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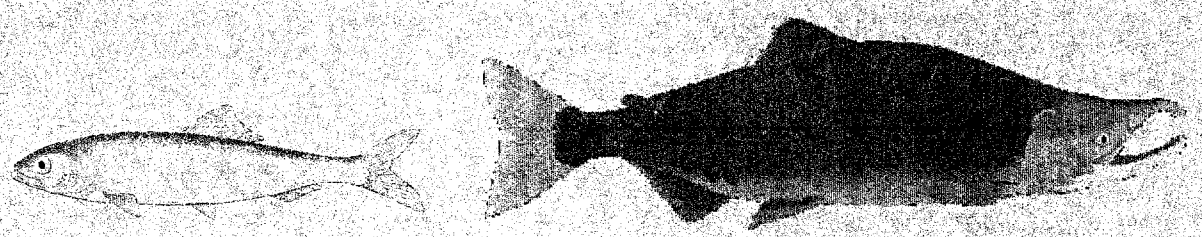
State of Alaska
DEPARTMENT of
FISH and GAME

2001 LOWER COOK INLET ANNUAL FINFISH MANAGEMENT REPORT



Regional Information Report No. 2A02-16

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March, 2002

2001 LOWER COOK INLET ANNUAL FINFISH MANAGEMENT REPORT

by

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Regional Information Report[1] 2A02-16

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Division of Commercial Fisheries
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333 Raspberry Road
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March, 2002

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 The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports.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

ACKNOWLEDGMENTS

2001 DIVISION OF COMMERCIAL FISHERIES STAFF

The finfish operations for the Division of Commercial Fisheries in Lower Cook Inlet employed six permanent full-time employees, ten permanent seasonal employees, and one non-permanent seasonal employee in various area management and research programs during the 2001 season. Appreciation is extended to all personnel for a successful program during 2001.

Permanent Employees during the 2001 season:

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ANNUAL MANAGEMENT REPORT
LOWER COOK INLET
2001

COMMERCIAL SALMON FISHERY

INTRODUCTION

The Lower Cook Inlet (LCI) management area is comprised of all waters west of the longitude of Cape Fairfield, north of the latitude of Cape Douglas, and south of the latitude of Anchor Point, and is divided into five fishing districts (Figure 1). The Barren Islands District is the only non-salmon fishing district, with the remaining four districts (Southern, Outer, Eastern, and Kamishak Bay) separated into approximately 40 subdistricts and sections to facilitate management of discrete stocks of salmon and herring.

The 2001 LCI salmon harvest of 906,000 fish (Table 1, Figure 9) was the second lowest during the past decade and was slightly more than half the recent 10-year average of 1.704 million (Appendix Table 5). Unfortunately, the overall harvest also represented less than half of the preseason forecast. Prices paid for salmon this season yielded a LCI exvessel value of approximately $1.24 million (Table 7), making the value of the 2001 harvest the lowest since 1993 and less than two-thirds of the recent 10-year average (Appendix Table 2). Seine fishing effort decreased for the second consecutive year, with only 25 of 85 permit holders making deliveries this season (Appendix Table 1). The number of active set gillnet permits was 18 (Appendix Table 1), a decrease over the previous year and the smallest number since 1994.

Once again, LCI commercial salmon harvests in 2001 relied heavily on the success of hatchery and enhanced fish production. Over 80% of the sockeye salmon harvest in numbers of fish was attributed to joint Alaska Department of Fish and Game (ADF&G) and Cook Inlet Aquaculture Association (CIAA) lake stocking and fertilization projects. These projects were conducted at Leisure and Hazel Lakes in the Southern District, Kirschner Lake in the Kamishak Bay District, and

Bear and Grouse Lakes in the Eastern District. Another traditional sockeye salmon enhancement project, conducted by Chugach Regional Resources Commission (CRRC) at English Bay Lakes in the Southern District, experienced an extremely weak adult return and did not contribute to LCI harvests this season. Pink salmon production from Tutka Hatchery, now operated by CIAA, was very disappointing, with an overall return of 716,000 fish (Table 9). This total represented less than 40% of the preseason projection.

As has been the case since hatchery programs were taken over by private non-profit (PNP) corporations in LCI, a significant portion of the salmon harvest was utilized as hatchery cost recovery to recoup expenses incurred by the various stocking and enhancement projects throughout the management area. Nearly 55% of the total salmon harvest in numbers of fish was taken by CIAA to support the lake stocking programs and Tutka Hatchery operations, representing about 29% of the exvessel value of the LCI salmon fishery (Table 7). Although comparatively small in terms of catch contribution, natural returns bound for LCI drainages did provide significant commercial harvests in 2001, primarily chum salmon from the Kamishak and Douglas River Subdistricts in the Kamishak Bay District.

Two notable factors continued to affect the amount and distribution of seine effort, and ensuing harvest of salmon, in LCI during 2001. The first was the policy adopted in 1994 by major processors regarding tender service. Prior to that time processors routinely stationed a tender (or tenders) in remote districts in anticipation of salmon harvests, even when run strengths and catches were marginal. Since that policy was abandoned, however, seiners have been forced to devise their own means to transport fish from these remote areas to a processing plant in Homer or elsewhere. Due to equipment limitations and the high cost of contracting out for tendering services, significant numbers of fishermen are often unable to fish in remote areas, while some retain the flexibility to fish these traditional areas because of onboard chilling equipment. During 2000 and 2001, tender service in remote areas was provided on a somewhat more regular basis than during the previous five years, resulting in increased effort in these districts.

The second influential element affecting harvest and effort revolved around worldwide market situations. Salmon prices remained depressed and, in the case of sockeyes, were the lowest in the past 25 years. This pricing structure often dictated the fishing strategy of individual fishermen, even to the point of total non-participation, which might account for the decrease in seine effort.

PRESEASON FORECAST

The projected 2001 LCI all-species salmon harvest of 2.0 million fish was about 26% greater than the 20-year average. This optimism resulted almost entirely from the expected success of various sockeye and pink salmon stocking and enhancement programs. Formal total run forecasts for natural salmon returns other than pink salmon were not prepared because escapement and age-weight-length data are limited for those species. However, catch projections were calculated from relative estimates of parental run size, average age composition data, and recent relative productivity trends. Preseason harvest projections and actual catches for all species in 2001 are listed in the following table:

SPECIES	PROJECTED HARVEST	ACTUAL HARVEST	1981-2000 AVERAGE
Chinook	1,300	988	1,369
Sockeye	480,200	216,271	247,381
Coho	14,400	6,667	14,376
Pink	1,689,600	592,931	1,241,176
Chum	15,500	88,969	79,854
TOTAL	2,001,000	905,826	1,584,156

Enhanced runs to Leisure and Hazel Lakes in the Southern District, and Kirschner Lake in the Kamishak Bay District, were expected to comprise the bulk of the sockeye returns, while returns to Bear and Grouse Lakes in the Eastern District were expected to be relatively weak. It should be noted that the Grouse Lake return was specifically designated for hatchery cost recovery purposes as outlined in the Trail Lake Basic Management Plan (BMP). The sockeye return to the English Bay

Lakes system in the Southern District, increasingly important in recent years, was also predicted to be extremely weak and was not expected to contribute to LCI harvests. Although Chenik Lake in the Kamishak Bay District benefited from regular fry stocking and intermittent fertilization during the 1980's and early 1990's, adult sockeye returns in 2001 were again anticipated to be very poor due to the lingering effects of an epizootic of Infectious Hematopoietic Necrosis Virus (IHNV) within the system. As a result, the entire Chenik run was to be protected for escapement.

Returns to the Tutka Bay Hatchery were once again expected to be the mainstay of the pink salmon fishery, with a forecasted harvest totaling nearly 1.7 million fish. The projection was based on a release of 65.1 million fry from Tutka Hatchery in 2000 (Appendix Table 34), and typical ocean survival rates for even-year runs were expected to produce an overall adult return approaching 1.8 million fish.

Generally poor 1999 pink salmon escapements to major systems contributed to a harvest projection of only 35,000 naturally produced pinks throughout the entire LCI management area this season, considered abnormally meager for an odd year since LCI has traditionally been odd-year dominant for pinks. Port Dick and Port Chatham in the Outer District were the only areas forecasted to provide any potential for harvestable surpluses, but the expected numbers were small and fishing effort in these remote districts was uncertain due to the unknown levels of tender service.

After the strong catches of chum salmon experienced during 2000, the chum salmon harvest outlook in 2001 remained questionable. Most west-side LCI systems experienced relatively reasonable escapements during the 1996 and 1997 parent years, and recent years' returns to area systems have displayed a generally positive trend. Numerous systems, such as those in northern Kamishak Bay, seemed to be responding positively to recent years' conservative management measures, and with the unexpectedly good catches in 2000, many fishermen believed that the returns in 2001 would be equally strong.

2001 SUMMARY BY SPECIES

Chinook Salmon

The harvest of chinook salmon, not normally a commercially important species in LCI, at 988 fish was the lowest catch for this species since 1986 and represented only about three-fourths of the 20-year average (Table 2, Appendix Table 12). Virtually all of the catch came from the Southern District and can be primarily attributed to enhanced production at Halibut Cove Lagoon and Seldovia Bay. Set gillnetters accounted for about 88% of the LCI chinook catch, with purse seiners taking the remaining 12%.

Sockeye Salmon

The 2001 LCI sockeye salmon harvest of 216,000 fish (Figure 10, Table 3) fell short of both the preseason forecast and the recent 10-year average by about 23%, representing the lowest catch for this species since 1994 (Appendix Table 13). Sockeyes accounted for only about one-fourth of the LCI salmon harvest in total numbers of fish, yet provided one-half of the exvessel value of the entire salmon fishery this season (Table 7). The 2001 LCI commercial sockeye harvest was characterized by weaker than anticipated contributions from Southern District enhancement programs at Leisure and Hazel Lakes, a stronger than expected return to Kirschner Lake in the Kamishak Bay District, and weak returns to Resurrection Bay enhancement sites, as predicted. As has been the case during past seasons, non-local stocks were thought to have intermixed with local stocks while migrating through the Southern District terminal harvest areas, providing additional sockeyes for harvest there. Natural returns to Outer District systems were also below expectations although the return to Delight Lake in East Nuka Bay did contribute to seine harvests.

Returns to enhancement sites, which typically have provided the bulk of the LCI sockeye catch, were variable in 2001. In the Southern District, harvests of enhanced runs of sockeye salmon returning to Leisure and Hazel Lakes were predicted to total just over 150,000 fish combined.

However, the estimated combined harvest total of 127,000 fish (Figure 11, Appendix Table 15) produced as a result of these two enhancement projects represented about 85% of the preseason forecast. This year's harvest figure represents the fifth lowest combined total since adults began returning to Hazel Lake in 1991 (prior to that year, only Leisure Lake sockeyes contributed to the harvests).

Also in the Southern District, the sockeye run to English Bay Lakes was extremely weak, as predicted, failing to achieve an escapement within the desired range for the second consecutive year. Due to the pessimistic preseason expectations, all fisheries targeting this return in the Port Graham Subdistrict (including the English Bay Section) were closed to fishing for the duration of the run, and no fish were harvested. Despite the closures, the final estimated escapement totaled only 10,500 sockeyes, the lowest figure since 1993 (Appendix Table 23). The continued viability of the sockeye return to this system may rest on the future success of an ongoing rehabilitation project originally initiated by ADF&G in the late 1980's and presently being conducted by Chugach Regional Resources Commission (CRRC) in conjunction with the village of Nanwalek.

In the Kamishak Bay District, the enhanced return to Kirschner Lake produced a harvest of nearly 39,000 sockeyes (Table 3), exceeding the preseason harvest forecast of 23,000 fish by almost 70%. No fishing was allowed on sockeyes returning to Chenik Lake in the Kamishak Bay District since that return was expected to be poor due to the after-effects of an outbreak of IHN, a naturally occurring viral disease, in the early 1990's. The outbreak caused increased mortality to young salmon, subsequently resulting in weak adult returns.

At Bear Lake in Resurrection Bay of the Eastern District, the cumulative commercial seine and hatchery cost recovery catch of "early run" sockeyes totaled just over 3,000 fish, nearly achieving the preseason forecast of 3,200 sockeyes. The nearby Grouse Lake return, in conjunction with "late run" adults returning from an experimental release of juveniles at Bear Lake, contributed an additional 10,800 sockeyes to commercial catches in the form of hatchery cost recovery.

The LCI management area has only four lake systems with significant naturally occurring sockeye salmon runs, and three of the four achieved their escapement goals in 2001. In the Outer District, Delight Lake escapement, enumerated via a picket weir, achieved its goal of 10,000 sockeyes (Appendix Table 23), and had a small harvestable surplus of 7,300 fish (Table 3) taken by the seine fleet. The peak daily aerial survey escapement estimate at nearby Desire Lake, with an identical escapement goal of 10,000 fish, totaled only 5,500 sockeyes. Weather and visibility, however, hampered surveys throughout the season at the latter lake, and the staff felt that actual escapement was likely much nearer to the escapement goal. Waters of Aialik Bay, including Aialik Lagoon, in the Eastern District were opened to fishing in late July, but little effort occurred because the run was well past its peak, therefore no harvest resulted. Still, the final estimate of escapement at Aialik Lake slightly exceeded the upper end of the escapement goal range (Table 3, Appendix Table 23) of 2,500 to 5,000 sockeyes. At Mikfik Lake in the Kamishak Bay District, a modest return resulted in an escapement estimated at about 5,400 sockeyes (5-7,000 goal range), but the minimal seine effort targeting this return resulted in a cumulative harvest of less than 300 sockeyes despite continuous fishing allowed in June. Returns to Delusion (Ecstasy) Lakes, a recently formed glacial lake system in East Nuka Bay of the Outer District which supported no documented salmon run prior to the mid-1980's, had a peak aerial escapement estimate of 2,840 sockeye salmon in 2001.

Coho Salmon

The coho salmon resource is not extensive in the LCI management area, and as a result this species rarely attains commercial prominence. The 2001 commercial harvest of 6,700 coho salmon (Table 4) was the lowest LCI total for this species since 1992, representing less than half of the 20-year average (Appendix Table 17). As is typical, the majority (59%) of the harvest came from hatchery cost recovery operations at Bear Lake and entries into the Seward Silver Salmon Derby, both in the Eastern District, with the remainder split between set gillnetters (27%) and seiners (13%) in the Southern District. Coho run assessment in LCI is limited, with commercial, sport, and personal use harvests providing the best indicators of run strength. Based on these indicators, returns during 2001 were considered average to slightly above average. Also as is

common, the combination of low prices and the lack of remote tender service seemed to discourage the seine fleet from targeting cohos late in the season, especially in the Kamishak Bay District, thus the commercial harvest may not have been truly indicative of run strengths. Two aerial surveys were flown specifically for coho salmon assessment in August and September, at Clearwater Slough in the Northshore Subdistrict of the Southern District. The resulting peak daily index count of over 3,200 cohos, recorded during a survey on September 26, was the highest in the last 30 years.

Pink Salmon

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered poor for an odd year, with an overall harvest of only 593,000 fish (Figure 12, Table 5). This number represents the third lowest commercial catch for any year during the last 10 years and was less than half of both the recent 10- and 20-year averages (Appendix Table 18). The majority of the catch was taken in the Southern District (Table 5, Appendix Table 18) as a direct result of Tutka Hatchery production, but over three-fourths of this total, or about 421,000 fish, was utilized for Tutka Hatchery cost recovery (Tables 1 and 5). An additional 179,000 fish, not accounted for in commercial catch totals, were taken for hatchery brood stock purposes (Table 9). The estimated overall hatchery return, including escapement into Tutka Creek, brood stock, commercially harvested fish, and sport harvest, was 716,000 pinks (Table 9), falling far short of the preseason projection of over 1.8 million fish. The 2001 survival rate of approximately 1.1% was considered well below average for this facility.

The Outer District produced the greatest contribution of natural pinks to LCI catches, but at a total harvest of only 49,000 fish, the figure was less than 40% of the recent 10-year average (Table 5, Appendix Table 18). Nearly half of the harvest was taken in the East Nuka Subdistrict as incidental harvest to the directed sockeye fishery there. Several other Outer District systems experienced reasonable pink returns, including Port Dick (head end) Creek, Island Creek, Slide Creek, Rocky River, South Nuka Creek, and Windy Left Creek. Pink returns to the remainder of

systems within the management area were relatively weak, and pink salmon escapements into major systems throughout LCI were considered highly variable (Appendix Table 24).

Chum Salmon

The 2001 commercial chum salmon harvest of nearly 89,000 fish (Table 6) represented the highest total for this species since 1988 and was over five times the recent 10-year average (Figure 13, Appendix Table 21). These numbers were not completely surprising based on the recent trend of increasingly better returns, especially to systems in Kamishak Bay. For the second consecutive season, strong chum returns to the Big and Little Kamishak Rivers proved a boon to the seine fleet, with the catches from the adjacent marine waters providing over 90% of the area-wide total. Although most of the monitored Outer District systems failed to achieve their established chum salmon escapement goals, the majority of west-side (Kamishak Bay) systems did achieve their minimum escapement goals. One exception, McNeil River in the Kamishak Bay District, failed to attain the lower end of its escapement goal range of 20,000 to 40,000 fish for the third consecutive year (Appendix Table 25) despite a subdistrict closure and complete lack of directed fishing effort.

2001 EXVESSEL VALUE

The estimated exvessel value of the 2001 salmon harvest in LCI, not including any postseason adjustments in price paid to fishermen, was approximately $1.24 million (Table 7, Appendix Table 2), making it the lowest since 1993. Purse seine gear in the common property fishery, which normally accounts for the majority of the catch and value, comprised about $716,000 or 58% of the overall total (Table 7), while set gillnets accounted for $156,000 or 13%. An estimated $358,000, or about 29% of the entire exvessel value of the LCI salmon fishery, was utilized for hatchery cost recovery purposes. Estimated average prices paid to fishermen in 2001, not including any postseason adjustments, were as follows: chinook - $1.76/pound; sockeye -

$0.62/pound; coho - $0.41/pound; pink - $0.15/pound; and chum - $0.28/pound (Appendix Table 3). The sockeye price in LCI this season was the lowest since 1975.

2001 DISTRICT INSEASON MANAGEMENT SUMMARIES

Southern District

Set Gillnet Fishery

An Area H set gillnet permit is valid for fishing in any part of Cook Inlet (Upper or Lower), but there are only five beach areas in LCI, all located along the south shore of Kachemak Bay in the Southern District, where set gillnets may be used (Figure 2). The limited area provides only enough productive fishing sites to accommodate approximately 25 set net permits.

The 2001 LCI all-species set gillnet harvest totaled 48,000 fish, about 20% less than the recent 10-year average (Appendix Table 7). Approximately 59% of the catch was comprised of sockeyes, followed by pinks at 28%. For comparison, these figures are considerably different than those of the past decade, where typical species composition in the commercial set gillnet fishery has been 50% sockeyes, 38% pinks, 5% cohos, 5% chums, and 2% chinooks. Catches of chinook salmon, at 865 fish, were the lowest since 1991 and about 29% less than the recent 10-year average. Enhancement efforts, directed at recreational fisheries in Seldovia Bay and Halibut Cove Lagoon, are primarily responsible for the commercial gillnet chinook catch during 2001.

Based on a preseason sockeye forecast projected to be less than the minimum escapement requirements at English Bay Lakes, the commercial set gillnet fishery in the Port Graham Subdistrict, including the English Bay Section, was never opened at the beginning of the season. Due to high juvenile mortalities encountered in the enhancement program there, this year's adult return was anticipated to total only 7,300 fish. With an escapement goal of 15,000 sockeyes established for this system, no exploitation was justified and the local subsistence and sport

fisheries were also closed. The forecast proved slightly conservative and the return better than expected, but escapement into the lakes still totaled only 10,500 sockeyes (Appendix Table 23) despite the fishery restrictions. Escapement into English Bay Lakes failed to meet the 15,000-fish goal for the second consecutive year.

Brood stock for the English Bay Lakes sockeye enhancement project is traditionally collected by beach seine after the fish escape into Second Lake. However, the fish this season behaved differently than in the past, remaining in deep offshore water for a much longer time than normal. As a result, no brood stock or eggs were collected in 2001, equating to absence of fry stocking into the lake in 2002. Despite this setback, optimism for future returns at English Bay Lakes remains high due to the ongoing enhancement project.

After the English Bay Lakes sockeye return was over, waters of Port Graham Subdistrict remained closed to commercial set gillnet fishing to protect the natural stock of pink salmon returning to Port Graham River, as well as enhanced pinks returning to Port Graham Hatchery. The preseason forecast for the natural return was only 18,000, below the low end (20,000) of the desired range established for Port Graham River. At the hatchery, the projected return was only expected to total 37,000 pinks, all of which would be required for brood stock. As a result, keeping waters of Port Graham Subdistrict closed to set gillnet fishing was warranted to provide maximum protection to these stocks. Despite the closure, weak natural and hatchery returns resulted in a failure to achieve both the escapement goal for Port Graham River (Appendix Table 24) and the egg take goal for Port Graham Hatchery.

LCI set gillnet fishing effort in 2001 decreased to the lowest level since 1994, with a total of 18 set gillnet permits actively fished. Only two years (1993 and 1994) saw lower effort levels during the past 20 years (Appendix Table 1).

Seine Fishery

Sockeye Salmon

The overall catch of sockeye salmon by all gear types, at 155,400 fish, was the second lowest for the Southern District since 1994 (Appendix Table 13) and was about 12% less than the recent 10-year average. Purse seiners in the common property fishery accounted for almost two-thirds of the sockeye salmon landed in the district in 2001 (Table 1), while an additional 27,000 sockeyes (17%) were harvested by purse seine for hatchery cost recovery.

As in recent years, waters of Halibut Cove Subdistrict, as well as the outer waters of China Poot Bay and Tutka Bay Subdistricts, were opened to seining five days per week beginning Monday, June 18, to target enhanced returns to Leisure and Hazel Lakes. Within these subdistricts, however, waters of the China Poot and Hazel Lake Special Harvest Areas (SHA's; Figure 3) were opened only to authorized agents of CIAA at this time, seven days per week, for the express purpose of hatchery cost recovery. They were to be kept closed to the common property commercial fishery until the preseason revenue goal established for each SHA was achieved.

Preseason combined harvest projections for returns to the Leisure and Hazel Lakes stocking projects were estimated at 151,000 fish. The actual commercial harvest of fish returning to the two sites was estimated at 127,000 fish (Figure 11, Appendix Table 15), comprising roughly 60% of the total LCI sockeye salmon harvest (Table 3). Because of the geographic proximity of these two projects, the overlapping area of harvest, and the lack of tagging, no definitive assessment of separate returns to each system can be established. However, fish returning as a result of these two projects not only contributed to seine catches in China Poot Bay Subdistrict but also to those in adjacent Halibut Cove and Tutka Bay Subdistricts. It was estimated that personal use dip net and sport fishermen harvested another 4,900 sockeyes at the head of China Poot Bay based on recent years' average catches. The 2001 total cumulative return from both projects was estimated at 132,500 sockeyes (Appendix Table 15). Although the disparity between the preseason forecast

and the actual return cannot be fully explained, lower than average fresh and/or salt water survival was likely responsible.

As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the CIAA revenue goal necessary to meet operational expenses incurred in LCI sockeye salmon lake stocking projects was set at $103,600. This figure was to be split amongst locations as follows: 66% from combined China Poot and Hazel Lake SHA's, both in the Southern District, and 34% from the Kirschner Lake SHA in the Kamishak Bay District. No cost recovery was planned at Chenik Lake in 2001 since stocking has been discontinued and weak returns were expected. Cost recovery harvests inside the China Poot and Hazel Lake SHA's (Figure 3) were to occur at CIAA's discretion early in the runs since harvests could take place without interference or competition from the fleet at large. A minimum harvest of 31,200 sockeyes from the China Poot and Hazel Lake SHA's was necessary to achieve the combined goal of $68,500 for these two areas, assuming an average price of $0.55 per pound and an average weight of 4.0 pounds per fish. As previously described, these SHA's were to remain closed to common property seining until the combined goal established for the two areas was achieved.

Similar to past years, CIAA once again contracted the Cook Inlet Seiners Association (CISA) to undertake sockeye cost recovery in LCI for the 2001 season. For the first time in many seasons, CISA dedicated a single vessel from within the fleet to direct efforts solely at cost recovery, and the first such harvest in the China Poot Subdistrict occurred on July 3 in the China Poot SHA, netting about 1,600 fish. However, the cost recovery vessel, as well as those participating in the common property fishery outside the SHA's, reported that numbers of fish present in area waters was low by historical standards and that very little "buildup" of fish was occurring within the SHA's. Although a firm contract price for sockeyes had been established at $0.55 per pound, this low price was offset by a slightly higher than expected average weight of about 4.6 pounds per fish. As a result, the number of fish necessary to achieve the revenue goal was revised downward to a new combined total of approximately 27,100 fish.

Cost recovery efforts continued steadily over the next week, with the peak daily harvest of the season occurring on July 11 in the China Poot SHA with a catch of about 3,360 fish. The first cost recovery effort of the season in the nearby Hazel Lake SHA occurred on July 8, with a harvest of 1,500 fish. Sockeyes were finally building within the respective SHA's, and steady cost recovery efforts continued. A final effort on July 14 brought the cumulative harvest to 27,000 sockeyes, totaling 126,500 pounds and effectively achieving the desired revenue goal. As a result, the China Poot and Hazel Lakes SHA's were closed to cost recovery harvest on July 16, and both the China Poot and Hazel Lake Sections of China Poot Subdistrict were opened to common property seining seven days per week beginning Tuesday, July 17. A small portion of the China Poot Section near the mouth of China Poot Creek remained closed to commercial fishing (on weekends only) in deference to the heavy sport/personal use traffic in the vicinity.

Common property seine catches in China Poot Subdistrict, outside of the SHA's, began slowly at the end of June, but seiners remained optimistic that run strength would begin to build in early July. Catches increased modestly during the first week of July in the Neptune Bay Section, and on July 9 and 10 catches in China Poot Subdistrict "spiked" to nearly 7,000 sockeyes each day. Over the next four days, harvests averaged about 5,300 sockeyes per day in the subdistrict. On July 17, the day that common property fishing was allowed in all waters of China Poot Subdistrict (since the hatchery revenue goal had been achieved) catches peaked at nearly 19,000 sockeyes for the day, taken by an estimated 10-12 vessels. Catches dropped steadily thereafter for the remainder of the month, with the last landing made on July 29. The cumulative commercial catch in the two sections totaled 90,600 sockeyes (Table 3), with slightly more than half of this harvest taken in the Neptune Bay Section. Seine effort for sockeyes within adjacent waters of Tutka Bay Subdistrict resulted in an additional harvest of 7,800 fish, but seiners in Halibut Cove Subdistrict took only about 1,400 sockeyes. Although no tag/recovery efforts were conducted this season, it must be pointed out that some portion of the sockeyes taken in the Tutka Bay Subdistrict may have been returning to the Tutka Hatchery as the result of low level smolt releases in prior years.

Pink Salmon

Returns of pink salmon to the Tutka Bay Hatchery contributed to an overall Southern District harvest of 543,000 fish (Table 5, Appendix Table 18), representing less than half of the recent 10-year average and disappointingly short of the preseason hatchery harvest forecast of nearly 1.7 million fish. Waters of Tutka Bay Subdistrict outside of Tutka Bay proper first opened to commercial seining five days per week beginning June 18, as has been the case in recent years. The open waters consisted of those waters offshore of a line running from the "rock quarry" on the north shore of Tutka Bay to the Tutka Bay Lodge on the south shore (Figure 4).

Waters within the Tutka Bay SHA (Figure 4) were open to hatchery brood stock and cost recovery harvest by authorized agents of CIAA on a continuous basis, as established in the Tutka Hatchery Annual Management Plan, beginning June 25. The plan called for hatchery incubators to be filled to maximum capacity if possible, and excess fish beyond brood stock and natural escapement requirements were to be harvested for cost recovery to help offset operational expenses, estimated at $570,700 for FY01. A minimum of 178,000 fish (133,000 females) was desired for hatchery brood stock in order to achieve the goal of 125 million eggs, and an additional 6-10,000 pinks were needed to meet the natural spawning escapement goal for Tutka Creek. At a projected average weight of 2.8 pounds and a preseason projected price of $0.182 per pound for cost recovery fish, over 500,000 fish would potentially be available for common property harvest if the return came in as predicted, after accounting for hatchery requirements. However, the forecast range suggested that if the return were weak virtually all hatchery pinks would be necessary for revenue, brood stock, and escapement goals. Because of this, the Tutka Hatchery AMP contained a clause stating that additional common property fishery restrictions within Tutka Bay Subdistrict would be imposed if the aforementioned goals could not be projected.

The contracted cost recovery vessel and crew was available and ready to begin harvesting in early July, with the first harvest occurring on July 7 inside Tutka Lagoon. Catches over the next four days suggested that the return was either late or weak. Due to the apparent weakness of the

return, seiners at first showed little interest in targeting hatchery pinks in waters of Tutka Bay Subdistrict open to commercial seining. As a result, the original common property seine closure line (rock quarry to Tutka Bay Lodge) was left intact even though hatchery goals could not be projected with any degree of certainty.

The primary cost recovery vessel fished on a daily basis, except for nine days, between July 7 and August 1. The peak daily cost recovery harvest occurred on July 9, with a total of only 56,000 pinks taken. Daily catches averaged just less than 25,000 pinks for each day fished. Cost recovery efforts in waters outside Tutka Lagoon were unnecessary due to the weak run strength.

Pinks harvested for cost recovery averaged 3.0 pounds per fish, slightly greater than the expected average weight. Despite the larger fish, catches and catch rates had dropped off significantly by late July and cost recovery efforts were becoming financially inefficient. CIAA officials indicated that cost recovery fishing would voluntarily cease and that the revenue goal for FY01 would not be achieved. Waters of Tutka SHA were never opened to common property seining at any time during the 2001 season. The final cost recovery harvest occurred on August 1, resulting in a cumulative hatchery cost recovery catch of only 421,400 pinks for the season (Table 9). The overall value of the harvest was about $230,000 (Table 7), substantially short of the revenue goal of $570,700. An additional 179,000 fish were harvested for hatchery brood stock.

As previously mentioned, the weak return at first provided little incentive for seiners to target pinks destined for Tutka Hatchery. However, several seiners took notice of large numbers of pink salmon apparently staging in waters open to commercial fishing at the mouth of Tutka Bay, between Tutka Bay and Little Tutka Bay, in mid-July. Traditionally, pinks bound for the hatchery quickly transit these waters, but for unknown reasons fish this season tended to remain near the mouth of Tutka Bay for longer periods of time before moving on towards the hatchery. By the time the Department was able to identify this situation and close those waters, seiners harvested an estimated 100,000 pinks in the subdistrict between July 17 and July 24. Beginning on July 24, the seine restriction line at the mouth of Tutka Bay was moved seaward to the traditional "outer" line, running from the rock quarry to a point on the west shore of Little Tutka Bay, effectively

eliminating the productive fishing area on these staging fish. Virtually all of the pinks caught during this time period were believed to be of Tutka Hatchery origin and would undoubtedly have contributed to the hatchery's cost recovery program had they reached the hatchery location.

The estimated pink salmon escapement of 4,500 fish into Tutka Creek (Table 5, Appendix Table 24) failed to meet the desired range of 6-10,000 fish for the first time since 1996 and only the third time since the hatchery's inception. As in recent years, this escapement was thought to contain a disproportionately high percentage of males discarded during hatchery sorting operations. The total return of pinks to Tutka Hatchery, including commercial, cost recovery, brood stock, and sport harvest, as well as escapement, was estimated at 716,000 fish (Table 9), representing less than 40% of the preseason forecast.

At Port Graham in the Southern District, a spring 2000 fry release of 1.14 million pinks from Port Graham Hatchery was expected to produce an adult return approaching 37,000 fish this season. The Port Graham Hatchery Corporation (PGHC) anticipated that all returning fish would be required for brood stock. Brood stock harvest could only begin once the Department ground survey team verified the established escapement threshold of 6,000 pinks into nearby Port Graham River, as outlined in the Port Graham Hatchery Annual Management Plan (AMP). In addition, the hatchery egg removal schedule for Port Graham River, also summarized in the AMP, was identical to previous years. The forecast for the wild stock return to nearby Port Graham River was estimated at 18,000 pinks, shy of the desired escapement range of 20,000 to 40,000 fish. Given the recent trend of weak natural returns, and the forecasted weakness of the hatchery return, the common property set gillnet fishery closure, established earlier in the season to protect English Bay sockeyes, was extended in waters of Port Graham Subdistrict in order to protect pinks. An in-river brood stock harvest was improbable since escapement requirements were unlikely to be met given the weak forecast.

The first ground survey of Port Graham River confirming the presence of pink salmon was completed on July 30, but numbers were negligible. Weekly ground surveys in August verified that the natural return was once again weak, as predicted. Nonetheless, routine Department aerial

surveys in mid-August documented fresh pinks entering Port Graham Bay and staging near the hatchery net pens, which are the source of fresh water for imprinting juvenile hatchery fish prior to release. As a result, a portion of the Port Graham SHA (Figure 6) east of the longitude of the U.S. Coast Guard navigational buoy was opened to harvest by authorized agents of PGHC beginning August 20. The hatchery return to Port Graham was weaker than predicted, with a final total of 19,100 pinks taken for brood stock purposes, while the final escapement into Port Graham River, estimated at only 10,300 pinks, fell short of the desired range of 20,000 to 40,000 fish for the tenth consecutive year. The commercial fishery in Port Graham Subdistrict, having been closed earlier in the season to protect sockeyes returning to English Bay Lakes, was never reopened due to the weakness of both the wild and hatchery pink returns. As a result, no commercial pink harvest occurred in the subdistrict.

Returns of wild pink salmon stocks to other systems in the Southern District were mostly poor as indicated by ground survey escapement counts, and no directed seine openings were allowed. Pink escapement into Humpy Creek fell into the desired escapement range for the first time since 1997, but Seldovia and Barabara Creeks both failed to meet their respective goals (Table 5, Appendix Table 24).

Other Species

Southern District chum salmon returns were relatively poor for a twelfth consecutive year. The chum harvest of 3,800 fish (Table 6) was the lowest since 1996 but slightly exceeded the recent 10-year average (Appendix Table 21). Set gillnets accounted for over 90% of the total, split between Seldovia Bay (43%), Tutka Bay (39%), and Barabara Creek (18%) Subdistricts (Table 6). Escapements into Southern District chum systems were generally fair to good, and an escapement within the desired range was achieved at Port Graham River for the fifth consecutive season (Appendix Table 25). Although no formal goal is established, Seldovia River also experienced a relatively strong chum return for the second consecutive season, with a final escapement totaling 10,100 fish.

Although minor in total numbers of fish, the majority of the Southern District chinook harvest usually consists of incidental catches of adult fish returning to three separate enhancement projects. The 2001 Southern District harvest of 986 chinooks was the lowest since 1986 (Appendix Table 12). Only about 12% of the chinook catch was taken by seiners, with set gillnetters harvesting the remainder. The district-wide coho salmon catch of 2,700 fish was slightly less than two-thirds of the recent 10-year average (Appendix Table 17), with seiners accounting for only about 33% of the total and set gillnetters taking the rest (Table 1).

Kamishak Bay District

Sockeye Salmon

The entire Kamishak Bay District, with the exception of Chenik Subdistrict, opened to salmon seining by regulation on June 1. For the second consecutive year, waters of Paint River Subdistrict were allowed to open along with the rest of the Kamishak Bay District because the stocking program at Paint River Lakes has been discontinued, and once again few sockeyes were expected back to that location this season. The weekly fishing schedule for the district was set at seven days per week for the third consecutive year. This schedule was originally implemented because the complexion of the fishery had evolved since 1994, when fish processors ended the routine practice of stationing a tender or tenders in this remote district at the start of each season. As a result, effort and ensuing catches declined as fishermen were forced to devise their own transport of all salmon harvested. Recognizing this shift in effort levels, as well as the harsh weather that typically limits effective fishing activity, the staff determined that opening waters of Kamishak Bay District to commercial seine fishing seven days per week would allow opportunity to harvest salmon without unduly jeopardizing spawning escapement requirements.

The earliest natural sockeye salmon return to the management area, at Mikfik Creek in the McNeil River Subdistrict, first showed promise when 370 fish were spotted during an aerial survey on June 1. From that time through June 9, the approximate time period of the traditional peak, increasing numbers of new fish entered fresh water, with an escapement estimate of over

5,000 sockeyes made on the latter date. This total fell into the desired escapement goal range of 5-7,000 fish established for the system. Despite the continuous fishing time, however, only minimal directed effort occurred this season, resulting in a harvest of less than 300 sockeyes (Table 3). Aerial estimates throughout the remainder of the return showed no increase in numbers of fish entering the system, and the peak aerial survey on June 9, totaling 5,350 sockeyes, was used as the final escapement index (Table 3, Appendix Table 23). Run timing this season was considered normal for this system.

After the Mikfik sockeye return, seiners would next normally turn their attention to the Chenik or Douglas River Subdistricts during the final days of June. Once again, however, no fishing occurred at Chenik Lake this year due to the lingering effects of the IHNV outbreak in previous years and the subsequent closure to protect the few returning fish for escapement. Despite the weak projection, modestly increasing returns to Chenik Lake during recent seasons fostered optimism that the run might approach the escapement goal of 10,000 sockeyes. Unfortunately, an eighth consecutive year of small returns occurred, and even with no fishing effort during the entire season, the total escapement at Chenik Lake was estimated by aerial surveys at a dismal 250 sockeyes (Table 3, Appendix Table 23). This number represented the lowest escapement estimate for Chenik Lake since the pre-enhancement period of the 1970's. No effort or sockeye harvest occurred in the Douglas River/Silver Beach Subdistrict, as seiners appeared to be waiting for more lucrative fishing elsewhere in the district.

The next sockeye return in Kamishak Bay District was to Kirschner Lake in the Bruin Bay Subdistrict, the traditional site of a sockeye salmon lake stocking project. A similar project at nearby Bruin Bay Lake was discontinued, and no fish were expected to return to that site this season. At Kirschner Lake, where a steep falls at tideline precludes escapement into the lake, 23,000 sockeyes were predicted to return. As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the revenue goal necessary to meet operational expenses incurred in all LCI sockeye salmon lake stocking projects was set at $103,600. This amount was to be split between the Southern District SHA's (Leisure/Hazel) at 66% of the total and the Kamishak SHA (Kirschner) at 34%. No cost recovery was planned at Chenik Lake in

2001 since a weak return was once again expected. A projected harvest of 23,000 sockeyes from the Kirschner Lake SHA (Figure 5), or virtually the entire return, was anticipated in order to achieve the revenue goal of $35,100, assuming an average price of $0.38 per pound and an average weight of 4.0 pounds per fish.

Preseason management strategy for the Bruin Bay Subdistrict, as outlined in the Trail Lakes Hatchery AMP, was to open the Kirschner SHA to hatchery cost recovery fishing on a continuous basis beginning June 18 while simultaneously keeping it closed to common property seining. The intent was to allow opportunity for CIAA to achieve the sales harvest goal quickly at the beginning of the run. As soon as the goal was met, the SHA was to be closed to cost recovery harvest and opened to commercial seining so the fleet could work the area uninhibited for the remainder of the season.

CIAA had made arrangements prior to the season for a CISA vessel to conduct cost recovery. The first effort occurred in the Kirschner Lake SHA on July 17, netting an estimated harvest of 10,500 fish. Three more harvests occurred over the next nine days, resulting in a cumulative catch of nearly 30,000 sockeyes and attainment of the revenue goal on July 26. In response, waters of the Kirschner SHA were closed to hatchery cost recovery fishing on that date.

Because sockeye salmon returning to the Kirschner Lake stocking site are prevented from entering the lake by a steep waterfall at tideline, no escapement is possible and a total harvest is desired. In an effort to provide maximum opportunity to achieve a 100% harvest, all waters of Bruin Bay Subdistrict were opened to continuous commercial salmon seining 18 hours after the hatchery revenue goal was achieved. Once seiners were allowed to target the Kirschner Lake sockeye return in the common property fishery, just over 9,000 sockeyes were landed for the season (Table 3), with the last landing made on August 7. The total return to Kirschner Lake was estimated at nearly 39,000 sockeyes, exceeding the preseason prediction for the system by almost 70%. The Kirschner Lake sockeye enhancement project has remained one of LCI's steadiest producers.

Pink Salmon

Preseason pink salmon projections for the Kamishak Bay District in 2001 were poor, with a negligible harvestable surplus forecasted for only Rocky Cove and Ursus Cove Subdistricts. The staff believed that the weak forecast, combined with the meager price for pinks, would effectively discourage any directed effort and, therefore, protective closures would be unnecessary. Indeed this proved true, and the total harvest for the season amounted to only 1,400 fish (Table 5, Appendix Table 18), all taken incidentally in fisheries directed at other species. Two of the three major monitored pink systems, Sunday Creek and Brown's Peak Creek, achieved escapements within or slightly exceeding the desired range, while the pink return to Bruin Bay River fell short of the minimum goal (Table 5, Appendix Table 24).

Chum Salmon

For the second consecutive season, significant catches of chum salmon occurred in the LCI management area. Seiners in Kamishak Bay District took over 90% of the total LCI catch of 89,000 chums this season (Table 6, Appendix Table 21), and chum returns throughout the district were once again generally strong.

Aerial surveys to monitor chum returns in Kamishak Bay began in mid/late June, with the first chums of the season noted in McNeil River on June 25. Because chum runs to McNeil River have not been strong over the past decade, waters of McNeil River Subdistrict were closed to commercial fishing as a precaution beginning June 30, even though no seiners were present in area waters. Escapement into McNeil River progressed slowly into mid-July, as evidenced by only incrementally increasing aerial survey counts. The return was decidedly weak, with a peak single survey estimate of 6,900 chums made on July 17. Post-season analysis of aerial survey data using the standard area under the curve (AUC) method yielded a final estimated escapement index at McNeil River of 17,000 fish, falling short of the low end (20,000) of the escapement range for the tenth time in the last 12 years (Appendix Table 25) despite the absence of fishing mortality through the entire 2001 return.

Chum returns to nearly all other Kamishak Bay systems were strong. In the southern portion of the district, which had been opened to fishing seven days per week at the beginning of the season, seiners began targeting chums returning to systems in the Kamishak and Douglas River Subdistricts on July 17. The run strength appeared impressive based on early catch reports, and the known effort levels of 3-5 vessels on the grounds posed little threat of overharvest. Therefore, no changes to the continuous fishing schedule were implemented. This strategy appeared successful at allowing opportunity for seiners to harvest surplus fish while still allowing adequate chum escapement throughout the duration of the return. Between July 17 and August 2, seiners harvested over 83,000 chums in the Kamishak River and Douglas River Subdistricts (Table 6), with nearly 90% coming from Kamishak River Subdistrict. Escapements were also positive, with final estimates of 36,000 chums into Big Kamishak River and 27,000 into Little Kamishak River (Table 6, Appendix Table 25), achieving the respective goals established for each system.

Following the same pattern as that in the Kamishak Rivers, central and northern Kamishak Bay chum returns were also relatively strong this season. At Bruin Bay River, chums began to show in fresh water in late June, continually building through the month of July. The peak individual aerial survey of Bruin Bay River occurred on July 24, when nearly 15,000 chums were documented. Despite the good return, no effort was directed specifically at this stock, and the entire return entered the river as escapement, estimated at almost 22,000 chums (Appendix Table 25).

Because the run timing for the more northerly systems is later than that in southern and central Kamishak areas, and because the effort levels targeting the earlier Kamishak Rivers chum runs had been relatively modest, the staff decided to delay any fishing schedule changes until these later runs could be assessed. Aerial evaluation of northern Kamishak systems began on August 1, and good chum numbers were observed at all locations on this relatively early date, suggesting that returns would be strong. By the end of the first week of August, escapements into Cottonwood Bay, Iniskin Bay, Rocky Cove, and Ursus Cove systems had increased considerably and, in the case of Ursus Cove head end streams, had actually exceeded the low end of the desired escapement range. Large numbers of chums were also seen staging near the mouth of

Sunday Creek in Rocky Cove. This strong showing substantiated the earlier assessment, and as a result no changes to the seven-day-per-week fishing schedule were made. However, to allow additional opportunity for seiners to target the strong chum return to Ursus and Rocky Coves, regulatory marker restrictions at Ursus Cove (head end) and Sunday Creek were removed beginning August 8, thus opening waters inside Ursus Cove Lagoon and up to the mouth of Sunday Creek on a continuous basis. Despite the liberalized fishing schedules, very little seine effort occurred, and harvests from the northerly subdistricts totaled only about 1,500 chums for the season (Table 6), all taken in Rocky Cove Subdistrict. This brought the cumulative Kamishak Bay District chum catch to nearly 85,000 fish for the season (Appendix Table 21), the highest since 1988.

With little or no directed effort, chum escapements continued to build steadily at all the northerly Kamishak systems. Escapements at all Kamishak chum systems, with the exception of McNeil River, met their respective goals (Appendix Table 25). The second consecutive season of strong district-wide returns was a positive sign that the trend of weak chum salmon runs has reached a turning point and will hopefully return to former levels.

Other Species

Chinook salmon harvests in the Kamishak Bay District historically have been insignificant (Appendix Table 12). On the other hand, coho harvests within the district have at times been substantial, providing fishermen with some lucrative late season catches. Coho assessment in LCI is very limited, but early signs from other areas within LCI gave no indication that returns were overly strong. This fact, combined with the lack of tender service and low prices, conspired to preclude any effort or harvest, other than a negligible incidental catch (Appendix Table 17), for the sixth consecutive season in this district.

Outer District

Sockeye Salmon

Outer District sockeye harvests have traditionally focused on natural returns to the Delight and Desire Lakes systems in East Nuka Bay Subdistrict. A lake stocking project in the Port Dick area during the late 1980's provided additional fish for harvest in the early 1990's, but stocking was discontinued after 1989 and a small harvest in 1993 was the last documented catch. Preseason projections forecasted a harvest of up to 23,000 sockeyes for the entire Outer District, but those projections were based solely on the long-term average catch. The actual harvest totaled 7,300 fish (Table 3), considerably less than the previous three seasons and only about half of the recent 10-year average (Appendix Table 13).

Aerial surveys to assess the Delight and Desire Lake systems in East Nuka Bay began on June 14, and small numbers of fish were observed in both lake systems. The next survey on June 18, conducted under good conditions, showed modest increases in escapement at both lakes, but by June 22, the escapement at Delight Lake had increased to over 2,000 sockeyes, while Desire Lake escapement was estimated at only about 1,400 fish. For the second straight season, this situation contradicted the traditional run timing trend for these two systems, in which run timing for sockeyes at Delight Lake is normally later than that of Desire Lake, therefore in most years the sockeye escapement level at Desire Lake increases noticeably earlier than that into Delight Lake. Despite the apparently strong return, the staff decided against opening waters near Delight Lake to commercial fishing, fearing the return might simply be early.

Aerial surveys continued, and by July 6 the estimate of escapement into fresh water at Delight Lake had surged to 10,100 sockeyes, the peak individual estimate for the season. Meanwhile, escapement at Desire Lake was lagging, with only about 5,500 sockeyes estimated during a July 2 survey. Since the figure for Delight Lake exceeded the system's established escapement goal of 10,000 fish, waters of East Nuka Subdistrict south of the entrance to James Lagoon were opened to commercial seining five days per week beginning July 9. The regulatory markers protecting the mouth of

Delight Lake Creek were not in effect for this opening, and waters of nearby McCarty Lagoon were also opened to fishing on the same aforementioned fishing schedule. Waters near Desire Lake (north of the latitude of James Lagoon) were kept closed to fishing while monitoring of that system's return continued.

The first commercial seine catches near Delight Lake suggested the run may have already peaked. Good weather conditions allowed steady aerial monitoring of the two lake systems throughout the month of July, and escapement counts at Delight Lake showed no further increases. Meanwhile, escapement at Desire Lake never increased to a level that warranted a fishery opening. The peak count of 10,100 sockeyes was used as the final escapement estimate for Delight Lake (Table 3, Appendix Table 23), while the final escapement estimate for Desire Lake totaled only 5,500 fish. It must be noted that, due to aerial survey conditions plagued by overcast skies and frequent rain throughout the season, the staff believed that actual escapement into Desire Lake was likely higher than the documented peak count.

Low water levels, and subsequent cessation of upstream salmon migration, are typical conditions observed at Delight Lake following extended periods of warm weather and limited precipitation during mid to late summer periods. Although reduced for a short time in early July 2001, water levels and flow rates at Delight Lake never appeared to reach the "critically" low stage, i.e. making fish passage impossible. However, sockeyes inexplicably delayed their migration from the freshwater lagoon into the lake until July 10, creating a relatively large buildup of fish in the lagoon. Once fish began moving on July 10, the migration progressed steadily and water levels were not an issue.

The first seine landing of sockeyes in East Nuka Subdistrict came on July 11 when 2,000 sockeyes were taken. This catch turned out to be the peak daily harvest of the season as catches declined steadily after the first week of active fishing. Effort remained modest, with catches averaging less than 1,500 sockeyes per week actively fished for the season, during which time only those waters around Delight Lake were open to fishing. Incidental catches of pink salmon increased significantly during the last seven days of July, while seiners were still targeting sockeyes. The final sockeye

landing occurred on August 10, bringing the cumulative commercial catch in East Nuka Subdistrict to 7,300 sockeyes in 2001 (Table 3, Appendix Table 14).

A third system of lakes known as Delusion (or Ecstasy or Delectable) Lakes in East Nuka Subdistrict has been monitored over the last decade to document the sockeye return there. Located near the head of the East Arm of Nuka Bay, the two-lake system is relatively new, formed during the late 1970's and early 1980's by a receding glacier. A review of charts and maps drawn prior to the mid-1980's substantiated this fact as no lakes are indicated at the site of the present bodies of water. Prior to the 1980's, no salmon were known to utilize the system, but in approximately 1989, during a routine aerial survey, adult sockeye salmon were documented in the system by the staff for the first time. Each year since then, aerial surveys have revealed sockeye salmon as well as pink salmon in the system. The peak 2001 aerial count of 2,840 sockeyes was recorded during an aerial survey on August 13. Little is known of the origins of this return, although the predominant hypothesis suggests that sockeyes probably strayed from nearby Desire and/or Delight Lake to colonize this new lake system. ADF&G personnel conducted sampling of sockeyes in this system during 1992, 1993, and 1994, with help from University of Alaska students on site. Otoliths and length measurements indicated primarily large 3-ocean fish (six years old). Additional tissue samples were taken from post-spawning individuals in 1993 and 1994 for inclusion into the genetic baseline data set and future genetic stock identification analysis.

Pink Salmon

Due to weak escapements during the 1999 parent year, harvest forecasts for pink salmon in the Outer District were pessimistic at just over 14,000 fish in 2001, only about 11% of the recent 10-year average. The greatest potential for harvestable surpluses was expected at Port Chatham and Port Dick. The actual harvest of nearly 49,000 pinks (Table 5, Appendix Table 18) was considerably better than the forecast but still less than 40% of the recent 10-year average.

For the fourth consecutive season, a management strategy based on real-time aerial assessment of returns and escapements was utilized for pink salmon throughout the Outer District. Aerial surveys

in Port Dick began in early July, with pinks first observed in salt water along the south shore on July 23, but numbers were small. By July 28, aerial observations showed pinks entering fresh water, while over 20,000 pinks were noted on the head end saltwater "flats". A ground survey on August 2 documented nearly 8,000 fish in fresh water, while an aerial survey the same day estimated 35,000 pinks on the flats and additional fish along the south shore. Although escapement into fresh water had not yet reached the minimum desired goal of 20,000 fish, the numbers appearing in fresh water suggested that the return was stronger than forecasted and that the escapement goal would likely be met. As a result, waters of the South Section of Port Dick Subdistrict were opened to seining five days per week beginning August 3.

Unfortunately, seiners found the fishing less productive than hoped, and despite the liberal weekly fishing periods, the first day's effort produced a catch of only 5,900 pinks taken by three vessels. Only one other day of active fishing occurred for the remainder of the season, with the cumulative catch in the South Section of Port Dick Subdistrict totaling about 17,000 pinks. Ground assessment showed that pink escapement into Port Dick (head end) Creek progressed steadily into mid/late-August, with a final escapement estimate of 43,600 pinks (Table 5, Appendix Table 24).

Pink salmon escapement at nearby Island Creek in Port Dick began in early August. The first observation of pinks was made there during a ground survey on August 9, but with a count of less than 200 fish the run followed the traditional pattern of a slightly later run timing than that of Port Dick (head end) Creek. An aerial survey on August 13 showed a significant buildup of pinks, in excess of 26,000 fish, in salt water adjacent to Island Creek. Although attainment of the chum escapement goal into Island Creek appeared unlikely at this time, the staff believed the chum return was nearly complete and fish not already in fresh water were safely protected by markers in salt water near the stream mouth. As a result, waters of the North Section of Port Dick Subdistrict were opened to seining beginning August 14 on the same five-day-per week fishing schedule as in the South Section of the subdistrict in order to allow seiners the opportunity to harvest a portion of the stronger than anticipated pink return while not jeopardizing either chum or pink escapement into Island Creek.

Despite the numerous and liberal openings throughout the Port Dick Subdistrict during August, and the unexpectedly strong pink returns, only minimal seine effort occurred, all focused on the South Section. The final harvest from Port Dick for the season totaled 16,700 pinks (Table 5, Appendix Table 19), the highest odd-year harvest since 1993 and exceeding the preseason forecast for the subdistrict by 10,000 fish. Due to the absence of fishing effort, the entire pink return to Island Creek entered the system as escapement, with the final estimate reaching nearly 82,000 pinks (Table 5, Appendix Table 24), the second highest on record. Interestingly, the four highest escapement totals for Island Creek have all occurred since 1997.

Numerous other systems throughout the Outer District exhibited stronger than anticipated pink salmon returns in 2001. Aerial surveillance of Nuka Island streams began on July 6, but no fish were observed on that early date. Pinks were first observed aerially on July 23, and by August 2 the escapement goal of 10,000 pinks established for this system had been achieved, with additional pinks staging in salt water off the creek mouth. In response, waters on the south end of Nuka Island were opened to seining beginning August 3 five days per week. Waters along the western shore of Nuka Island were kept closed to fishing to protect the smaller systems there, where returns appeared minimal. Despite the opening, no effort occurred in Nuka Island Subdistrict, and the final escapement into South Nuka Island Creek was estimated at 20,700 pinks (Table 5, Appendix Table 24).

The pink returns to Windy Bay first showed promise during an aerial survey on July 23, when nearly 9,000 pinks were observed in salt water along the south shore of the bay. By August 2, the numbers had increased significantly to an estimated 37,000 pinks in marine and intertidal waters protected by regulatory markers, with additional fish observed in fresh water, suggesting that the established minimum escapement goals of 10,000 pinks for Windy Left Creek and 30,000 pinks for Windy Right Creek would likely be attained. As a result, waters of Windy Bay were opened to seining five days per week beginning August 3. The pink return to nearby Rocky River was also very strong, as evidenced by an aerial estimate exceeding 27,000 fish in fresh water on August 2, with additional fish observed in marine and intertidal waters. Waters of Rocky River Subdistrict were therefore opened to seining on the same schedule as in Windy Bay Subdistrict, also on August

3. As was the case in Port Dick, only minimal effort occurred, all in Windy Bay, with a resultant harvest of 9,400 pinks (Table 5, Appendix Table 19). Final escapements totaled 73,000 pinks at Rocky River, 61,800 pinks at Windy Left Creek, and 10,300 pinks at Windy Right Creek (Table 5, Appendix Table 24).

At Port Chatham, aerial surveys documented good numbers of pink salmon in salt water beginning in late July. By August 2, an estimated 12,000 pink salmon were observed in salt water protected by regulatory markers, with additional fish noted in fresh water. Although escapement into the creeks had not yet been documented by ground surveys, the aerial estimate suggested that the escapement goal range of 10,000 to 15,000 pinks would be attained. As a result, waters of Port Chatham Subdistrict were opened to seining on the same five-day-per-week fishing schedule as in other subdistricts beginning August 3. No effort occurred in these waters, however, as seiners elected to focus on the stronger pink returns to Port Dick and Windy Bay. Postseason analysis of ground survey data indicated an estimated cumulative escapement of 17,900 pinks into Port Chatham systems (Table 5, Appendix Table 24).

Elsewhere in the Outer District, pink returns to other monitored systems were variable but generally fair to good, with most meeting their salmon escapement goals. The pink return to the small stream at the head end of Chugach Bay showed surprising strength, and marine waters there were opened to fishing on August 3, but the opening failed to attract any effort. Desire Lake Creek, with an escapement range of 10-20,000 pinks, experienced an exceptional escapement, totaling 67,500 pinks (Table 5, Appendix Table 24), but because of the weak sockeye return to the system, waters adjacent to Desire Lake Creek were never opened to directed effort on pinks.

Chum Salmon

Chum salmon numbers have experienced dramatic declines in the Outer District since the peak harvest years of the late 1970's and early 1980's, and large returns were once again not expected in 2001 due to a succession of poor runs over the past decade. Not surprisingly, 2001 chum returns to locations in the Outer District were relatively weak, as anticipated. In a continuing effort to reverse

the trend of weak returns and allow stocks maximum protection, no specific commercial openings targeting chum salmon occurred this season. The final harvest of 400 chums (Table 6, Appendix Table 21) was all incidentally taken during other directed fisheries.

Escapements into three of the four monitored chum salmon systems in the Outer District were weak, with only one of the four achieving its goal. The creeks of Koyuktolik (Dogfish) Bay, having a combined desired escapement range of 5-10,000 chums, were the only ones to achieve their goal at an estimated total of 6,100 chums (Table 6, Appendix Table 25). Port Dick (head end) Creek fell short of its 4,000 chum escapement goal with a total of 1,800 fish, while Rocky River escapement amounted to only 3,000 chum salmon, far short of the goal of 20,000 (Appendix Table 25). Island Creek also failed to meet its chum escapement goal range of 10,000 to 15,000 fish, with a total of 6,300 fish.

Eastern District

Sockeye Salmon

The Eastern District had potential for harvestable surpluses of sockeye salmon in Aialik and Resurrection Bay Subdistricts during 2001, with a district-wide preseason projection totaling 26,500 fish. Actual harvest totaled 13,800 sockeyes (Table 3, Appendix Tables 13 and 14), representing just over one-half of the forecast and only about one-third of the recent 10-year average. Of the total catch, about 80% was taken as hatchery cost recovery for the Bear and Grouse Lakes enhancement projects (Table 1) in the Resurrection Bay Subdistrict.

At Bear Lake, near Seward in the Resurrection Bay Subdistrict, sockeye enhancement activities by CIAA resulted in a projected return ranging up to 15,000 fish assuming optimum survival of various smolt and fry releases. This figure was considerably less than recent years' returns due to a combination of lower stocking densities (because of difficulties obtaining adequate numbers of brood stock and eggs) and lower than anticipated fry-to-smolt survival rates. If the forecast proved

true, the projected harvestable surplus was only about 3,000 fish after accounting for escapement requirements.

Based upon the expected long-term increase of sockeyes returning to the Bear Lake system, a Resurrection Bay Management Strategy was developed during the winter of 1991-92. The plan allows the seine fleet to begin fishing on the Bear Lake sockeye run at a relatively early date in the outer reaches of Resurrection Bay in order to promote product quality. In addition, several modifications to the plan, first implemented by emergency order in 1996, have been utilized each ensuing season. The first change increased fishing time from two 40-hour periods per week to a single five-day period (Monday through Friday). Based on experience over the past five seasons, this increase would allow greater opportunity to harvest sockeyes without jeopardizing the escapement goal for Bear Lake, set at 12,000 fish in the 2001 Trail Lakes Hatchery Annual Management Plan (AMP). The second change posted closed waters markers at the mouth of the Resurrection River to better define the river's mouth and the fishing boundaries, which had been problematic prior to 1996. Finally, an area of closed waters along the west side of Resurrection Bay between Caines Head and the city of Seward was implemented in order to protect returning chinook salmon, which are allocated entirely to the sport fleet and are illegal to retain in the commercial fishery.

A change from the 2000 season regarding the escapement goal for sockeye salmon at Bear Lake was carried over for this season. Traditionally, sockeyes entering Bear Lake as escapement are later collected and utilized as a brood stock source for continuation of the enhancement project. Prior to 2001, the desired escapement goal was established at 8,000 fish. Normally, this goal is achieved with little inseason manipulation to the commercial fishery, and once attained, CIAA has routinely harvested excess fish for cost recovery. Because CIAA suspended sockeye enhancement of nearby Grouse Lake in Resurrection Bay and proposed to increase sockeye production at Bear Lake, more Bear Lake brood stock would theoretically be required to provide an adequate number of eggs. Last season, although the formal escapement goal of 8,000 sockeyes as established in the Trail Lakes AMP was not modified, CIAA resolved that it would voluntarily allow more fish into Bear Lake,

up to a cumulative total of 12,000 adults, in order to achieve its newly increased egg take objective. In 2001, the new goal of 12,000 fish was formally adopted in the Trail Lakes AMP.

The entire Resurrection Bay Subdistrict, up to a point one mile due south of Cape Resurrection and Aialik Cape, was opened to seining by emergency order beginning on May 14, in keeping with the traditional recent year opening time of mid-May. Prior to 1998, these waters were opened on the second Monday in May, but experience had demonstrated that sockeyes did not begin arriving in Resurrection Bay in appreciable numbers until the end of the month. Despite presumption of an early run timing for this enhanced run (since brood stock utilized for the project had a documented run timing peaking in early June), the first three years of adult returns from 1992 through 1994 actually trickled in over the course of two months. Between 1995 and 2000, with larger numbers of fish returning, the majority of the run appeared in waters at the head of Resurrection Bay during the first two weeks of June.

Unlike recent seasons, the weekly fishing schedule for 2001 was scaled back, from five days per week to two 40-hour periods per week, due to the weak forecast and the need to protect sufficient numbers of fish for escapement. When the area first opened in 2001, fishermen were expectedly skeptical of fishing given the weakness of the forecast. The first landing occurred on May 25, eleven days after the opening, but fish concentrations were expectedly meager. During the next week, minimal effort resulted in a cumulative total reported harvest approaching 3,000 sockeyes, while escapement through the Bear Creek weir had just begun and numbered fewer than 100 sockeyes, suggesting that the preseason forecast might be on track. If the projection proved accurate, the staff reasoned that the remainder of the return would be required for escapement purposes. As a result, the commercial seine fishery was closed at the end of a regular weekly fishing period at 10:00 p.m. Friday, June 1. The actual catch, tallied from fish tickets, was just over 2,600 sockeyes (Table 3).

The closure accomplished the desired results, as escapement built steadily, peaking on June 14 and 15, with about 1,000 sockeyes passing through the weir on each of those days. Even though passage rates through the weir dropped after this time, the escapement goal appeared assured, but the

projected surplus was deemed inadequate to justify reopening the commercial fishery. Moderate cost recovery efforts, however, were initiated beginning on June 20. Escapement counts continued to decline through the end of the month, and a cumulative total of 12,800 sockeyes passed as escapement (Table 3, Appendix Table 23), achieving the desired goal. Cost recovery efforts directed at Bear Lake sockeyes netted about 400 fish through the end of the month, and when combined with the commercial seine catch and Bear Lake escapement, the total Bear Lake sockeye return was estimated at 15,800 fish.

Beginning July 1, the Bear Lake weir was closed to fish passage and all returning sockeyes were harvested for cost recovery because the sockeyes returning at that time were thought to be of Tustamena brood stock origin. The returning adults were the result of an experimental release of small numbers of fry in Bear Creek several years earlier, and a 100% harvest of these fish was desired. The total harvest of these "late run" Bear Creek sockeyes was approximately 4,700 fish, bringing the cumulative Bear Creek weir cost recovery harvest to about 5,100 fish. A large percentage of the "late run" fish were of poor product quality due to water marking and, as a result, were donated to dog mushers.

A second, more recent sockeye enhancement project was initiated at nearby Grouse Lake in 1996, when over 200,000 juvenile fish were planted in the system. Grouse Lake was subsequently stocked for two additional years, but adult returns failed to meet expectations for unknown reasons, and CIAA suspended the enhancement of Grouse Lake after the 1998 season. As outlined in the Trail Lakes Basic and Annual Management Plans, the entire sockeye return to Grouse Lake was allocated specifically to CIAA for the purpose of hatchery cost recovery. For the second consecutive season, a provision within the Trail Lakes AMP defined the Resurrection Bay Special Harvest Area (SHA; Figure 7), to include a small area of marine waters, so that sockeyes of Grouse Lake origin could be more efficiently harvested. However, given the small forecasted sockeye return to Grouse Lake, totaling less than 12,000 fish, CIAA felt that cost recovery efforts in salt water would likely be inefficient and cost prohibitive.

With a run timing later than Bear Lake fish, Grouse Lake sockeye adults first began to show up in fresh water at the Lost Creek weir in mid-July, but numbers were small. Daily harvests there peaked on August 4, when about 1,300 sockeyes were collected. Efforts continued through the end of August, with the cumulative Grouse Lake sockeye return, measured by the catch, totaling about 6,200 sockeyes, falling short of the preseason projection of 11,000 fish. As in years past, a high percentage of the catch was composed of low quality fish, which were donated rather than sold. The final cumulative hatchery harvest of sockeyes returning to both Grouse and Bear Lakes totaled about 11,200 sockeyes this season (Table 3), about two-thirds of which were donated.

At Aialik Lake in the Aialik Subdistrict, the first aerial survey of the season on June 18 produced an estimate of only 10 sockeyes present in fresh water, but by the time of the next survey four days later the figure had jumped to nearly 1,000. Although surveys continued into July, glacially turbid waters persistently hampered observation conditions, and no increase in escapement was documented. As a result, and because the minimum escapement goal of 2,500 sockeyes could not be projected, commercial effort was not justified and the area remained closed to seining. Finally, a survey on July 23 revealed over 5,000 sockeyes in fresh water, assuring the escapement goal. Waters of Aialik Subdistrict, including Aialik Lagoon, were subsequently opened to seining five days per week beginning July 24. The run was virtually over by this time, however, and no effort ensued, thus no harvest occurred. Final escapement into Aialik Lake was estimated at 5,100 fish (Table 3, Appendix Table 23), slightly exceeding the goal range of 2,500 to 5,000 sockeyes.

Pink Salmon

A harvestable surplus of about 19,000 pinks was forecasted in Eastern District waters for 2001, but this projection was questionable due to weak returns in some recent years. Surveys of Resurrection Bay systems were limited to on-grounds estimates in mid-July and mid-/late August. Results and final estimates suggested that returns were weak to all systems. At Bear and Salmon Creeks, where the combined pink escapement goal is 15,000 fish, a total of 3,000 pinks were estimated (Appendix Table 24), the lowest total since 1988. The figure for Thumb Cove, with a goal of 4,000, was estimated at 3,100 pinks, while at Humpy Cove (2,000 fish escapement goal) just over 300 fish

were estimated. Tonsina Creek produced an estimate of 2,800 pinks, falling short of the escapement goal of 5,000 fish for the sixth time in the last seven seasons. Due to the trend of primarily weak but highly variable returns during recent years, no openings for pinks were allowed in Resurrection Bay this season and therefore no harvest occurred.

The fishing schedule in Aialik Subdistrict, originally set at five days per week beginning July 24 for sockeye salmon, was never altered after the sockeye run was effectively over. During some recent years, the subdistrict was allowed to remain open despite knowledge that seiners were fishing the outer areas later in the season, targeting pink salmon bound primarily for Prince William Sound. The staff elected to leave the area open again in 2001 because the relatively modest historical catches would not likely threaten either local or non-local stocks. No effort resulted, however, therefore no harvest occurred in Aialik Subdistrict.

Other Species

Chum salmon have occasionally been an important component of commercial catches in the Eastern District, but catches during the past 10 years have averaged only about 600 fish annually. This season's chum harvest amounted to only a trace (Table 6, Appendix Table 21), with all fish taken in the Resurrection Bay directed sockeye fishery during June. An estimated 1,600 chums were estimated as escapement into Tonsina Creek in Resurrection Bay (Table 6), continuing a trend of weak returns to that system.

Coho salmon are not normally a commercially important species in the Eastern District but are an integral component of an enhancement project, originating from Bear Lake, which benefits sport fishermen in area waters. Because the Resurrection Bay Salmon Management Plan specifically directs the Department to manage coho stocks there for recreational use only, coho salmon may not be retained in the commercial fishery. However, all sport-caught coho salmon entered into the Seward Silver Salmon Derby are subsequently sold by the city of Seward, organizer of this sport fishing derby, to a commercial processor. Therefore, these catches are considered "commercial harvests" and are listed in the commercial catch tables to document this fact. In 2001, a total of

nearly 2,200 cohos were entered into the Seward Silver Salmon Derby (Table 4). In addition, a portion of the returning adults from the enhancement project are harvested at the Bear Creek weir by CIAA as cost recovery for expenses incurred. Although CIAA historically has sold most of these fish to a commercial processor(s), nearly all of the fish this season were unmarketable due to excessive fresh water marking and were subsequently donated to various individuals, many of whom were dog mushers. Total hatchery harvest from the Bear Creek weir was just under 1,800 cohos (Tables 1 and 4), comprising about one-quarter of the entire LCI coho catch this season. Just over 600 cohos were collected for hatchery brood stock, with an additional 500 fish allowed into Bear Lake as escapement (Table 4). Total commercial catch in the entire Eastern District amounted to about 3,900 cohos (Table 4, Appendix Table 17), just over half of the recent 10-year average of 7,000.

SALMON ENHANCEMENT AND REHABILITATION

Introduction

Fisheries enhancement has played a major role in LCI salmon production for over two decades. Natural adult salmon returns to the LCI area continue to demonstrate wide fluctuations, often the result of environmental impacts such as streambed scour, de-watering, or redd freeze-out on spawning grounds, and potentially lower marine survivals. Since their inception in the mid-1970's, enhancement and rehabilitation projects have made significant contributions to both commercial and sport fishing harvests. These contributions have historically ranged from 24% to 90% of the entire LCI commercial salmon harvest and are expected to remain high in future years.

Projects initiated by the ADF&G and presently being undertaken by CIAA provided an estimated 78% (710,700 salmon) of the total 2001 LCI commercial harvest of 905,800 fish, while CRRC-managed projects did not produce any harvestable surpluses during 2001. The Leisure/Hazel, Kirschner, Bear, and Grouse Lakes sockeye salmon enhancement projects produced approximately 83% (179,600 fish) of the total LCI sockeye harvest of 216,300 fish in 2001, down slightly from

the record high of 84% contribution in 1995 and 1999. Tutka Lagoon Hatchery production accounted for 90% (531,100 fish) of the 2001 LCI commercial pink salmon harvest of 592,900 fish.

Using average weights per fish and average prices per pound in LCI, the estimated contribution of ADF&G/CIAA -produced salmon was 57% ($0.71 million) of the $1.24 million total value of the 2001 LCI commercial salmon harvest. About 29% ($0.36 million) of the total exvessel value of the fishery was utilized for hatchery cost recovery purposes (Table 7). A brief description of the current enhancement projects in LCI follows.

Tutka Lagoon Hatchery

The Tutka Lagoon Salmon Hatchery/Rearing Facility was constructed in 1976 with an initial production capacity of 10 million salmon eggs, but expansion over time, including major renovation work during the winter of 1993-94, has increased its capacity to the present level of approximately 150 million eggs. Pink salmon have been the primary species produced at the hatchery, while secondary chum enhancement was discontinued in favor of recent efforts directed toward sockeye salmon. Although the hatchery now has a sockeye egg capacity of 1.8 million eggs, and raceways to accommodate the resulting fry, efforts to incubate and rear sockeye smolts have been plagued by the IHN virus, resulting in an indefinite suspension of the sockeye program.

In 2001, the total return of adult pink salmon produced by Tutka Lagoon Hatchery amounted to approximately 716,000 fish (Table 9). No attempt was made to identify the contribution resulting from natural spawning in Tutka Creek. The estimated 1.1% overall survival rate this season was a decrease over the 2.1% survival experienced in 2000. The commercial harvest, including cost recovery, of 531,100 pink salmon from Tutka Bay and Lagoon (Table 9), accounted for approximately 98% of the pink salmon landed in the Southern District and 90% of the entire LCI commercial pink salmon harvest. Pinks taken for hatchery cost recovery purposes from the Tutka Bay Subdistrict totaled 421,600 fish, worth approximately $230,000, which fell short of the $570,720 sales revenue goal for 2001. Approximately 99.3 million short-term reared pink salmon

fry were released into Tutka Bay in 2001 (Appendix Table 34), the highest since 1996 and the second highest on record.

Leisure and Hazel Lakes Sockeye Salmon Stocking

Leisure (China Poot) Lake, located on the south side of Kachemak Bay across from the Homer Spit, historically was a system barren of sockeye salmon. A study initiated in 1976 involved the stocking of hatchery-produced sockeye salmon fry to determine optimum stocking levels prior to and after lake enrichment through fertilization. Because a barrier falls below the lake prevents upstream migration and precludes any adult spawning, it is desirable to harvest all returning adult fish in the terminal harvest area, China Poot Bay. Beginning in 1988, a similar sockeye stocking program was initiated at Hazel Lake, which empties into Neptune Bay and is located approximately three miles south of Leisure Lake. Since the inception of these projects, over 2.1 million adult sockeyes were estimated to have returned as a result of these stocking programs (Appendix Table 15), making significant contributions to the commercial and recreational sockeye harvests in the Southern District.

Because of the close proximity of the two terminal harvest areas, and the absence of a mark/recovery program, adult returns to Leisure and Hazel Lakes cannot be separately identified through sampling within the commercial catches and are therefore presented as a combined total. The cumulative total sockeye return to Leisure and Hazel Lakes in 2001 was estimated at 132,500 fish (Figure 11, Appendix Table 15), an increase over last year's return of 102,900 fish. The cumulative commercial harvest of 126,900 fish comprised over 82% of the Southern District sockeye harvest and about 57% of the total LCI sockeye salmon harvest.

Leisure Lake was stocked with only .089 million fry in 2001 (Appendix Table 34), while Hazel Lake was not stocked at all, due to an outbreak of the Infectious Hematopoietic Necrosis Virus (IHNV) at the Trails Lake Hatchery earlier in the year.

English Bay Sockeye Salmon Rehabilitation

The English Bay Lake system has the only significant stock of sockeye salmon native to the Southern District of LCI. Unfortunately, the English Bay sockeye returns declined to their lowest recorded levels in the last half of the 1980's decade. Sockeye escapement estimates between 1985 and 1993 ranged from 2,500 to 8,900 fish; all but one of these years (1993) was well below the 20-year average of 7,800 fish (Appendix Table 23). The decline of the English Bay sockeye run resulted in a very restrictive management strategy for this area. The commercial, sport, and subsistence fisheries were closed during the sockeye run for most years mentioned. Efforts to rehabilitate this depressed stock were initiated by ADF&G with an egg take in 1989 and the subsequent release of 350,000 sockeye salmon fry in 1990 (Appendix Table 34). Chugach Regional Resources Commission (CRRC), in cooperation with the village of Nanwalek (formerly English Bay) and the Bureau of Indian Affairs (BIA), has since taken over this enhancement project and continued egg collections/incubation, fry rearing, fry stocking, and operation of a smolt/adult enumeration weir.

Whereas the escapement figures for English Bay Lakes prior to 1994 were index estimates based on aerial surveys, escapements beginning with the 1994 season have been monitored through the use of a counting weir, operated by CRRC. The cumulative total that first year numbered 13,800 sockeyes (Appendix Table 23), the highest return since 1982 and the first year since 1984 in which the minimum desired goal of 10,000 fish was achieved. In 1995 and 1996, the weir totals were 22,500 and 12,400, respectively, with the former representing the highest figure over the past 20 years.

Optimum escapement for this system recently was estimated to be less than the original maximum goal of 20,000 sockeyes (Edmundson et al. 1992). A plan to tightly control spawning escapement into the lake by harvesting those fish surplus to the maximum desired goal of 15,000 was adopted by ADF&G staff, representatives of CRRC, and village residents from Nanwalek during meetings held over the winter of 1995-96.

No harvestable adult sockeye salmon were forecasted to return to English Bay Lakes in 2001 due to the low smolt out-migrant numbers in 1998 and 1999. The low numbers of smolt emigrating the lake system in 1998 were due to problems encountered during the 1997 fry rearing season when higher than normal water temperatures triggered a parasitic outbreak among the pen-reared fish, resulting in high mortality. A devastating fire that destroyed the Port Graham Hatchery building in early 1998 killed all of the sockeye fry destined to return to the English Bay Lakes system as aged-2 ocean adults in 2001 and as 3-ocean adults in 2002. Subsequently, the few adult salmon that were anticipated to return (forecasted at 7,300 fish) were needed to meet escapement goals. As a result, Department staff announced prior to the season that the commercial set gillnet fishery in the Port Graham Subdistrict would not open at the beginning of the 2001 season, while both the subsistence gillnet fishery and the fresh water sport fishery targeting this sockeye stock would be closed at the start of the return.

The CRRC enumeration weir became operational on May 29. Relatively strong passage rates were documented early in the return, with the cumulative counts actually tallying higher than the historic average until June 18, when the daily counts began to weaken. By June 28, the 2001 cumulative total fell behind the historic average, and when the weir was finally removed on July 24, the total escapement reached only 10,508 fish, falling short of the desired escapement goal of 15,000 fish and barely achieving the minimum goal of 10,000 fish. (Table 3, Appendix Table 23).

An estimated 100,000 sockeye fry were released in the spring of 2001 after being held over in English Bay "Second" Lake during the winter of 2000. Fry destined for release in late 2001/early 2002 were destroyed because of an outbreak of Infectious Hematopoietic Necrosis Virus (IHNV) that occurred during the summer pen rearing operations within English Bay Lakes, thus no stocking occurred this past season.

Bear Lake Sockeye Salmon Enhancement

Bear Lake, located at the head of Resurrection Bay in the Eastern District, has been the target of sockeye salmon enhancement efforts over recent years. Since 1962, this system has also been the centerpiece of a Sport Fish Division coho salmon enhancement program, part of which included limiting the escapement of sockeye salmon into the lake. As a result, only a small remnant run of naturally spawning sockeye salmon remained at Bear Lake. In an effort to produce increasing numbers of adult sockeyes without adversely affecting coho salmon production, as mandated by Board of Fisheries policy, CIAA undertook a sockeye stocking program beginning in 1989 with the release of 2.2 million sockeye fingerlings. Since then, additional releases of fry, fingerlings, and accelerated growth ("zero check") smolts have occurred, ranging from 0.2 to 2.4 million juvenile sockeye salmon each year (Appendix Table 34).

The first year of adult returns in 1992 was discouraging, with a total of less than 2,000 fish, but returns increased during each of the following three seasons. The return in 1996 was almost identical to that of 1995, totaling nearly 53,000 sockeyes, the highest to date. Since 1996, returns have not met the system's hypothesized potential.

Sockeye returns to Bear Lake were forecasted to be weak this year with an estimated harvestable surplus of approximately 3,000 fish. The poor forecast was due principally to a reduction in the number of outmigrating smolts for the years 1998 and 1999. The reduction of outmigrants was due to lower fry stocking levels for brood year (BY) 97 as well as a decrease in the fry-to-smolt survival from a high of approximately 30% (BY's 93-5 & 97) to only 10% for BY96.

As a result of the lower adult return forecast, and because the escapement goal for Bear Lake increased from 8,000 to 12,000 fish (to accommodate an increased egg-take goal), a more conservative fishing schedule was implemented for the waters of Resurrection Bay this year. Fishing time was reduced from recent year's five days per week to 40 hours per week (from 6:00 a.m. Monday until Tuesday at 10:00 p.m. and from 6:00 a.m. Thursday until 10:00 p.m. on Friday) beginning May 14. Commercial harvests as well as escapement trends were monitored

closely and by May 31, only 45 sockeyes had been counted past the weir at Bear Lake. Seine catches totaled approximately 2,600 fish at that time, suggesting a weak return. Therefore, in an effort to increase the escapement rate into Bear Lake, commercial salmon seining was closed effective 10:00 p.m. Friday June 1 until further notice. Daily escapement rates increased, reaching a peak daily count of 1,033 fish on June 14, with a final cumulative total of 12,806 sockeyes counted for the 2001 escapement. The common property purse seine fishery never reopened after the initial closure, ending the season with a harvest of 2,629 sockeyes, while CIAA cost recovery harvests of the early run at the Bear Creek weir totaled an additional 330 fish. When combined with the escapement and the 70 fish that were harvested at the weir and donated, the 2001 Bear Lake total return equaled 15,800 sockeyes, making the commercial catch (common property, hatchery cost recovery and donations) the lowest since 1994.

Approximately 0.145 million sockeye fry were released into Bear Lake during 2001 (Appendix Table 34), while 6.0 million sockeye eggs were collected for incubation over the 2001-2002 winter at Trail Lakes Hatchery in Moose Pass.

A number of returning sockeyes of Tustamena stock origin, with an identical (late) run timing as the Grouse Lake return, was also expected back to the Bear Creek weir as a result of an earlier experimental release of excess juveniles. None of these fish were allowed to escape into Bear Lake, with all fish harvested for cost recovery at the Bear Creek weir. The total estimated number of these late-run fish (tallied at the Bear Creek weir after July 1) actually harvested was approximately 4,700 sockeyes.

Grouse Lake Sockeye Salmon Stocking

A sockeye enhancement project in Resurrection Bay of the Eastern District was initiated in 1993 at Grouse Lake. All returning fish were designated for hatchery cost recovery in accordance with the Trail Lakes Hatchery Basic Management Plan, therefore a directed common property seine fishery has never been allowed on this return. Brood stock for this project, from Packers Lake on Kalgin Island in Upper Cook Inlet, were selected for late run timing characteristics so as not to

overlap with the earlier Bear Lake sockeye return. The preseason forecast for the 2001 Grouse Lake return projected an adult return of up to 11,100 fish. However, the history of Grouse Lake enhanced returns failing to achieve the system's theorized potential left this season's projection questionable. Additionally, the majority of sockeyes returning to this system have traditionally been plagued by poor product quality due to fresh water marking.

Unlike last year when CIAA chartered a seine vessel to conduct cost recovery harvest operations in a designated saltwater Special Harvest Area (SHA) in an effort to minimize the frequency of water marked fish and improve product quality, the only cost recovery operation intended for the Grouse Lake return this year included a weir placed into upper Salmon Creek. The 2001 Grouse Lake cost recovery efforts netted CIAA approximately 6,200 fish. Because of the traditionally poor product quality, however, nearly all of the harvested fish were donated, primarily to local dog mushers. When adding the estimate of 200 sport caught fish, the total return to Grouse Lake amounted 6,400 sockeyes.

Due to the program's lack of success and issues regarding product quality, CIAA has ceased sockeye enhancement at Grouse Lake and expects to increase early-run sockeye production at nearby Bear Lake. As a result, no sockeye smolt or fry have been released into Grouse Lake since 1998 (Appendix Table 34).

Chenik Lake Sockeye Salmon Enhancement

Chenik Lake, located in Kamishak Bay, historically was an excellent sockeye producer prior to the 1940's when annual runs approached 150,000 fish. Since that time, however, sockeye runs declined dramatically, forcing a complete closure of the Chenik area fishery beginning in 1952. By the mid-70's the average annual return to this system was less than 500 fish.

In 1978 ADF&G initiated a program to re-establish the sockeye runs and subsequently increase commercial fishing opportunities in the Kamishak Bay area. Sockeye fry from the now closed Crooked Creek Hatchery were annually stocked in Chenik Lake from 1986 through 1996 (except

for one year, Appendix Table 34), and a partial migrational barrier at the intertidal mouth of Chenik Creek was modified to allow easier fish passage. Beginning in 1987, and from 1989-1991, lake enrichment occurred through the experimental application of liquid fertilizer. Increased sockeye escapements in the early 1980's augmented production, and the Chenik area was reopened to commercial fishing. Subsequent returns accounted for up to 50% of the total LCI commercial sockeye harvest in some years, approaching the historical record high runs of the 1930's.

In 2001, however, the sockeye return to Chenik Lake was the eighth consecutive sub-par run, with no commercial harvest and an estimated escapement of only 250 adults (Appendix Table 16). The lingering effects of Infectious Hematopoietic Necrosis Virus (IHNV), a disease commonly affecting both juvenile salmon and trout, have caused reduced adult returns in recent years. IHNV was documented in the Chenik system during the 1991-1993 smolt outmigrations, and is suspected of causing increased mortality to juvenile sockeyes, thereby reducing the adult returns. A thorough investigation of the relationship between the Chenik Lake sockeye stocking project and the IHNV problem was initiated during the winter of 1992-93, ultimately resulting in a staff recommendation to reduce fry stocking densities from peak levels occurring in 1989 and 1990.

Between 1991 and 1996, the outmigration of sockeye smolts at Chenik Lake was monitored through the use of a weir and live trap. However, due to reduced adult returns and smolt outmigrations, operation of the adult/smolt counting weir after 1996 could not be justified.

Factors relating to IHNV epizootics are very complex and currently not well understood. Although remotely possible that stocked sockeye salmon fry were the source of the virus, a more likely cause is that Chenik Lake has become a reservoir for IHNV released from the sex products of naturally spawning adult sockeyes or their decomposing carcasses. It has been hypothesized that the tremendous population declines experienced by the sockeye stock at Chenik Lake in the late 1930's and 1940's may have resulted from IHNV epizootics caused by record high escapements of up to 53,000 adults in the 1930's.

Unfortunately, there is no known practical onsite treatment of IHNV other than perhaps decreasing fry stocking densities, which was begun in 1993 with a reduction to just over one million sockeye fry (Appendix Table 34). This experiment was inadvertently stretched to its maximum limit by default in 1994 when no hatchery-produced fish were released into the system. The fry from Crooked Creek Hatchery, which were slated for stocking at Chenik Lake that year, were destroyed due to an outbreak of the IHN virus at the hatchery facility. It should be noted that this was the first documented incidence of IHNV at the Crooked Creek facility in its 23 years of operation. Stocking resumed in 1995 with the release of 1.13 million sockeye fry into Chenik Lake, while just under 1.0 million fry were stocked in 1996, the last year stocking occurred (Appendix Table 34).

It was thought that reduced adult escapement would also help to decrease transmission of IHNV into the littoral zone of Chenik Lake. Escapement into Chenik Lake, monitored via aerial surveys once again in 2001, totaled only 250 fish, the ninth consecutive year in which the escapement fell substantially short of the 10,000 fish goal (Appendix Tables 16 and 23). This year's total represents the lowest escapement into the system since 1978, the year enhancement efforts began. The escapement shortfall, when combined with the discontinuation of supplemental stocking, equates to reduced fry production, which in turn should theoretically benefit the system by reducing the potential for IHNV epizootics. Furthermore, informal studies indicated that the resident lake trout population in Chenik Lake undoubtedly benefited from the regular stocking of sockeye fry. Evidence suggests that the inflated lake trout numbers may be continuing to suppress juvenile sockeye levels in the lake, thereby reducing the size of annual smolt outmigrations.

The aforementioned schemes of reduced adult escapements and decreased stocking levels appeared to successfully reduce the incidence of IHN in the system as evidenced by the healthy smolt leaving the lake from 1994 - 1996. Unfortunately, the numbers of outmigrating smolts during that time were miniscule relative to the stocking levels, and measures taken failed to achieve the expected increase in production at Chenik Lake. As a result, CIAA could no longer justify the expense of stocking Chenik Lake and discontinued the project after the 1996 season. The Department and CIAA will continue to include Chenik Lake in future enhancement considerations, but new information will undoubtedly be required before any projects are undertaken at the system.

Other Sockeye Salmon Lake Stocking

Kirschner Lake in the Kamishak Bay District was stocked with sockeye fry for the first time in 1987 (Appendix Table 34), and 2001 marked the twelfth year that adult sockeye's have returned to this site. The 2001 total return, including common property and hatchery cost recovery fish, totaled 38,938 fish, with 9,198 (24%) taken in the commercial seine fishery. This year's return exceeded the preseason forecast by 59%, or over 15,000 fish. No fish were expected to return to nearby Bruin Lake in 2001, a result of the discontinuation of fry stocking in 1996. The Kirschner Lake system has remained one of the steadiest producers of LCI stocked lakes since the inception of the program at that site. No sockeye fry were available for stocking into Kirschner Lake in 2001 due to an outbreak of the IHN virus at Trails Lake Hatchery earlier in the spring. Four other lakes, evaluated through pre-stocking studies conducted between 1986 and 1989, and which were regularly stocked between 1988 and 1996, were again not stocked in 2001 as those enhancement programs have been discontinued. The four lakes included Bruin Lake, Ursus Lake, Upper Paint Lake, and Lower Paint Lake, all in the Kamishak Bay District (Appendix Table 34).

Halibut Cove Lagoon and Seldovia Bay Chinook Salmon Enhancement

The chinook salmon enhancement projects at Halibut Cove Lagoon and Seldovia Bay involve the release of chinook salmon smolts, with the objective of increasing sport fishing opportunities in Kachemak Bay. The program at Halibut Cove Lagoon is the oldest and one of the most popular sport fishing enhancement projects in LCI, operating continually with an annual release of smolts since 1979. Although adult returns from the two stocking programs are not intended for commercial harvest, there is incidental harvest of these chinook salmon in the commercial set gillnet and seine fisheries. The long-term estimated incidental harvest of enhanced chinook salmon by commercial fishermen in Halibut Cove Subdistrict has been approximately 30% of the total return. No such estimates are available for the commercial fishery in Seldovia Bay Subdistrict. Figures for the incidental chinook harvest during 2001 were not available but were thought to be near the historical average. The commercial harvest of chinook salmon in Halibut Cove and Seldovia Bay Subdistricts

this season totaled approximately 325 and 161 fish, respectively. Historical releases of juvenile chinook salmon at these two project sites are found in Appendix Table 34.

Port Graham Hatchery

In an effort to supplement natural fish production and provide increased employment opportunities in the native village of Port Graham, the Port Graham Hatchery Corporation (PGHC) applied for and received a permit to operate a private non-profit (PNP) hatchery in 1992. Port Graham is located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). The hatchery had conducted experimental egg-takes and fry releases via a scientific/educational permit from 1990 through 1992, while these activities have subsequently been permitted in the Port Graham Hatchery Basic and Annual Management Plans (BMP/AMP). The PNP permit for PGHC allows pink salmon brood stock collection from a natural run in the Port Graham River, at the head of Port Graham. However, the Port Graham River pink run historically has experienced significant natural fluctuations in escapements despite conservative fishing schedules, causing some concern for protection of the natural stocks. Consistent with the priority of managing for natural stocks (**AS 16.05.730**), a brood stock collection schedule based on the desired natural escapement into Port Graham River as well as historical escapement levels has been developed to offer maximum protection to the wild pink salmon stock during years of weak returns. Harvest of both natural and hatchery stocks could potentially occur in commercial purse seine and set gillnet fisheries as well as a subsistence set gillnet fishery in Port Graham since the returning hatchery fish would undoubtedly intermix with wild stocks bound for the Port Graham River. Management decisions attempt to address the effects of these various fisheries to protect natural stocks until adequate escapement into Port Graham River can be confirmed. A small natural return of chum salmon to Port Graham River also occurs, and since this run has been depressed in recent years, management measures also strive to protect this species as well.

The approved Port Graham Hatchery BMP designated a salt water Special Harvest Area (SHA) to allow for brood stock collection and cost recovery harvest (Figure 6). The SHA was designed

to provide a migration corridor on the northeast side of the bay for wild stocks traveling to Port Graham River at the head of the bay, thus affording some limited protection to the natural spawning stocks of pink and chum salmon.

Initial adult returns to the hatchery in both 1992 and 1993 failed to appear despite predictions of at least moderate returns. Because no fry were released in 1993, both the forecast and actual return for 1994 were zero. The 1995 pink return to Port Graham Hatchery was forecasted at 20,000 to 50,000 fish, with the actual return totaling an estimated 20,000 pinks, while only 2,700 fish returned in 1996, when the preseason forecast called for 7,000 to 10,000 returning pinks. In 1997, returns finally fell within the preseason forecast range of 80,000 to 200,000 pinks, with a total run size estimated at about 130,000 fish. Despite a forecast of 30,000 to 50,000 fish in 1998, the return totaled less than 13,000 pinks. Because of a fire in January 1998 that destroyed all of the hatchery pinks and sockeyes in incubation at the time, no pink salmon returned to the hatchery in 1999.

Because of the low number of fry stocked in 2000 (1.14 million), there was no harvestable surplus of pink salmon forecasted for 2001, and hatchery officials anticipated that all returning adults would be required for brood stock purposes. Hatchery brood harvest efforts netted just over 19,000 pinks, resulting in the collection of approximately 12.4 million eggs for incubation in 2001-2002. In the Port Graham River approximately 10,300 pink salmon were counted as escapement, down from 1991 and short of the biological escapement goal of 20,000-40,000 fish. An estimated 27.3 million pink salmon fry were released from the Port Graham hatchery facility in the spring of 2001 (Appendix Table 34).

Although all efforts prior to 1993 were directed towards pink salmon, sockeye salmon production has also been underway at the Port Graham Hatchery. The facility has incubated sockeye salmon eggs collected from English Bay Lakes, destined for eventual release back into that system, since 1993 (eggs from this collection site were formerly incubated at Big Lake Hatchery near Wasilla). According to project personnel, there were no sockeye salmon eggs collected from the English Bay lake system this year because adult sockeyes that entered the lake system remained in deeper

water for a longer than normal time period, making collection for brood stock impossible. Eggs collected are typically incubated at the Port Graham Hatchery, and resulting fry are transported to net pens located in the lake system the following spring for long-term rearing prior to release into the lakes.

In an effort to rehabilitate depressed coho salmon stocks in Port Graham River, a Permit Alteration Request (PAR) by PGHC to produce approximately 25,000 presmolts for stocking in the upper portion of Port Graham River was approved in 1995. PGHC began to monitor the smolt outmigration from that system in 1996 and collected eggs from adults beginning that same year. These eggs were incubated at the Port Graham Hatchery and the resultant fry were subsequently released into Port Graham River. No estimate of adult returns from this stocking program, first expected in 1999, were made. However, the project was discontinued after the 1998 release and its future is currently uncertain.

Paint River Fish Pass

The Paint River system in the Kamishak Bay District contains at least 40 kilometers (25 miles) of potential salmonid spawning and rearing habitat. Currently the Paint River system is barren of salmon because of a waterfall at tide line that was impassable prior to 1993. ADF&G and CIAA initiated feasibility studies for a fishway in 1979. CIAA received State and Federal grant funds to build the fishway, completing construction in the fall of 1991. ADF&G Commissioner Carl Rosier declared the fish pass officially operational in January 1993.

To test the feasibility of developing a sockeye salmon return to the fish pass project site, the Paint River Lakes were first stocked with sockeye fry in 1986 and annually from 1988 through 1996, except in 1994 when no fry were available (Appendix Table 34). Because adult returns from these plantings proved negligible, CIAA discontinued fry stocking after the 1996 season. Only 75 adult sockeyes were observed during aerial surveys of the Paint River mouth and Akjemguiga Cove during 2001, the eleventh consecutive year of meager returns to this enhancement site.

Because of the small numbers of returning fish, the fish pass was never opened to migrating adult salmon and no freshwater escapement has ever occurred.

2002 COMMERCIAL SALMON FISHERY OUTLOOK

Sockeye Salmon

Commercial sockeye salmon harvests in LCI during 2002 could exceed 215,000 fish, representing roughly three-fourths of the recent 10-year average. Over 60% of the total sockeye harvest should be a result of continuing enhancement and lake stocking projects in LCI. Forecasted returns to enhancement sites in the Southern District during 2002 are considerably below the recent average, with a return of about 36,000 sockeyes anticipated at Leisure Lake/China Poot Bay and an additional 30,000 sockeyes expected to return to Neptune Bay/Hazel Lake. The low forecasts are the result of low stocking levels in 1999.

Kirschner Lake in the Kamishak Bay District is expected to produce nearly 20,000 adult sockeyes in 2002. This projection is based on a lower than normal stocking rate in 1999 combined with average survival rates over the past decade. Stocking in other Kamishak Bay systems, such as Bruin, Ursus, and Paint River Lakes, has now been discontinued, and no returns are expected back to these systems in 2002. No harvest is expected to occur at Chenik Lake in the Kamishak Bay District during 2002 as a result of the lingering effects of the previously described IHNV epizootic there.

The 2002 enhanced sockeye return to Bear Lake (eleventh year of enhanced returns) is expected to produce a harvest of 11,000 fish after accounting for brood stock and escapement requirements. Sockeye returns to Grouse Lake, also near Seward in Resurrection Bay, are not expected to contribute to commercial harvests in 2002 due to a suspension of the stocking program there.

Natural sockeye run projections for LCI are based solely on average historical harvests and could be expected to contribute up to 84,000 fish to commercial catches in 2002. Despite not reaching the preseason projection during recent years, natural sockeye runs have nevertheless improved, with a concurrent improvement in spawning escapements to most systems. The Southern District is expected to contribute the most to the harvest of non-enhanced stocks, while additional catches could come from the East Nuka Bay systems of Delight and Desire Lakes in the Outer District, Aialik Lake in the Eastern District, and Mikfik Lake in the Kamishak Bay District.

Pink Salmon

Harvest of pink salmon in LCI during 2002 could reach nearly 3.4 million fish, with enhanced production expected to provide over two-thirds of the total. Tutka Hatchery, in the Southern District, is expected to contribute over 2.0 million pinks to commercial harvests, while the pink return to Port Graham Hatchery could provide a harvestable surplus of nearly 0.5 million pinks. However, if prices for this species continue to remain depressed, it is likely that the two hatcheries will require a significant percentage of the respective returns in order to meet brood stock and revenue requirements.

Natural pink salmon spawning escapement levels into most major LCI systems ranged from fair to excellent in 2000, contributing to a harvest projection of over 900,000 naturally produced pinks throughout the entire LCI management area. This relatively strong forecast, however, could be tempered by the recent history of erratic tender service in remote districts, and it remains questionable whether the harvest forecast of naturally produced pinks will be attained in 2002.

Chum Salmon

Based solely on recent years' average harvests (after 1988), the total LCI commercial chum salmon catch is projected to be exceed 20,000 fish during 2002. Consecutively strong chum runs during the past two seasons, however, suggest that actual harvests could be even greater. The LCI

chum harvest will consist exclusively of natural production since chum salmon enhancement is no longer conducted in LCI.

Chinook and Coho Salmon

No formal harvest forecast is prepared for chinook or coho salmon in LCI. However, average annual harvests since 1980 indicate that about 1,300 chinook and 14,000 coho salmon can be expected to contribute to LCI commercial harvests in 2002.

The following table summarizes the projected harvest figures by species in the Lower Cook Inlet management area during 2002:

Species	Harvests of Enhanced Returns	Harvests of Natural Returns	Total Harvest
Chinook	[a]	[a]	1,300[a]
Sockeye	131,500[c]	83,800[b]	215,300
Coho	[a]	[a]	13,900[a]
Pink	2,485,200[c]	910,000	3,395,200
Chum	0	21,100[b]	21,100
TOTAL	2,616,700	1,014,900	3,646,800

[a] Commercial harvest forecasts of chinook and coho salmon represent average harvests since 1980 and are comprised of a combination of naturally-produced fish as well as fish produced from enhancement programs in LCI; no attempt is made to separate the two components.
[b] Harvest forecasts for naturally-produced sockeye and chum salmon are simply average commercial harvests since 1980 and 1989, respectively.
[c] Includes common property plus cost recovery harvests.

SUBSISTENCE AND PERSONAL USE SALMON NET FISHERIES

KACHEMAK BAY PERSONAL USE FISHERY

The Southern District (Kachemak Bay) fall coho salmon gillnet fishery dates back prior to statehood under varying names, being known as a "personal use" fishery during the years 1986-1990, 1993, and 1995-present, and as a "subsistence" fishery in 1991, 1992, and 1994. Numerous court rulings have affected the status of this fishery over the past 20 years, causing it to change in

status between the two categories. The most recent court action, after the 1994 fishery, reestablished the "subsistence" and "non-subsistence" areas originally created by the Alaska Board of Fisheries (BOF) in 1992, and because most of Kachemak Bay was included in a "non-subsistence" area, the subsistence fishery and the regulations governing it were no longer valid. The BOF re-adopted personal use regulations governing this fishery into permanent regulation for the 1995 season and rescinded the subsistence regulations formerly governing the fishery; those personal use regulations have remained in effect since that time.

The target species in the Kachemak Bay gillnet fishery is coho salmon, with returning fish a mixture of natural stocks primarily bound for the Fox River drainage at the head of Kachemak Bay and enhanced runs bound for the Homer Spit fishing lagoon and, formerly, Fox Creek/Caribou Lake near the head of Kachemak Bay. The regulations governing the fishery are found in the Personal Use Coho Salmon Fishery Management Plan (**5 AAC 77.549**). The BOF addressed this fishery during their last meeting in Homer (November, 1998). After hearing the staff's concerns regarding the harvest of wild stocks of cohos, the BOF adopted a change to the regulatory guideline harvest range (GHR), from a former range of 2,500 to 3,500 coho salmon to a new range of 1,000 to 2,000 cohos. The new GHR was implemented for the first time during the 1999 season. Incorporated into the management plan is a requirement that cohos taken during the earlier Seldovia area subsistence salmon fishery be included as part of the personal use guideline.

All other regulations from the previous year's fishery remained essentially unchanged for the 2001 personal use fishery. This year's fishery opened on the regulatory opening date of August 16. Legal gear was limited to a single set gillnet not exceeding 35 fathoms in length, 45 meshes in depth, and 6 inches in mesh size. Nets were not permitted more than 500 feet from the mean high water mark, and a net could not be set offshore of another net. A permit from the Homer office was required, with an Alaska resident sport fishing license necessary to obtain a permit. The seasonal limit was 25 salmon per head of household and 10 additional salmon per each dependent. There were two scheduled 48-hour fishing periods each week, from Monday 6:00 a.m. until Wednesday 6:00 a.m. and Thursday 6:00 a.m. until Saturday 6:00 a.m. Prior to 1991, little Department management interaction occurred and the fishery often proceeded until the regulatory closing date of September

15, regardless of the harvest level. Between 1991 and 2000, years of intensive management for the GHR, fishing time allowed in this fishery ranged from 72 to 192 hours.

No coho salmon harvest was reported from the early August Seldovia subsistence fishery, therefore the guideline harvest range remained at 1,000 to 2,000 fish for the personal use fishery. Prior to the opening on August 16, the Department requested voluntary daily reporting from each permit holder during the fishery, as has been the case since 1991. After the first 48-hour fishing period, with only 26% of permit holders reporting their catch, just over 600 coho salmon were harvested. With the lower end of the GHR not yet achieved, the staff allowed the fishery to continue for a second 48-hour fishing period. Early in that second period, preliminary catch reports indicated that coho catch rates appeared to be strong, particularly along the east side of the Homer Spit where the majority of effort and harvest traditionally occurs. In addition, it became apparent once again that the low level of volunteer catch reporting was not accurately reflecting actual total catches. For these reasons, as well as the fact that over 60% of the lower end of the GHR was achieved during the first fishing period, the staff determined that the catch would likely fall within the GHR by the end of the second period. It was reasoned that additional fishing time, however, could easily result in a cumulative harvest exceeding the upper end of the GHR. Therefore, ***LCI E.O. No. 2-F-H-018-01*** was issued closing the 2001 Personal Use Coho Salmon Fishery at 6:00 a.m. Wednesday August 22, for the remainder of the 2001 season after 96 hours of fishing time.

A total of 154 permits were issued for the 2001 fishery (Appendix Table 29). Approximately 96%, or 148 permit holders, reported their catches by returned permits or by phone. Of this number, 114 permit holders (74%) actively fished, 34 (22%) did not fish at all, and the remaining six permit holders (4%) did not report. A total of 146 permit holders (95.0%) actually returned their permits. Based on permits actually returned and voluntary catch reports, the harvest was estimated to be 1,579 coho salmon, 150 pink salmon, 27 sockeye salmon, 86 chinooks, and 16 chums (Appendix Table 29).

The duration of the 2001 Southern District personal use fishery (96 hours of fishing time) was identical to the previous year, but shorter than the 1991-2000 average of 112 hours. The number of

permits issued (154) was down 28% from that of 2000, and also lower than the 1991-2000 average of 285 permits, while 74% of the permits issued actually fished, up slightly from 2000. The coho harvest of 1,579 fish was down from last year's harvest of 2,064 fish as well as the average harvest since 1999, when the lower 1000-2000 fish GHR was implemented.

Reasons for the decreased effort during the 2001 fishery are difficult to explain. Permits for, and catches in, the personal use fisheries north of Homer (e.g. the Kasilof and Kenai River dip and set gill net fisheries) have increased since 1997. Perhaps news of the fishing success during the 2001 personal use fisheries farther north motivated fewer people to register for LCI fishery. Additionally, the recently reduced GHR now in effect may have discouraged some prospective participants from obtaining permits.

Fishing time for the 2001 season was identical to last year at 96 hours, but only half of the 192 hours in 1999, the first year that the lower GHR of 1,000-2,000 fish was implemented. As expected, the most fishing success occurred in those waters adjacent to the Homer Spit enhancement lagoon. Other areas that produced reasonable catches during years of Caribou Lake enhancement, especially the north shore of Kachemak Bay from Mud Bay to Swift Creek, were not expected to produce significant harvests and indeed didn't.

The lower GHR implemented in 1999 appears to have succeeded at protecting the majority of naturally produced cohos by prompting a fishery closure prior to the peak of those stocks' migration. Catch data indicates that the coho harvest fell near the midpoint of the 1,000-2,000 fish GHR. Although no tagged adult fish returned to the enhancement lagoon this year, tag recovery analysis from last year indicated that approximately 80% of the cohos caught during the set gillnet fishery were of hatchery origin.

Overall run strength of coho returns to Kachemak Bay this year appeared to range between average and above average. Sport and commercial catches are normally utilized as indicators of run strength, but as has become commonplace in recent years, commercial catches in LCI did not accurately reflect the strength of the 2001 coho return due to a lack of directed effort. Informal

observations conducted in the local sport fishery by Sport Fish Division staff, indicated relatively strong returns to the enhancement lagoon. Aerial surveys this year of Clearwater Creek, the major coho index stream at the head of Kachemak Bay, substantiated the larger return of cohos to the area. Two surveys were conducted, the first on 10 September when 350 cohos were estimated and the second on 26 September, when over 3,200 cohos were estimated. The latter figure is the highest single aerial observation of cohos in the Clearwater Creek drainage on record.

Due to the abbreviated nature of the personal use fishery during most of this decade, the staff made a concerted effort prior to the opening to inform the public of the anticipated short duration, which has become common knowledge among experienced local participants. As usual, this prior knowledge of the brevity of the fishery led to intense competition for desirable fishing sites, especially along the east side of the Homer Spit. This area continues to remain the most sought after location to fish, undeniably due to the coho enhancement project at the Homer Spit fishing lagoon.

Prior to enhancement, the Spit was considered only average in terms of harvest productivity. The Spit's easy road access and the enhanced coho return have combined to incite fishermen to clamor for fishing sites on the Spit, a situation which resulted in numerous violations during some previous gillnet fisheries. The last time that Fish and Wildlife Protection (FWP) officers issued citations during this fishery was in 1994. Since then, numerous verbal warnings have been issued, and many complaints received via telephone in the Homer ADF&G office, regarding infractions. This year FWP officers were on site for the beginning of the fishery, with two follow up visits during the first period. As is usually the case, the presence of these uniformed FWP officers generated relatively expedient voluntary compliance; no formal citations were issued and only one verbal warning given.

The 2001 catch of 86 chinook salmon (Appendix Table 29) was approximately 65% higher than the long term average (1969-2001) but the lowest since returns of late-run chinook salmon, stocked by the Sport Fish Division, began overlapping the personal use season dates. Moreover, the Sport Fish Division discontinued the stocking of late-run chinook in 1999, which has resulted in reduced catches of the later returning chinook in the personal use fishery.

The catch for the 2002 personal use fishery is expected to be comparable to the previous five-year period, 1997-2001, a period when adult contribution from Caribou Lake enhancement no longer contributed to the fishery. However, the length of time to achieve a harvest within the GHR is difficult to forecast particularly when comparing this year's relatively short fishing time (96 hrs. vs. up to 196 hrs.) to that of years 1997-1999. Fishing effort and participation in the 2002 fishery is expected to be comparable to that of the past three years when the fishery was managed with the 1,000-2,000 fish GHR in place, but once again could be affected by other alternative fisheries elsewhere in Cook Inlet. Although limited as an inseason management tool, voluntary catch reports will once again be employed to help determine an appropriate closure time. Based on experience gained during the past ten years' fisheries, and especially that of the past five seasons, it should be possible to keep the harvest within the GHR.

NANWALEK/PORT GRAHAM SUBSISTENCE FISHERY

One of two subsistence fisheries in LCI during 2001 occurred near the villages of Nanwalek (formerly English Bay) and Port Graham, located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). Most fishing occurs within close proximity to the respective villages and targets sockeye salmon returning to the English Bay Lakes system early in the summer, as well as pink salmon returning to Port Graham and English Bay Rivers later in the summer. Some additional fishing also occurs in Koyuktolik ("Dogfish") Bay, located about seven nautical miles south of English Bay, targeting non-local stocks of chinook salmon as well as local stocks of chum salmon.

The sockeye salmon run to English Bay Lakes was severely depressed for much of the late 1980's and early 1990's, with returns failing to achieve the minimum escapement goal for nine consecutive years between 1985 and 1993. Recent returns have been bolstered as a result of a rehabilitation/enhancement project initiated by ADF&G and subsequently taken over by the Chugach Regional Resources Commission (CRRC) on behalf of the village of Nanwalek.

There were no harvestable adult sockeye salmon forecasted to return to English Bay Lakes in 2001 due to the low smolt out-migrant numbers in 1998 and 1999. The low numbers of smolt emigrating the lake system in 1998 were due to problems encountered during the 1997 fry-rearing season when higher than normal water temperatures fostered a parasitic outbreak among the pen-reared fish, resulting in high mortality. A devastating fire that destroyed the Port Graham Hatchery building in early 1998 killed all of the sockeye fry that were destined for stocking into English Bay Lakes and consequently would have returned as aged-2 ocean adults in 2001 and as 3-ocean adults in 2002. Subsequently, the few adult salmon that were anticipated to return this season (forecasted at 7,300 fish) were needed to meet escapement goals. As a result, Department staff announced prior to the season that the commercial set gillnet fishery in the Port Graham Subdistrict would not open for the 2001 season on the first Monday in June, as set in regulation. However, the 2001 subsistence season for the Port Graham and Koyuktolik Subdistricts was allowed to open on the regulatory opening date of April 1. Because of the meager sockeye forecast this year, the subsistence season was allowed to proceed only until the traditional start of the sockeye return and was closed by ***LCI E.O. No. 2-F-H-002-01*** beginning Wednesday May 30 at 6:00 a.m. Realizing that closure of the subsistence fishery would negatively impact on the village residents' ability to fill subsistence sockeye salmon needs, fishing time prior to the closure was liberalized (to 7 days per week, versus the traditional two 48-hour periods per week) beginning on May 19 until the emergency order closure on May 30 to permit residents to target alternative species. An enumeration weir operated by CRRC at English Bay River monitored sockeye escapement inseason, as has been the case since 1994, with a final escapement estimate of 10,500 fish, shy of the desired goal of 15,000 sockeyes for the second consecutive season.

Because of the poor return of sockeyes to the English Bay Lakes system in 2001, followed by a similarly poor pink return to the Port Graham River, all fish returning were needed for escapement goals and/or brood stock purposes. The resulting restrictive closures precluded residents of Port Graham and Nanwalek from the opportunity to meet their subsistence salmon needs locally. Consequently, a petition to add waters of Port Chatham and Windy Bay to the area open to subsistence fishing was submitted to the Alaska Board of Fisheries (BOF) for their consideration at the November 2001 meeting. Although the BOF denied the original petition

because it did not meet administrative requirements, they felt that the issues raised in the petition merited attention, so the BOF generated its own proposal to address the villagers' concerns. At the meeting, the BOF amended, and subsequently adopted, the proposal, allowing fishing weekly from 10:00 p.m. Thursday to 10:00 a.m. Wednesday between April 1 and September 30 in waters of Port Graham and Koyuktolik Subdistricts. However, in waters of Port Chatham and Windy Bay Subdistricts, the BOF established identical weekly fishing periods but chose season dates for these two subdistricts from April 1 until August 1 to protect returning coho salmon.

Subsistence Division end-of-year summaries indicated that the residents of Nanwalek harvested 909 sockeyes, the lowest reported harvest since 1998 when only 18 sockeyes were harvested (Appendix Table 32). Salmon harvests for the village residents of Port Graham in 2001 were not available at the time of this report, but historical catches appear in Appendix Table 31.

SELDOVIA AREA SUBSISTENCE SALMON GILLNET FISHERY

The set gillnet fishery in waters near Seldovia on the south side of Kachemak Bay in 2001 was the sixth year of LCI's newest subsistence salmon fishery. Established by the BOF at their LCI meeting in the fall of 1995, the fishery was designed to primarily target non-local stocks of chinook salmon as they transited these waters. In considering initial seasons and bag limits, the BOF carefully restricted the fishery to reduce potential interception of enhanced chinook salmon bound for a popular stocking site in the Seldovia small boat harbor. These enhanced fish were intended to principally benefit sport fishermen and were not considered "customary and traditional" for subsistence purposes.

Regulations in the fishery included a "split" season, the first occurring from April 1 through May 30 and the second occurring during the first two weeks of August. A guideline harvest limit of 200 chinook salmon was established for the early season, while the annual possession limit was set at 20 chinooks per household. During the April/May season, fishing was allowed during two 48-hour periods each week, while in August the fishery was only open during the first two

weekends of the month. Waters open to fishing included those along the eastern shore of Seldovia Bay as well as a short stretch of water outside of Seldovia Bay proper just west of Point Naskowhak (also called the "outside beach"). Gear was limited to set gillnets not exceeding 35 fathoms in length, 45 meshes in depth, and six inches (stretched) mesh size, identical to gear regulations governing the nearby Port Graham/English Bay subsistence fishery. A permit issued by the Department was required prior to fishing, and catches were to be recorded on the permit and also voluntarily reported to the Department's Homer office inseason so that cumulative harvest totals could be monitored.

A total of 19 permits was issued for the early season, while no permits were issued for the August season. Although permit holders were required to call in their catches inseason, few actually did. At the close of the early season, nearly all permits were returned to the Department as required by regulation, and catches were determined from records on each permit. For the early season, 14 of 19 permit holders (74%) actively fished, three (16%) did not fish, and two permit holders (10%) failed to return his/her permit. Total reported catch was 134 chinook salmon and 124 sockeyes (Appendix Table 33).

The 2001 subsistence harvest of 258 fish was the lowest since 1998, when the all-species catch totaled 201 fish. This season's harvest was, however, higher than the historical average of 218 fish. Chinook salmon comprised the greatest part of the catch with 134 harvested, down from 189 in 2000. The sockeye harvest totaled 124 fish, down from last year's record harvest of 249, but higher that the historical average of 93 fish. The relatively high harvests can be attributed to a longer season for the fourth straight year (the BOF adopted a 10-day extension for the early season, from May 20 to May 30, beginning with the 1998 season). This extra time equated to additional opportunity for participants during a time when numbers of chinook and sockeye salmon in Seldovia area waters were greater, subsequently increasing subsistence harvests. In addition, participants continued to gather more knowledge on fishing techniques and productive locations.

The fishery in 2002 is expected to be similar to that of 2001. Because the fishery is still relatively new, fishermen are continuing to learn the most productive fishing sites and successful techniques. Based on these factors, the harvest during the early season could approach or exceed the guideline harvest limit in 2002.

COMMERCIAL HERRING FISHERY

INTRODUCTION

Similar to the salmon fishery, commercial herring fishing has historically occurred in four of the five management districts, with the Barren Islands District being the sole area where commercial herring fishing has not occurred (Figure 1). LCI herring fishing first occurred in the Southern District in 1914 with development of a gillnet fishery within Kachemak Bay. Eight saltries, six near Halibut Cove, were operating during the peak of the fishery. A purse seine fishery in Kachemak Bay began in 1923, but after three successive years of average annual harvests approaching 8,000 short tons (st; 1 short ton = 2,000 pounds), herring populations, and the fishery, collapsed.

The next LCI herring fishery began in 1939 and was centered in the Resurrection Bay and Day Harbor areas of the Eastern District (Figure 1). Product from this purse seine fishery was used exclusively for oil and meal reduction. Although the fishery continued through 1959, peak harvests occurred from 1944 to 1946 and averaged 16,000 st each of those years. After this time period, stocks sharply declined, apparently due to over-exploitation.

HISTORY AND DEVELOPMENT OF THE SAC ROE FISHERY

Introduction

Japanese market demand for salted herring roe resulted in development of a sac roe fishery in the 1960s. The relatively high prices paid to fishermen caused rapid expansion of the fishing fleet and harvest. In an effort to decrease the risk of a stock collapse and to sustain the fishery, the department established conservative management strategies and guideline harvest levels. Following a period of suspected overexploitation, herring stocks throughout LCI generally declined after 1973. Concern over the declining trend led the Alaska Board of Fish and Game, prior to the start of the 1974 season, to establish a quota of 4,000 st for all of LCI.

The only allowable gear type in the LCI herring sac roe fishery is purse seine. The limited entry permit system for sac roe herring seining in Cook Inlet was implemented in 1977, and at the present time 74 permanent and two interim use permits are issued for the management area.

Outer/Eastern Districts

During the early years of sac roe herring fishing in LCI, seining occurred primarily in the Outer and Eastern Districts (Figure 1), with the majority of effort and harvest once again concentrated in Resurrection Bay of the Eastern District. The first major harvest occurred in 1969, when 760 st of herring were taken in the Eastern District. The catch increased dramatically in 1970 to a record high of 2,100 st in this district, but the stocks, and resultant harvests, declined over the next three seasons. The Alaska Board of Fish and Game allocated 1,000 st from the total LCI quota of 4,000 st to each of the Outer and Eastern Districts beginning with the 1974 season. However, stock abundance continued to decline and these quotas were never achieved. As a result, the Outer and Eastern Districts were closed to herring fishing from 1975 to 1984.

In 1985, the sac roe fishery was allowed to resume in the Outer and Eastern Districts on a very conservative basis, even though no noticeable change in spawning biomass had been observed. Because of the stocks' reduced abundance and extreme vulnerability to fishing, guideline harvest

levels were set at 150 to 200 st for each of the four fishing areas created within these two districts. Fishing effort in 1985 was minimal and the majority of the harvest (216 st) once again occurred in Resurrection Bay. Only limited and sporadic harvests occurred in these two districts since 1985, with the majority of both the herring catch and the observed biomass comprised of fish age 4 and younger.

Despite considerable opportunity for exploratory fishing on a daily basis in the Outer and Eastern Districts during 1991 and 1992, the predominance of juvenile herring and the history of marginally acceptable roe recoveries from fish caught in these areas contributed to a lack of interest by fishermen and processors. These conditions prevailed from 1993 - 2001 and, consequently, the Outer and Eastern Districts were not opened to purse seining in any of the past nine seasons.

Southern District

Sac roe herring seining in the Southern District began in the early 1960's, but catches were sporadic and relatively insignificant until 1969. That year, over 550 st were taken, followed the next season by a district record high harvest of 2,700 st. Although commercial harvests continued during the 1970's, albeit at much lower levels, observed low abundance of herring has virtually precluded commercial openings during the past 20 years in the Southern District. The only exception occurred in 1989, when 10 vessels in a single 2.5-hour opening harvested 170 st of herring (Appendix Table 35) averaging 8.9% roe recovery.

Kamishak Bay District

Since 1973, most LCI sac roe harvests have occurred within the Kamishak Bay District. Historical commercial harvests ranged from a low of 240 st taken in 1973 to a high of 6,100 st taken in 1987 (Appendix Table 35), with estimated exvessel values ranging from $70,000 to $9.30 million (Appendix Table 36). After the initial harvest in 1973, Kamishak Bay herring catches increased dramatically over the next three years, peaking at 4,800 st in 1976. Harvests dropped sharply during

the ensuing three seasons, and by 1980 the stocks had declined to a point that the Kamishak Bay fishery was closed entirely beginning with the 1980 season.

Although the Kamishak Bay District herring season remained fairly constant during the 1970's, roughly from late April through June, a significant management change occurred during this time. From 1973 through 1977, the fishery was basically "open season until closed", but in 1978 it was changed to "closed season until opened by emergency order" (Appendix Table 37). This change required more active assessment of the herring stocks by the Department in order to determine appropriate opening times and harvest levels.

Herring stocks appeared to respond positively and rebuild rather quickly following the 5-year closure that began in 1980. The fishery was reopened in 1985, with a resulting harvest of 1,100 st (Appendix Table 38). Beginning in 1985, the commercial fishery in Kamishak Bay District was regulated to achieve a 10 - 20% exploitation rate mandated by the Board of Fisheries. By 1989, fishing efficiency had increased to a level where intensive regulatory management was required to maintain harvests within guideline levels, to direct the fishery at herring aggregations with high quality roe, and to protect younger age herring from harvest. From 1985 through 1989, harvests averaged about 3,900 st, with a peak catch of 6,100 st in 1987 (Appendix Table 35).

Management of the Kamishak Bay District between 1990 and 1997 stabilized the average harvest at roughly 40% of the 1987 record high catch. However, hindcast biomass estimates generated by an age-structured-assessment (ASA) model show that stocks were declining steadily throughout the decade (Appendix Table 38, Figure 14), and by 1998 the total commercial herring catch in the Kamishak Bay District totaled only 300 st despite several extended district-wide openings. The fishery was closed beginning with the 1999 season due to low abundance levels and has remained closed since.

The Kamishak Bay District Herring Management Plan (KBDHMP) was formally adopted into regulation beginning with the 1993 season. Highlights of the plan included a minimum biomass threshold of 8,000 st, a maximum exploitation rate of 20% (scaled depending on the forecasted

biomass), and a management strategy intended to limit the harvest of herring age 5 and younger. In addition, because the spawning stock of Kamishak Bay herring is believed to reside in waters of north Shelikof Strait in the Kodiak Management Area for at least a part of the year, the KBDHMP dictated that 10% of the allowable harvest of Kamishak Bay herring be allocated to the Shelikof food/bait fishery.

2001 SEASON OVERVIEW

Assessment Methods

The primary method of herring biomass assessment in LCI is the aerial survey. Aerial surveys are conducted annually throughout the herring-spawning season in the Kamishak Bay and Southern Districts, from late April through early June, to determine relative abundance and distribution of herring. Aerial surveys of the Outer and Eastern Districts are not normally conducted due to the size of the area and the characteristically poor weather in the Gulf of Alaska, which precludes surveys on a regular basis and makes aerial biomass estimation in these districts impractical. Data collection methods in the Kamishak Bay and Southern Districts are consistent between seasons, with numbers and distribution of herring schools, location and extent of milt, and visibility factors affecting survey results recorded on index maps for each survey. Three standard conversion factors are used to estimate herring biomass based on each 538 ft^2 (50 m^2) of school surface area sighted and water depth: 1) 1.52 st for water depths of 16 ft or less; 2) 2.56 st for water depths between 16 and 26 ft; and 3) 2.83 st for water depths greater than 26 ft (Lebida and Whitmore 1985).

Due to invariably poor weather and water clarity, aerial surveys rarely provide reliable estimates of total herring biomass returning to Kamishak District Bay waters (Otis et al. 1998). As a result, an age-structured-assessment (ASA) model has been used for the past eight years to forecast herring abundance for Kamishak Bay, as well as to "hindcast" previous years' total abundance. This dynamic model incorporates a variety of heterogeneous data sources including: times series of commercial catch age composition; total run age composition; and aerial survey biomass estimates from years with adequate survey conditions and coverage. The model simultaneously minimizes the

differences between expected and observed return data for each of its components, updates hindcasts of previous years' abundance, and returns a forecasted estimate of the following year's return.

Another tool the Department annually utilizes to aid in herring assessment in the Kamishak Bay District, and opportunistically in the Southern District, is a chartered commercial seine vessel. In years when a commercial fishery does not occur, the Department is unable to utilize the fleet to collect samples for age composition analysis. The chartered commercial purse seine vessel is able to collect such samples and related information to further aid in understanding the dynamics of the herring stocks. As long as sufficient funding is available, separate sampling charters are conducted to sample different portions of the spawning migration (early and late). In years when a fishery occurs (traditionally in the early part of the migration), a single "late season" sampling charter is employed to obtain a more complete picture of the overall return. Hydroacoustic observations and water temperature/depth parameters are concurrently accumulated during the charters. The information gathered during these sampling efforts provides age class data that: 1) allows the staff to generate an age composition estimate of the overall biomass observed by aerial surveyors throughout the entire duration of the spawning migration; and 2) facilitates the evaluation of the relative strength of recruiting year classes. This is critical in generating the annual herring forecast. The charters further serve to informally verify the relative magnitude of herring biomass observed by aerial surveyors.

Kamishak Bay District 2001 Season Summary

Aerial survey coverage for Kamishak Bay in 2001 was considered good to excellent, while overall observation conditions were considered only fair. A single 7-day period in early May represented the longest time period during which no surveys were flown due to poor weather. A total of 15 surveys were completed in the Kamishak Bay District between April 17 and June 8. Herring were first observed during a survey on April 23, when an estimated 33 st were observed in Iliamna Bay and about 25 st spotted in and near Bruin Bay. The highest daily biomass estimation during the seasonal surveying period was made on April 27 with a cumulative estimate of nearly 1,400 st.

Over half of that survey's total was observed in Bruin Bay and in waters just south of Contact Point.

Only two sightings of spawning activity occurred during surveillance flights, considered relatively normal by recent standards and cumulatively amounting to just over 0.5 linear miles of spawn. Due to the often sporadic schedule of surveillance flights, however, no correlation between documented spawning and herring abundance was attempted. Therefore, the low number of spawn sightings this year is not necessarily considered indicative of a weak herring return.

Despite the good coverage, Department aerial surveyors cumulatively observed only about 3,400 tons of herring in the Kamishak Bay District this season, in sharp contrast to the 2000 season's observed total of around 8,100 tons. The 2001 observation was somewhat discouraging in that the Department had been guardedly optimistic about the Kamishak herring stock prior to the season and was expecting to see a significant increase in the biomass resulting from the relatively strong showing of age-3 recruit fish in 2000.

Good weather contributed to the success of the Department's two 10-day vessel charters to collect age composition samples during the periods April 24 – May 2 and May 14 – 23. During the 20 days spent in the district, the contracted vessel made a cumulative total of 13 sets, resulting in the collection of nearly 4,600 fish for age/weight/length (AWL) analysis. The second charter, to collect age composition samples during the latter portion of the return in 2001, was particularly crucial in documenting the unexpected weakness in the recruit component within the population. Information and samples collected during the Department's two charters indicated that the predicted influx of young, newly recruited fish did not materialize to the extent suggested by the previous year's information.

Although herring biomass had been declining in Kamishak Bay through 1998, that trend now appears to have reversed and has been slowly increasing since that time. The ASA model estimated the total 2001 return at 7,730 st (Otis *in preparation*; Table 10, Appendix Table 38, Figure 14), a modest increase over the 2000 hindcast estimate of 6,320 st. Recruitment into the

spawning population did occur in 2001, but the magnitude of this recruitment does not appear to be as great as was anticipated. Postseason data analysis of test fishing samples indicate that the overall return this season was dominated by fish age 4 and 5 at 24% and 30% of the biomass by weight, respectively (Table 10, Figure 15). While the 1993 and 1994 cohorts appeared relatively strong at 12-13% each of the forecasted biomass, they were estimated to be only about one-quarter the size of the very strong 1988 cohort that supported the commercial fishery throughout most of the 1990's.

Southern District 2001 Season Summary

A total of seven aerial surveys of the Southern District were flown between April 24 and May 23 in 2001, all conducted under relatively good conditions. The 2001 run biomass, estimated as the sum of all daily biomass estimates, totaled only 1,380 st, a sharp decrease from the previous year's estimate of 7,200 st, which was the highest in many years. The peak 2001 individual biomass survey (791 st) occurred on April 30, with the majority of herring observed in Tutka Bay. Peak surveys in areas where herring historically have been observed were as follows: Mallard Bay, 80 st on May 14; east of the Homer Spit/Mud Bay, 180 st on April 30; Glacier Spit/Halibut Cove, 150 st on May 10; and Tutka Bay, 610 st on April 30. A chartered seine vessel opportunistically collected 1,200 herring for AWL analysis during two sets in the Southern District this season, with one set made near Glacier Spit and the other by Rusty's Lagoon. Age-3, -4, and -5 fish dominated the combined results from these samples at 29%, 20%, and 18%, respectively. As has been the persistent trend over the past two decades, low abundance levels in the Southern District precluded any commercial fishing during the 2001 season.

Outer/Eastern District 2001 Season Summary

As in previous recent seasons, no herring assessment occurred in the Outer and Eastern Districts during 2001. Unlike the Southern and Kamishak Bay Districts, historical samples from the Outer and Eastern Districts have contained up to 14% age-2 (sexually immature) herring. Although formal sampling has not occurred in recent years and was very limited in previous years, two small,

informal samples of herring from two separate schools observed aerially in Day Harbor (Eastern District, late June) and Port Dick (Outer District, early July) were obtained by handline jigging during the 2000 season. Scales were not collected for age composition analysis, but size of all fish caught suggested that they were age-2 juveniles. No discernible shift to older age herring has ever been observed in this area, suggesting the possibility that the Outer and Eastern Districts may be feeding and rearing grounds for juvenile fish from another area.

New Research

Two additional research projects were recently undertaken to better understand Kamishak Bay herring stock structure and it's relationship to other North Gulf of Alaska herring stocks. The KBDHMP dictates that 10% of the allowable harvest for Kamishak Bay be allocated to the Shelikof food/bait fishery because it appears these two stocks mix during part of the year around the north end of Shelikof Strait (Johnson et. al. 1988; unpublished data). The extent to which these stocks intermix is poorly understood, however, the ramifications of their mixing greatly complicate the assessment and management of each stock. Therefore, the Department successfully applied for a grant from the Exxon Valdez Trustee Council (EVOS-TC) to investigate the feasibility of using two relatively new stock identification techniques, fatty acid composition of heart tissue and elemental composition of otoliths, to distinguish between several Alaska herring stocks. Representative samples were collected from Sitka, Prince William Sound, Kamishak, Kodiak, and Togiak spawning aggregations during the spring of 2001. Chemical analysis of those samples is underway and results should become available during 2002.

The second recent research project undertaken by the Department also stems from an alternative funding source. The National Marine Fisheries Service agreed to fund a Department project to synthesize all of the historical Kamishak Bay herring stock assessment and commercial fishery data into a geo-referenced database. Much of this historical information, dating back to 1973, exists only in hard copy form on aerial survey maps. During the next year, the Department plans to capture those data into electronic maps, making them available for a variety of more in-depth analyses.

2002 SEASON OUTLOOK

Kamishak Bay District

The forecasted herring biomass generated by the ASA model for 2002 in the Kamishak Bay District is 9,020 st (Table 10, Figure 14). Although this total exceeds the KBDHMP regulatory threshold of 8,000 st for which a commercial harvest can occur, nearly 40% of the predicted return in 2002 should be comprised of fish age 5 and younger, with the single age-5 year class projected to make up over one-fourth of the overall return (Table 10, Figure 15). Since the KBDHMP directs the Department to limit the harvest of fish age-5 and younger, the sac roe fishery in the Kamishak Bay district will remain closed for the 2002 season. The resource, and hence the commercial fishery, is best served by protecting the remaining spawning population in order to rebuild it to a harvestable level.

Without a commercial fishery in 2002, the Department's ability to collect age composition information will be greatly reduced. The Department expects to once again obtain samples using a chartered commercial seine vessel throughout the duration of the 2002 run, with sufficient funding expected for both an early and a late season charter. The Department will also attempt to conduct comprehensive aerial surveys throughout the spawning season, from mid-April to early June, as conditions permit.

Other Districts

Based on the persistent trend of low herring abundance in the Southern District and a historical preponderance of juvenile herring in the Outer and Eastern Districts, no commercial herring harvests are anticipated during 2002 in any of these areas. Monitoring of the Southern District herring stocks will occur as in the past through the use of aerial surveys in conjunction with test fishing samples collected on an opportunistic basis.

COMMERCIAL AQUATIC PLANT HARVEST

A very small "Bull Kelp" (*Nereocystis leutkeana*) fishery occurred in LCI during 1998 and 1999 for the stated purpose of manufacturing specialty kelp products with limited market demand. After these two consecutive seasons of minor harvests, each governed by terms of an experimental permit issued under authority of state regulations regarding aquatic plants (**5AAC 37.100**), no requests for such harvests in LCI were submitted to the Department during 2000 or 2001, and therefore no subsequent effort or harvest resulted. Previous harvest amounts totaled 171 pounds (wet weight) in 1999 and 500 pounds in 1998.

Future aquatic plant harvests in LCI will likely fall under guidelines set forth in the Department's Developing Fisheries Policy (DFP). Although only a draft at this time, the document garnered initial support from the Alaska Board of Fisheries (BOF) at their October 1999 meeting. The DFP specifies that, in general, the development of new commercial fisheries through a commissioner's permit will no longer be allowed. However, there are situations in which the commissioner may issue an experimental permit for commercial fishing. One such exception entails very small, historic commercial fisheries, such as the Bull Kelp fishery in LCI. These fisheries are characterized as dependent on limited, local markets and targeting stocks of such low abundance that they attract little interest. They are often important to local residents in providing special foods and limited income in remote areas. Universal and consistent application of the DFP would likely require closure of many of these fisheries, but this may not be warranted given the low levels of harvest and lack of potential expansion.

As with other experimental or developing fisheries, the Department currently has no funding available to develop and manage the aquatic plant fishery in LCI. There is no guarantee that an annual or long-term permit would be issued for any proposed harvest if market demand increases and larger amounts of kelp are subsequently desired. Because of limited time and funding, a precautionary management approach restricting harvest levels and requiring stringent accounting of harvest periods, methods, and areas has been adopted. Until funds become available for

surveying harvest areas, estimating annual biomass, and monitoring and examining effects of the harvest on the standing crop, aquatic plant harvest in Kachemak Bay must be regulated on a small-scale experimental basis.

2001 ALASKA BOARD OF FISHERIES MEETING

REGULATORY ACTIONS

The Alaska Board of Fisheries (BOF) met between November 8 and 13 in Anchorage to consider changes to existing regulations governing LCI subsistence, commercial, and sport salmon and herring fisheries. One proposal was submitted for commercial salmon fishing, three for commercial herring fishing, and one for subsistence salmon fishing in the LCI area. All but one of the proposals were submitted by members of the general public, the exception being a lone staff proposal regarding commercial herring fishing. Table 11 briefly summarizes the nature of the proposals, authors, and BOF resultant action on each.

The single proposal dealing with the commercial salmon fishery (#31) was a request by Cook Inlet Aquaculture Association to modify the Bear Lake Sockeye Salmon Management Plan. Because CIAA suspended its sockeye enhancement program at Grouse Lake in Resurrection Bay, the organization sought to increase production at its nearby Bear Lake enhancement site. In order to effectively utilize the expanding numbers of returning sockeyes resulting from the larger juvenile releases, CIAA proposed to allow the commercial seine fishery to start at the traditional mid-May opening time and proceed only until a harvest of 66,000 sockeyes occurred or could be projected. When that level was achieved, the proposal specified that the commercial fishery would close and marine waters of the Resurrection Bay Special Harvest Area would concurrently open to hatchery cost recovery fishing, and CIAA would be allowed to harvest all remaining fish over and above Bear Lake escapement requirements (12,000 sockeyes). Although the BOF members discussed and deliberated the proposal at length, they rejected it because it had not been approved by the Cook Inlet Regional Planning Team (CIRPT). The latter group had indeed been

exposed to the plan in early 2000 but chose not to formally vote on it because the team believed the proposal was outside the team's authority regarding the commercial fishery harvest "cap". CIAA intends to continue pursuit of a means to generate additional revenue to allow maintenance, and possible expansion, of its enhancement programs throughout Cook Inlet.

Of the three submitted herring proposals, two were submitted by a single organization, and both dealt with the commercial herring fishery in the Outer, Eastern, and Southern Districts. Proposal #2 sought to require a BOF-approved fishery management plan, containing seven specific criteria, before allowing any commercial fishing for herring in the aforementioned districts, while Proposal #3 sought to completely eliminate present regulatory language regarding commercial herring fishing in these districts. After careful consideration, the BOF determined that requiring a management plan prior to commercial fishing in the Outer, Eastern, and Southern Districts, as outlined in Proposal #2, was a reasonable and prudent approach to future harvests. Because of the action taken on this proposal, no action was taken on Proposal #3.

The third commercial herring proposal (#1), submitted by Department staff, was a request to alter the Kamishak Bay District Herring Management Plan (KBDHMP) in order to make it more conservative. The two key components of the new plan included a reduction in the maximum exploitation rate allowed in the fishery, from a former level of 20% of the forecasted herring biomass to a new level of 15%, and a reduction in the biomass threshold (the minimum volume necessary in order to allow a fishery) from 8,000 st to 6,000 st. The staff reasoned that the decreased exploitation rate, although equating to a smaller annual harvest for the fleet, would help to preclude the extended closures that have plagued the Kamishak Bay commercial herring fishery since its inception. The new threshold level was the result of a biomass threshold analysis conducted by the LCI research staff (Otis, *in press).* After hearing the staff's justification for the changes to the management plan, the BOF unanimously approved Proposal #1.

The lone subsistence proposal stemmed from an Agenda Change Request (ACR) submitted by an individual from the village of Port Graham after the local salmon subsistence fishery in waters adjacent to the villages of Port Graham and Nanwalek was closed to protect weak salmon

returns. Although the BOF denied the ACR at its October, 2001 work session, because it did not meet the necessary criteria to accept such a request, the BOF determined that the requested action had merit, and the BOF subsequently generated its own proposal to address the issue. As a result, Proposal #498 sought to allow subsistence salmon set gillnet fishing in waters of Port Chatham and Windy Bay Subdistricts, thus expanding the existing areas of Port Graham and Koyuktolik (Dogfish) Subdistricts where subsistence fishing is currently allowed. After discussing the proposal, BOF members concluded that the increased area open to fishing would improve the opportunity for village residents to meet their salmon subsistence needs, especially in times when local salmon returns required protection via fishery closures. They additionally chose to amend the proposal, based on input from longtime participants in the Port Graham fishery, to change the weekly fishing periods in the Port Graham, Koyuktolik, Port Chatham, and Windy Bay Subdistricts, from the traditional two 48-hour periods to a single period running from 10:00 p.m. Thursday until 10:00 a.m. Wednesday, an increase of 36 hours per week. A final amendment created a seasonal closure for the newly added subdistricts (Port Chatham and Windy Bay only) of August 1, to protect stocks of returning coho salmon. Proposal #498 was unanimously approved as amended.

All changes adopted by the BOF became effective, after review by the Department of Law and approval by Lieutenant Governor Fran Ulmer, on March 8, 2002.

LCI ESCAPEMENT GOAL REVIEW

As part of the standard order of business during each BOF meeting, the staff at the November 2001 meeting presented a review of LCI salmon escapement goals. The existing goals for all species were set in the late 1970's and early 1980's, but origins of and methods for establishing most goals were not well documented. The BOF meeting presented a timely and appropriate forum to conduct such a review.

Under the ADF&G Salmon Escapement Goal Policy, adopted in 1992, escapement goals were categorized as biological escapement goals (BEG's), optimal escapement goals (OEG's), or inriver goals. At that time, all LCI goals were considered BEG's. During 2000 and 2001, the BOF adopted **5 AAC 39.222. POLICY FOR THE MANAGEMENT OF SUSTAINABLE SALMON FISHERIES** and **5 AAC 39.223. POLICY FOR STATEWIDE SALMON ESCAPEMENT GOALS**. Under these new policies, sustainable escapement goals SEG's) were added to BEG's, OEG's, and inriver goals. BEG's require reliable salmon escapement estimates, as well as total annual returns, whereas SEG's suggest a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a five to 10 year period. The latter is used in situations where a BEG cannot be estimated due to the absence of stock specific catch estimate. Because nearly all LCI escapement estimates are actually indices of abundance rather than estimates of total spawner abundance, the staff determined that SEG's were much more appropriately applied to LCI salmon streams than BEG's.

A more thorough and detailed discussion of the escapement goal review and analysis is presented in ADF&G Regional Information Report 2A01-21 (Otis, 2001). Taking advantage of additional escapement data collected since the existing goals were established, the staff recommended SEG's for 12 chum salmon stocks, 24 pinks salmon stocks, and eight sockeye stocks. All SEG's were expressed as ranges, consistent with the new policies. After hearing and reviewing the staff's presentation, the BOF unanimously adopted the recommended SEG's. Appendix Tables 26 (chum), 27 (pink), and 28 (sockeye) show the former goals as well as the new SEG's. The Department will begin actively utilizing the new SEG's beginning with the 2002 season.

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Table 1. Commercial, hatchery, and derby salmon catches in numbers of fish by species, district, and gear type, Lower Cook Inlet, 2001.

District Gear Type	Chinook	Sockeye	Coho	Pink	Chum	Total
Southern						
Commercial:						
Set gillnet	865	28,503	1,811	13,393	3,487	48,159
Purse seine	121	99,866	895	107,967	293	209,142
Hatchery:						
Purse seine		27,042		421,615	9	448,666
Total	***986***	***155,411***	***2,706***	***542,975***	***3,789***	***705,967***
Outer						
Commercial:						
Purse seine		***7,339***	***5***	***48,559***	***408***	***56,311***
Eastern						
Commercial:						
Purse seine		2,629			6	2,635
Hatchery:						
Weir		11,180	1,792			12,972
Derby[a]:						
Hook & Line			2,155			2,155
Total		***13,809***	***3,947***		***6***	***17,762***
Kamishak						
Commercial:						
Purse seine	2	9,972	9	131	84,766	94,880
Hatchery:						
Purse seine		29,740		1,266		31,006
Total	***2***	***39,712***	***9***	***1,397***	***84,766***	***125,886***
LCI Total	988	216,271	6,667	592,931	88,969	905,826
Percent	0.11%	23.88%	0.74%	65.46%	9.82%	100.00%
1981-2000 Average	1,369	247,381	14,376	1,241,176	79,854	1,584,156

[a] Derby catches are fish entered into the Seward Silver Salmon Derby that are subsequently sold to a commercial processor, therefore these catches are considered part of the LCI "commercial harvest".

Table 2. Commercial chinook salmon catches, and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 2001.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove	325		325
China Poot Bay	44		44
Neptune Bay	60		60
Tutka/Kasitsna Bays	260		260
Barabara Creek	136		136
Seldovia Bay	161		161
SOUTHERN DISTRICT TOTAL	**986**		**986**
OUTER DISTRICT TOTAL	**0**		**0**
EASTERN DISTRICT TOTAL	**0**		**0**
KAMISHAK BAY DISTRICT			
McNeil River	2		2
KAMISHAK BAY DISTRICT TOTAL	**2**		**2**
TOTAL LOWER COOK INLET	**988**		**988**

[a] Chinook escapement in Lower Cook Inlet is very limited; no escapement surveys are conducted.

Table 3. Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 2001.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		37	37
Halibut Cove	5,800		5,800
China Poot Bay			
Common Property Fishery	43,676		
Hatchery Cost Recovery	21,479		
China Poot Creek		57[b]	
Total Run			65,212
Neptune Bay			
Common Property Fishery	46,973		
Hatchery Cost Recovery	5,558		
"Oxbow" Creek		150	
Total Run			52,681
Tutka/Kasitsna Bays	16,505[c]		16,505
Barabara Creek	6,455		6,455
Seldovia Bay	8,965	3	8,968
English Bay			
English Bay Lakes		10,508[d]	
Hatchery Broodstock		0[e]	
Total Run			10,508
SOUTHERN DISTRICT TOTAL	**155,411**	**10,755**	**166,166**
OUTER DISTRICT			
Port Dick	3		3
East Arm Nuka Bay (McCarty Fiord)	7,336		
Delight Lake		10,110	
Desire Lake		5,470	
Delusion Lake		2,840	
Total Run			25,756
OUTER DISTRICT TOTAL	**7,339**	**18,420**	**25,759**
EASTERN DISTRICT			
Aialik Bay & Aialik Lake		5,100	5,100
Resurrection Bay North			
Common Property Fishery	2,629		
Hatchery Harvest (sold)	3,837		
Hatchery Harvest (donated)	7,343		
Bear Lake Escapement		8,606[d]	
Hatchery Brood Stock		4,200[f]	
Clear Creek		4	
Total Run			26,619
EASTERN DISTRICT TOTAL	**13,809**	**17,910**	**31,719**

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Table 3. (page 2 of 2)

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT			
Iniskin Bay/North Head Creek		40	40
Kirschner Lake			
Common Property Fishery	9,198		
Hatchery Cost Recovery	29,740		
Total Run			38,938
Bruin Bay/ Bruin Bay River		700	700
Chenik Lake			
Amakdedori Creek		2,690	
Chenik Creek/Lake		250	
Total Run			2,940
Paint River		75[g]	75
McNeil Cove/Mikfik Creek & Lake	275	5,350	5,625
Kamishak Bay/ Big Kamishak River		250	250
Douglas River/Silver Beach	499		499
KAMISHAK BAY DISTRICT TOTAL	**39,712**	**9,355**	**49,067**
TOTAL LOWER COOK INLET	**216,271**	**56,440**	**272,711**

[a] Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.
[b] No freshwater escapement, prevented by barrier falls.
[c] Commercial catch in Tutka Bay includes 5 sockeyes harvested incidentally during pink salmon hatchery cost recovery.
[d] Weir counts.
[e] No hatchery brood stock were collected at English Bay Lakes during 2001 because sockeyes in the lakes remained in deep water and capture was not possible.
[f] Brood stock total at Bear Lake includes 5 mortalities.
[g] No freshwater escapement, ladder not opened during 2001.

Table 4. Commercial coho salmon catches (including hatchery cost recovery and sport derby sold to commercial processors) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 2001.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Northshore Subd./Clearwater Slough		3,230[a]	3,230
Halibut Cove	329		329
China Poot Bay	303		303
Neptune Bay	484		484
Tutka/Kasitsna Bays	1,158		1,158
Barabara Creek	294		294
Seldovia Bay	138		138
SOUTHERN DISTRICT TOTAL	**2,706**	**3,230**	**5,936**
OUTER DISTRICT			
Port Dick	4		4
East Arm Nuka Bay (McCarty Fiord)	1		1
OUTER DISTRICT TOTAL	**5**		**5**
EASTERN DISTRICT			
Resurrection Bay North			
Hatchery Harvest (sold)	34		
Hatchery Harvest (donated)	1,758		
Sport Derby	2,155		
Bear Lake (weir counts)		495	
Hatchery Brood Stock		644	
Total Run			5,086
EASTERN DISTRICT TOTAL	**3,947**	**1,139**	**5,086**
KAMISHAK BAY DISTRICT			
Douglas River	9		9
KAMISHAK BAY DISTRICT TOTAL	**9**		**9**
TOTAL LOWER COOK INLET	**6,667**	**4,369**	**11,036**

[a] Coho escapement estimates in Lower Cook Inlet are very limited; two escapement surveys were conducted during 2001, number represents unexpanded peak aerial live count.

Table 5. Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 2001.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		30,463	30,463
Halibut Cove	232		232
China Poot Bay/Creek	2,091	6,639	8,730
Neptune Bay	2,671		2,671
Tutka/Kasitsna Bays			
Common Property Fishery	109,682		
Hatchery Cost Recovery	421,408		
Hatchery Brood Stock		179,006	
Tutka Lagoon Creek		4,451	
Total Run			714,547
Barabara Creek	2,006	2,287	4,293
Seldovia Bay & River	4,885	12,259	17,144
Port Graham			
Port Graham River		10,260	
Port Graham Left Creek		3,587	
Hatchery Brood Stock		19,145	
Total Run			29,405
SOUTHERN DISTRICT TOTAL	**542,975**	**268,097**	**811,072**
OUTER DISTRICT			
Dogfish Bay		1,980	1,980
Port Chatham		17,921	17,921
Chugach Bay		3,724	3,724
Windy Bay	9,429		
Windy Right Creek		10,300	
Windy Left Creek		61,813	
Total Run			81,542
Rocky Bay			
Scurvy Creek		840	
Rocky River		72,951	
Total Run			73,791
Port Dick	16,758		
Port Dick (head end) Creek		43,568	
High Tech Creek		640	
Well Flagged Creek		484	
Slide Creek		30,978	
Middle Creek		2,506	
Island Creek		81,764	
			176,698

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Table 5. (page 2 of 2)

Subdistrict/System	Catch	Escapement[a]	Total Run
OUTER DISTRICT (cont'd)			
Taylor Bay		440	440
Nuka Island			
South Nuka Island Creek		20,654	
Berger Bay		354	
Mike's Bay		6,234	
Herring Pete Bay		886	
Total Run			28,128
East Arm Nuka Bay (McCarty Fiord)	22,372		
Delight Lake		7,310	
Desire Lake		67,480	
James Lagoon		2,860	
Total Run			100,022
OUTER DISTRICT TOTAL	**48,559**	**435,687**	**484,246**
EASTERN DISTRICT			
Resurrection Bay North			
Bear/Salmon Creeks		3,025	
Clear Creek		263	
Sawmill Creek		52	
Spring Creek		149	
Tonsina Creek		2,780	
Humpy Cove		330	
Thumb Cove (Likes Creek)		3,121	
Total Run			9,720
EASTERN DISTRICT TOTAL	**0**	**9,720**	**9,720**
KAMISHAK BAY DISTRICT			
Inisksin Bay			
North Head Creek		2,423	
Sugarloaf Creek		500	
Total Run			2,923
Ursus Cove/Brown's Peak Creek		19,166	19,166
Rocky Cove/Sunday Creek	98	26,231	26,329
Kirschner Lake	1,266[b]		1,266
Bruin Bay/Bruin Bay River		18,522	18,522
Douglas Reef/Silver Beach	33		33
KAMISHAK BAY DISTRICT TOTAL	**1,397**	**66,842**	**68,239**
TOTAL LOWER COOK INLET	**592,931**	**780,346**	**1,373,277**

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.
[b] Kirschner Lake pinks were all taken during hatchery sockeye cost recovery harvests.

Table 6. Commercial chum salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 2001.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		690	690
Halibut Cove	43		43
China Poot Bay	61		61
Neptune Bay	209		209
Tutka Bay	1,366		1,366
Barabara Creek	636		636
Seldovia Bay & River	1,474	10,120	11,594
Port Graham			
Port Graham River		6,037	
Port Graham Left Creek		535	
Total Run			6,572
SOUTHERN DISTRICT TOTAL	**3,789**	**17,382**	**21,171**
OUTER DISTRICT			
Dogfish Bay		6,068	6,068
Port Chatham		971	971
Windy Bay	345		
Windy Right Creek		785	
Windy Left Creek		2,520	
Total Run			3650
Rocky Bay & River		2,990	2,990
Port Dick	57		
Port Dick (head end) Creek		1,801	
High Tech Creek		23	
Well Flagged Creek		69	
Slide Creek		798	
Middle Creek		1,165	
Island Creek		6,270	
Total Run			10,183
Nuka Island/Petrof River		185	185
East Arm Nuka Bay/James Lagoon	6	22	28
OUTER DISTRICT TOTAL	**408**	**23,667**	**24,075**

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Table 6. (page 2 of 2)

Subdistrict/System	Catch	Escapement[a]	Total Run
EASTERN DISTRICT			
Resurrection Bay North	6		
Clear Creek		117	
Sawmill Creek		345	
Spring Creek		748	
Thumb Cove		430	
Tonsina Creek		1,640	
Total Run			3,286
EASTERN DISTRICT TOTAL	**6**	**3,280**	**3,286**
KAMISHAK BAY DISTRICT			
Iniskin Bay			
Iniskin River		13,754	
Sugarloaf Creek		1,885	
North Head Creek		2,067	
Total Run			17,706
Cottonwood Bay & Creek		15,868	15,868
Ursus Cove			
Brown's Peak Creek		7,795	
Ursus Lagoon Right Creek		22,239	
Ursus Cove Lagoon Creek		15,460	
Ursus Head Creek		103	
Total Run			45,597
Rocky Cove/Sunday Creek	1,485	9,125	10,610
Kirschner Lake	2		2
Bruin Bay & River		21,782	21,782
McNeil River	2	16,997	16,999
Kamishak River/Reef	72,978		
Big Kamishak River		36,341	
Little Kamishak River		27,184	
Strike Creek		5,169	
Total Run			141,672
Douglas River/Silver Beach	10,299		
Douglas Beach Creek		1,871	
Douglas Reef Creek		914	
Total Run			13,084
KAMISHAK BAY DISTRICT TOTAL	**84,766**	**198,554**	**283,320**
TOTAL LOWER COOK INLET	**88,969**	**242,883**	**331,852**

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

Table 7. Exvessel value[a] of the commercial salmon catch in numbers of dollars by species, gear type, and harvest type, Lower Cook Inlet, 2001.

	Chinook	Sockeye	Coho	Pink	Chum	Total
			COMMON PROPERTY - PURSE SEINE			
No. of Fish	123	119,806	909	156,657	85,473	362,968
Pounds	1,354	590,003	5,838	490,080	806,380	1,893,655
Price/lb.	$0.74	$0.64	$0..30	$0.09	$0.36	
Value	$1,012	$379,689	$1,755	$44,107	$289,292	$715,855
			COMMON PROPERTY - SET GILLNET			
No. of Fish	865	28,503	1,811	13,393	3,487	48,059
Pounds	12,070	164,151	12,603	52,158	27,543	268,525
Price/lb.	$1.87	$0.73	$0.43	$0..05	$0.20	
Value	$22,571	$119,830	$5,419	$2,608	$5,509	$155,937
			HATCHERY - PURSE SEINE & WEIR			
No. of Fish	0	67,962	1,792	422,881	9	492,644
Pounds	0	302,710	13,364	1,280,992	64	1,597,130
Price/lb.	$0.00	$0.48[b]	$0.89[b]	$0.18	$0.22	
Value	$0	$127,658[b]	$250[b]	$230,237	$14	$358,159
			SPORT FISHING DERBY[c] - HOOK & LINE			
No. of Fish			2,155			2,155
Pounds			18,318			18,318
Price/lb.			$0.43			
Value			$7,877			$7,877
			TOTAL ALL GEARS			
No. of Fish	988	216,271	6,667	592,931	88,969	905,826
Pounds	13,424	1,056,864	50,123	1,823,230	833,987	3,777,628
Price/lb.	$1.76	$0.62[b]	$0.41[b]	$0.15	$0.28	
Value	$23,583	$627,177[b]	$15,301[b]	$276,952	$294,815	$1,237,828

[a] Exvessel value is calculated from average prices, which are determined only by fish ticket information and may not reflect retroactive or postseason adjustments.

[b] Average price and value for sockeyes and cohos include only those fish actually sold and does not include hatchery fish that were donated.

[c] Fish entered into the Seward Silver Salmon Derby are subsequently sold to a commercial processor and are therefore considered "commercial harvest".

Table 8. Emergency orders issued for the commercial, personal use, and subsistence salmon fisheries in Lower Cook Inlet, 2001.

Number/ Issue Date	DESCRIPTION
2-F-H-001-01 May 9	Opens those waters of Resurrection Bay in the Eastern District enclosed by a line from Aialik Cape south to a point one mile due south of Aialik Cape, then northeast to a point one mile due south of Cape Resurrection, then north to Cape Resurrection, to commercial salmon seining on a weekly schedule of two 40-hour periods per week, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and Thursday 6:00 a.m. until Friday 10:00 p.m., effective Monday, May 14, 2001, until further notice. All waters along the west shore of Resurrection Bay west of a line from the old military dock pilings north of Caines Head to a regulatory marker near the Seward Airport will remain closed to seining.
2-F-H-002-01 May 18	Opens waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, to subsistence salmon set gillnet fishing on a continuous basis (seven days per week), effective at 6:00 a.m. Saturday, May 19, 2001, until 6:00 a.m. Wednesday; May 30, 2001. Effective at 6:00 a.m. Wednesday, May 30, 2001, this emergency order also closes all waters of Port Graham Subdistrict to subsistence salmon set gillnet fishing until further notice.
2-F-H-003-01 May 23	Closes the Port Graham Subdistrict, including both the Port Graham and English Bay Sections, in the Southern District to commercial salmon set gillnet fishing until further notice. In addition, this emergency order establishes a seven-day-per-week fishing schedule in the Kamishak Bay District commercial salmon seine fishery, which opens by regulation on June 1, 2001. The Chenik Subdistrict within the Kamishak Bay District will remain closed to commercial salmon seining until further notice based on the provisions of this emergency order.
2-F-H-004-01 June 1	Closes waters of Resurrection Bay in the Eastern District to commercial salmon seining effective 10:00 p.m. Friday, June 1, 2001, until further notice.
2-F-H-005-01 June 11	Designates and establishes Special Harvest Areas (SHA's) for Cook Inlet Aquaculture Association (CIAA) in China Poot and Bruin Bay Subdistricts of the Lower Cook Inlet (LCI) management area. It also designates and establishes an English Bay SHA for the Port Graham Hatchery Corporation (PGHC) in the English Bay Section of Port Graham Subdistrict, located in the Southern District of the LCI management area. This emergency order closes the Kirschner and Bruin Lakes SHA's to the common property salmon seine fishery, while concurrently opening waters of the Kirschner Lake and Bruin Lake SHA's in the Kamishak Bay District, and the China Poot and Hazel Lake SHA's in the Southern District, to the harvest of salmon seven days per week by authorized

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Table 8. (page 2 of 6)

Number/ Issue Date	DESCRIPTION
2-F-H-005-01 June 11 (continued)	agents of CIAA effective at 6:00 a.m. Monday, June 18, 2001, until further notice. The English Bay SHA will remain closed to hatchery fishing until the escapement goal of 15,000 sockeyes into English Bay Lakes can be projected and the sockeye salmon subsistence needs of Nanwalek and Port Graham villagers are met. This emergency order also opens portions of the China Poot, Tutka Bay, and Halibut Cove Subdistricts, all within the Southern District, to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Monday, June 18, 2001, until further notice. In the China Poot Subdistrict, commercial seining shall be allowed five days per week only in those waters outside (offshore) of a line beginning at a marker on the west shore of Neptune Bay at approximately 59° 32.83' N. latitude, 151° 24.95' W. longitude, then to Lancashire Rock, then to the navigational light on Gull Island, then to Moosehead Point, effective June 18. In the Halibut Cove Subdistrict, seining shall be allowed only in waters outside of Halibut Cove Lagoon beginning June 18 on a five days per week basis. In the Tutka Bay Subdistrict, commercial seining is restricted to those waters seaward of a line extending from the "rock quarry" on the north side of the bay at approximately 59° 30.23' N. latitude, 151° 28.23' W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59° 28.45' N. latitude, 151° 28.95' W. longitude, five days per week effective 6:00 a.m. Monday, June 18, 2001. This emergency order also repeals the regulatory closed waters markers near the HEA power lines in China Poot Bay, and establishes temporary closed waters at the head of China Poot Bay to provide a Dungeness crab sanctuary.
2-F-H-006-01 June 21	Designates and establishes a Special Harvest Area (SHA) for the Cook Inlet Aquaculture Association (CIAA) in Tutka Bay Subdistrict within the Southern District of Lower Cook Inlet. The Tutka Bay SHA consists of all marine waters of Tutka Bay Subdistrict southeast of the Homer Electric Association powerline crossing, including waters of Tutka Lagoon. In addition, this emergency order opens the Tutka Bay SHA to the harvest and sale of salmon seven days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, June 25, 2001, until further notice. Revenue obtained from the sale of these fish will be used for recovery of operational expenses associated with the Tutka Lagoon Hatchery salmon enhancement programs in Lower Cook Inlet. The commercial purse seine fishery in the Tutka Bay Subdistrict is currently restricted to those waters seaward of a line extending from the "rock quarry" on the north side of Tutka Bay at approximately 59° 30.23' N. latitude, 151°

-continued-

Table 8. (page 3 of 6)

Number/ Issue Date	DESCRIPTION
2-F-H-006-01 June 21 (continued)	28.23' W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59° 28.95' N. latitude, 151° 28.45' W. longitude, on a five day per week basis. Waters of Tutka Bay between the HEA powerlines and the above-described line remain closed to all seine fishing. This emergency order also designates and establishes a SHA for the Port Graham Hatchery Corporation (PGHC) in the Port Graham Subdistrict within the Southern District of Lower Cook Inlet. The Port Graham SHA consists of all marine waters of the Port Graham Subdistrict east of 151° 53.08' W. longitude, and south and west of a line from the southernmost tip of Passage Island to the Coast Guard navigational buoy at approximately 59° 21.45' N. latitude, 151° 50.05' W. longitude, then southeast to a point on the mainland at approximately 59° 20.83' N. latitude, 151° 48.53' W. longitude. This area is located along the south shore of Port Graham from Passage Island to (and including) Duncan Slough. No fishing periods for the Port Graham SHA are being established at this time.
2-F-H-007-01 June 26	Closes waters of McNeil River and Paint River Subdistricts in the Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Saturday, June 30, 2001, until further notice.
2-F-H-008-01 June 29	Extends fishing time for commercial set gillnets in Halibut Cove Subdistrict of the Southern District to five days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Wednesday, July 4, 2001, until further notice.
2-F-H-009-01 July 6	Opens those waters of East Nuka Subdistrict in the Outer District south of the latitude of the entrance to James Lagoon at approximately 59° 33.50' N. latitude to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 6:00 a.m. Monday, July 9, 2001, until further notice. The closed waters markers at the mouth of Delight Lake Creek **WILL NOT BE** in effect for this opening, and fishing will be allowed up to the stream mouth. In addition, seining will be allowed inside waters of McCarty Lagoon near Delight Lake. Waters north of the latitude of the entrance to James Lagoon also remain closed to fishing, therefore fishing is prohibited in the vicinity of Desire Lake Creek.
2-F-H-010-01 July 16	Closes waters of the China Poot and Hazel Lakes Special Harvest Areas (see ***LCI E.O. #2-F-H-005-01***) in the Southern District to salmon hatchery cost recovery harvest by Cook Inlet Aquaculture Association effective at 12:00 noon Monday, July 16, 2001. In addition, this emergency order opens waters of

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Table 8. (page 4 of 6)

Number/ Issue Date	DESCRIPTION
2-F-H-010-01 July 6 (continued)	China Poot Subdistrict, including both the China Poot and Hazel Lake Sections, to commercial salmon seining **west** (or offshore) of the regulatory markers located near the HEA power lines in China Poot Bay on a **seven-day-per-week basis**, effective at 6:00 a.m. Tuesday, July 17, until further notice. Waters of China Poot Bay **east** (or inshore) of these markers will open to commercial seining **five days per week**, from Monday 6:00 a.m. until Saturday 6:00 a.m., also effective at 6:00 a.m. Tuesday, July 17, until further notice. The regulatory markers designating the Dungeness crab sanctuary in the north arm of China Poot Bay are still in effect for these openings. At China Poot Creek, the regulatory markers near the creek mouth will be in effect during the Monday through Saturday opening. At Neptune Bay, no markers will be in effect and fishing is allowed up to the Wosnesenski River mouth.
2-F-H-011-01 July 23	Opens all waters of East Nuka Subdistrict in the Outer District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 6:00 a.m. Tuesday, July 24, until further notice. The closed waters markers at the mouths of Desire Lake Creek and Delight Lake Creek will not be in effect, and fishing will be allowed up to the mouths of both creeks. In addition, seining is allowed inside waters of McCarty Lagoon near Delight Lake.
2-F-H-012-01 July 24	Restricts commercial salmon seining in Tutka Bay Subdistrict within the Southern District to those waters seaward (northwest) of a line beginning at the "rock quarry" on the north side of the bay at approximately 59° 30.23' N. latitude, 151° 28.23' W. longitude, to a point on the west shore of the entrance to Little Tutka Bay at approximately 59° 28.73' N. latitude, 151° 30.37' W. longitude, effective at 12:00 noon Tuesday, July 24, 2001. The weekly fishing period for waters of Tutka Bay Subdistrict, already established at five days per week (see ***LCI Emergency Order #2-F-H-005-01***), is not altered and remains the same. In addition, this emergency order opens waters of Aialik Subdistrict, including Aialik Lagoon, in the Eastern District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 6:00 a.m. Wednesday, July 25, 2001, until further notice.
2-F-H-013-01 July 26	Closes the Kirschner and Bruin Lakes Special Harvest Areas (SHA's; see ***LCI Emergency Order #2-F-H-005-01***) in the Kamishak Bay District to the harvest of salmon by authorized agents of Cook Inlet Aquaculture Association (CIAA) effective at 6:00 a.m., Friday, July 27, 2001, until further notice.

-continued-

Table 8. (page 5 of 6)

Number/ Issue Date	DESCRIPTION
2-F-H-013-01 July 26 (continued)	In addition, this emergency order opens all waters of Bruin Bay Subdistrict to commercial salmon seining seven days per week, also effective at 6:00 a.m., Friday, July 27, 2001, until further notice. Waters of McNeil River, Chenik, and Paint River Subdistricts, which were closed earlier this season (see ***LCI Emergency Orders #2-F-H-007-01***), remain closed to seining.
2-F-H-014-01 August 2	Opens the following waters in the Outer District to commercial salmon seining five days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Friday, August 3, until further notice: those waters of Nuka Island Subdistrict south of the latitude of the southwestern-most point of Westdahl Cove at approximately 59° 19.00' N. latitude and east of the longitude of the entrance to Tonsina Bay at approximately 150° 52.87' W. longitude; waters of both the South and Outer Sections of Port Dick Subdistrict (or statistical reporting areas 232-06 and 232-07); waters of Windy Bay Subdistrict; and waters of Port Chatham Subdistrict. Normal regulatory makers at all locations will be in effect for these openings.
2-F-H-015-01 August 7	Removes the commercial fishing regulatory markers located in the Ursus and Rocky Cove Subdistricts and allows commercial salmon seining up to the stream mouths in these subdistricts effective at 6:00 a.m. Wednesday, August 8, until further notice. Fishing is therefore allowed inside waters of Ursus Cove Lagoon and up to the stream mouths at Sunday Creek and Brown's Peak Creek beginning August 8. Since the weekly fishing period in waters of the two aforementioned subdistricts was previously set at seven days per week (see ***LCI Emergency Order #2-F-H-003-01***) and has not been subsequently altered, that schedule remains in effect for waters specified within this emergency order.
2-F-H-016-01 August 13	Opens waters of the North Section of Port Dick Subdistrict (or statistical reporting area 232-09), waters of Rocky River Subdistrict, and waters of Chugach Bay, all in the Outer District, to commercial salmon seining five days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Tuesday, August 14, 2001, until further notice. Regulatory makers will not be in effect at Chugach Bay (*only*) for this opening and fishing will be allowed up to the stream mouth at the head of Chugach Bay during open fishing periods. Normal regulatory markers at other locations specified within this emergency order will be in effect during open fishing periods. Weekly fishing periods for areas open to seining in the Outer District were previously set at five days per week (see ***LCI Emergency Order #2-F-H-014-01***) and remain unchanged.
2-F-H-017-01 August 17	Opens those waters of the Port Graham Special Harvest Area (see ***LCI Emergency Order #2-F-H-006-01***) east of the longitude of the U.S. Coast

-continued-

Table 8. (page 6 of 6)

Number/ Issue Date	DESCRIPTION
2-F-H-017-01 August 17 (continued)	Guard navigational buoy at approximately 151° 50.05' W. longitude to the harvest of salmon seven days per week by authorized agents of Port Graham Hatchery Corporation (PGHC), effective at 6:00 a.m. Monday, August 20, 2001, until further notice. Pink salmon harvested during this opening will be utilized for hatchery brood stock.
2-F-H-018-01 August 21	Closes the Southern District (Kachemak Bay) personal use set gillnet fishery for coho salmon, effective at 6:00 a.m. Wednesday, August 22, 2001, for the remainder of the season.

Table 9. Total return of adult pink salmon to the Tutka Bay Hatchery in the Southern District of Lower Cook Inlet, 2001.

COMMERCIAL HARVEST	
Tutka Bay/Lagoon:	
Purse Seine	103,261
Set Gillnet	6,421[a]
Hatchery Cost Recovery	421,408
TUTKA COMMERCIAL HARVEST	***531,090***
SPORT HARVEST	
TOTAL SPORT HARVEST (Tutka Bay and Lagoon)	***1,500***[b]
ESCAPEMENT	
Tutka Creek and Channel	4,451
Tutka Hatchery Brood Stock	179,006
TOTAL ESCAPEMENT	***183,457***
TOTAL RETURN	***716,047***

[a] Based primarily on run timing, all of the set gillnet pink salmon catch in the Tutka Bay Subdistrict was apportioned to the Tutka Hatchery return.

[b] Figure represents estimated average sport catch of pinks in Tutka Bay from 1990 – 1999.

Table 10. Total biomass estimates and commercial catch of Pacific herring (*Clupea pallasi*) in short tons by age class, Kamishak Bay District, Lower Cook Inlet, 2001, and 2002 forecast.

Age	2001 Est. Spawning Biomass	Percent by Weight	2001 Commercial Harvest[a]	Percent by Weight	2001 Total Biomass	Percent by Weight	2002 Forecast Biomass	Percent by Weight
1								
2								
3	199	2.6			199	2.6	406	4.5
4	1,372	17.7			1,372	17.7	545	6.1
5	2,139	27.7			2,139	27.7	2,363	26.2
6	831	10.7			831	10.7	2,692	29.9
7	1,125	14.6			1,125	14.5	714	7.9
8	1,325	17.1			1,325	17.1	904	10.0
9	380	4.9			380	4.9	940	10.4
10	98	1.3			98	1.3	288	3.2
11	94	1.2			94	1.2	75	0.8
12	46	0.6			46	0.6	58	0.6
13+	126	1.6			126	1.6	36	0.4
TOTALS	7,733	100.0	0		7,733	100.0	9,020	100.00

[a] Due to the low forecasted biomass, the commercial herring fishery in Kamishak Bay was not opened in 2001.

Table 11. Proposed regulatory changes for the Lower Cook Inlet commercial and subsistence salmon and herring fisheries, and resultant actions taken, at the Alaska Board of Fisheries meeting held in Anchorage, November, 2001[a].

PROPOSAL NUMBER	PROPOSED BY	DESCRIPTION	BOARD ACTION	BOARD VOTE
1	ADF&G	**5 AAC 27.465.** Amend the Kamishak Bay District Herring Management Plan.	Adopted (see text)	7 - 0
2	Pioneer Alaskan Fisheries	**5 AAC 27.410 (b).** Require a Board of Fisheries approved management plan prior to allowing commercial herring fishing in the Southern, Outer, or Eastern Districts.	Adopted (see text)	7 - 0
3	Pioneer Alaskan Fisheries	**5 AAC 27.410 (b).** Eliminate regulatory language allowing commercial herring fishing in the Southern, Outer, and Eastern Districts.	No Action (see text)	
31	Cook Inlet Aquaculture Association	**5 AAC 21.375.** Amend the Bear Lake Management Plan to cap the commercial seine fishery at 66,000 sockeyes and create a saltwater Special Harvest Area for hatchery cost recovery.	Opposed (see text)	0 - 7
498	Alaska Board of Fisheries	**5 AAC 01.560 (b) (3)** and **5 AAC 01.575 (a) (1).** Amend regulatory language regarding subsistence salmon fishing on the southwest tip of the Kenai Peninsula to add more waters open to fishing.	Adopted (see text)	7 - 0

[a] Proposed regulatory changes adopted by the Alaska Board of Fisheries become effective in March, 2002, upon approval of language by the Alaska Dept. of Law and subsequent signing by the Lt. Governor.

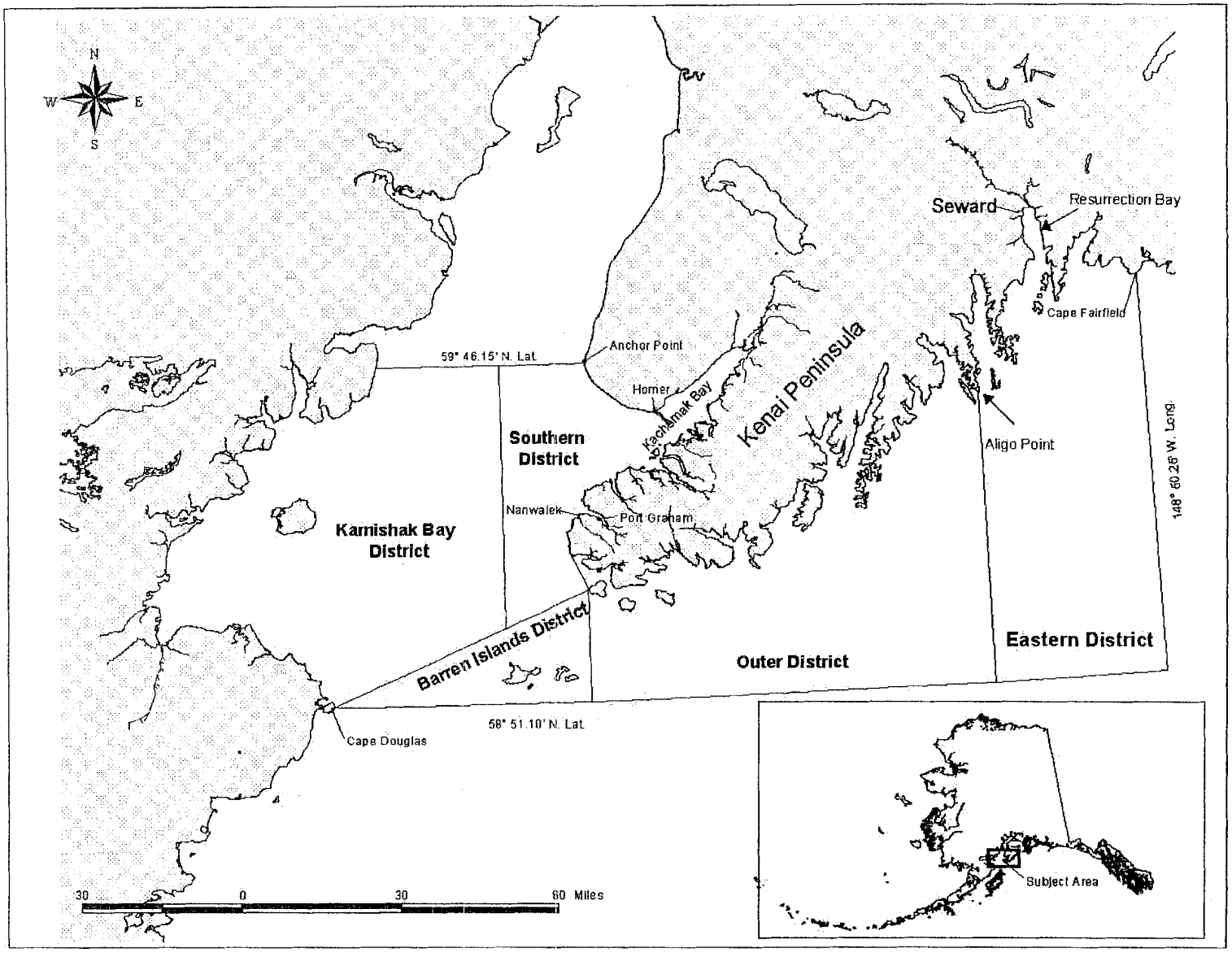

Figure 1. Lower Cook Inlet salmon and herring management area.

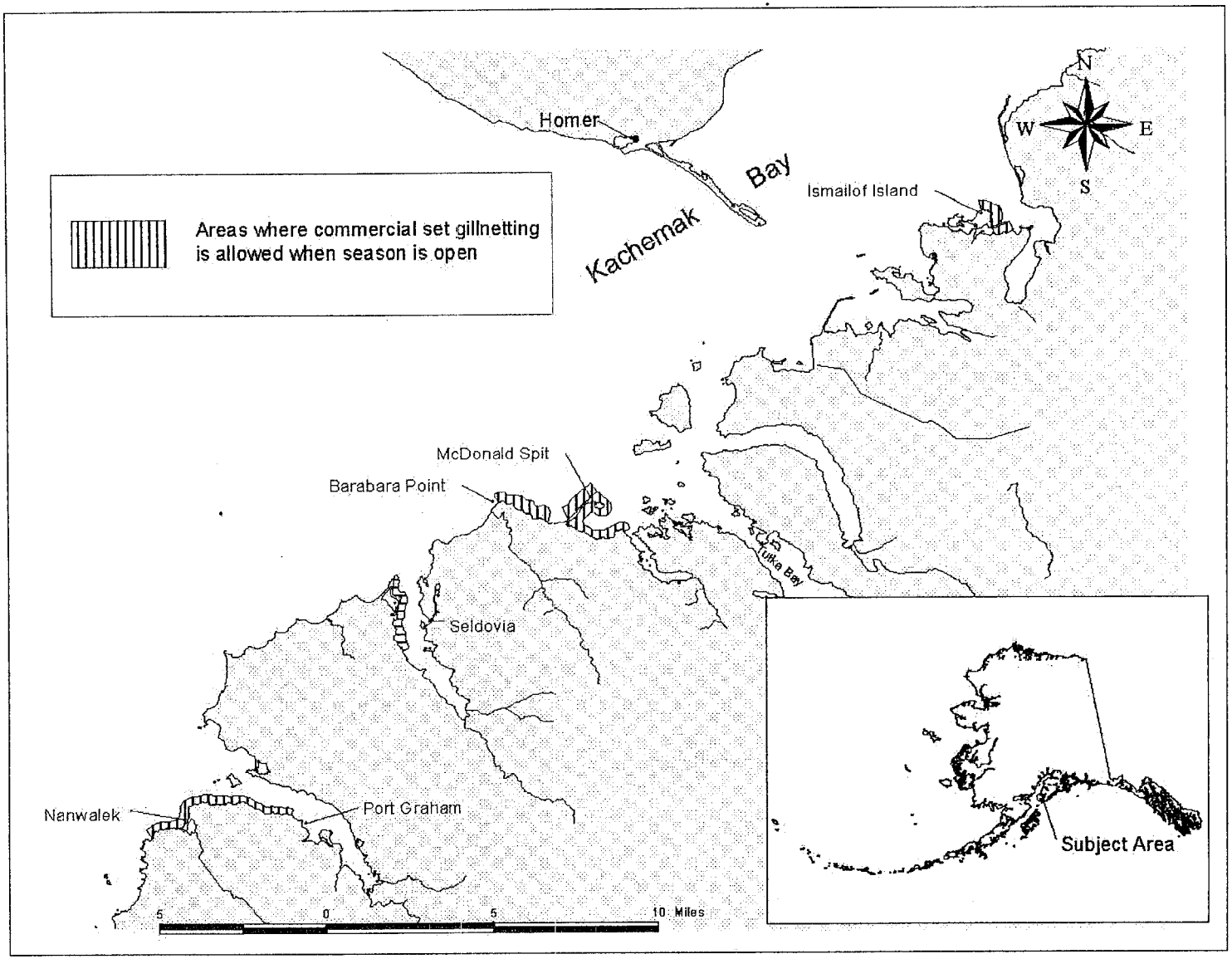

Figure 2. Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

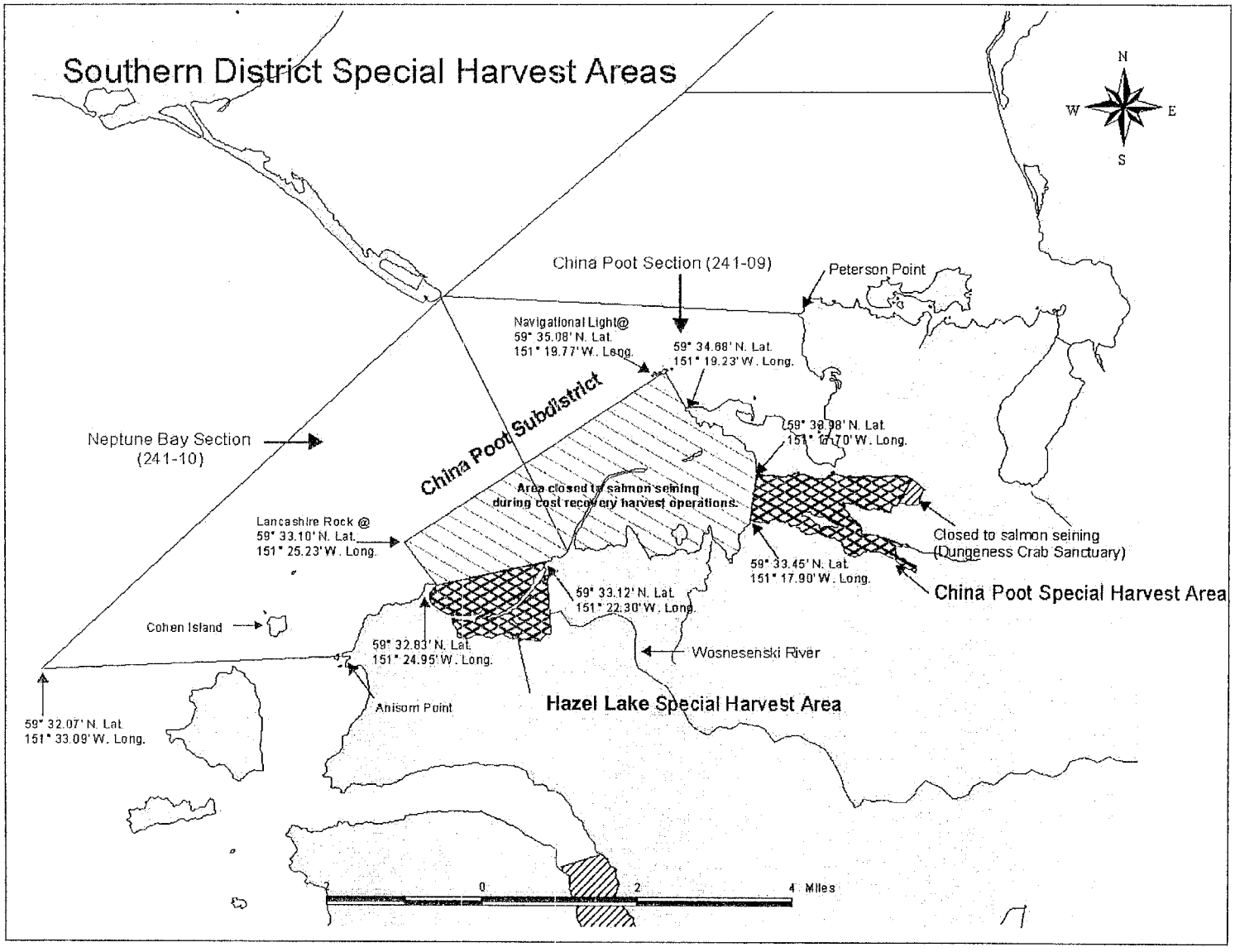

Figure 3. China Poot and Hazel Lake Special Harvest Areas for hatchery cost recovery in the Southern District of Lower Cook Inlet.

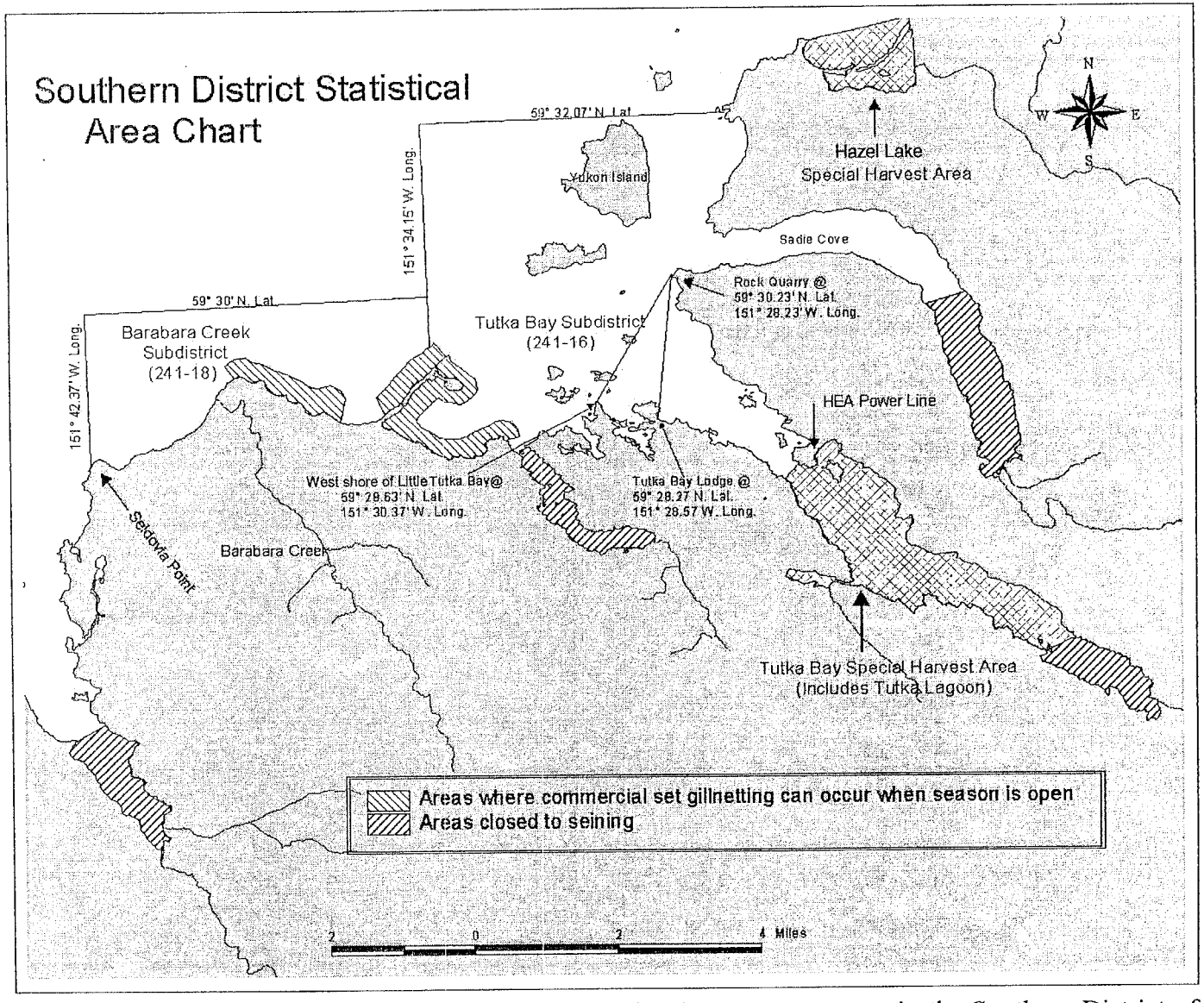

Figure 4. Tutka Bay Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

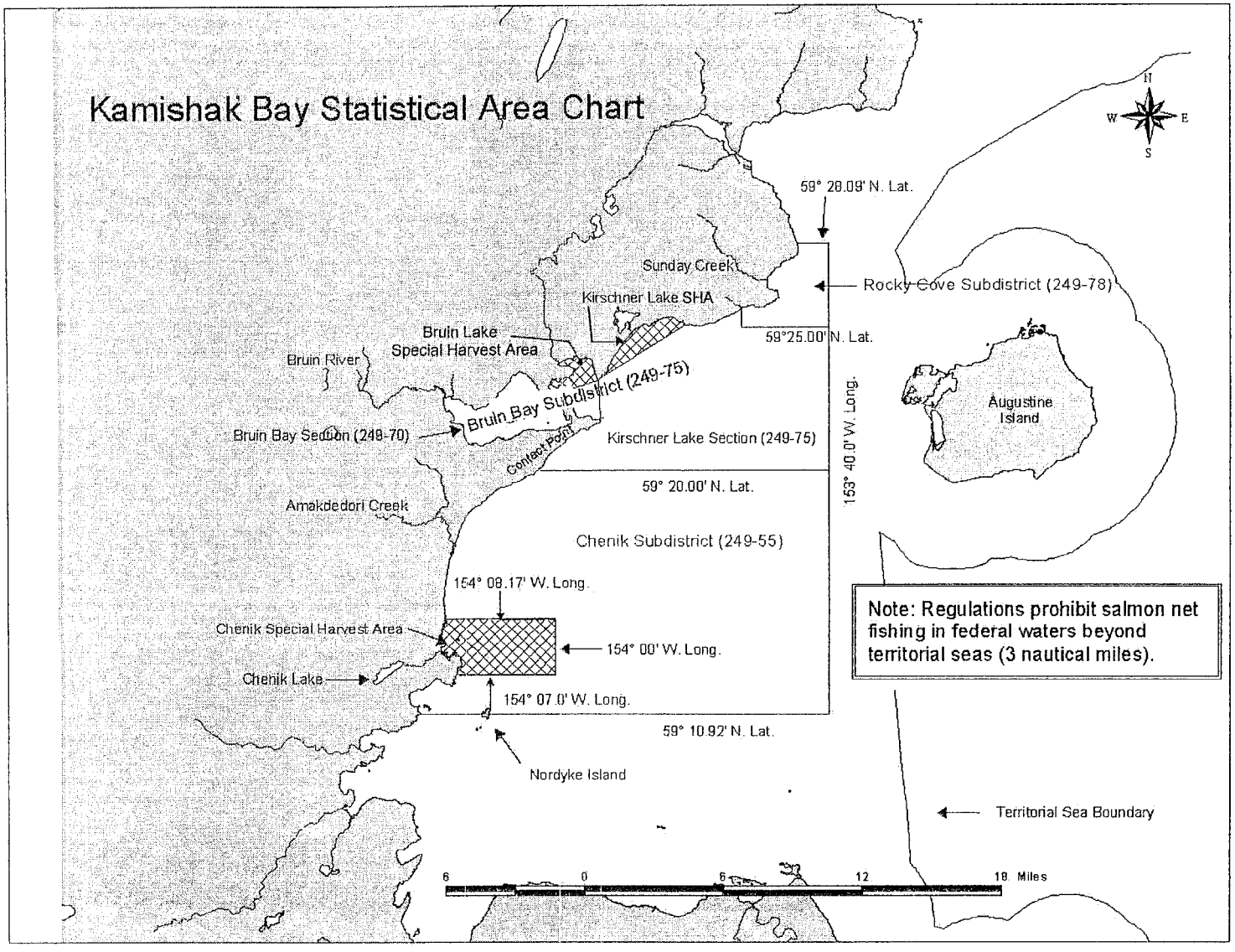

Figure 5. Kirschner, Bruin, and Chenik Lakes Special Harvest Areas for salmon hatchery cost recovery in Kamishak Bay District of Lower Cook Inlet.

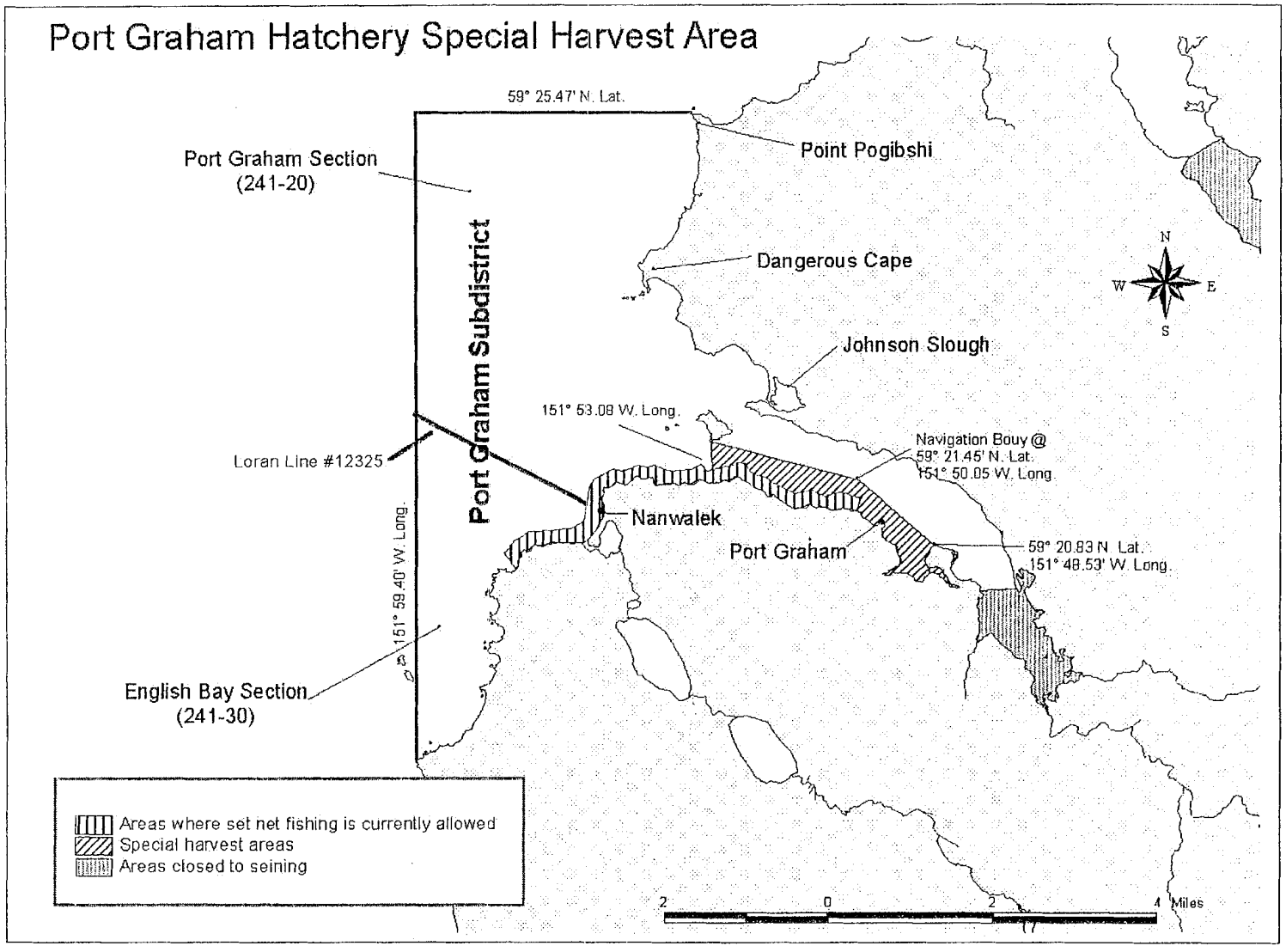

Figure 6. Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

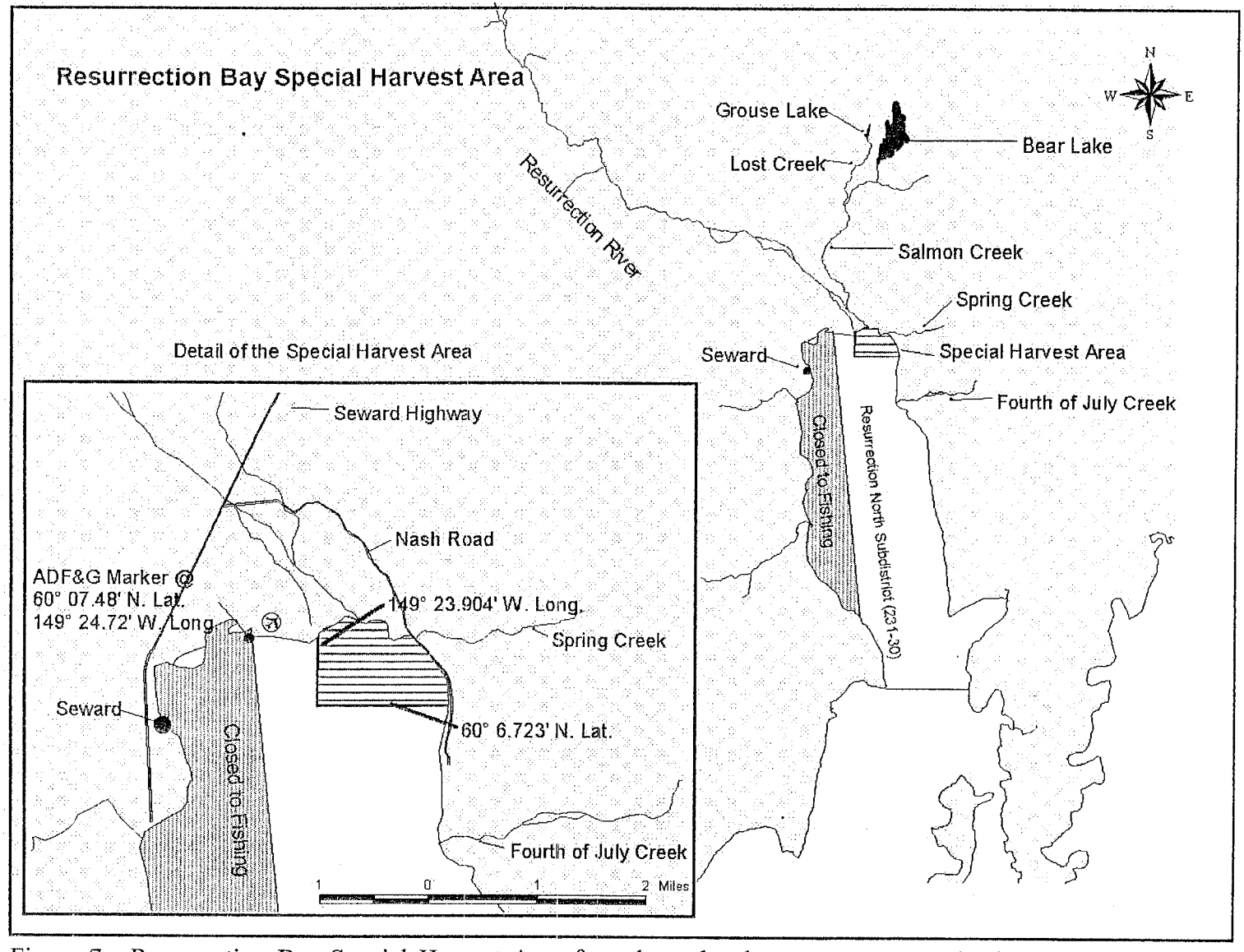

Figure 7. Resurrection Bay Special Harvest Area for salmon hatchery cost recovery in the Eastern District of Lower Cook Inlet.

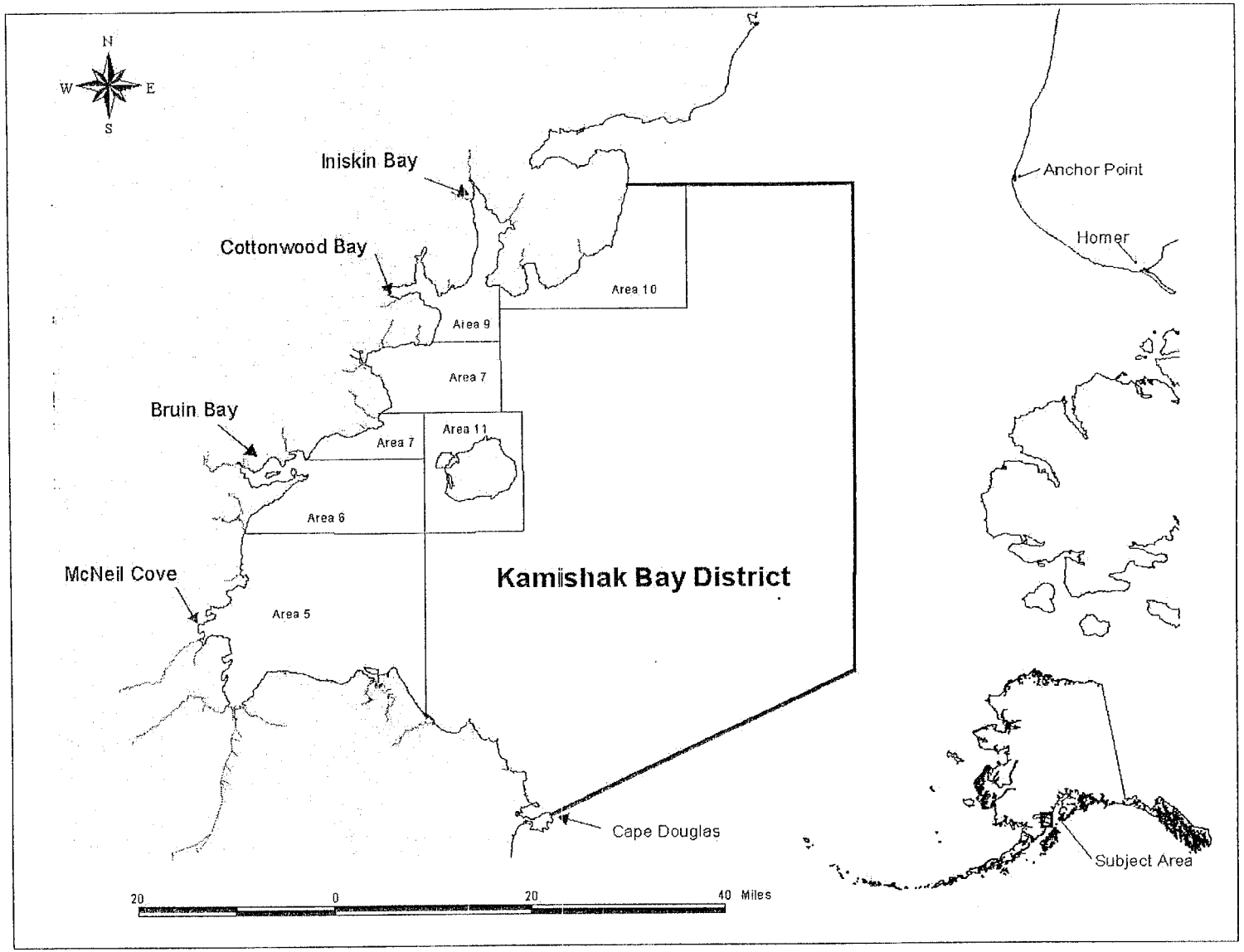

Figure 8. Commercial herring fishing areas for management purposes in Kamishak Bay District of Lower Cook Inlet.

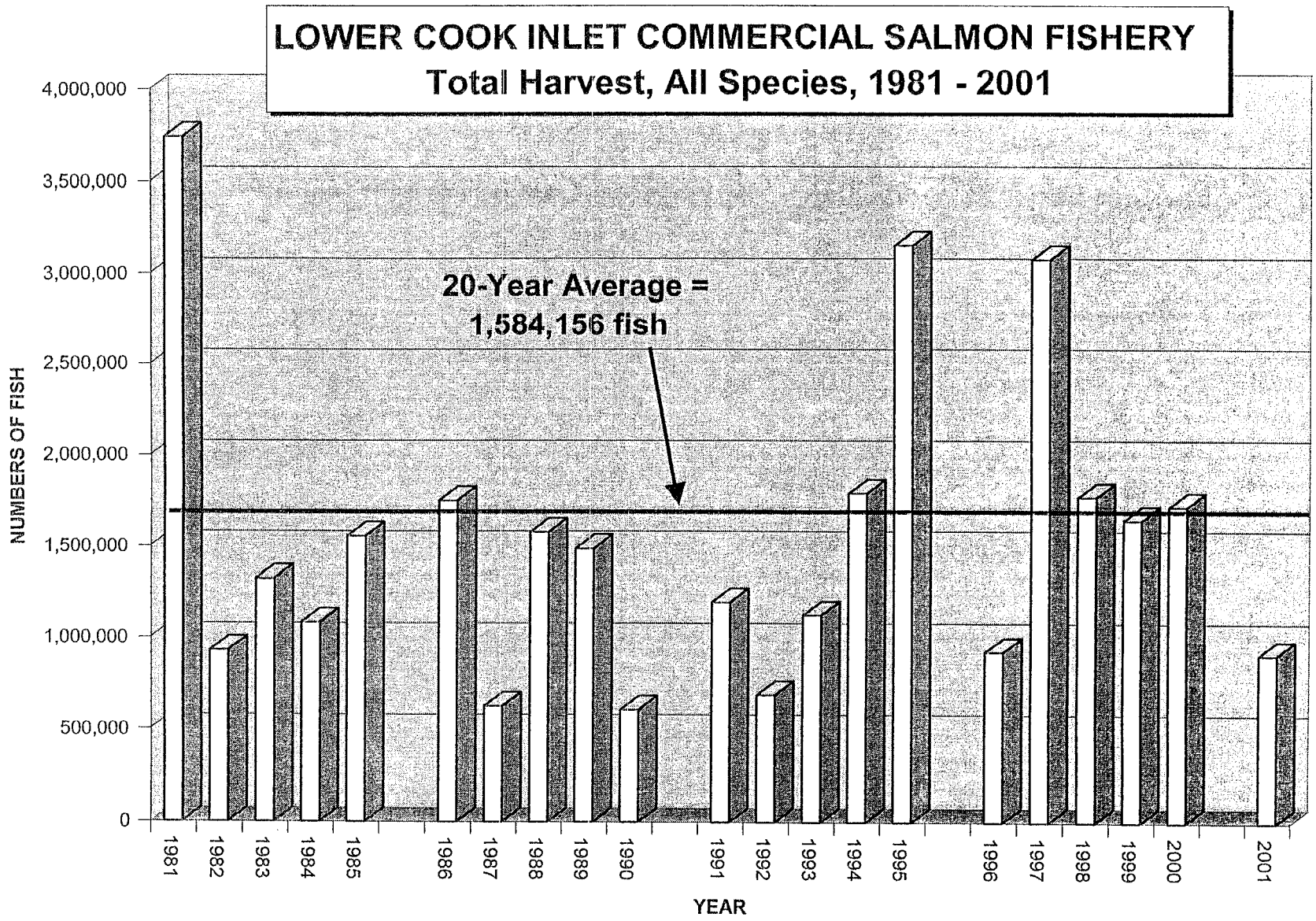

Figure 9. Total commercial salmon catch, Lower Cook Inlet, 1981 -2001.

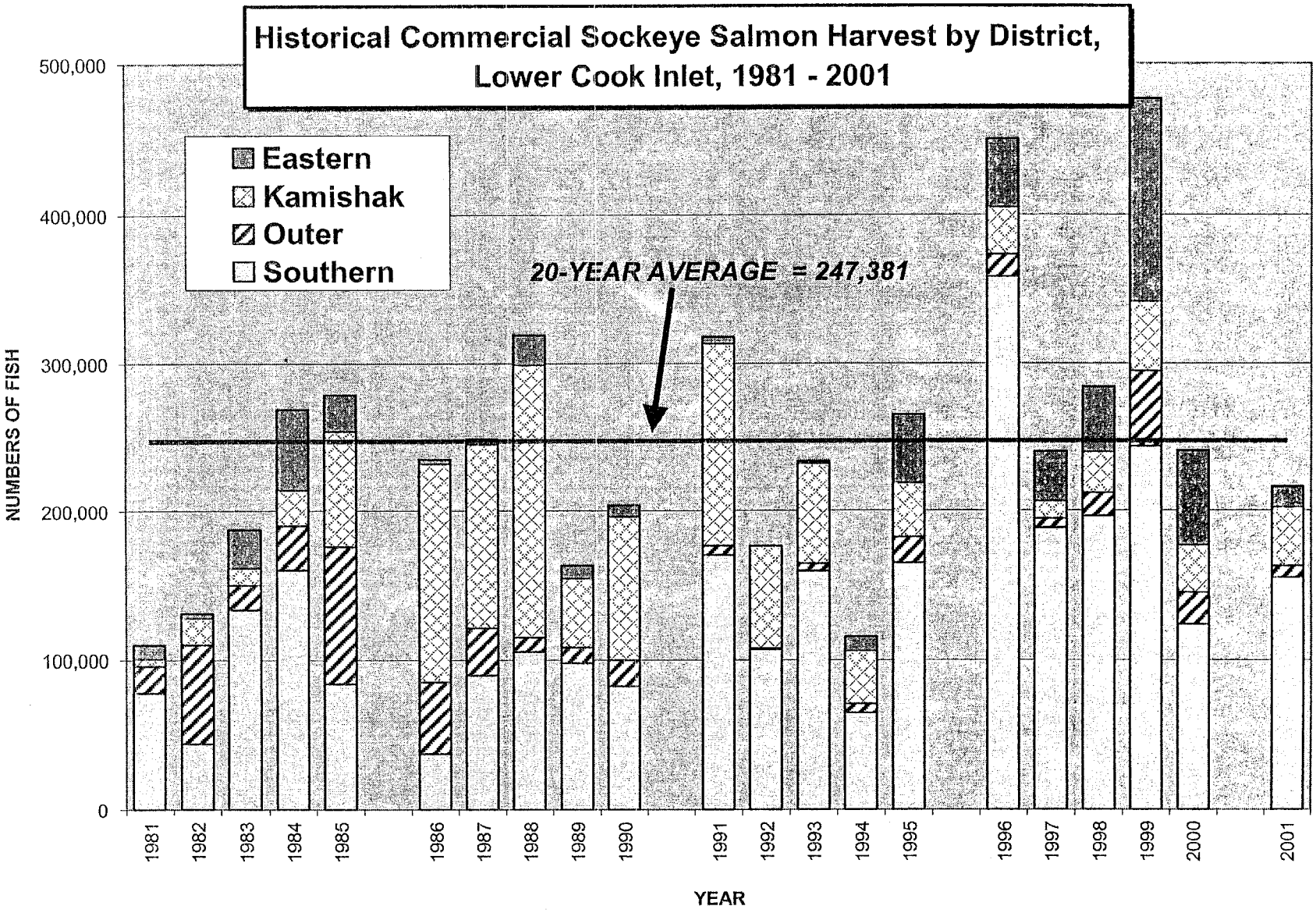

Figure 10. Commercial sockeye salmon catch by district, Lower Cook Inlet, 1981 - 2001.

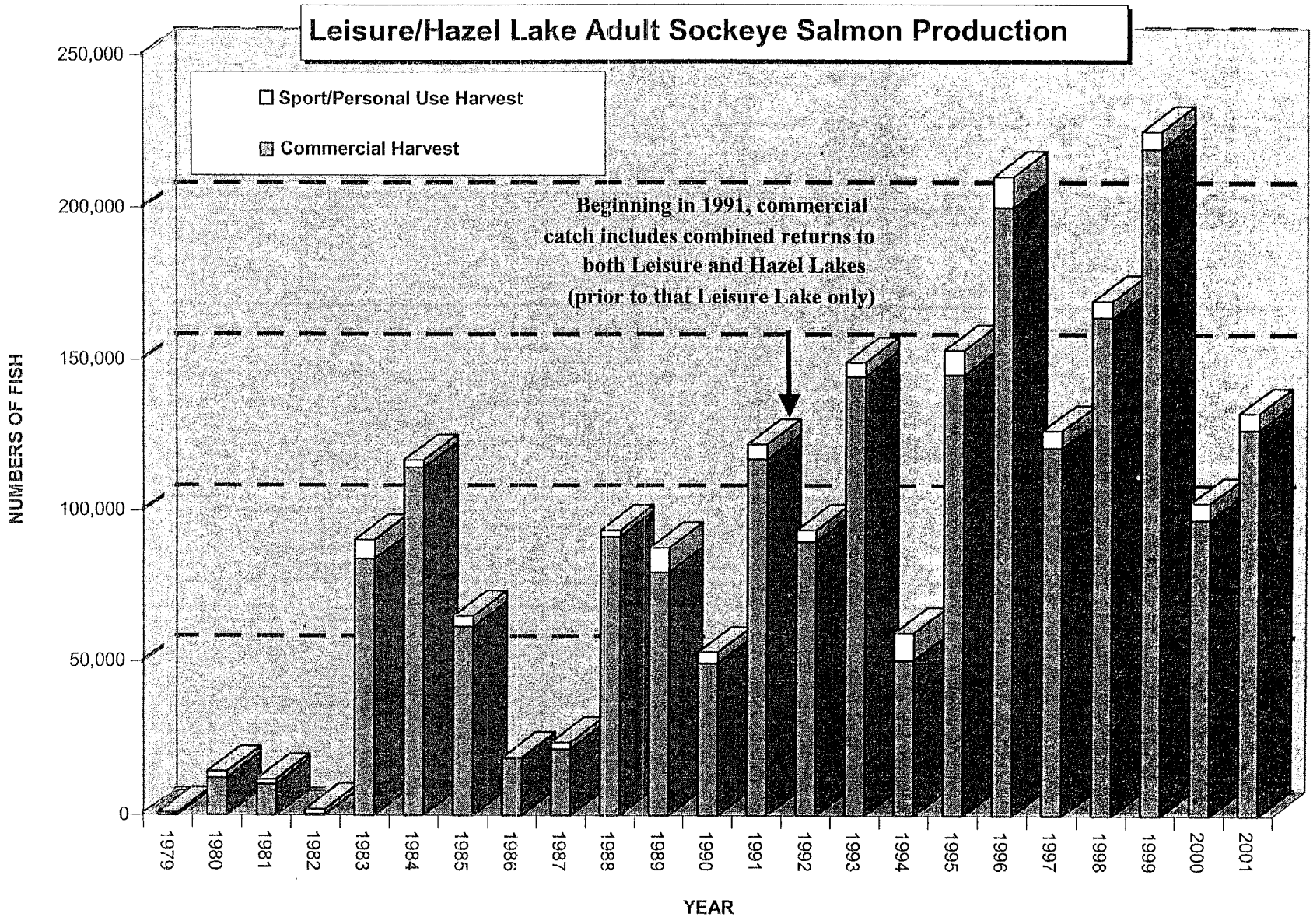

Figure 11. Sockeye salmon returns to Leisure and Hazel Lakes in the Southern District of Lower Cook Inlet, 1979 -2001.

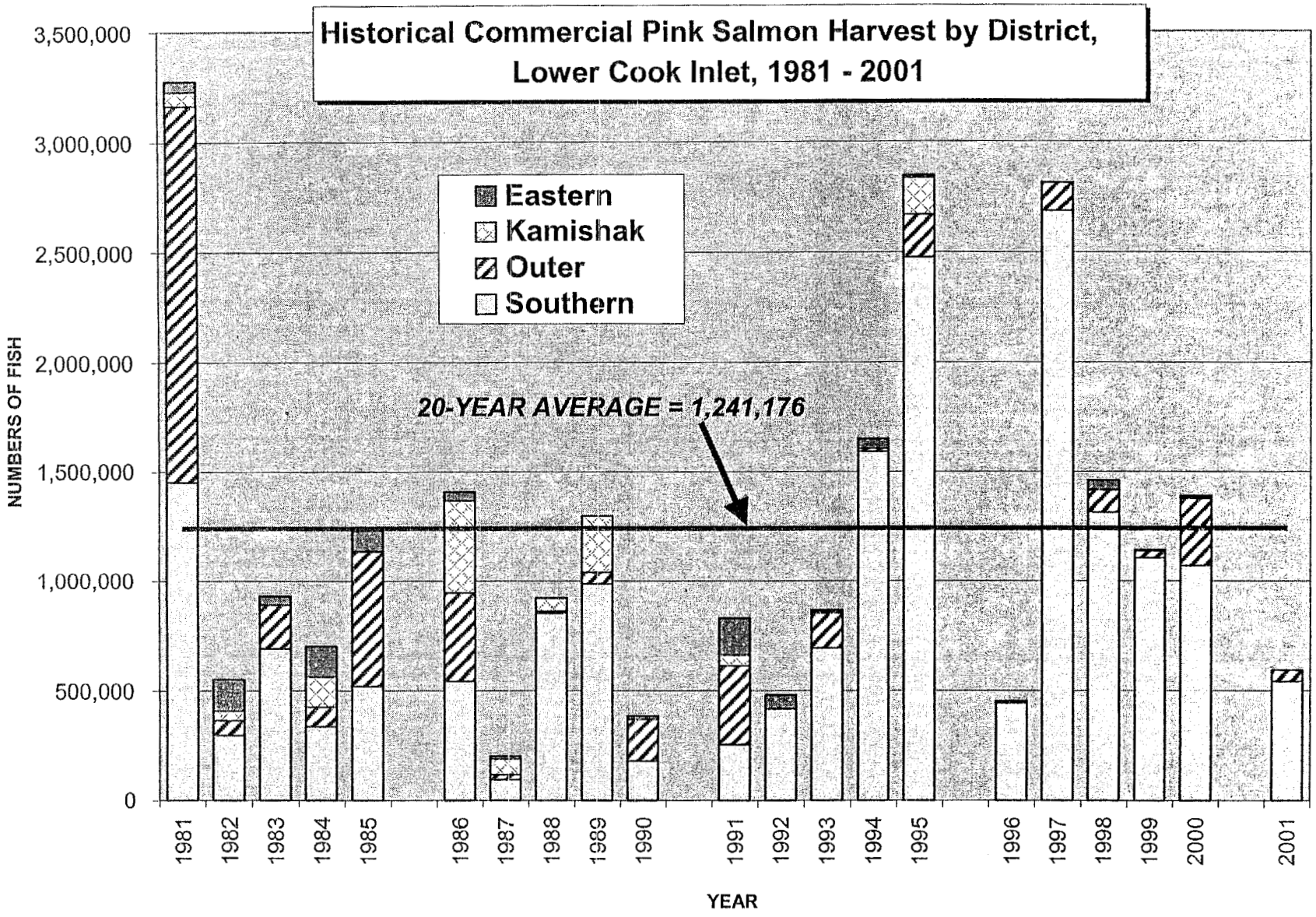

Figure 12. Commercial pink salmon catch by district, Lower Cook Inlet, 1981 - 2001.

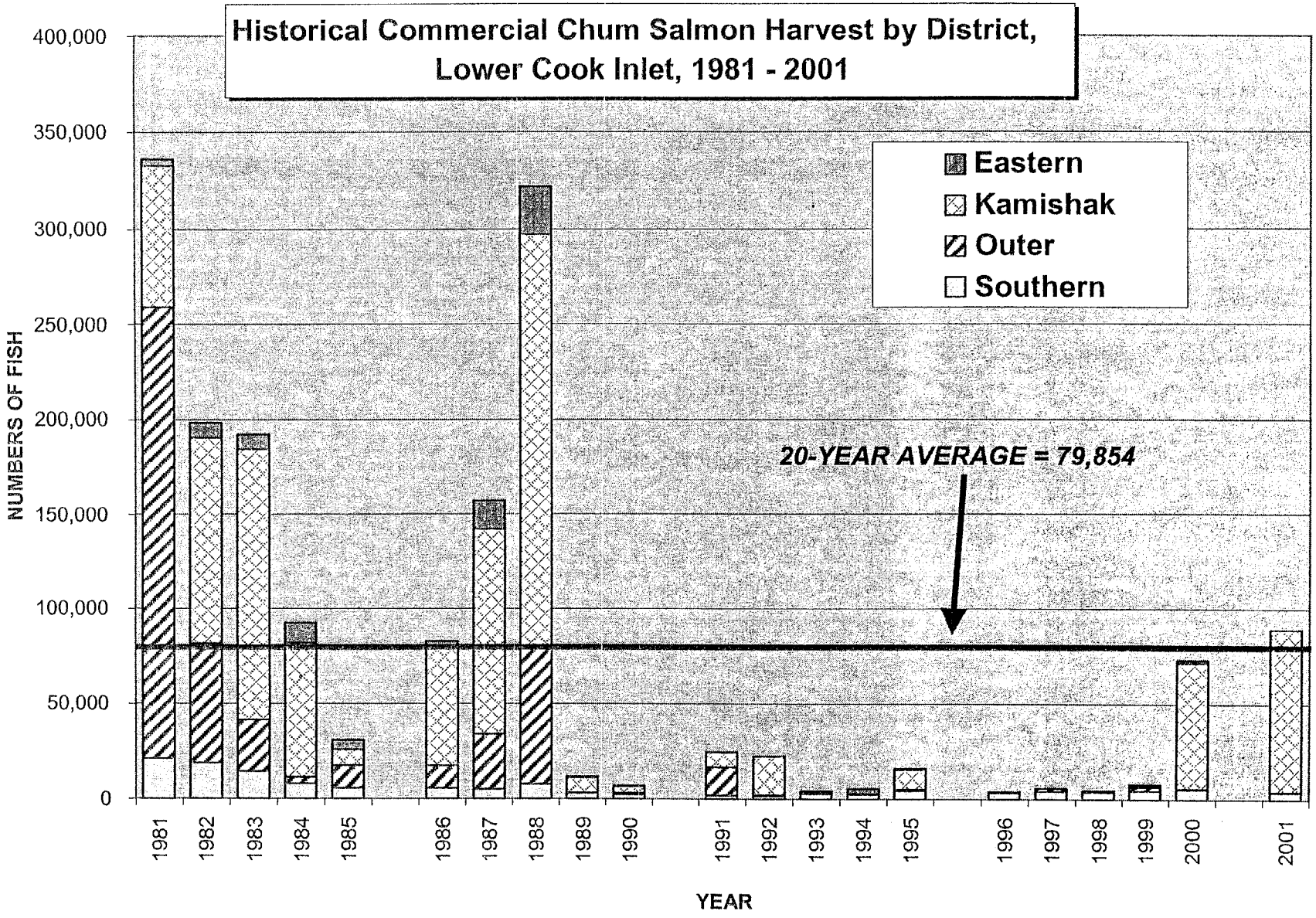

Figure 13. Commercial chum salmon catch by district, Lower Cook Inlet, 1981 - 2001.

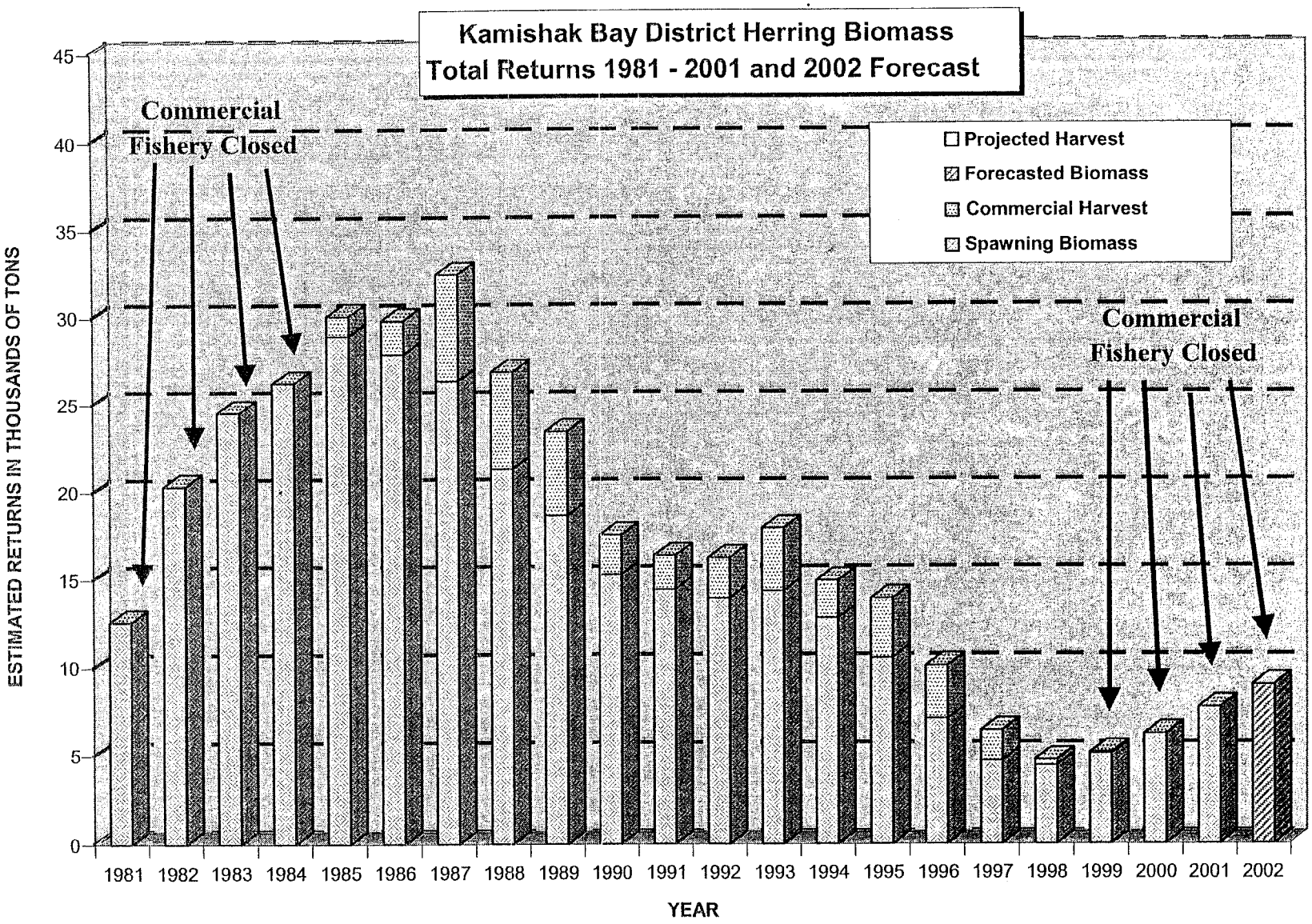

Figure 14. Biomass estimates and commercial harvests of Pacific herring in the sac roe seine fishery, Kamishak Bay, District, Lower Cook Inlet, 1981 - 2001, and 2002 projection.

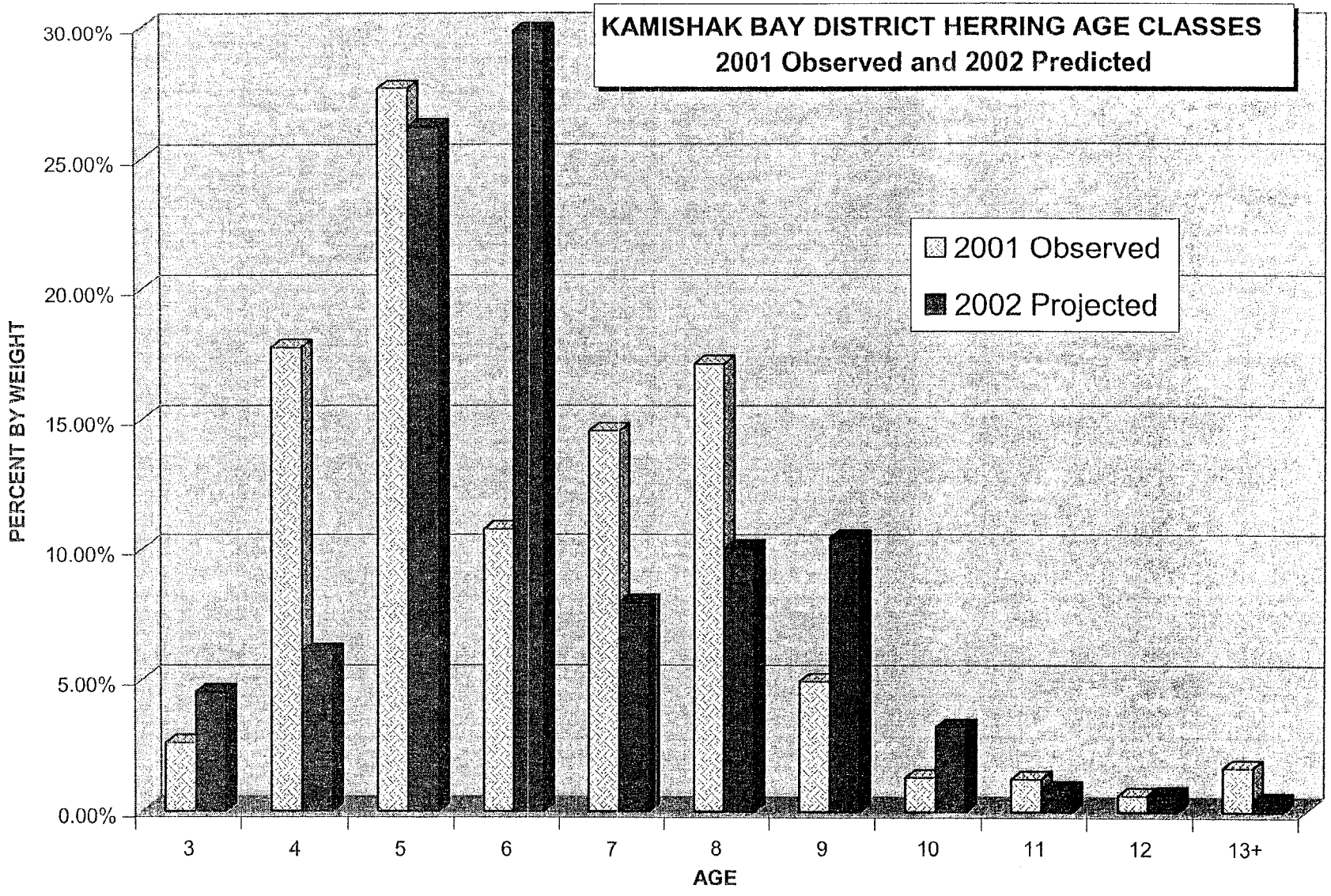

Figure14. Herring age composition from samples collected in Kamishak Bay District, Lower Cook Inlet, 2001, and 2002 forecast.

Appendix Table 1. Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1981 - 2001[a].

	Seines				Set Net
Year	Permanent Permits	Interim Permits	Total Issued	Actively fished	Permits fished
1981	75	10	85	85	40
1982	77	7	84	69	39
1983	78	5	83	83	24
1984	78	3	81	54	35
1985	80	1	81	51	34
1986	79	0	79	62	34
1987	79	0	79	66	29
1988	79	0	79	71	27
1989	83	0	83	64	23
1990	82	1	83	71	20
1991	82	1	83	68	20
1992	82	1	83	63	21
1993	82	1	83	51	17
1994	82	1	83	32	16
1995	83	1	84	49	23
1996	84	1	85	34	24
1997	84	1	85	23	25
1998	84	1	85	41	24
1999	84	1	85	45	20
2000	84	1	85	36	24
2001	84	1	85	25	18
1981-2000 Avg.	81	2	83	56	26
1991-2000 Avg.	83	1	84	44	21

[a] Data source: Commercial Fisheries Entry Commission and ADF&G fish ticket database.

Appendix Table 2. Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	18	740	69	5,334	1,346	7,507
1982	28	827	367	406	820	2,448
1983	20	704	57	696	513	1,990
1984	23	1,393	120	635	242	2,413
1985	47	1,637	86	974	78	2,822
1986	21	1,414	132	1,245	201	3,013
1987	27	1,951	118	295	598	2,989
1988	32	3,812	127	2,237	2,548	8,756
1989	33	1,213	59	1,660	39	3,004
1990	29	1,287	28	306	31	1,681
1991[b]	19	1,115	36	275	48	1,493
1992[b]	30	1,152	19	212	53	1,466
1993[b]	27	802	41	287	7	1,164
1994[b]	18	496	93	745	9	1,361
1995[b]	48	1,381	62	1,245	24	2,760
1996[b]	26	2,113	42	100	5	2,286
1997[b]	23	1,066	36	1,286	10	2,421
1998[b]	20	1,224	37	712	9	2,002
1999[b]	51	2,459	23	470	20	3,023
2000[b]	31	1,112	19	431	192	1,786
2001[b]	24	627	15	277	295	1,238
1981–2000 Avg.	29	1,395	79	978	340	2,819
2001 % of Total	1.94%	50.65%	1.21%	22.37%	23.83%	100.00%

[a] Values obtained by using the formula: (average price per lb.) x (average weight per fish) x (catch) = Exvessel value; average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

[b] Includes hatchery cost recovery.

Appendix Table 3. Average salmon price in dollars per pound by species, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum
1981	1.35	1.10	0.75	0.44	0.49
1982	1.29	1.05	0.87	0.23	0.46
1983	1.00	0.75	0.70	0.25	0.29
1984	1.29	1.05	0.77	0.26	0.28
1985	1.60	1.25	0.85	0.22	0.31
1986	1.25	1.40	0.85	0.26	0.30
1987	1.25	1.60	1.00	0.42	0.46
1988	1.25	2.50	1.80	0.80	0.84
1989	1.25	1.60	0.70	0.40	0.40
1990	1.35	1.55	0.60	0.30	0.50
1991	1.12	0.83	0.29	0.13	0.27
1992	1.29	1.47	0.43	0.14	0.27
1993	1.02	0.80	0.51	0.12	0.28
1994	0.95	1.06	0.62	0.15	0.25
1995	1.17	1.11	0.47	0.15	0.24
1996	1.33	0.91	0.40	0.08	0.18
1997	1.29	0.93[b]	0.50[b]	0.15	0.23
1998	1.45	0.96[b]	0.36[b]	0.16	0.27
1999	1.96	1.22[b]	0.45[b]	0.16	0.32
2000	1.86	0.87[b]	0.60[b]	0.12	0.28
2001	1.76	0.62[b]	0.41[b]	0.15	0.28
20-Year Avg.	1.32	1.20	0.67	0.25	0.35
1981-90 Avg.	1.29	1.39	0.89	0.36	0.43
1991-2000 Avg.	1.34	1.01	0.46	0.14	0.26

[a] Average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

[b] Average price for sockeyes and cohos includes only those fish actually sold and does not include hatchery cost recovery fish that were donated, discarded, or harvested but not paid for due to contractual agreement with the processor.

Appendix Table 4. Salmon average weight in pounds per fish by species in the commercial fishery, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum
1981	12.5	6.1	8.5	3.7	8.1
1982	20.6	6.0	9.0	3.2	9.0
1983	22.8	5.0	7.2	3.0	9.2
1984	28.8	4.7	8.8	3.5	8.9
1985	28.0	4.7	9.8	3.5	8.2
1986	20.6	4.3	8.6	3.4	8.1
1987	18.1	4.9	8.2	3.5	8.3
1988	15.3	4.8	8.9	3.0	9.4
1989	14.1	4.6	7.0	3.1	8.6
1990	13.8	4.1	7.1	2.8	8.9
1991	12.3	4.2	6.6	2.6	7.5
1992	12.3	4.4	7.7	3.2	8.8
1993	12.0	4.4	6.0	2.7	6.2
1994	15.0	4.1	10.2	3.0	6.4
1995	17.8	4.7	7.4	2.9	6.4
1996	16.9	5.2	7.6	2.9	8.0
1997	13.9	4.9	7.8	3.1	7.6
1998	13.1	4.6	8.5	3.1	7.4
1999	14.8	4.7	6.6	2.5	7.9
2000	14.7	5.3	8.2	2.5	9.3
2001	13.6	4.9	7.5	3.1	9.4
20-Year Avg.	16.9	4.8	8.0	3.1	8.1
1981-90 Avg.	19.5	4.9	8.3	3.3	8.7
1991-2000 Avg.	14.3	4.6	7.7	2.9	7.5

[a] Values obtained from ADF&G fish ticket database.

Appendix Table 5. Commercial salmon catch in numbers of fish by species, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	1,086	110,255	10,776	3,279,183	336,093	3,737,393
1982	1,066	131,320	46,892	551,589	198,185	929,052
1983	873	187,645	11,219	927,607	192,319	1,319,663
1984	714	268,950	16,797	700,622	92,540	1,079,623
1985	1,043	278,694	10,327	1,229,708	30,640	1,550,412
1986	796	234,861	18,852	1,408,293	82,688	1,745,490
1987	1,179	248,848	14,354	201,429	157,018	622,828
1988	1,694	319,008	7,946	921,296	321,911	1,571,855
1989	1,893	163,271	12,089	1,296,926	11,305	1,485,484
1990	1,560	203,895	9,297	383,670	6,951	605,373
1991	1,419	317,947	19,047	828,709	24,232	1,191,354
1992	1,891	176,644	5,902	479,768	22,203	686,408
1993	2,168	233,834	13,477	866,774	4,367	1,120,620
1994	1,231	115,418	14,673	1,647,929	5,469	1,784,720
1995	2,303	265,423	17,709	2,848,464	15,636	3,149,535
1996	1,181	449,685	13,572	451,506	3,764	919,708
1997	1,262	240,184	11,004	2,814,431	5,908	3,072,789
1998	1,071	284,029	16,653	1,457,819	4,647	1,764,219
1999	1,764	476,779	8,033	1,140,488	7,941	1,635,005
2000	1,188	240,932	8,909	1,387,307	73,254	1,711,590
2001	988	216,271	6,667	592,931	88,969	905,826
20-Year Avg.	1,369	247,381	14,376	1,241,176	79,854	1,584,156
1981-90 Avg.	1,190	214,675	15,855	1,090,032	142,965	1,464,717
1991-2000 Avg.	1,548	280,088	12,898	1,392,320	16,742	1,703,595
2001 % of Total	0.11%	23.88%	0.74%	65.46%	9.82%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 6. Commercial salmon catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	1,024	77,880	7,976	1,453,982	20,920	1,561,782
1982	926	43,433	7,165	296,556	18,466	366,546
1983	858	133,671	3,433	690,254	14,281	842,497
1984	661	160,654	3,193	336,595	8,065	509,168
1985	1,007	84,149	4,258	518,889	5,513	613,816
1986	776	36,838	3,095	542,521	5,560	588,790
1987	1,158	89,662	2,163	90,522	5,030	188,535
1988	1,655	105,302	2,987	852,382	7,742	970,068
1989	1,889	98,052	6,667	987,488	3,141	1,097,237
1990	1,546	82,412	1,552	178,087	2,433	266,030
1991	1,399	170,224	9,415	253,962	1,962	436,962
1992	1,852	106,793	1,277	417,021	1,885	528,828
1993	2,162	159,747	4,431	692,794	2,788	861,922
1994	1,230	64,531	1,373	1,589,709	2,631	1,659,474
1995	2,289	164,798	5,161	2,475,312	4,530	2,652,090
1996	1,180	358,163	9,543	444,236	3,511	816,633
1997	1,262	188,413	5,597	2,685,764	4,260	2,885,296
1998	1,070	196,262	2,243	1,315,042	3,956	1,518,534
1999	1,760	243,444	2,757	1,105,267	4,624	1,357,852
2000	1,184	123,574	768	1,070,065	5,340	1,200,931
2001	986	155,411	2,706	542,975	3,789	705,867
20-Year Avg.	1,344	134,400	4,253	899,822	6,332	1,046,152
1981-90 Avg.	1,150	91,205	4,249	594,728	9,115	700,447
1991-2000 Avg.	1,539	177,595	4,257	1,204,917	3,549	1,391,856
2001 % of Total	0.14%	22.02%	0.38%	76.92%	0.54%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 7. Commercial set gillnet catch of salmon in numbers of fish by species in the Southern District, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	222	53,665	6,735	68,794	8,524	137,940
1982	894	42,389	5,557	15,838	7,113	71,791
1983	822	41,707	1,799	20,533	4,377	69,238
1984	639	40,987	2,862	17,836	5,008	67,332
1985	958	23,188	3,908	22,898	4,221	55,173
1986	745	21,807	2,827	14,244	2,426	42,049
1987	653	28,209	2,025	9,224	2,419	42,530
1988	1,145	14,758	2,819	29,268	4,423	52,413
1989	1,281	13,970	4,792	16,210	1,877	38,130
1990	1,361	15,863	1,046	12,646	1,938	32,854
1991	842	20,525	5,011	3,954	1,577	31,909
1992	1,288	17,002	848	15,958	1,687	36,783
1993	1,089	14,791	3,088	12,008	2,591	33,567
1994	1,103	14,004	1,073	23,621	2,419	42,220
1995	2,078	19,406	3,564	41,654	3,958	70,660
1996	1,054	69,338	5,779	14,813	2,792	93,776
1997	1,136	59,412	4,475	64,162	4,166	133,351
1998	952	26,131	1,057	24,403	3,754	56,297
1999	1,491	27,646	1,374	5,348	4,313	40,194
2000	1,019	26,503	621	21,845	5,214	55,202
2001	865	28,503	1,811	13,393	3,487	48,059
20-Year Avg.	1,039	29,565	3,063	22,763	3,741	60,170
1981-90 Avg.	872	29,654	3,437	22,749	4,233	60,945
1991-2001 Avg.	1,205	29,476	2,689	22,777	3,249	59,396
2001 % of Total	1.80%	59.31%	3.77%	27.87%	7.26%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 8. Commercial salmon catch in numbers of fish by species in the Outer District, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	61	18,133	485	1,714,115	238,393	1,971,187
1982	129	66,781	92	67,523	63,075	197,600
1983	14	16,835	54	199,794	27,203	243,900
1984	3	29,276	41	89,085	3,204	121,609
1985	19	91,957	3,210	618,222	11,844	725,252
1986	6	48,472	5,052	401,755	11,701	466,986
1987	14	31,845	2,481	23,890	28,663	86,893
1988	5	9,501	2	6,094	71,202	86,804
1989	1	10,286	72	52,677	43	63,079
1990	2	17,404	74	191,320	614	209,414
1991	2	6,408	12	359,664	14,337	380,423
1992	0	572	1	146	181	900
1993	2	4,613	119	159,159	970	164,863
1994	0	5,930	993	13,200	32	20,155
1995	12	17,642	1,272	192,098	474	211,498
1996	0	14,999	96	7,199	3	22,297
1997	0	6,255	63	128,373	1,575	136,266
1998	0	15,991	45	102,172	611	118,819
1999	3	51,117	1,482	32,484	2,062	87,148
2000	2	21,623	20	306,555	302	328,502
2001	0	7,339	5	48,559	408	56,311
20-Year Avg.	14	24,282	783	233,276	23,824	282,180
1981-90 Avg.	25	34,049	1,156	336,448	45,594	417,272
1991-2000 Avg.	2	14,515	410	130,105	2,055	147,087
2001 % of Total	0.00%	13.03%	0.01%	86.23%	0.72%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 9. Commercial salmon catch in numbers of fish by species in the Eastern District, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	0	9,270	470	44,989	3,279	58,008
1982	0	3,092	950	143,639	7,698	155,379
1983	0	25,932	594	36,154	7,934	70,614
1984	47	54,420	536	136,797	10,535	202,335
1985	11	24,338	835	92,403	5,144	122,731
1986	0	3,055	770	40,243	3,757	47,825
1987	0	3,687	1,631	14,333	14,913	34,564
1988	1	20,253	486	1,740	24,668	47,148
1989	0	8,538	5,346	92	312	14,288
1990	0	7,682	7,645	11,815	307	27,449
1991	1	4,703	7,283	167,250	80	179,317
1992	0	432	3,136	60,007	86	63,661
1993	0	1,824	8,924	10,616	9	21,373
1994	1	9,661	10,410	44,987	2,792	67,851
1995	0	46,556	5,192	12,000	330	64,078
1996	0	44,919	3,932	36	223	49,110
1997	0	33,783	5,344	1	66	39,194
1998	1	44,274	14,365	38,829	51	97,520
1999	1	135,305	3,794	1,930	1,232	142,262
2000	1	64,099	8,114	4,473	1,540	78,227
2001	0	13,809	3,947	0	6	17,762
20-Year Avg.	3	27,291	4,488	43,117	4,248	79,147
1981-90 Avg.	6	16,027	1,926	52,221	7,855	78,034
1991-2000 Avg.	1	38,556	7,049	34,013	641	80,259
2001 % of Total	0.00%	77.74%	22.22%	0.00%	0.03%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 10. Commercial salmon catch in numbers of fish by species in the Kamishak Bay District, Lower Cook Inlet, 1981 - 2001[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1981	1	4,972	1,845	66,097	73,501	146,416
1982	11	18,014	38,685	43,871	108,946	209,527
1983	1	11,207	7,138	1,405	142,901	162,652
1984	3	24,600	13,027	138,145	70,736	246,511
1985	6	78,250	2,024	194	8,139	88,613
1986	14	146,496	9,935	423,774	61,670	641,889
1987	7	123,654	8,079	72,684	108,412	312,836
1988	33	183,952	4,471	61,080	218,299	467,835
1989	3	46,395	4	256,669	7,809	310,880
1990	12	96,397	26	2,448	3,597	102,480
1991	17	136,612	2,337	47,833	7,853	194,652
1992	39	68,847	1,488	2,594	20,051	93,019
1993	4	67,650	3	4,205	600	72,462
1994	0	35,296	1,897	33	14	37,240
1995	2	36,427	6,084	169,054	10,302	221,869
1996	1	31,604	1	35	27	31,668
1997	0	11,733	0	293	7	12,033
1998	0	27,502	0	1,776	29	29,307
1999	0	46,913	0	807	23	47,743
2000	1	31,636	7	6,214	66,072	103,930
2001	2	39,712	9	1,397	84,766	125,886
20-Year Avg.	8	61,408	4,853	64,961	45,449	176,678
1981-90 Avg.	9	73,394	8,523	106,637	80,401	268,964
1991-2000 Avg.	6	49,422	1,182	23,285	10,498	84,392
2001 % of Total	0.00%	31.55%	0.01%	1.11%	67.34%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 11. Total commercial salmon catch in numbers of fish by district, Lower Cook Inlet, 1981 - 2001[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1981	1,561,782	1,971,187	146,416	58,008	3,737,393
1982	366,546	197,600	209,527	155,379	929,052
1983	842,497	243,900	162,652	70,614	1,319,663
1984	509,168	121,609	246,511	202,335	1,079,623
1985	613,816	725,252	88,613	122,731	1,550,412
1986	588,790	466,986	641,889	47,825	1,745,490
1987	188,535	86,893	312,836	34,564	622,828
1988	970,068	86,804	467,835	47,148	1,571,855
1989	1,097,237	63,079	310,880	14,288	1,485,484
1990	266,030	209,414	102,480	27,449	605,373
1991	436,962	380,423	194,652	179,317	1,191,354
1992	528,828	900	93,019	63,661	686,408
1993	861,922	164,863	72,462	21,373	1,120,620
1994	1,659,474	20,155	37,240	67,851	1,784,720
1995	2,652,090	211,498	221,869	64,078	3,149,535
1996	816,633	22,297	31,668	49,110	919,708
1997	2,885,296	136,266	12,033	39,194	3,072,789
1998	1,518,573	118,819	29,307	97,520	1,764,219
1999	1,357,852	87,148	47,743	142,262	1,635,005
2000	1,200,931	328,502	103,930	78,227	1,711,590
2001	705,867	56,311	125,886	17,762	905,826
20-Year Avg.	1,046,152	282,180	176,678	79,147	1,584,156
1981-90 Avg.	700,447	417,272	268,964	78,034	1,464,717
1991-2000 Avg.	1,391,856	147,087	84,392	80,259	1,703,595
2001 % of Total	77.93%	6.22%	13.90%	1.96%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 12. Commercial chinook salmon catch in numbers of fish by district, Lower Cook Inlet, 1981 - 2000[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1981	1,024	61	1	0	1,086
1982	926	129	11	0	1,066
1983	858	14	1	0	873
1984	661	3	3	47	714
1985	1,007	19	6	11	1,043
1986	776	6	14	0	796
1987	1,158	14	7	0	1,179
1988	1,655	5	33	1	1,694
1989	1,889	1	3	0	1,893
1990	1,546	2	12	0	1,560
1991	1,399	2	17	1	1,419
1992	1,852	0	39	0	1,891
1993	2,162	2	4	0	2,168
1994	1,230	0	0	1	1,231
1995	2,289	12	2	0	2,303
1996	1,180	0	1	0	1,181
1997	1,262	0	0	0	1,262
1998	1,070	0	0	1	1,071
1999	1,760	3	0	1	1,764
2000	1,184	2	1	1	1,188
2001	986	0	2	0	988
20-Year Avg.	1,344	14	8	3	1,369
1981-90 Avg.	1,150	25	9	6	1,190
1991-2000 Avg.	1,539	2	6	1	1,548
2001 % of Total	99.80%	0.00%	0.20%	0.00%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 13. Commercial sockeye salmon catch in numbers of fish by district, Lower Cook Inlet, 1981 - 2001[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1981	77,880	18,133	4,972	9,270	110,255
1982	43,433	66,781	18,014	3,092	131,320
1983	133,671	16,835	11,207	25,932	187,645
1984	160,654	29,276	24,600	54,420	268,950
1985	84,149	91,957	78,250	24,338	278,694
1986	36,838	48,472	146,496	3,055	234,861
1987	89,662	31,845	123,654	3,687	248,848
1988	105,302	9,501	183,952	20,253	319,008
1989	98,052	10,286	46,395	8,538	163,271
1990	82,412	17,404	96,397	7,682	203,895
1991	170,224	6,408	136,612	4,703	317,947
1992	106,793	572	68,847	432	176,644
1993	159,747	4,613	67,650	1,824	233,834
1994	64,531	5,930	35,296	9,661	115,418
1995	164,798	17,642	36,427	46,556	265,423
1996	358,163	14,999	31,604	44,919	449,685
1997	188,413	6,255	11,733	33,783	240,184
1998	196,262	15,991	27,502	44,274	284,029
1999	243,444	51,117	46,913	135,305	476,779
2000	123,574	21,623	31,636	64,099	240,932
2001	155,411	7,339	39,712	13,809	216,271
20-Year Avg.	134,400	24,282	61,408	27,291	247,381
1981-90 Avg.	91,205	34,049	73,394	16,027	214,675
1991-2000 Avg.	177,595	14,515	49,422	38,556	280,088
2001 % of Total	71.86%	3.39%	18.36%	6.39%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 14. Commercial sockeye salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 – 2001[a,b].

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Resurrection Bay	0	0.1	0	0	0	0	0	0	0	74.5	99.4	1.8	2.2
Aialik Bay	1.3	0.2	4.3	2.6	0.5	0	0	0	0	0	0	3.1	0
Nuka Bay	8.3	6.7	8.2	5.1	0.5	0	2.0	0	2.2	1.5	0	1.0	1.6
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove & Lagoon	1.3	1.4	0.8	2.0	1.1	0.7	1.4	1.5	1.9	2.7	1.7	1.3	1.3
Tutka/Barabara	1.1	1.7	3.0	5.2	2.9	9.0	5.2	6.0	11.8	6.3	5.6	6.0	10.0
Seldovia Bay	0.4	1.2	1.2	1.7	1.2	2.1	0.9	1.0	2.2	1.9	1.1	1.2	1.5
Port Graham Bay	6.6	7.8	5.2	6.8	7.8	5.5	3.5	2.7	10.4	7.7	4.3	3.7	5.6
Kamishak/Douglas	0	0	0	0	0	0	0	0	0	0	0	0	0
McNeil (Mikfik)	0	0.7	0	0	0	1.9	0.2	0	0	0	8.9	2.8	0
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	0	0	0.2	0	1.9	0	0
Bruin (Kirschner)	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	2.6	4.9	0.1	1.9	1.1	1.5	0.8	4.1	0.3	0.6	0.1	0	0
Totals	21.6	24.7	22.8	25.3	15.1	20.7	14.0	15.3	29.0	95.2	122.8	20.9	22.2

Location	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Resurrection Bay	0.1	0	0	0	0	0	0	0	0	0.6	0	0	3.4
Aialik Bay	0.3	3.1	0.2	0.6	0	5.8	0	0	0.1	8.7	3.0	25.9	50.8
Nuka Bay	26.1	1.1	0.1	0	18.9	31.1	10.6	24.4	21.5	17.2	66.3	16.8	29.2
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove & Lagoon	3.7	2.1	3.0	3.4	5.1	3.6	12.9	5.3	11.5	11.2	1.2	77.7	116.6
Tutka/Barabara	14.8	8.1	10.8	12.6	14.2	21.3	92.1	15.6	13.2	41.0	15.8	35.9	26.7
Seldovia Bay	2.3	2.2	2.3	2.1	2.1	3.0	5.6	2.6	1.6	5.3	5.0	6.7	4.9
Port Graham Bay	10.5	11.7	10.9	9.2	13.6	16.6	30.5	12.9	16.5	20.3	21.5	13.4	12.5
Kamishak/Douglas	0	0	0	0	0.2	5.3	4.6	0.5	0	4.9	0	2.8	0
McNeil (Mikfik)	0	0	0	0	3.8	2.1	0	1.2	3.9	0	17.8	5.8	10.7
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	0	0	0	0	0.3	2.7	13.9
Bruin (Kirschner)	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0.1	0.8	0.1	0.2	0.3	2.8	0.1	1.9	1.1	1.1	0.4	0	0.3
Totals	57.9	29.1	27.4	28.1	58.2	101.6	156.4	64.4	69.4	110.3	131.3	187.6	269.0

Location	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Resurrection Bay	0.3	0	0.2	0	0	0	0	0	1.7	9.0	44.6	43.9	31.7
Aialik Bay	24.1	3.0	3.5	20.2	8.5	7.7	4.7	0.4	0.2	0.6	2.0	1.0	2.1
Nuka Bay	91.8	48.4	31.8	9.5	10.3	5.7	1.8	0	3.5	5.9	17.6	15.0	6.2
Port Dick	0	0	0	0	0	11.7	4.6	0.6	1.0	0	0	0	0
Halibut Cove & Lagoon	63.2	15.2	69.1	24.9	46.6	20.3	36.0	14.7	19.0	12.2	9.0	75.3	12.3
China Poot[c]				63.6	35.8	49.9	116.7	76.0	127.6	38.7	133.4	225.2	116.1
Tutka/Barabara	14.9	16.3	14.7	12.9	13.4	7.9	13.4	12.9	8.4	11.0	15.4	27.8	14.4
Seldovia Bay	2.6	3.2	3.5	2.5	1.8	4.3	4.0	3.3	4.4	2.7	4.2	11.9	12.5
Port Graham Bay	3.5	2.0	2.4	1.4	0	0	0	0	0	0	2.6	17.9	33.1
Kamishak/Douglas	0.7	7.6	2.3	5	0	0.1	7.0	9.9	1.3	3.4	2.7	0	2.6
McNeil (Mikfik)	67.0	27.5	21.4	14.6	7.0	9.1	12.9	4.0	0.9	0	0.1	0	0.2
Paint River	0	0	0	0	0	0	0.4	0	0	0	0	0	0
Chenik Lake	10.6	111.3	98.5	164.2	38.9	70.3	60.4	14.4	24.6	0	0	0	0
Bruin/Kirschner	0	0	0	0	0.2	14.5	55.9	40.5	39.7	31.9	33.6	31.6	9.0
Miscellaneous	0	0.4	1.6	0.2	0.8	2.4	0.1	0	1.5	0	0.2	0	0
Totals	278.7	234.9	248.8	319.0	163.3	203.9	317.9	176.6	233.8	115.4	265.4	449.7	240.2

- continued -

Appendix Table 14. (page 2 of 2)

Location	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Resurrection Bay	35.0	135.2	64.1	13.8									
Aialik Bay	8.6	0.1	T	0									
Nuka Bay	16.0	51.1	21.6	7.3									
Port Dick	0	0	T	T									
Halibut Cove & Lagoon	62.3	42.9	24.3	5.8									
China Poot[c]	100.2	170.6	78.3	117.7									
Tutka/Barabara	9.8	22.9	12.4	23.0									
Seldovia Bay	6.0	6.3	6.4	9.0									
Port Graham Bay	17.9	0.7	2.1	0									
Kamishak/Douglas	0	0	T	0.5									
McNeil (Mikfik)	0	7.2	0	0.3									
Paint River	0	0	0	0									
Chenik Lake	0	0	0	0									
Bruin/Kirschner	27.5	39.8	31.6	38.9									
Miscellaneous	0.7	0	T	0									
Totals	284.0	476.8	240.9	216.3									

[a] Data source: ADF&G fish ticket database.

[b] "T" denotes trace, less than 50 fish caught.

[c] China Poot Subdistrict, which includes China Poot, Peterson, and Neptune Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 15. Harvest of sockeye salmon returning to China Poot Bay in the Southern District of Lower Cook Inlet, by user group, 1979 - 2001[a].

Return Year	Sport Harvest	Personal Use Harvest	Commercial Harvest	Non-harvested fish	Total Return
1979	650	0	[b]	0	650
1980	1,000	1,000	12,000	0	14,000
1981	1,500	0	10,000	0	11,500
1982	450	1,320	200	1,430	3,400
1983	480	5,910	84,020	10	90,420
1984	500	2,000	114,360	500	117,360
1985	500	3,000	61,500	920	65,920
1986	100	150	18,350	200	18,800
1987	200	2,000	21,500	0	23,700
1988	500	1,500	91,469	470	93,939
1989	1,000	7,000	79,714	0	87,714
1990	500	3,000	49,587	0	53,087
1991	1,000	4,000	117,000[c]	0	122,000
1992	300	3,500	89,791[c]	0	93,591
1993	400	4,000	144,677[c]	0	149,077
1994	500	8,500	50,527[c]	0	59,527
1995	1,000	7,000	145,392[c]	450	153,842
1996	1,000	9,000	200,000[c]	441	210,441
1997	650[d]	4,900[e]	120,900[c]	1,130	127,620
1998	650[d]	4,900[e]	164,000[c]	380	170,542
1999	650[d]	4,900[e]	219,300[c]	522	225,983
2000	650[d]	4,900[e]	97,100[c]	256	102,906
2001	650[d]	4,900[e]	126,900[c]	57	132,507
1981-2000 Average	644	3,930	90,052	319	94,946

[a] Through 1990, "Commercial Harvest" and "Total Return" includes returns only to Leisure Lake in China Poot Bay; after 1990, these figures include combined returns to both Leisure Lake in China Poot Bay and Hazel Lake in Neptune Bay.

[b] No data.

[c] Portions of the commercial sockeye harvest in China Poot, Halibut Cove, and Tutka Bay Subdistricts were attributed to the Leisure and/or Hazel Lake returns.

[d] The final "Sport Harvest" figures for 1997 - 2001 represent the estimated recent 10-year average.

[e] The final "Personal Use Harvest" figures for 1997 - 2001 represent the statewide sport fish harvest survey average for the years 1990 - 1995.

Appendix Table 16. Commercial catch and escapement of sockeye salmon at Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1975 - 2001.

Return Year	Commercial Harvest	Escapement[a]	Total Return
1975	[b]	100	100
1976	[b]	900	900
1977	[b]	200	200
1978	[b]	100	100
1979	[b]	[c]	[c]
1980	[b]	3,500	3,500
1981	[b]	2,500	2,500
1982	[b]	8,000	8,000
1983	2,800	11,000	13,800
1984	16,500	13,000	29,500
1985	10,500	3,500	14,000
1986	111,000	7,000	118,000
1987	102,000	10,000	112,000
1988	164,200	9,000	173,200
1989	38,905	12,000	50,905
1990	70,347	17,000	87,347
1991	60,397	10,189	70,586
1992	13,793	9,269	23,062
1993	24,567	4,000	28,567
1994	0[d]	808	808
1995	0[d]	1,086	1,086
1996	0[d]	2,990	2,990
1997	0[d]	2,338	2,338
1998	0[d]	1,880	1,880
1999	0[d]	2,850	2,850
2000	0[d]	4,800	4,800
2001	0[d]	250	250
Average Since 1985	35,042	5,821	40,863

[a] Estimated from aerial surveys between 1975-90 and 1998-present, weir counts between 1991-97.
[b] Closed to fishing.
[c] No data.
[d] Due to low returns, the Chenik Subdistrict was closed to fishing for the entire season.

Appendix Table 17. Commercial coho salmon catch in numbers of fish by district, Lower Cook Inlet, 1981 - 2001[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1981	7,976	485	1,845	470	10,776
1982	7,165	92	38,685	950	46,892
1983	3,433	54	7,138	594	11,219
1984	3,193	41	13,027	536	16,797
1985	4,258	3,210	2,024	835	10,327
1986	3,095	5,052	9,935	770	18,852
1987	2,163	2,481	8,079	1,631	14,354
1988	2,987	2	4,471	486	7,946
1989	6,667	72	4	5,346	12,089
1990	1,552	74	26	7,645	9,297
1991	9,415	12	2,337	7,283	19,047
1992	1,277	1	1,488	3,136	5,902
1993	4,431	119	3	8,924	13,477
1994	1,373	993	1,897	10,410	14,673
1995	5,161	1,272	6,084	5,192	17,709
1996	9,543	96	1	3,932	13,572
1997	5,597	63	0	5,344	11,004
1998	2,243	45	0	14,365	16,653
1999	2,757	1,482	0	3,794	8,033
2000	768	20	7	8,114	8,909
2001	2,706	5	9	3,947	6,667
20-Year Avg.	4,253	783	4,853	4,488	14,376
1981-90 Avg.	4,249	1,156	8,523	1,926	15,855
1991-2000 Avg.	4,257	410	1,182	7,049	12,898
2001 % of Total	40.59%	0.07%	0.13%	59.20%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 18. Commercial pink salmon catch in numbers of fish by district, Lower Cook Inlet, 1981 - 2001[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1981	1,453,982	1,714,115	66,097	44,989	3,279,183
1982	296,556	67,523	43,871	143,639	551,589
1983	690,254	199,794	1,405	36,154	927,607
1984	336,595	89,085	138,145	136,797	700,622
1985	518,889	618,222	194	92,403	1,229,708
1986	542,521	401,755	423,774	40,243	1,408,293
1987	90,522	23,890	72,684	14,333	201,429
1988	852,382	6,094	61,080	1,740	921,296
1989	987,488	52,677	256,669	92	1,296,926
1990	178,087	191,320	2,448	11,815	383,670
1991	253,962	359,664	47,833	167,250	828,709
1992	417,021	146	2,594	60,007	479,768
1993	692,794	159,159	4,205	10,616	866,774
1994	1,589,709	13,200	33	44,987	1,647,929
1995	2,475,312	192,098	169,054	12,000	2,848,464
1996	444,236	7,199	36	35	451,506
1997	2,685,764	128,373	293	1	2,814,431
1998	1,315,042	102,172	1,776	38,829	1,457,819
1999	1,105,267	32,484	807	1,930	1,140,488
2000	1,070,065	306,555	6,214	4,473	1,387,307
2001	542,975	48,559	1,397	0	592,931
20-Year Avg.	899,822	233,276	64,961	43,117	1,241,176
1981-90 Avg.	594,728	336,448	106,637	52,221	1,090,032
1991-2000 Avg.	1,204,917	130,105	23,285	34,013	1,392,320
2001 % of Total	91.57%	8.19%	0.24%	0.00%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 19. Commercial pink salmon catch in thousands of fish by subdistrict during odd-numbered years, Lower Cook Inlet, 1959 – 2001[a,b].

Location	1959	1961	1963	1965	1967	1969	1971	1973	1975	1977
Humpy Creek	13.2	34.5	20.6	6.7	6.9	0.6	0	37.3	242.1	26.4
Halibut Cove and Lagoon		33.4	36.9	7.1	33.4	0	11.4	7.2	97.2	16.3
Tutka/Barabara	14.4	106.8	37.7	44.6	31.6	32.9	3.9	20.0	89.2	21.9
Seldovia Bay	4.9	15.1	1.6	19.2	11.7	28.8	27.4	19.4	429.6	47.6
Port Graham Bay	5.3	1.0	2.7	12.4	5.1	2.0	1.0	13.9	18.3	44.8
Dogfish Bay	1.6	0	0	0.1	2.3	0	10.4	0.3	0	5.0
Port Chatham	1.2	0	0.8	0	0	0	26.3	20.6	16.0	1.4
Windy Bay	3.1	2.2	0	5.4	0	0	57.3	68.5	18.1	173.2
Rocky Bay	2.3	0	1.4	0.1	0	0	0.1	0.2	0	11.6
Port Dick Bay	28.2	92.9	19.0	15.3	259.9	51.5	94.6	96.6	90.3	881.7
Nuka Island	33.3	2.0	0.3	0	0.1	0	25.0	5.2	31.4	40.6
E. Nuka Bay							94.6	T	0	8.7
Resurrection Bay	8.4	0	0	0	1.2	0	0	0	0	0
Bruin Bay	0	0	12.3	0.9	2.1	0	11.7	0	0	6.2
Rocky/Ursus Coves .	3.7	2.7	44.2	0	13.0	52.8	16.4	7.9	0	0
Iniskin/Cottonwood Bays	1.5	3.3	21.8	0	0.1	26.0	0	4.7	0	0.1
Miscellaneous	3.6	9.5	4.3	3.8	8.1	7.8	12.8	5.6	31.1	8.4
Total	124.7	303.4	203.6	115.6	375.5	202.4	392.9	307.4	1,063.3	1,293.9

Location	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Humpy Creek	277.0	239.9	8.1	5.6	0	91.4	0	0.2	13.7	0
Halibut Cove and Lagoon	27.1	11.1	18.8	5.9	30.5	254.4	91.1	100.2	1.9	2.6
China Poot[c]						8.5	135.7	50.6	12.9	14.5
Tutka/Barabara	416.8	1,026.6	616.0	491.2	56.5	632.1	117.6	539.4	2,428.5	2,511.2
Seldovia Bay	140.8	126.4	43.3	3.8	1.2	1.1	0.3	2.4	8.2	12.3
Port Graham Bay	124.7	45.9	4.1	12.5	2.3	0	0	0	10.2	145.1
Dogfish Bay	7.4	22.9	0.2	0	0	0	0	0	0	0
Port Chatham	174.4	47.6	3.3	7.0	0	9.7	7.5	14.7	17.6	0
Windy Bay	552.7	82.9	0	4.8	0	0	49.1	43.4	111.2	93.2
Rocky Bay	122.2	16.5	1.3	0	0	0	0	0	27.5	0
Port Dick Bay	964.8	1,140.9	140.0	455.6	3.0	0	289.7	26.6	0	0.6
Nuka Island	87.2	244.9	30.2	9.6	0	0	10.6	51.9	6.0	33.3
E. Nuka Bay	0.9	121.0	18.1	141.2	20.9	43.0	T	13.8	21.4	1.3
Resurrection Bay	0	32.6	27.1	74.6	11.8	0	0	0.7	0	0
Bruin Bay	40.3	51.9	0.3	0	1.2	202.8	45.1	0.1	104.8	0.3
Rocky/Ursus Coves	14.4	14.1	0	0	69.4	53.8	0	0	58.0	0
Iniskin/Cottonwood Bays	0.2	0	0.3	0	0.2	0	0	0	0	0
Miscellaneous	40.0	54.0	16.5	17.9	4.4	0.1	82.0	22.8	26.6	0
Total	2,990.9	3,279.2	927.6	1,229.7	201.4	1,296.9	828.7	866.8	2,848.5	2,814.4

- continued -

Appendix Table 19. (page 2 of 2)

Location	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017
Humpy Creek	0	0								
Halibut Cove and Lagoon	3.4	0.2								
China Poot[c]	19.6	4.8								
Tutka/Barabara	1,080.8	533.1								
Seldovia Bay	1.5	4.9								
Port Graham Bay	0	0								
Dogfish Bay	0	0								
Port Chatham	0	0								
Windy Bay	0	9.4								
Rocky Bay	0	0								
Port Dick Bay	0	16.7								
Nuka Island	0	0								
E. Nuka Bay	32.5	22.4								
Resurrection Bay	0	0								
Bruin Bay	0.8	0								
Rocky/Ursus Coves	0	0.1								
Iniskin/Cottonwood Bays	0	0								
Miscellaneous	1.9	1.3								
Total	1,140.5	592.9								

[a] Data source: ADF&G fish ticket database.

[b] "T" denotes trace, less than 50 fish harvested

[c] China Poot Subdistrict, which includes China Poot, Neptune, and Peterson Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 20. Commercial pink salmon catch in thousands of fish by subdistrict during even-numbered years, Lower Cook Inlet, 1960 – 2000[a,b].

Location	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978
Humpy Creek	51.0	73.9	53.5	24.6	2.6	85.2	1.7	33.3	3.3	16.3
Halibut Cove and Lagoon	20.7	35.5	28.9	16.0	41.3	28.9	0.4	2.2	69.8	27.8
Tutka/Barabara	87.6	279.5	100.9	53.5	26.9	43.9	5.2	5.5	18.0	167.9
Seldovia Bay	42.6	142.8	37.4	44.1	23.6	29.0	0.2	3.5	3.0	35.8
Port Graham Bay	7.1	18.1	38.4	5.1	23.0	19.6	1.1	4.5	3.9	4.0
Dogfish Bay	1.8	1.4	0.1	7.1	0	9.8	0.3	0	0	0.3
Port Chatham	15.7	102.2	67.1	6.7	10.0	1.9	0	0	0	0
Windy Bay	29.2	85.5	68.6	20.1	3.4	0.8	0	0	0	0
Rocky Bay	17.0	225.9	53.2	0	10.8	36.8	0	0	0	0
Port Dick Bay	257.4	1,118.3	526.3	296.8	55.0	336.5	0	0.6	0	63.6
Nuka Island	26.6	129.8	23.8	0	90.2	48.4	0	0	0	0
E. Nuka Bay							0.3	T	0.1	3.3
Resurrection Bay	5.8	0.1	0.3	0	37.4	40.2	18.2	0	35.4	29.7
Bruin Bay	2.6	0	0	0	126.2	10.2	0	0	0	0
Rocky/Ursus Coves	6.6	3.2	13.5	2.9	18.0	7.5	0	0	0	0.1
Iniskin/Cottonwood Bays	2.1	3.2	4.3	0	9.9	3.5	0	0	0.1	0.1
Miscellaneous	37.8	28.9	39.1	102.3	107.1	14.0	1.3	1.0	2.8	3.4
Total	611.6	2,248.3	1,055.4	579.2	585.4	716.2	28.7	50.6	136.4	352.6

Location	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998
Humpy Creek	48.6	4.9	53.5	116.7	0	0	0	0	0	0
Halibut Cove and Lagoon	4.7	1.0	10.9	14.0	106.8	91.0	58.4	105.6	2.3	2.4
China Poot[c]					5.4	46.1	35.7	24.2	8.2	3.3
Tutka/Barabara	312.5	184.9	262.0	400.2	723.9	37.4	320.9	1,454.5	428.2	1,300.6
Seldovia Bay	81.7	70.3	2.2	2.8	5.5	3.6	1.9	5.4	4.1	7.4
Port Graham Bay	30.5	35.4	8.0	8.8	10.7	0	0	0	1.5	0.6
Dogfish Bay	4.7	1.7	0.1	0	0	0	0	0	0	0
Port Chatham	1.8	12.6	0	0	0	22.1	0	0	0	9.4
Windy Bay	0	0	0	0	0	0	0	0	0	0
Rocky Bay	1.4	0	0	0	0	0	0	0	0	35.0
Port Dick Bay	133.3	44.0	84.6	304.0	5.9	169.1	0.1	1.6	0	2.4
Nuka Island	0	0	0	0	0	0	0	0	0	41.1
E. Nuka Bay	12.4	8.7	4.4	97.8	0.1	0.2	0	11.6	7.2	14.2
Resurrection Bay	155.8	137.4	122.3	36.5	0.5	0	0	T	T	0
Bruin Bay	100.6	13.3	125.2	349.7	5.0	0.4	1.9	T	T	1.8
Rocky/Ursus Coves	0	20.2	8.5	71.1	49.9	0	0.3	0	0	0
Iniskin/Cottonwood Bays	0.1	0.4	0.4	0.2	1.3	0	T	0	0	0
Miscellaneous	1.6	16.8	18.5	6.5	6.3	13.8	60.6	45.0	0	39.6
Total	889.7	551.6	700.6	1,408.3	921.3	383.7	479.8	1,647.9	451.5	1,457.8

- continued -

Appendix Table 20. (page 2 of 2)

Location	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
Humpy Creek	0									
Halibut Cove and Lagoon	0.5									
China Poot[c]	4.0									
Tutka/Barabara	1,055.4									
Seldovia Bay	10.2									
Port Graham Bay	0									
Dogfish Bay	0									
Port Chatham	0									
Windy Bay	0									
Rocky Bay	0									
Port Dick Bay	306.6									
Nuka Island	0									
E. Nuka Bay	0.3									
Resurrection Bay	0									
Bruin Bay	5.5									
Rocky/Ursus Coves	0									
Iniskin/Cottonwood Bays	0									
Miscellaneous	4.8									
Total	1,387.3									

[a] Data source: ADF&G fish ticket database.

[b] "T" denotes trace, less than 50 fish harvested

[c] China Poot Subdistrict, which includes China Poot, Neptune, and Peterson Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 21. Commercial chum salmon catch in numbers of fish by district, Lower Cook Inlet, 1981 - 2001[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1981	20,920	238,393	73,501	3,279	336,093
1982	18,466	63,075	108,946	7,698	198,185
1983	14,281	27,203	142,901	7,934	192,319
1984	8,065	3,204	70,736	10,535	92,540
1985	5,513	11,844	8,139	5,144	30,640
1986	5,560	11,701	61,670	3,757	82,688
1987	5,030	28,663	108,412	14,913	157,018
1988	7,742	71,202	218,299	24,668	321,911
1989	3,141	43	7,809	312	11,305
1990	2,433	614	3,597	307	6,951
1991	1,962	14,337	7,853	80	24,232
1992	1,885	181	20,051	86	22,203
1993	2,788	970	600	9	4,367
1994	2,631	32	14	2,792	5,469
1995	4,530	474	10,302	330	15,636
1996	3,511	3	27	223	3,764
1997	4,260	1,575	7	66	5,908
1998	3,956	611	29	51	4,647
1999	4,624	2,062	23	1,232	7,941
2000	5,340	302	66,072	1,540	73,254
2001	3,789	408	84,766	6	88,969
20-Year Avg.	6,332	23,824	45,449	4,248	79,854
1981-90 Avg.	9,115	45,594	80,401	7,855	142,965
1991-2000 Avg.	3,549	2,055	10,498	641	16,742
2001 % of Total	4.26%	0.46%	95.28%	0.01%	100.00%

[a] Data source: ADF&G fish ticket database.

Appendix Table 22. Commercial chum salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 – 2001[a,b].

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Tutka Bay	0.1	2.4	1.8	2.9	2.4	5.6	1.1	3.9	4.0	1.3	0.7	1.6	0.5
Port Graham	2.3	1.8	0.5	4.0	3.8	2.1	0.9	5.3	3.0	2.3	1.3	4.8	2.0
Dogfish Bay	4.9	0.4	0.1	0	0.2	0	0	7.0	15.3	0.1	0	50.9	114.5
Port Chatham	1.0	2.5	0	2.8	4.3	5.2	0	17.8	0	1.0	0	0.1	2.4
Rocky/Windy Bays	14.9	6.4	2.2	8.5	0.3	33.8	8.1	1.7	0	0.5	0	39.4	1.4
Port Dick	42.4	51.0	36.8	112.0	110.8	227.4	14.2	60.9	36.0	10.9	5.4	41.2	0.7
Nuka Bay	1.7	8.4	1.7	0.5	1.5	0	0	0	1.5	6.9	0	5.9	0.1
Resurrection Bay	0.1	0.5	0	0	0	0	0	0	0.1	0.7	0	0.6	0.4
Douglas River	0.2	0	0	0	0	0	0	0	0	0	0	0	0
Kamishak River	0	0	0	0	0	0	0	0	0	3.7	0.4	0	0
McNeil River	0	0.4	0	0	0	2.7	0.9	0	0.4	8.3	4.4	1.9	0
Bruin Bay	0	0.3	0.5	0	0.1	0	0.4	0	1.0	7.5	0	12.8	1.6
Ursus/Rocky Coves	8.5	8.6	1.8	1.1	2.8	1.2	0	4.0	2.9	1.0	3.6	8.9	10.3
Cottonwood/Iniskin	12.1	33.4	10.2	41.7	10.9	10.9	0	0	19.0	25.5	44.4	71.9	14.5
Miscellaneous	22.6	0	0	5.8	1.4	1.4	2.5	28.5	2.2	5.4	1.0	2.4	0.2
Totals	110.8	116.1	55.6	179.3	138.5	323.3	28.1	129.1	85.4	75.1	61.2	242.4	148.6

Location	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Tutka Bay	1.3	0.8	1.4	2.0	0.9	0.8	2.6	2.7	1.8	7.9	8.3	9.9	3.4
Port Graham	3.2	2.6	1.0	2.2	0.5	5.0	2.4	4.3	2.5	11.2	7.4	1.7	3.6
Dogfish Bay	41.1	0.4	0	0	0	9.4	0	8.5	2.1	71.8	15.6	2.8	1.1
Port Chatham	0	0.4	0	0.6	0	0.1	0	1.7	1.3	59.6	16.2	2.1	0
Rocky/Windy Bays	0	0.9	0	0.3	0	17.7	0	76.7	2.1	7.4	0	3.2	0
Port Dick	0	33.4	8.1	6.8	0	25.6	10.3	79.0	19.0	85.8	30.3	18.0	1.9
Nuka Bay	2.3	40.8	3.9	3.6	0.4	17.4	0.4	14.7	7.8	3.8	0.9	0.8	0.2
Resurrection Bay	0.7	0	0	0	0	0	0.1	0	0.7	2.4	7.7	6.9	3.0
Douglas River	0	0	0	0.1	7.1	4.0	2.9	0.7	10.1	46.7	37.1	27.2	9.2
Kamishak River	2.4	0	1.8	0	10.5	0	23.9	17.8	2.8	8.6	9.2	23.9	16.2
McNeil River	2.3	0	2.0	0	16.9	38.5	4.9	6.5	6.3	11.6	32.6	67.9	12.0
Bruin Bay	1.8	0	0.7	0	0	0	0	4.0	11.0	1.7	1.3	2.6	5.9
Ursus/Rocky Coves	0.2	5.7	0	2.0	2.8	7.8	1.9	0.5	0.3	1.5	13.5	0	3.7
Cottonwood/Iniskin	19.7	29.9	0	2.8	11.5	15.3	14.9	0.2	5.4	3.5	21.6	21.4	23.0
Miscellaneous	0.5	0.6	0.3	1.2	0.2	4.2	9.2	1.2	0.4	2.6	3.5	3.9	9.3
Totals	75.5	115.5	19.2	21.6	50.8	145.8	73.5	218.5	73.5	336.1	198.0	192.3	92.5

Location	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Tutka Bay	3.2	3.9	3.9	4.7	2.5	1.5	0.8	0.6	0.9	0.8	1.6	1.0	1.1
Port Graham	1.3	0.8	0.4	1.2	0	0	0	0	0	0	0.7	0.7	2.0
Dogfish Bay	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Chatham	1.3	0	0	0	0	0.1	0.1	0	0.1	0	T	0	0
Rocky/Windy Bays	0	0	0	0	0	0	0.5	0	0.1	0	0.4	0	1.6
Port Dick	9.6	10.4	27.1	64.4	0	0.5	13.7	0.2	0.7	T	0	0	0
Nuka Bay	0.8	1.3	1.6	6.8	0	T	T	0	T	T	0.1	T	T
Resurrection Bay	3.0	3.5	13.9	23.9	0	0	0	0	0	2.5	0.3	0.2	0
Douglas River	8.0	11.6	23.7	24.8	0	0.1	3.0	12.5	T	T	0.7	0	0
Kamishak River	0.1	0.1	24.6	26.7	0	T	0.7	1.5	0	0	0.1	0	0
McNeil River	0	13.7	32.9	104.0	0.1	0.1	0.1	2.0	0.4	0	0	0	T
Bruin Bay	0	5.4	0.1	2.8	4.4	0.1	2.6	0.8	T	0	4.9	T	T
Ursus/Rocky Coves	0	22.1	17.2	20.7	3.4	0	0	2.7	0	0	2.2	0	0
Cottonwood/Iniskin	0	8.8	9.7	39.2	0	0	1.0	0.2	0	0	2.3	0	0
Miscellaneous	3.3	1.1	1.9	2.7	0.9	4.7	1.7	1.6	2.1	2.1	2.3	1.9	1.2
Totals	30.6	82.7	157.0	321.9	11.3	7.0	24.2	22.2	4.4	5.5	15.6	3.8	5.9

- continued -

Appendix Table 22. (page 2 of 2)

Location	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Tutka Bay	0.9	1.5	1.8	1.4									
Port Graham	0.8	0	T	0									
Dogfish Bay	0	0	0	0									
Port Chatham	0.1	0	0	0									
Rocky/Windy Bays	0.3	0	0	0.3									
Port Dick	0.1	0	0.1	0.1									
Nuka Bay	T	2.1	0.2	T									
Resurrection Bay	0	0	1.5	T									
Douglas River	0	0	19.9	10.3									
Kamishak River	0	0	43.7	73.0									
McNeil River	0	0	0	T									
Bruin Bay	T	T	2.4	0									
Ursus/Rocky Coves	0	0	0	1.5									
Cottonwood/Iniskin	0	0	0	0									
Miscellaneous	2.3	4.4	3.6	2.4									
Totals	4.6	7.9	73.3	89.0									

[a] Data source: ADF&G fish ticket database.
[b] "T" denotes trace, less than 50 fish harvested.

Appendix Table 23. Estimated sockeye salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1981 - 2001[a].

Year	English Bay	Delight Lake	Desire Lake	Bear Lake[b,c]	Aialik Lake	Mikfik Lake	Chenik Lake	Amakd. Creek	Kamish. Rivers	Douglas River	Total
1981	10.5	7.3	12.0	0.7	1.8	5.3	2.5	1.9	[d]	0.2	42.2
1982	20.0	25.0	18.0	0.5	22.4	35.0	8.0	3.2	1.0	4.2	137.3
1983	12.0	7.0	12.0	0.7	20.0	7.0	11.0	1.2	0.4	0.5	71.8
1984	11.1	10.5	15.0	0.5	22.0	6.0	13.0	1.4	0.1	0.0	79.6
1985	5.0	26.0	18.0	1.1	8.0	20.0	3.5	0.9	0.8	0.0	83.3
1986	2.8	13.0	10.0	0.8	7.6	7.8	7.0	1.9	5.0	0.2	56.1
1987	7.0	10.5	13.4	0.3	9.2	9.0	10.0	1.1	[d]	0.1	60.6
1988	2.5	1.2	9.0	0.1	13.0	10.1	9.0	0.4	0.5	0.0	45.8
1989	4.5	7.7	9.0	0.1	6.5	11.5	12.0[c]	1.2	0.5	0.6	53.6
1990	3.3	5.2	9.5	0.1	5.7	8.8	17.0	1.8	0.2	0.6	52.2
1991	7.0	4.1	8.2	0.7	3.7	9.7	10.2[c]	1.9	0.7	[d]	46.2
1992	6.4	5.9	11.9	1.9	2.5	7.8	9.3[c]	1.9	4.9	0.2	52.7
1993	8.9	5.6	11.0	5.0	3.0	6.4	4.0[c]	2.0	4.1	[d]	50.0
1994	13.8[c]	5.6	10.5	8.6	7.3	9.5	0.8[c]	0.8	[d]	[d]	56.9
1995	22.5[c]	15.8	15.8	8.3	2.6	10.1	1.1[c]	2.4	[d]	[d]	78.6
1996	12.4[c]	7.7	9.4	8.0	3.5	10.5	3.0[c]	2.9	1.8	0.6	55.8
1997	15.4[c]	27.8[c]	14.7[c]	7.9	11.4	8.5	2.3[c]	1.5	[d]	[d]	89.5
1998	15.4[c]	9.2[c]	7.9	8.4	4.9	12.6	1.9	4.1	[d]	[d]	63.1
1999	15.8[c]	17.0[c]	14.6	7.8	3.8	15.7	2.9	8.8	2.2	0.4	89.0
2000	12.6[c]	12.3	4.0	11.9	4.3	10.9	4.8	3.3	1.5	0.4	66.0
2001	10.5[c]	10.1	5.5	12.8	5.1	5.4	0.3	2.7	2.5	[d]	54.9
20-year Average	10.4	11.2	11.7	3.7	8.2	10.9	6.7	2.2	1.7	0.6	67.2
1981-90 Average	7.9	11.3	12.6	0.5	11.6	12.1	9.3	1.5	1.1	0.6	68.5
1991-2000 Average	12.9	11.1	10.8	6.9	4.7	9.8	4.0	3.0	2.5	0.4	66.0
Esc. Goal	15	10	10	12	2.5-5	5-7	10	1	[f]	[f]	58.5-66

[a] Unless otherwise noted, estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.
[b] Limited by Bear Lake Management Plan since 1971.
[c] Weir counts.
[d] Insufficient survey data to generate escapement estimate.
[e] Combination of weir and video counts.
[f] No formal escapement goal established.

Appendix Table 24. Estimated pink salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1960 – 2001[a].

	YEAR										
Location	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Humpy Creek	10.0	22.6	56.0	34.7	18.5	28.0	30.0	25.0	24.7	5.4	55.2
China Poot Creek	9.0	2.0	26.0	—	—	—	—	2.5	6.0	0.2	1.5
Tutka Lagoon Creek	15.0	15.0	30.0	10.0	20.0	20.0	12.0	7.0	7.9	6.5	6.5
Barabara Creek	2.0	0.1	1.5	0.1	—	—	5.0	—	2.0	0.9	0.4
Seldovia River	25.0	25.0	50.0	13.0	60.0	30.0	86.0	55.0	53.2	60.0	23.0
Port Graham River	15.0	5.0	50.0	2.0	16.0	1.5	24.0	2.0	24.4	4.0	16.6
Dogfish Lagoon	2.0		3.0	—	—	—	—	—	—	—	—
Port Chatham Creeks	4.0	7.0	7.0	—	—	—	10.0	—	—	—	3.0
Windy Right Creek	8.0	10.0	12.5	4.9	6.2	2.0	7.0	6.0	2.8	3.2	2.1
Windy Left Creek	8.0	5.0	12.5	4.5	7.7	10.0	7.0	6.0	6.9	23.0	13.0
Rocky River	130.0	2.0	200.0	12.0	80.0	0.3	44.0	1.0	43.1	1.0	32.0
Port Dick Creek[b]	35.0	14.0	40.0	16.0	31.5	50.0	35.0	20.0	29.0	12.0	34.5
Island Creek	23.2	2.0	15.0	3.6	30.0	0.5	7.0	0.5	4.3	0.1	5.5
South Nuka Island Creek	20.0	2.0	22.0	0.1	10.0	—	10.0	—	10.0	3.0	11.0
Desire Lake Creek	—	—	18.0	—	1.3	—	—	—	—	—	—
James Lagoon	—	—	—	—	—	—	—	—	—	—	—
Aialik Lagoon	—	—	25.0	0.3	—	—	2.0	—	—	—	—
Bear Creek	1.4	—	3.1	—	6.4	—	—	—	3.1	—	—
Salmon Creek	—	—	—	—	—	—	—	—	—	—	—
Thumb Cove	—	—	—	—	—	—	—	—	—	—	—
Humpy Cove	—	—	—	—	—	—	—	—	—	—	—
Tonsina Creek	—	—	—	—	—	—		—	2.9	0.1	—
Big Kamishak River	—	—	100.0	75.0	75.0	—	13.0	—	—	—	—
Little Kamishak River	—	—	100.0	24.0	—	—	28.0	3.5	—	0.5	2.0
Amakdedori Creek	60.0	—	80.0	—	10.0	—	8.0	—	—	1.0	13.0
Bruin Bay River	18.0	—	300.0	25.0	—	—	20.0	0.5	—	5.0	40.0
Sunday Creek	1.5	—	5.0	2.0	—	—	20.0	—	—	1.0	2.0
Brown's Peak Creak	—	—	25.0	10.0	20.0	10.0	11.0	—	—	2.0	—
Totals	387.1	111.7	1,181.6	237.2	392.6	152.3	379.0	129.0	220.3	128.9	261.3

-continued-

Appendix Table 24. (page 2 of 5)

Location	YEAR										
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Humpy Creek	45.0	13.8	36.9	17.4	64.0	27.2	86.0	46.1	200.0	64.4	115.0
China Poot Creek	2.1	1.0	6.0	5.2	21.6	2.0	3.9	11.2	20.6	12.3	5.0
Tutka Lagoon Creek	16.7	1.5	6.5	2.6	17.6	11.5	14.0	15.0	10.6	17.3	21.1
Barabara Creek	4.0	0.6	—	0.2	22.7	0.2	5.7	1.4	10.0	5.8	16.8
Seldovia River	31.1	5.8	14.5	13.7	36.2	25.6	35.7	24.6	43.7	65.5	62.7
Port Graham River	13.2	2.4	7.0	2.8	27.3	6.5	20.6	6.7	32.7	40.2	18.4
Dogfish Lagoon	0.3	—	1.0	—	2.3	—	8.1	0.6	7.3	0.3	2.6
Port Chatham Creeks	15.5	1.0	5.0	0.2	7.7	—	14.2	0.3	20.8	7.7	11.2
Windy Right Creek	13.0	0.1	4.6	0.1	18.7	0.2	11.1	0.3	10.4	3.3	4.7
Windy Left Creek	35.4	0.4	12.9	0.1	9.7	0.2	47.3	1.1	74.8	10.9	31.3
Rocky River	1.6	8.2	2.0	1.5	4.4	2.7	36.7	8.2	85.0	6.4	25.0
Port Dick Creek[b]	97.8	10.0	26.4	1.5	62.8	12.7	109.3	44.9	116.0	56.1	106.0
Island Creek	0.1	1.7	0.5	0.5	0.1	—	0.6	0.4	0.6	2.2	25.0
South Nuka Island Creek	14.0	0.3	16.0	—	28.0	—	12.0	—	15.0	0.3	16.0
Desire Lake Creek	30.0	0.3	3.0	—	0.4	0.6	0.8	1.0	3.0	16.0	5.0
James Lagoon	—	—	—	—	—	—	—	—	—	4.6	14.0
Aialik Lagoon	—	—	—	0.1	—	0.4	—	—	—	—	—
Bear Creek	—	0.5	—	4.9	—	10.0	—	7.8	—	13.3	0.4
Salmon Creek	—	—	—	—	—	16.9	—	11.0	—	15.5	0.1
Thumb Cove	—	—	—	1.1	—	2.0	—	2.0	—	1.2	1.0
Humpy Cove	—	—	—	0.6	—	1.4	—	0.9	—	5.7	0.4
Tonsina Creek	—	—	—	1.4	—	5.7	—	1.5	—	0.7	0.2
Big Kamishak River	—	—	15.0	1.0	—	8.0	—	12.0	10.0	2.0	—
Little Kamishak River	—	—	13.0	—	—	6.0	—	0.4	3.5	0.6	—
Amakdedori Creek	—	0.2	3.0	1.0	5.0	—	—	0.9	6.0	3.8	1.5
Bruin Bay River	22.0	2.5	2.0	0.6	20.0	13.5	60.0	33.0	200.0	400.0	95.0
Sunday Creek	43.0	2.0	5.0	0.1	20.0	0.3	9.0	0.2	12.0	5.2	14.2
Brown's Peak Creak	8.0	1.2	3.2	0.1	10.0	1.2	13.0	0.9	15.0	2.3	17.7
Totals	392.8	53.5	183.5	56.7	378.5	154.8	488.0	232.4	897.0	763.6	610.3

-continued-

Appendix Table 24. (page 3 of 5)

Location	YEAR										
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Humpy Creek	31.9	104.0	84.2	117.0	49.7	26.6	21.4	93.0	27.0	17.4	14.9
China Poot Creek	3.1	14.1	8.4	1.9	11.5	3.1	3.9	8.5	4.2	2.6	4.1
Tutka Lagoon Creek	18.5	12.9	10.5	14.0	13.4	4.8	11.2	11.9	38.5	16.8	26.7
Barabara Creek	2.1	14.8	1.0	1.6	1.8	0.3	0.7	4.5	3.9	10.9	2.2
Seldovia River	38.4	27.9	14.2	22.8	28.2	7.6	16.9	26.2	27.8	30.0	14.7
Port Graham River	28.9	4.6	10.9	26.3	17.5	3.8	7.9	19.1	20.1	29.0	5.4
Dogfish Lagoon	2.6	1.0	0.6	0.2	0.4	1.2	0.3	0.2	7.1	9.3	d
Port Chatham Creeks	2.0	3.5	7.8	8.9	11.5	10.2	21.0	31.7	27.8	23.8	4.3
Windy Right Creek	4.7	4.3	3.4	5.4	2.5	2.0	1.3	6.6	7.1	20.7	3.9
Windy Left Creek	4.4	11.9	2.5	8.9	2.2	5.6	3.4	25.2	7.5	34.5	8.2
Rocky River	6.6	16.6	9.0	12.1	12.0	4.5	5.4	10.3	18.0	26.1	25.4
Port Dick Creek[b]	19.9	64.1	44.6	65.3	41.6	4.5	12.0	55.4	41.7	54.2	6.9
Island Creek	15.0	15.3	35.0	27.9	16.6	0.1	7.2	6.7	25.0	24.4	12.5
South Nuka Island Creek	0.4	22.2	0.6	3.6	7.0	2.8	1.2	7.3	13.3	16.4	6.1
Desire Lake Creek	12.0	8.5	23.0	62.5	32.0	11.0	2.5	47.0	1.0	1.3	0.4
James Lagoon	6.0	5.1	4.0	9.0	6.6	1.1	1.7	4.9	3.8	4.4	0.4
Aialik Lagoon	5.0	3.0	4.0	9.4	6.0	1.5	0.7	0.8	—	—	d
Bear Creek	7.9	0.8	7.7	4.1	14.0	3.5	0.2	1.7	4.4	15.4[c]	2.3
Salmon Creek	21.0	0.5	10.2	2.1	8.3	1.7	0.1	1.6	—	c	5.3
Thumb Cove	7.9	4.9	4.2	14.5	4.0	2.7	0.3	4.2	—	3.4	0.4
Humpy Cove	4.0	2.0	2.5	5.0	0.9	0.3	0.4	1.0	3.8	—	d
Tonsina Creek	7.5	5.4	6.0	48.2	11.2	3.4	0.1	0.5	1.2	0.3	d
Big Kamishak River	5.0	—	—	—	5.0	—	1.0	—	—	—	d
Little Kamishak River	2.2	—	0.1	1.6	2.0	—	0.5	—	—	0.9	d
Amakdedori Creek	6.3	0.2	—	1.0	6.0	0.4	1.0	2.0	0.1	0.7	3.2
Bruin Bay River	75.0	4.0	110.0	3.5	1,200.0	24.0	29.0	350.0	19.0	74.9	3.2
Sunday Creek	12.0	4.7	12.0	11.4	109.0	29.7	18.0	103.0	2.8	20.9	2.9
Brown's Peak Creak	3.5	1.7	6.8	7.0	28.0	40.2	17.0	120.0	1.0	16.7	5.0
Totals	353.8	358.0	423.2	495.2	1,648.9	196.6	186.3	943.3	306.1	455.0	158.4

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Appendix Table 24. (page 4 of 5)

Location	YEAR										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Humpy Creek	36.0	14.1	89.3	9.0	78.3	17.5	12.8	22.4	30.5		
China Poot Creek	1.6	5.7	2.0	2.8	2.8	5.7	0.7	7.5	6.6		
Tutka Lagoon Creek	27.4	14.5	15.9	3.5	45.0	17.5	27.9	19.0	4.5		
Barabara Creek	11.9	4.5	10.8	2.4	12.5	2.8	3.9	5.6	2.3		
Seldovia River	43.4	24.4	48.5	17.8	39.1	31.5	12.2	53.5	12.3		
Port Graham River	12.8	7.6	10.0	7.0	12.5	12.6	9.7	15.6	10.3		
Dogfish Lagoon	0.3	1.3	13.3	2.3	20.0	6.7	12.4	11.1	2.0		
Port Chatham Creeks	22.2	3.3	14.0	8.6	42.7	22.2	10.7	16.7	17.9		
Windy Right Creek	13.6	2.2	11.4	9.9	13.9	19.5	5.2	23.0	10.3		
Windy Left Creek	25.9	3.0	31.6	2.5	64.6	12.9	24.0	20.1	61.8		
Rocky River	70.0	17.1	56.3	80.1	48.1	165.0	17.2	131.6	73.0		
Port Dick Creek[b]	37.0	18.1	6.6	23.2	36.9	59.1	8.5	124.4[e]	44.7		
Island Creek	12.1	28.3	10.6	40.1	71.1	83.6	8.6	70.8	81.8		
South Nuka Island Creek	34.3	1.4	6.2	6.8	9.3	14.0	2.4	13.6	20.7		
Desire Lake Creek	19.3	—	—	—	6.2	6.2	6.8	21.1	67.5		
James Lagoon	3.3	0.8	0.6	—	—	—	—	3.9	2.3		
Aialik Lagoon	—	—	1.1	—	—	0.4	0.9	—	—		
Bear Creek	6.6[c]	34.8[c]	38.6[c]	8.0[c]	6.3[c]	13.2[c]	7.8[c]	35.6[c]	3.0[c]		
Salmon Creek	c	c	c	c	c	c	c	c	c		
Thumb Cove	5.5	10.8	9.3	9.5	4.7	21.0	9.2	8.5	3.1		
Humpy Cove	0.9	2.2	1.8	3.4	2.2	1.2	4.0	1.7	0.3		
Tonsina Creek	3.2	7.0	0.5	0.4	0.4	2.3	0.5	6.6	2.8		
Big Kamishak River	—	—	—	16.7	—	2.0	5.7	14.9	—		
Little Kamishak River	—	—	—	—	—	—	4.2	13.0	—		
Amakdedori Creek	1.7	0.7	4.5	—	1.7	—	—	—	6.0		
Bruin Bay River	86.4	5.9	307.3	27.5	162.7	134.9	2.9	176.7	18.5		
Sunday Creek	57.8	3.1	95.9	2.8	52.5	24.0	5.3	39.8	26.2		
Brown's Peak Creak	41.6	1.3	96.7	2.4	42.3	7.9	2.6	9.8	19.2		
Totals	574.8	212.1	882.8	286.7	775.8	683.7	205.9	865.0	527.6		

-continued-

Appendix Table 24. (page 5 of 5)

Location	YEAR 2004	2005	2006	2007	2008	2009	2010	2011	1960-2000 Average	Escapement Goal
Humpy Creek									46.2	25-50
China Poot Creek									6.3	5
Tutka Lagoon Creek									15.5	6-10
Barabara Creek									4.8	18-24
Seldovia River									33.3	25-35
Port Graham River									14.6	20-40
Dogfish Lagoon									4.2	-
Port Chatham Creeks									12.0	10-15
Windy Right Creek									7.1	10
Windy Left Creek									15.3	30-50
Rocky River									35.6	50
Port Dick Creek[b]									41.0	20-100
Island Creek									15.9	12-18
South Nuka Island Creek									10.0	10
Desire Lake Creek									12.2	10-20
James Lagoon									4.4	5-10
Aialik Lagoon									3.8	5
Bear Creek									9.1	5
Salmon Creek									7.3	10
Thumb Cove									5.8	4
Humpy Cove									2.1	2
Tonsina Creek									4.7	5
Big Kamishak River									21.3	20
Little Kamishak River									10.8	20
Amakdedori Creek									8.0	5
Bruin Bay River									109.6	25-50
Sunday Creek									20.8	10-20
Brown's Peak Creak									16.7	10-20
Totals									434.2	377-593

[a] Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are peak aerial survey counts adjusted for survey conditions and time of surveys.

[b] Escapement figures for Port Dick Creek include escapements for High Tech and Well Flagged Creeks beginning in 1998.

[c] Escapement figure for Bear Creek represents the combined escapement for Bear and Salmon Creeks.

[d] Insufficient data for escapement estimates.

[e] Port Dick Creek counts derived from aerial data in 2000. Other methods also used to generate escapement estimates included ground surveys (91,795) and weir counts (142,450).

Appendix Table 25. Estimated chum salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1981 - 2001[a].

Year	Port Graham	Dogfish Lagoon	Rocky River	Pt. Dick Head	Island Creek	Big Kamishak	Little Kamishak	McNeil River	Bruin Bay	Ursus Cove	Cotton-wood	Iniskin Bay	Total
1981	4.8	11.5	12.5	4.1	17.5	11.0	6.0	30.0	10.0	10.0	9.0	9.0	135.4
1982	2.5	8.5	2.8	1.7	8.7	25.0	18.0	25.0	10.0	9.0	7.0	12.8	131.0
1983	1.9	5.3	4.0	4.5	36.2	25.0	25.0	48.0	5.5	7.7	8.3	12.0	183.4
1984	2.1	8.6	3.5	2.7	25.6	19.0	12.0	21.0	8.0	7.0	6.5	9.8	125.8
1985	0.5	4.9	2.5	1.0	9.1	6.0	4.5	9.5	2.0	3.0	3.0	5.0	51.0
1986	0.6	2.5	2.0	1.7	8.6	24.0	17.0	22.0	2.0	11.0	11.0	5.9	108.3
1987	1.5	2.0	0.2	6.1	13.2	12.0	18.0	26.0	10.0	9.9	17.0	9.1	125.0
1988	3.0	8.6	0.3	9.0	7.8	15.0	13.0	49.0	7.0	9.4	16.0	9.5	147.6
1989	1.3	1.8	1.2	3.3	4.8	30.0	12.0	34.0	8.0	6.3	8.0	5.9	116.6
1990	2.6	1.0	0.8	1.1	2.3	2.5	7.9	8.0	4.0	3.8	4.3	8.4	46.7
1991	1.1	3.1		7.4	17.3	8.7	8.4	10.0	6.0	1.3	7.7	8.3	79.3
1992	1.4	0.8	1.7	5.4	6.7	4.5	7.1	19.2	8.5	1.7	6.1	3.4	66.5
1993	2.5	5.4	0.1	2.5	3.6	9.1	6.3	17.4	6.0	7.7	12.0	8.0	78.8
1994	5.2	11.3	1.9	3.5	8.8	—	9.0	15.0	6.1	6.2	10.2	18.9	96.1
1995	3.8	4.2	5.1	3.3	7.7	b	b	14.4	6.6	11.1	15.4	22.7	90.9
1996	3.7	6.7	2.0	2.3	6.9	11.1	4.4	16.1	14.9	7.6	16.1	7.8	99.6
1997	4.1	12.7	1.1	1.9	5.2	—	—	27.5	8.8	6.2	5.6	15.4	88.5
1998	5.1	9.8	0.7	1.8	3.4	7.1	9.7	23.5	9.4	4.6	2.3	18.6	96.0
1999	6.6	18.8	5.4	2.9	16.4	11.6	8.9	13.5	10.3	21.0	12.0	23.3	150.7
2000	11.4	19.6	4.2	3.4	12.1	45.3	26.9	18.6	13.6	41.7	24.1	23.6	244.5
2001	6.0	6.1	3.0	1.8	6.3	36.3	27.2	17.0	21.8	37.7	15.9	13.8	192.9
20-Year Avg.	3.3	7.4	2.7	3.5	11.1	15.7	11.9	22.4	7.8	9.3	10.1	11.9	116.9
1981-90 Avg.	2.1	5.5	3.0	3.5	13.4	17.0	13.3	27.3	6.7	7.7	9.0	8.7	117.1
1991-2000 Avg.	4.5	9.2	2.5	3.4	8.8	13.9	10.1	17.5	9.0	10.9	11.2	15.0	115.7
Esc. goal	4-8	5-10	20	4	10-15	20	20	20-40	5-10	5-10	10	10	133-177

[a] Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are peak aerial survey counts adjusted for survey conditions and time of surveys.

[b] Insufficient data to generate escapement estimates.

Appendix Table 26. Previous biological escapement goals (BEG's) and new sustainable escapement goals (SEG's) for chum salmon systems in Lower Cook Inlet, Alaska.

		Former BEG			New SEG				% Change
System	District	BEG	Mid-point	Year Adopted	Low	Range High	Mid-point	n[a]	in Midpoint
Chum Salmon									
Port Graham River	Southern	4,000-8,000	6,000	1982	1,450	- 4,800	3,125	26	-48%
Dogfish Lagoon	Outer	5,000-10,000	7,500	1982	3,350	- 9,150	6,250	26	-17%
Rocky River	Outer	20,000	20,000	1982	1,200	- 5,400	3,300	25	-84%
Port Dick Creek	Outer	4,000	4,000	1982	1,900	- 4,450	3,175	26	-21%
Island Creek	Outer	10,000-15,000	12,500	1979	6,400	- 15,600	11,000	26	-12%
Big Kamishak River	Kamishak	20,000	20,000	1982	9,350	- 24,000	16,675	22	-17%
Little Kamishak River	Kamishak	20,000	20,000	1982	6,550	- 23,800	15,175	23	-24%
McNeil River	Kamishak	20,000-40,000	30,000	1988	13,750	- 25,750	19,750	26	-34%
Bruin River	Kamishak	5,000-10,000	7,500	1988	6,000	- 10,250	8,125	26	8%
Ursus Cove	Kamishak	5,000-10,000	7,500	1982	6,050	- 9,850	7,950	26	6%
Cottonwood Creek	Kamishak	10,000	10,000	1982	5,750	- 12,000	8,875	26	-11%
Iniskin Bay	Kamishak	10,000	10,000	1982	7,850	- 13,700	10,775	26	8%
								Mean:	-20%

[a] n = number of years of escapement data used in analysis.

Appendix Table 27. Previous biological escapement goals (BEG's) and new sustainable escapement goals (SEG's) for pink salmon systems in Lower Cook Inlet, Alaska.

		Former BEG			New SEG					% Change in
System	District	BEG	Mid-point	Year Adopted	Low		High	Range Mid-point	n[a]	Midpoint
Pink Salmon										
Humpy Creek	Southern	25,000-50,000	37,500	1982	21,650	-	85,550	53,600	26	43%
China Poot Creek	Southern	5,000	5,000	1982	2,900	-	8,200	5,550	26	11%
Tutka Creek	Southern	6,000-10,000	8,000	1982	11,600	-	18,900	15,250	18	91%
Barabara Creek	Southern	18,000-24,000	21,000	1982	1,900	-	9,000	5,450	26	-74%
Seldovia Creek	Southern	25,000-35,000	30,000	1982	19,050	-	38,950	29,000	26	-3%
Port Graham River	Southern	20,000-40,000	30,000	1977	7,000	-	19,850	13,425	26	-55%
Port Chatham	Outer	10,000-15,000	12,500	1982	7,800	-	21,000	14,400	25	15%
Windy Creek Right	Outer	10,000	10,000	1982	3,350	-	10,950	7,150	26	-29%
Windy Creek Left	Outer	30,000-50,000	40,000	1982	3,650	-	29,950	16,800	26	-58%
Rocky River	Outer	50,000	50,000	1982	9,350	-	54,250	31,800	26	-36%
Port Dick Creek	Outer	20,000-100,000	60,000	1982	18,550	-	58,300	38,425	26	-36%
Island Creek	Outer	12,000-18,000	15,000	1982	7,200	-	28,300	17,750	25	18%
S. Nuka Island Creek	Outer	10,000	10,000	1982	2,700	-	14,250	8,475	24	-15%
Desire Lake	Outer	10,000-20,000	15,000	1986	1,900	-	20,200	11,050	23	-26%
Bear Creek	Eastern	5,000	5,000	1982	2,950	-	8,450	5,700	24	14%
Salmon Creek	Eastern	10,000	10,000	1981	1,900	-	13,250	7,575	23	-24%
Thumb Cove	Eastern	4,000	4,000	1985	2,350	-	8,850	5,600	23	40%
Humpy Cove	Eastern	2,000	2,000	1985	900	-	3,200	2,050	22	3%
Tonsina Creek	Eastern	5,000	5,000	1982	500	-	5,850	3,175	23	-37%
Big Kamishak River	Kamishak	20,000	20,000	1982	3,500	-	11,000	7,250	11	-64%
Little Kamishak River	Kamishak	20,000	20,000	1982	600	-	3,700	2,150	12	-89%
Bruin River	Kamishak	25,000-50,000	37,500	1982	18,650	-	155,750	87,200	26	133%
Sunday Creek	Kamishak	10,000-20,000	15,000	1989	4,850	-	28,850	16,850	26	12%
Brown's Peak Creek	Kamishak	10,000-20,000	15,000	1989	2,450	-	18,800	10,625	26	-29%
									Mean:	-8%

[a] n = number of years of escapement data used in analysis.

Appendix Table 28. Previous biological escapement goals (BEG's) and new sustainable escapement goals (SEG's) for sockeye salmon systems in Lower Cook Inlet, Alaska.

		Former BEG			New SEG					% Change in Midpoint
System	District	BEG	Mid-point	Year Adopted	Low		High	Range Mid-point	n[a]	
Sockeye Salmon										
English Bay	Southern	10,000-20,000	15,000	1982	6,000	-	13,500	9,750	25	-35%
Delight Lake	Outer	10,000	10,000	1982	5,950	-	12,550	9,250	26	-8%
Desire Lake	Outer	10,000	10,000	1982	8,800	-	15,200	12,000	26	20%
Bear Lake	Eastern	5,000-8,000	6,500	1985	550	-	7,950	4,250	23	-35%
Aialik Lake	Eastern	2,000-5,000	3,500	1982	3,700	-	8,000	5,850	26	67%
Mikfik Lake	Kamishak	5,000-7,000	6,000	1988	6,300	-	12,150	9,225	26	54%
Chenik Lake	Kamishak	10,000	10,000	1990	1,880	-	9,300	5,590	25	-44%
Amakdedori Creek	Kamishak	1,000	1,000	1984	1,250	-	2,600	1,925	26	93%
									Mean:	14%

[a] n = number of years of escapement data used in analysis.

Appendix Table 29. Personal use/subsistence set gillnet salmon catches, in numbers of fish by species, and effort, Southern District, Lower Cook Inlet, 1969 – 2001[a].

Year	Permits Issued	Permits Returned Number	Permits Returned %	Permits Did Fish	Permits Not Fished	Total Catch Chinook	Sockeye	Coho	Pink	Chum	Other	Total
1969	47	44	93.6	35	9	0	9	752	38	0	17	816
1970	78	73	93.6	55	18	0	12	1,179	143	13	39	1,386
1971	112	95	84.8	53	42	2	16	1,549	44	7	20	1,638
1972	135	105	77.8	64	41	1	11	975	48	69	19	1,123
1973	143	128	89.5	82	46	0	18	1,304	84	40	9	1,455
1974	148	118	79.7	52	66	0	16	376	43	77	27	539
1975	292	276	94.5	221	55	4	47	1,960	632	61	95	2,799
1976	242	221	91.3	138	83	16	46	1,962	1,513	56	75	3,668
1977	197	179	90.9	137	42	12	46	2,216	639	119	84	3,116
1978	311	264	84.9	151	113	4	35	2,482	595	34	89	3,239
1979	437	401	91.8	238	163	6	37	2,118	2,251	41	130	4,583
1980	533	494	92.7	299	195	43	32	3,491	1,021	25	153[b]	4,765
1981	384	374	97.4	274	100	25	64	4,314	732	89	100	5,324
1982	395	378	95.7	307	71	39	46	7,303	955	123	8	8,474
1983	360	328	91.1	210	118	4	21	2,525	330	40	2	2,922
1984	390	346	88.7	219	127	4	25	3,666	821	87	25	4,628
1985	316	302	95.6	205	97	5	43	3,372	166	35	3	3,624
1986	338	310	91.7	247	63	7	68	3,831	3,132	56	0	7,094
1987	361	338	93.6	249	89	5	50	3,977	279	61	0	4,372
1988	438	404	92.2	287	117	14	60	4,877	1,422	75	0	6,448
1989	466	452	97.0	332	120	41	156	7,215	882	53	49	8,396
1990	578	543	93.9	420	123	12	200	8,323	1,846	69	0	10,450
1991	472	459	97.2	295	164	8	47	4,931	366	23	0	5,375
1992	365	350	95.9	239	111	5	63	2,277	643	21	0	3,009
1993	326	317	97.2	215	102	6	44	1,992	463	18	0	2,523
1994	286	284	99.3	224	60	66	80	4,097	1,178	18	0	5,439
1995	235	232	98.7	178	54	118	108	2,916	343	7	0	3,492
1996	299	293	98.0	213	80	302	102	3,347	1,022	24	0	4,797
1997	276	264	95.7	185	79	383	191	1,814	252	12	0	2,652
1998	227	214	94.3	142	72	135	20	1,461	167	5	0	1,788
1999	146	141	96.6	111	30	276	119	1,803	168	3	0	2,369
2000	213	206	96.7	151	55	104	28	2,064	304	4	0	2,504
2001	154	148	96.1	112	34	86	27	1,579	150	16	0	1,858
69-00 Avg.	299	280	93.6	195	85	51	59	3,027	702	44	26	3,909
91-00 Avg.	285	276	97.0	195	81	140	80	2,672	491	14	0	3,397

[a] Figures after 1991 include information from both returned permits and inseason oral reports.
[b] Steelhead trout (*Onchorhyncus mykiss*).

Appendix Table 30. Summary of personal use/subsistence salmon gillnet fishermen in the Southern District of Lower Cook Inlet (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery) by area of residence, 1981 - 2001.

	Homer/ Fritz Cr.		Anchorage Area[a]		Halibut Cove		Anchor Pt./ Ninilchik		Seldovia		Pt. Graham/ Nanwalek		Kenai/ Soldotna		Other		Total Permits
Year	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Issued
1981	274	71.4	43	11.2	8	2.1	37	9.6	3	0.8	1	0.3	14	3.6	4	1.0	384
1982	295	74.7	19	4.8	9	2.3	44	11.1	0	0.0	0	0.0	7	1.8	21	5.3	395
1983	267	77.8	24	7.0	3	0.9	33	9.6	8	2.3	0	0.0	0	0.0	8	2.3	343
1984	266	72.1	20	5.4	6	1.6	62	16.8	5	1.4	1	0.3	5	1.4	4	1.1	369
1985	251	79.4	15	4.7	6	1.9	33	10.4	6	1.9	0	0.0	2	0.6	3	0.9	316
1986	280	82.8	18	5.3	4	1.2	29	8.6	1	0.3	0	0.0	1	0.3	5	1.5	338
1987	284	78.7	25	6.9	3	0.8	37	10.2	7	1.9	0	0.0	2	0.6	3	0.8	361
1988	338	77.2	36	8.2	5	1.1	43	9.8	6	1.4	0	0.0	10	2.3	0	0.0	438
1989	348	74.7	36	7.7	5	1.1	51	10.9	8	1.7	0	0.0	6	1.3	12	2.6	466
1990	441	76.3	36	6.2	5	0.9	65	11.2	12	2.1	0	0.0	6	1.0	13	2.2	578
1991	384	81.4	27	5.7	8	1.7	41	8.7	6	1.3	0	0.0	4	0.8	2	0.4	472
1992	302	82.7	21	5.8	5	1.4	32	8.8	3	0.8	0	0.0	1	0.3	1	0.3	365
1993	242	74.2	25	7.7	5	1.5	44	13.5	3	0.9	0	0.0	5	1.5	2	0.6	326
1994	235	82.2	20	7.0	4	1.4	21	7.3	1	0.3	0	0.0	1	0.3	4	1.4	286
1995	191	81.3	15	6.4	7	3.0	20	8.5	1	0.4	0	0.0	0	0.0	1	0.4	235
1996	241	80.6	16	5.4	7	2.3	26	8.7	3	1.0	1	0.3	2	0.7	3	1.0	299
1997	232	84.1	13	4.7	3	1.1	20	7.2	4	1.4	0	0.0	1	0.4	3	1.1	276
1998	175	77.1	18	7.9	2	0.9	24	10.6	5	2.2	0	0.0	2	0.9	1	0.4	227
1999	96	65.8	18	12.3	1	0.7	23	15.8	3	2.1	0	0.0	4	2.7	1	0.7	146
2000	168	78.9	15	7.0	2	0.9	21	9.9	4	1.9	0	0.0	1	0.5	2	0.9	213
2001	109	70.8	10	6.5	3	1.9	20	13.0	5	3.2	0	0.0	4	2.6	3	1.9	154
20-Year Avg.	266	77.7	23	6.7	5	1.4	35	10.3	4	1.3	0	0.0	4	1.1	5	1.4	342
1981-90 Avg.	304	76.3	27	6.8	5	1.4	43	10.9	6	1.4	0	0.1	5	1.3	7	1.8	399
1991-00 Avg.	227	79.6	19	6.6	4	1.5	27	9.6	3	1.2	0	0.0	2	0.7	2	0.7	285

[a] After 1989, "Anchorage Area" includes Mat-Su Valley, Eagle River, Chugiak, and/or Fort Richardson.

Appendix Table 31. Subsistence salmon catch in numbers of fish by species for the village of Port Graham, Lower Cook Inlet, 1981 - 2001[a].

	SALMON HARVEST						Dolly	Permits
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Varden	Reporting
1981	41	1,521	450	298	111	2,421	183	33
1982	107	820	602	858	183	2,570	15	34
1983	67	1,026	431	174	95	1,793	1	30
1984	27	2,037	125	269	6	2,464	0	23
1985	141	481	91	32	24	769	0	23
1986	123	274	179	237	13	826	12	27
1987	20	219	575	230	70	1,114	20	33
1988	96	411	459	542	75	1,583	18	27
1989	51	94	460	640	58	1,303	159	20
1990	211	524	803	1013	102	2,653	666	32
1991	155	58	541	1494	185	2,433	257	33
1992	129	98	475	745	178	1,625	398	36
1993	253	154	346	997	135	1,885	214	31
1994	273	260	859	866	461	2,719	1,133	42
1995	486	379	369	786	376	2,396	66	49[b]
1996	255	684	341	312	251	1,843	161	48
1997	202	324	203	497	152	1,378	57	25
1998	164	271	243	459	240	1,377	20	16
1999	383	360	427	150	214	1,534	64	21
2000	241	784	252	355	483	2,115		35
2001[c]								
1981-2001 Average	171	540	412	548	171	1,841	181	31

[a] Data source: ADF&G, Subsistence Division, data files..
[b] Salmon totals and permits include 3 reports from non-residents of Port Graham Village.
[c] Information for 2001 was unavailable at time of publishing.

Appendix Table 32. Subsistence salmon catch in numbers of fish by species for the village of Nanwalek (formerly English Bay), Lower Cook Inlet, 1981 – 2001[a].

	SALMON HARVEST						Dolly	Permits
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Varden	Reporting
1981	97	1,149	375	576	66	2,263	874	24
1982	17	1,534	891	2,074	37	4,553	75	27
1983	0	1,454	40	13	0	1,507	0	16
1984	18	1,225	385	404	0	2,032	0	1
1985	5	696	530	313	2	1,546	0	1
1986	2	373	302	825	1	1,503	144	17
1987	1	682	339	484	44	1,550	20	22
1988	8	610	385	1,214	35	2,252	70	21
1989	0	63	695	855	16	1,629	523	24
1990	54	638	614	1,947	49	3,302	2,833	28
1991	8	630	1,512	3,093	36	5,279	848	30
1992	71	437	675	676	58	1,917	1,331	35
1993	24	994	567	1666	122	3,373	577	25
1994	27	570	511	1113	43	2,264	473	28
1995	99	1,416	169	487	0	2,171	465	38
1996	55	1,060	598	437	25	2,175	221	27
1997	0	1	0	14	1	16	0	1
1998	5	18	0	0	0	23	31	3
1999	102	2,755	1,320	1,873	890	6,940	631	32
2000	18	3,880	1579	1251	471	7,199	.	32
2001	29	909	1,434	196	1,238	3,806		
1981-2001 Average	30	1,005	615	929	149	2,730	480	22

[a] Data source: ADF&G Subsistence Division files.

Appendix Table 33. Salmon set gillnet catch in numbers of fish by species and permit/effort information for the Seldovia area subsistence fishery, Lower Cook Inlet, 1996 - 2001.

	NUMBER OF PERMITS				NUMBER OF SALMON HARVESTED					
YEAR	Issued	Returned	Fished	Not Fished	Chinook	Sockeye	Coho	Pink	Chum	Total
Early Season: April – May[a]										
1996	41	41	13	28	51	7	0	0	0	58
1997	19	16	12	4	44	19	0	0	0	63
1998	20	19	10	9	132	61	0	8	0	201
1999	16	15	12	3	150	130	0	0	38	318
2000	28	21	17	4	189	249	0	0	14	452
2001	19	17	14	3	134	124	0	0	0	258
Average	25	22	13	10	113	93	0	2	10	218
Late Season: August										
1996	4	3	1	2	0	1	0	0	0	1
1997	1	1	0	1	0	0	0	0	0	0
1998	3	2	1	1	0	0	0	0	0	0
1999	0									
2000	0									
2001	0									
Average	2	2	1	1	0	0	0	0	0	0

[a] Season dates in 1996 and 1997 were from April 1 – May 20; subsequent years were from April 1 – May 30.

Appendix Table 34. ADF&G, CIAA, and/or CRRC salmon stocking projects and releases of salmon fry, fingerling, and smolt, in millions of fish, Lower Cook Inlet, 1984 - 2001.

	JUVENILE SOCKEYE SALMON													
YEAR	Leisure Lake	Hazel Lake	Chenik Lake	Paint Upper	River Lower	Lakes Elusivak	Kirschner Lake	Bruin Lake	Ursus Lake	Port Dick Lake	English Bay Lakes	Bear Lake	Grouse Lake	*TOTAL SOCKEYE*
1984	2.110													2.100
1985	2.018													2.018
1986	2.350		0.839	0.500	0.320									4.009
1987	2.022		1.000				0.867			0.705				4.594
1988	2.100	0.783	2.600	1.100	0.552	0.521	0.521			0.222				8.399
1989	2.000	1.000	3.500	1.000	0.500	0.500	0.250			0.430		2.200		11.380
1990	1.750	1.250	3.250	1.000	0.500	0.500	0.250	0.500			0.350	2.400		11.750
1991	2.000	1.300	2.200	0.500	0.250		0.250	0.250			0.241	1.619		8.610
1992	2.000	1.000	2.750	0.500	0.250		0.250	0.250	0.250		0.290	2.370		9.910
1993	2.000	1.000	1.400	0.500	0.250		0.250	0.250	0.250		0.581	1.813		8.294
1994	0	0	0	0	0		0.300	0	0		0.800	0.170		1.270
1995	1.632	1.061	1.129	0.337	0.251		0.251	0.251	0.252		0	0.360		5.524
1996	1.490	1.030	0.951	0.500	0		0.250	0.250	0.250		0.155	0.864	0.217	5.957
1997	2.000	1.000	0				0.250				0.199	0.788	2.425	6.662
1998	2.005	1.302					0.250				0	0.265	2.021	5.843
1999	0.265	0.453					0.173				1.149[a]	1.380	0	3.420
2000	1.708	1.248					0.248				1.006[b]	1.794	0	6.004
2001	0.089	0					0				0	0.145		0.234
AVG.	1.634	0.882	1.635	0.540	0.261	0.507	0.290	0.250	0.200	0.452	0.398	1.234	0.584	5.836

[a] Sockeye release at English Bay consisted of 918,000 fry released in Nov. 1999 and 231,000 fry held over winter for release in spring 2000.

[b] Sockeye release at English Bay consisted of 906,000 fry released in summer 2000 and an estimated 100,000 fry held over winter for expected release in spring 2001.

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Appendix Table 34. (page 2 of 3)

YEAR	JUVENILE PINK SALMON					JUVENILE CHINOOK SALMON					
	Tutka Bay Hatchery	Halibut Cove Lagoon	Homer Spit	Port Graham Hatchery	*TOTAL PINKS*	Seldovia Bay	Halibut Cove Lagoon	Homer Early	Spit Late	Resurrection Bay[c]	*TOTAL CHINOOK*
1984	19.560				19.560			0.080		0.111	0.191
1985	23.500				23.500		0.098	0.152		0.186	0.436
1986	23.100	2.000			25.100		0.101	0.104		0.101	0.306
1987	20.500	3.000	0.295		23.795	0.084	0.094	0.104		0.096	0.378
1988	12.000	3.000	0.300		15.300	0.084	0.094	0.104		0.205	0.487
1989	30.100	6.000	0.332		36.432	0.108	0.115	0.104		0.307	0.634
1990	23.600	6.000	0.303		29.903	0.099	0.112	0.212		0.329	0.752
1991	23.600	6.000	0.303	0.255	30.158	0.091	0.092	0.191		0.466	0.840
1992	23.600	6.000	0.300	1.800	31.700	0.113	0.117	0.226	0.126	0.370	0.952
1993	43.000	6.000		0	49.000	0.107	0.100	0.212	0.100	0.290	0.809
1994	61.000			1.295	62.295	0.106	0.107	0.192	0.157	0.270	0.832
1995	63.000			0.358	63.358	0.113	0.036	0.228	0.124	0.315	0.816
1996	105.000			6.470	111.470	0.109	0.103	0.101	0.121	0.415	0.849
1997	89.000			0.910	89.910	0.092	0.078	0.216	0.105	0.321	0.812
1998	90.000			0	90.000	0.079	0.073	0.137	0.120	0.307	0.716
1999	60.132			4.617	64.749	0.074	0.079	0.163	0.059	0.174	0.549
2000	65.120			1.144	66.264	0.068	0.083	0.220		0.322	0.693
2001	99.336			27.299	126.635	0.103	0.107	0.208		0.228	0.646
AVG.	48.619	4.750	0.306	4.013	57.688	0.095	0.093	0.164	0.114	0.267	0.467

[c] Chinook releases in Resurrection Bay are a cumulative total for all locations.

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Appendix Table 34. (page 3 of 3)

	JUVENILE COHO SALMON					
			Homer Spit			
YEAR	Caribou Lake	Seldovia Lake	Early	Late	Resurrection Bay[c]	TOTAL COHO
1984					0.341	0.341
1985	0.139	0.083			0.407	0.629
1986	0.138	0.072			0.622	0.832
1987	0.150	0.045			0.604	0.799
1988	0.150	0.045		0.060	0.530	0.785
1989	0.182	0.080		0.143	0.339	0.744
1990	0.180	0.050		0.123	1.126	1.479
1991	0.180	0.050		0.100	0.599	0.929
1992	0.150			0.100	0.265	0.515
1993	0.150			0.116	0.844	1.110
1994	0.064			0.156	0.560	0.780
1995				0.110	0.701	0.811
1996				0.150	0.676	0.826
1997				0.120	0.808	0.928
1998				0.148	0.726	0.874
1999				0.137	1.603	1.740
2000				0.122	0.618	0.740
2001			0.125	0.100	0.431	0.656
AVG.	0.148	0.061	0.125	0.120	0.655	0.862

[d] Coho releases in Resurrection Bay are a cumulative total for all locations.

Appendix Table 35. Catch of Pacific herring in short tons and effort in number of permits by district in the commercial sac roe seine fishery, Lower Cook Inlet, 1981 - 2001[a].

	Southern		Kamishak		Eastern		Outer		Total	
Year	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits
1981	---		---		---		---		---	
1982	---		---		---		---		---	
1983	---		---		---		---		---	
1984	---		---		---		---		---	
1985	---		1,132	23	204	7	12	2	1,348	29
1986	---		1,959	54	167	4	28	3	2,154	57
1987	---		6,132	63	584	4	202	9	6,918	69
1988	---		5,548	75	0	0	0	0	5,548	75
1989	170	6	4,801	75	0	0	0	0	4,971	75
1990	---		2,264	75	---		---		2,264	75
1991	---		1,992	58	0	0	0	0	1,992	58
1992	---		2,282	56	0	0	0	0	2,282	56
1993	---		3,570	60	---		---		3,570	60
1994	---		2,167	61	---		---		2,167	61
1995	---		3,378	60	---		---		3,378	60
1996	---		2,984	62	---		---		2,984	62
1997	---		1,746[b]	45[b]	---		---		1,746	45
1998	---		331[b]	20[b]	---		---		331	20
1999	---		100[c]	1[c]	---		---		100	1
2000	---		---		---		---		---	
2001	---		---		---		---		---	
20-Year Average	170	6	2,878	56	136	2	35	2	2,975	57
1981-90 Average	170	6	3,639	61	191	3	48	3	3,867	63
1991-2000 Average	---		2,306	53	0	0	0	0	2,306	53

[a] Data source: ADF&G fish ticket database.
[b] Includes both commercial harvest and ADF&G test fish harvest.
[c] Commercial fishery closed, ADF&G test fish harvest only.

Appendix Table 36. Preseason estimates of biomass and projected commercial sac roe seine harvests, and actual harvests, for Pacific herring (*Clupea pallasi*) in short tons, average roe recovery, numbers of permits making landings, and exvessel value in millions of dollars, Kamishak Bay District, Lower Cook Inlet, 1981 - 2001.

Year	PRESEASON Forecasted Biomass (st)	PRESEASON Projected Harvest (st)[a]	Actual Commercial Harvest (st)[a]	Average Roe %	No. of Permits w/Landings	Exvessel Value[b] ($$ millions)
1981	[c]	---	CLOSED	---	---	---
1982	[c]	---	CLOSED	---	---	---
1983	[c]	---	CLOSED	---	---	---
1984	[c]	---	CLOSED	---	---	---
1985	[c]	[d]	1,132	11.3	23	1.00
1986	[c]	[d]	1,959	10.4	54	2.20
1987	[c]	3,833	6,132	11.3	63	8.40
1988	[c]	5,190	5,548	11.1	74	9.30
1989	37,785	5,000	4,801	9.5	74	3.50[e]
1990	28,658	2,292	2,264	10.8	75	1.80
1991	17,256	1,554	1,992	11.3	58	1.30
1992	16,431	1,479	2,282	9.7	56	1.40
1993	28,805	2,592	3,570	10.2	60	2.20
1994	25,300	3,421	2,167	10.6	61	1.50
1995	21,998	2,970	3,378	9.8	60	4.00
1996	20,925	2,250	2,984	10.1	62	6.00[e]
1997	25,300	3,420	1,746	9.3	45	0.40
1998	19,800	1,780	331	8.5	20	0.07
1999	[f]	---	CLOSED	---	---	---
2000	6,330	---	CLOSED	---	---	---
2001	11,352	---	CLOSED	---	---	---
1981-2000 Average	22,887	2,982	2,878	10.3	56	3.08

[a] Kamishak Bay allocation only, does not include Shelikof Strait food/bait allocation.
[b] Exvessel values exclude any postseason retroactive adjustments (except where noted).
[c] Prior to 1989, preseason forecasts of biomass were not generated.
[d] Prior to 1987, preseason harvest projections were not generated.
[e] Includes retroactive adjustment.
[f] 1999 preseason biomass calculated as a range of 6,000 to 13,000 st.

Appendix Table 37. Summary of herring sac roe seine fishery openings and commercial harvests in the Kamishak Bay District of Lower Cook Inlet, 1969 - 2001.

Year	Dates of Openings	Total Hrs. Open	Harvest (short tons)	Catch Rate (short tons/ hour open)	Number of Permits w/Landings
1969-73	No closed periods				
1974	1/1 - 5/20		2,114		26
1975	1/1 - 6/6	(Closed Iniskin Bay 5/17)	4,119		40
1976	1/1 - 5/21	(Closed Iniskin Bay 5/17; reopened Kamishak 6/2)	4,824		66
1977	1/1 - 5/31	(Closed Kamishak Dist. 5/12; reopened 5/14 - 5/17; reopened 5/29 - 5/31)	2,908		57
1978[a]	4/16 - 5/31	96	402	4.2	44
1979	5/12 - 5/15	72	415	5.8	36
1980 through 1984	CLOSED	0	0		
1985	4/20 - 6/15	1,350 (56.2 days)	1,132	0.8	23
1986	4/20 - 6/13	1,303 (54.3 days)	1,959	1.5	54
1987	4/21 - 4/23	65	6,132	94.3	63
1988	4/22 - 4/29	42	5,548	132.1	74
1989	4/17 - 4/30	24.5	4,801	196.0	74
1990	4/22 - 4/23	8	2,264	283.0	75
1991	4/26	1	1,922	1,922.0	58
1992	4/24	0.5	2,282	4,564.0	56
1993	4/21	0.75	3,570	4,760.0	60
1994	4/25	0.5	778	1,556.0	35
	4/29	1.0	1,338	1,338.0	53
1995	4/27	0.5	1,685	3,370.0	45
	4/28	1.0	1,693	1,693.0	44
1996	4/24	0.5	2,984	5,968.0	62
1997	4/25[b]	0.5	0	0	0
	4/29	1.5	1,580	1,053.3	42
	4/30	8.0	61	7.6	[c]
	5/1	12.0	51	4.3	4
	5/22[d]	[d]	54	[d]	-
1998	4/21	0.5	160	320.0	12
	4/22	2.0	136	68.0	11
	5/14[d]	[d]	10	[d]	-
	5/22[d]	[d]	23	[d]	-
1999	CLOSED	CLOSED	100[d]	[d]	-

- continued -

Appendix Table 37. (page 2 of 2)

Year	Dates of Openings	Total Hrs. Open	Harvest (short tons)	Catch Rate (short tons/ hour open)	Number of Permits w/Landings
2000	CLOSED	CLOSED	0		
2001	CLOSED	CLOSED	0		

[a] Management by emergency order began.
[b] Despite the open fishing period, the entire fleet collectively agreed not to fish due to ongoing price negotiations with processors.
[c] To comply with **AS 16.05.815 CONFIDENTIAL NATURE OF CERTAIN REPORTS AND RECORDS,** effort data has been masked where fewer than four vessels fished in a given area.
[d] ADF&G test fishing harvest.

Appendix Table 38. Estimates of Pacific herring (*Clupea pallasi*) total biomass in short tons using two different methods, actual commercial sac roe seine harvest in short tons, and percent exploitation, Kamishak Bay District, Lower Cook Inlet, 1981 - 2001.

Year	Aerial Survey Total Biomass Estimate (st)[a]	ASA Model Total Biomass Estimate (st)[b,c]	Actual Commercial Harvest (st)	Estimated Exploitation Rate (%)[b]
1981	5,130	12,590	CLOSED	----
1982	4,835	20,356	CLOSED	----
1983	4,750	24,552	CLOSED	----
1984	6,500	26,237	CLOSED	----
1985	13,320	30,093	1,132	3.8
1986	26,001	29,843	1,959	6.6
1987	35,332	32,473	6,132	18.9
1988	29,548	26,869	5,548	20.6
1989	35,701	23,450	4,801	20.5
1990	19,664	17,534	2,264	12.9
1991	18,163[d]	16,356	1,992	12.2
1992	24,077	16,228	2,282	14.1
1993	32,439	17,914	3,570	19.9
1994	25,344[d]	14,929	2,167	14.5
1995	25,115	13,920	3,378	24.3
1996	21,121	10,080	2,984	29.6
1997	--------	6,431	1,746	27.1
1998	--------	4,736	331	7.0
1999	--------	5,165	CLOSED	----
2000	--------	6,231	CLOSED	----
2001	--------	7,773	CLOSED	----
1981-2000 Average	20,214	17,799	2,878	16.2

[a] Diverse methods have been used to generate historical aerial survey biomass estimates; after 1989, see LCI herring forecast report or statewide herring forecast document to determine specific method for individual year.

[b] Figures are based on the best available data at the time of publishing and are subject to change; therefore all figures herein supercede those previously reported.

[c] ASA model integrates heterogeneous data sources and simultaneously minimizes differences between observed and expected return data to forecast the following year's biomass as well as hindcast previous years' biomass.

[d] Due to poor aerial survey conditions, biomass was calculated from the preseason estimate of abundance, adjusted to match observed age composition samples in the commercial catch.

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