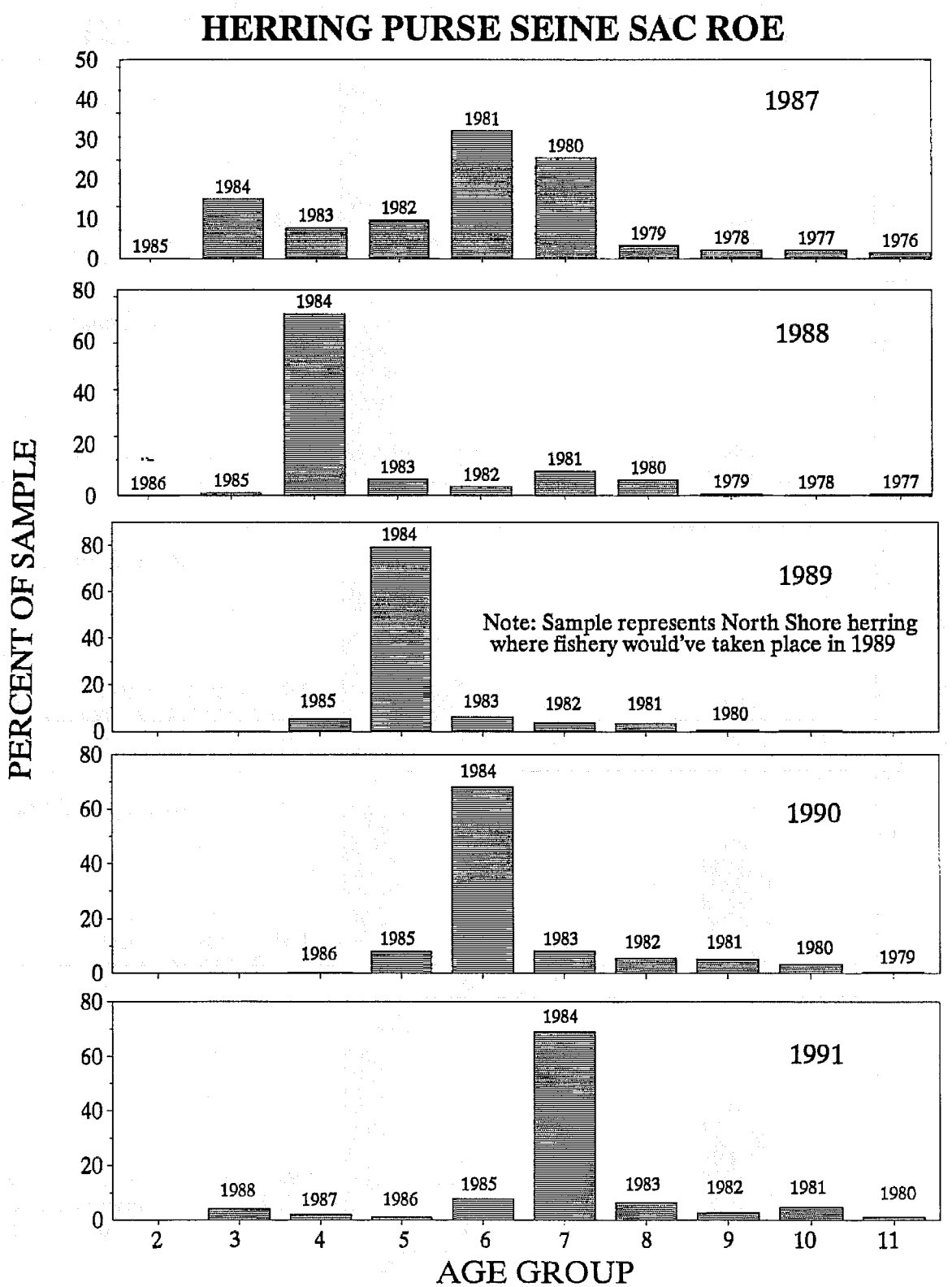
Sample Date	AGE	MALES						FEMALES						SEXES COMBINED[b]					
				LENGTH		WEIGHT				LENGTH		WEIGHT				LENGTH		WEIGHT	
		NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD	NUMBER	PERCENT	MEAN	STD	MEAN	STD
	2	1	0.1	143	NA	36	NA	0	0.0	NA	NA	NA	NA	2	0.2	143	0	36	0
	3	9	0.8	175	7	71	12	5	0.4	179	9	76	13	14	1.2	177	8	73	12
	4	545	46.3	192	10	100	16	437	37.1	193	9	100	15	987	83.9	192	9	100	15
Green Island	5	17	1.4	195	9	110	16	15	1.3	202	11	112	18	32	2.7	198	11	111	17
01 Oct thru 10 Oct, 1991	6	9	0.8	206	14	123	24	8	0.7	208	16	131	35	17	1.4	207	14	126	29
	7	27	2.3	216	9	143	20	13	1.1	215	6	141	16	40	3.4	216	8	142	19
	8	36	3.1	217	13	151	28	41	3.5	226	10	161	29	80	6.8	221	12	156	28
	9	1	0.1	228	NA	181	NA	2	0.2	242	8	158	1	3	0.3	237	10	166	13
	10	1	0.1	222	NA	171	NA	1	0.1	259	NA	262	NA	2	0.2	241	26	217	64
	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		646	54.9	194	13	105	23	522	44.4	197	14	107	26	1,177	100.0	195	13	106.0	24
UNAGED		32	62.7	202	14	115	24	18	35.3	200	9	109	15	51	100.0	201	12	113	21

[a] Indicates dominant age class

[b] Sample size for sexes combined may be greater than the sum of males and females due to immature fish for which sex could not be determined.



Appendix H.28. Percent contribution by age class in the herring test fishery, Prince William Sound, 1991.



Appendix H.29. Percent contribution by age class in the purse seine herring sac roe fishery, Prince William Sound, 1987 - 1991.