Fishery Management Report No. 11-26

2010 Lower Cook Inlet Annual Finfish Management Report

by

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and

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Alaska Department of Fish and Game **Divisions of Sport and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

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ABSTRACT

The 2010 Lower Cook Inlet commercial all-species salmon harvest of 468,200 fish was the lowest in the management area in nearly 35 years. The fishery was characterized by below 10-year average harvests of sockeye *Oncorhynchus nerka*, pink *O. gorbuscha*, Chinook *O. tshawytscha*, and coho *O. kisutch* salmon, but above the 10-year average for chum *O. keta* salmon. The harvest was dominated by pink salmon at 59%, followed by chum salmon and sockeye salmon at 20% each. The commercial fishery exvessel value totaled approximately $1.78 million, about 12% lower than the recent 10-year average. Participation remained at relatively low levels for the only two allowable gear groups, purse seine and set gillnet, with seine effort marginally exceeding the all-time low. For the second consecutive season, seine catches and effort were significantly affected by the regulatory management plan for Trail Lakes Hatchery. Despite the continued importance of salmon enhancement in commercial harvests due to numerous sockeye salmon lake stocking projects and remote releases, no hatchery-produced pink salmon contributed to Lower Cook Inlet commercial catches in 2010 for the third straight season. The harvest of salmon for cost recovery purposes by hatchery facilities in Lower Cook Inlet, expressed as a proportion of total commercial catches, was estimated at approximately 15% in numbers of fish and 34% in exvessel value for the season.

The Southern District personal use set gillnet fishery in Kachemak Bay produced an estimated harvest of 875 coho salmon, failing to achieve the guideline harvest range of 1,000 to 2,000 coho salmon for the second consecutive season. Active participation in the fishery, at 82 permits actively fished, was slightly less than the recent 10-year average of 92.

The commercial Pacific herring *Clupea pallasi* fishery in Lower Cook Inlet was closed during 2010 for the 12th successive season due to continuing low abundance levels.

Key words: Lower Cook Inlet, commercial salmon harvest, salmon enhancement, hatchery, cost recovery, personal use fishery, purse seine, set gillnet, escapement, sockeye *Oncorhynchus nerka*, pink *O. gorbuscha*, chum *O. keta*, coho *O. kisutch*, Pacific herring *Clupea pallasi*, Annual Management Report, AMR.

2010 COMMERCIAL SALMON FISHERY

INTRODUCTION

The Lower Cook Inlet (LCI) management area, 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, is divided into five commercial salmon fishing districts (Figure 1). Barren Islands District is the only fishing district where no salmon fishing occurs, 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.

The 2010 LCI all-species commercial salmon harvest of 468,200 fish (Table 1, Figure 8) was the lowest since 1976, representing less than 28% of the recent 10-year average of 1.69 million (Appendix A5). The overall harvest additionally fell far short of the cumulative preseason forecast of 1.04 million fish (revised to 1.02 million; Appendix C1), in large part due to the low harvests of natural runs of pink salmon *Oncorhynchus gorbuscha* (Table 5; Figure 11) and very poor runs of sockeye salmon *O. nerka* to nearly all enhancement project sites in the management area (Tables 1 and 3; Figure 9). On the other hand, commercial harvests of chum salmon *O. keta*, at nearly 95,000 fish (Tables 1 and 6; Figure 12), were greater than the recent 10- and 20-year averages (Appendix A22). Higher prices paid for all salmon species compared to the previous season (Appendix A3) yielded an estimated exvessel value of approximately $1.78 million (Table 7), making the value of the 2010 LCI harvest only 12% less than the recent 10-year average (Appendix A2) despite the modest catches. Seine fishing effort was similar to the previous year (a record low), with only 14 of 85 permit holders making deliveries this season (Appendix A1), continuing the recent trend of low participation for that gear group. The number

of active set gillnet permits in 2010 was 21 (Appendix A1), a minor increase over the 2009 level and slightly exceeding the recent 10-year average of 20.

For the fifth consecutive season, LCI commercial salmon harvests in 2010 were not dominated by hatchery and enhanced fish production, primarily because no pink salmon returned to Tutka Hatchery, where operations were suspended after 2004, or to Port Graham Hatchery, where no pink juveniles have been released since 2007. However, hatchery production still made significant contributions to sockeye salmon catches, with approximately three-fourths of the LCI sockeye salmon harvest in numbers of fish attributed to Cook Inlet Aquaculture Association (CIAA) lake stocking, fertilization, and/or remote release projects. These projects were conducted at Leisure and Hazel Lakes and (more recently) Tutka Bay Lagoon in the Southern District, Kirschner Lake in the Kamishak Bay District, and Bear Lake in the Eastern District. In major contrast to seasons prior to 2009, however, and for the second consecutive season, the recently adopted *5 AAC 21.373 Trail Lakes Hatchery Sockeye Salmon Management Plan* dictated that all CIAA Special Harvest Areas (SHAs) in LCI be managed primarily to achieve CIAA's corporate cost recovery and broodstock goals for that facility. Because runs of sockeye salmon returning to CIAA's stocking projects were so poor in 2010, all fish were required in pursuit of their hatchery revenue goal, and virtually all common property fishing targeting these runs was precluded for the second straight season. Another sockeye salmon enhancement project, conducted by the Port Graham Hatchery Corporation (PGHC) in the Southern District, did not contribute any sockeye salmon to LCI commercial catches in 2010. The overall area-wide commercial harvest of sockeye salmon in LCI, at just over 93,000 fish, was the lowest for this species since 1980 and represented less than one-third of the recent 10-year average of 303,000 fish (Appendix A13).

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered fair to poor this year, and the overall catch of 278,200 fish (Tables 1 and 5, Figure 11) was less than half of the preseason harvest forecast of 567,000 pink salmon. Additionally, the total pink salmon harvest in 2010 represents less than one-quarter of the average over the past two decades (Appendix A5), but this time period was dominated by LCI hatchery production. The only directed openings to target natural runs of pink salmon this season occurred in Port Dick (Outer District), where the majority of the management area's cumulative total catch was taken. Although Bruin Bay District in Kamishak Bay District remained open to commercial fishing this season, the pink salmon run to Bruin Bay River was weak and therefore attracted no effort.

The percentage of the overall LCI salmon harvest utilized as hatchery cost recovery to recoup expenses incurred by the various stocking and enhancement projects throughout the management area was similar to the previous season but did not approach the historical highs seen during the early part of the decade, when hatchery pink salmon production was still occurring. However, despite taking only an estimated 15% of the all-species salmon harvest in numbers of fish to support the LCI lake stocking and remote release programs this season, CIAA hatchery catches generated approximately 34% of the cumulative exvessel value of the LCI commercial fishery (Table 7) through cost recovery, down from the estimated 49% in 2009. For the second consecutive year, two factors contributed to such relatively high percentages: all fish harvested for hatchery cost recovery this season were higher valued sockeye salmon; and CIAA required all fish returning to their LCI enhancement sites to achieve their revenue goal (no common property harvest on any of these runs).

The shortage of regular tender service in remote districts, a persistent factor affecting the amount and distribution of seine effort in LCI over the past decade, and the ensuing harvest of salmon, seemed to have only a minor impact on overall harvests during 2010. The policy to severely restrict or eliminate such remote tender service was adopted in 1994 by major processors as a means to reduce costs. 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. Up until very recently, however, seiners were forced to devise their own means to transport fish from these remote areas to a processing facility. Due to equipment limitations and the high cost of contracting out for tendering services, significant numbers of fishermen were often unable to fish in remote areas, while others retained the flexibility to fish these traditional areas because of onboard chilling equipment. Strong markets and high prices for all salmon species in 2010, and for pink salmon in particular, seemed to reduce processors' apprehension about providing remote tender service, contributing to the Outer District's dominance of LCI pink salmon catches.

Prices paid for all species of salmon in LCI showed increases in 2010 (Appendix A3), with a modest increase for Chinook *O. tshawytscha* but relatively sharp increases for the remaining four species. Nonetheless, despite these relatively high prices, the majority of seine permit holders in LCI chose to refrain from participating in 2010, contributing to a near-record low amount of seine effort.

PRESEASON SUMMARY

The projected 2010 LCI all-species salmon harvest of approximately 1.04 million fish was just under two-thirds of the recent 20-year average actual harvest. However, that original projection was revised just prior to the field season to a new all-species harvest total of approximately 1.02 million fish due to the deletion of all sockeye salmon predicted to return to Port Graham Hatchery in 2010. Formal total forecasts for natural salmon runs other than pink salmon were not prepared because escapement and age, weight, and length data are limited for those species. However, the pink salmon catch projections were calculated from relative estimates of parental run size, average age composition data, and recent relative productivity trends.

Preseason LCI harvest projections and actual catches for all species in 2010 are listed below:

Species	Original Projected Harvest	Revised Projected Harvest	Actual Harvest	20-year (1990–2009) Average
Chinook	1,200	1,200	39	1,221
Sockeye	411,100	388,700	93,064	289,859
Coho	13,100	13,100	2,111	11,481
Pink	567,000	567,000	278,211	1,290,250
Chum	46,800	46,800	94,755	48,550
Total	**1,039,200**	**1,016,800**	**468,180**	**1,641,361**

The enhanced run to Bear Lake in the Eastern District was expected to comprise the bulk of the LCI sockeye salmon harvests this season, while those to Leisure and Hazel Lakes and Tutka Bay Lagoon in the Southern District, and Kirschner Lake in the Kamishak Bay District, were

expected to provide lesser contributions. Although Chenik Lake in the Kamishak Bay District benefited from regular sockeye salmon fry stocking and intermittent fertilization during the 1980s and early 1990s, the program was suspended after 1996 due to an epizootic of Infectious Hematopoietic Necrosis Virus (IHNV) within the system in previous years. Despite this lack of enhanced production, sockeye salmon runs to Chenik Lake from 2003–2009 were sufficiently strong to support directed effort, the first for stock in over a decade, resulting in annual commercial harvests ranging from 12,000 to 171,000 sockeye salmon between 2004 and 2009. Because of the strong runs the previous seven seasons, the outlook for the adult sockeye salmon run at Chenik Lake in 2010 was cautiously optimistic, and many fishermen expected reasonable harvest opportunities.

With the suspension of operations at Tutka Bay Hatchery after the 2004 season and at Port Graham Hatchery after the 2006 season, no pink salmon were slated to return to either facility in 2010. Thus, for the third consecutive year, no hatchery-produced pink salmon were expected to contribute to LCI catches this season.

Despite generally good pink salmon escapements to major systems in 2008, the harvest projection totaled only about 567,000 naturally produced pink salmon throughout the entire LCI management area this season. Port Dick, Windy Bay, and Rocky Bay Subdistricts in the Outer District all figured to provide good potential for harvestable surpluses. Bruin Bay, Ursus Cove, and Rocky Cove Subdistricts in the Kamishak Bay District were only expected to experience moderate runs, and the projected fishing effort in these remote districts was debatable due to the modest run sizes and questionable tender service. Humpy Creek and Seldovia Bay Subdistricts also showed promise, although directed seine effort had not been allowed in these subdistricts for many seasons.

Because nine of the past ten seasons' chum salmon runs and commercial catches in LCI were relatively strong, the chum salmon harvest outlook in 2010 once again appeared plausibly bright. Most west-side LCI systems experienced good to excellent escapements during the 2005 and 2006 parent years, and recent years' runs to area systems have continued to display a generally encouraging trend. Numerous systems, especially those in northern Kamishak Bay, seemed to effectively rebound from chronic weak annual runs in the 1990s decade, while chum salmon runs to the larger Big and Little Kamishak Rivers have also been comparatively strong during nine of the past ten years. The good catches during this time period, as well as the recent overall trend, suggested that harvest opportunities for chum salmon could be numerous in 2010.

2010 SEASON SUMMARY

Chinook Salmon

The 2010 harvest of Chinook salmon, not normally a commercially important species in LCI, totaled less than 50 fish (Table 2), or only 5% of the average during the last decade (Appendix A12) and the lowest figure for this species since 1960. As is typically the case, the majority of the catch (74%) was taken in the Southern District by commercial set gillnetters, while seiners in Kamishak Bay District harvested the remainder.

Sockeye Salmon

The 2010 sockeye salmon harvest of 93,100 fish (Table 3; Figure 9) was the lowest for LCI since 1980, which is approximately the time when sockeye salmon enhancement efforts first began in the management area. The 2010 total represented less than one-third of the 10-year average of

303,300 fish (Appendix A13). While sockeye salmon accounted for 20% of the LCI salmon harvest in total numbers of fish, the species provided 45% of the exvessel value of the entire salmon fishery this season (Table 7). And for the second straight year, the 2010 LCI commercial sockeye salmon harvest was heavily influenced by *5 AAC 21.373 Trail Lakes Hatchery Sockeye Salmon Management Plan*, which directed the ADF&G (department) to manage all CIAA hatchery SHA's to achieve the facility's preseason revenue goal of $1.43 million. As a result, approximately three-fourths of the commercially harvested sockeye salmon in LCI were taken for hatchery cost recovery, versus only 25% for the common property fishery. In addition, extremely weak runs to key enhanced systems at Bear Lake in the Eastern District and Leisure and Hazel Lakes in the Southern District contributed to much lower than anticipated sockeye salmon catches. Natural sockeye salmon runs within the management area were considered only fair, but sustainable escapement goals (SEG's) were achieved at five of six major systems.

At Bear Lake in Resurrection Bay of the Eastern District, the management strategy this season was dictated by the previously mentioned management plan for Trail Lakes Hatchery (*5 AAC 21.373*). Essentially this plan directed the department to manage all CIAA hatchery SHA's in LCI, including the Bear Lake SHA in Resurrection Bay, to achieve the facility's seasonal revenue goal, prior to allowing any common property fishing inside any SHA. Based on the preseason projections in 2010, CIAA expected that not all sockeye salmon returning to CIAA enhancement sites in LCI would be required to achieve the revenue goal, and that the potential for common property openings was reasonably good. However, the run to Resurrection Bay fell far short of projections, and only hatchery fishing could be allowed. The cumulative hatchery catch of these "early run" sockeye salmon in Resurrection Bay totaled less than 22,000 fish (Table 3; Appendix A17) despite a preseason harvest forecast of 175,000 fish. Although the desired inriver sockeye salmon goal for Bear Lake was easily achieved, the dismal run and resultant catches essentially dictated that sockeye salmon returning to CIAA's remaining LCI enhancement sites would all be required in pursuit of the Trail Lakes Hatchery revenue goal.

Sockeye salmon runs to traditional Southern District enhancement sites, which have at times provided the bulk of the annual LCI sockeye salmon catch, were weak for the seventh consecutive season, continuing a pattern of disappointing runs to these stocking and release locations. Although harvests of enhanced runs of sockeye salmon returning to Leisure and Hazel Lakes were originally predicted to cumulatively total over 71,000 fish in 2010, the estimated combined actual commercial harvest amounted to a meager 1,000 fish (Figure 10; Appendix A15). This figure represented a second consecutive year of record low catches, last experienced during the early 1980's for the then-fledgling Leisure Lake project, and catches were far short of the combined average annual total catch of 127,000 fish since adults began returning to both the Leisure and Hazel Lakes enhancement sites in 1991 (prior to that year, only Leisure Lake sockeye salmon contributed to the harvests). The enhanced run to CIAA's newest remote release site, at Tutka Bay Lagoon in the Southern District, was the organization's single sockeye salmon project where preseason expectations were met, showing a final harvest of 38,100 fish (Table 3.)

The sockeye salmon run to English Bay Lakes, also in the Southern District, was reasonably good for the fifth consecutive year, achieving the desired inriver escapement goal while additionally providing modest harvest opportunities for commercial set gillnetters in Port Graham Subdistrict and subsistence set gillnetters from two local native villages. The commercial set gillnet fishery in waters of Port Graham Subdistrict remained closed for the early portion of the sockeye salmon run to English Bay Lakes in order to protect fish for escapement

purposes, while the subsistence fishery in the same waters was restricted to a single 48-hour fishing period per week beginning on June 1. The subsistence fishery was allowed to return to the normal regulatory 132-hours per week fishing schedule on July 2 after the escapement goal was assured, while the commercial fishery opened six days later on July 8, resulting in a seasonal harvest of approximately 1,900 sockeye salmon for the latter user group (Table 3). Sockeye salmon runs to the English Bay Lakes system are expected to benefit from the recently inconsistent rehabilitation project conducted by Chugach Regional Resources Commission (CRRC) in conjunction with Nanwalek Salmon Enhancement Project (NSEP), operated by the village of Nanwalek. Although this sockeye salmon project has encountered setbacks in recent seasons due to viral and disease outbreaks in the pen rearing of juveniles, as well as years when no or reduced numbers of broodstock were collected, the fishery transport permits (FTP's) for the project transferred to CIAA's Trail Lakes Hatchery in early 2010. This collaborative effort is expected to result in greater success for the adult sockeye salmon returns. For the 2010 season, an estimated 200,000 sockeye salmon were released back into the English Bay Lakes system as "fall fry", marking only the second such release in the past five seasons. Additionally, just over 1,000 sockeye salmon adults were collected for use as broodstock this season, for use in both the English Bay Lakes project and a separate sockeye salmon remote release project conducted at Port Graham Hatchery.

In Kamishak Bay District, the enhanced run of sockeye salmon to Kirschner Lake produced a catch of just under 8,900 fish (Table 3), representing about 80% of the original preseason harvest forecast of 11,400 fish. All of the sockeye salmon harvested at Kirschner Lake in 2010 were utilized for CIAA hatchery cost recovery, with none taken by commercial seiners.

The LCI management area has only six lake systems with significant naturally occurring sockeye salmon runs, and four of five achieved or exceeded their SEG's in 2010, while the sixth system has no formal escapement goal. In East Nuka Bay Subdistrict of the Outer District, aerial and weir assessment of the run to Delight Lake indicated slow escapement rates during the early portion of the run, and when the commercial fishery was finally allowed to open catches totaled only 3,000 fish (Table 3). Aerial surveys at nearby Desire Lake showed poor escapement but were hampered throughout the season by inclement weather and unfavorable observation conditions; no commercial openings were allowed to target this stock. The escapement estimate of nearly 23,800 sockeye salmon for Delight Lake was nearly double the upper end of the established SEG range, while the Desire Lake estimate of 6,300 sockeye salmon fell short of the low end of its SEG range (Appendix A24). A third system in East Nuka Bay, known as Delusion (Ecstasy) Lake, is a recently formed glacial system that supported no documented salmon run prior to the mid 1980s. The sockeye salmon run to this system, which has no formal SEG, showed a peak aerial escapement estimate of about 600 sockeye salmon in 2010 (Table 3).

Targeted fishing effort was allowed on sockeye salmon returning to Chenik Lake in the Kamishak Bay District for the seventh consecutive season in 2010. From 1994 through 2002, returns to that system had been poor due to the after-effects of an outbreak of IHNV, a naturally occurring viral disease, in the early 1990s. The outbreak caused increased mortality to young salmon, subsequently resulting in weak adult returns, and CIAA ultimately suspended a traditional fry stocking program at Chenik Lake after the 1996 season. The sockeye salmon run to Chenik this year was considered only fair to good, with a total estimate of about 23,000 sockeye salmon returning. The run consisted of a commercial seine harvest of approximately 5,500 fish (Table 3) and an estimated escapement of 17,300 as documented by video (Appendix

A16). The latter figure exceeded the sockeye salmon escapement goal range of 2,000 to 9,300. It is important to note that all sockeye salmon adults returning to Chenik Lake in the last eight seasons were entirely the result of natural production since the stocking program has not been conducted at this system since 1996.

Waters of Aialik Bay in the Eastern District were not opened to commercial fishing for a fourth consecutive season in 2010 due to a relatively weak sockeye salmon run to Aialik Lake. Consequently, no harvest resulted and all fish entered the system as escapement, estimated by aerial surveys at 5,300 fish, falling within the SEG range of 3,700 to 8,000 sockeye salmon (Table 3; Appendix A24). At Mikfik Lake in the Kamishak Bay District, a reasonably strong run resulted in a freshwater escapement estimated by aerial surveys at about 11,300 sockeye salmon (Table 3; Appendix A24), achieving the established goal range of 6,300 to 12,200. However, escapement as documented by a department video project at the lake outlet showed a total of only 5,200 sockeye salmon actually entering the lake, suggesting a high predation rate by bears in downstream areas. No seine effort targeting Mikfik sockeye salmon occurred despite continuous fishing time allowed in June, thus no harvest resulted.

Coho Salmon

The coho salmon resource in the LCI management area is not extensive, and this species is therefore only occasionally targeted in the commercial fishery. The 2010 commercial harvest of 2,100 coho salmon (Table 4) was less than one-fourth of the average catch during the past 10 years (Appendix A18) and was the lowest figure since 1977. The Eastern District, which frequently produces the bulk of the LCI coho salmon catches because of the Seward Silver Salmon Derby and CIAA hatchery cost recovery at Bear Lake, accounted for around 64% of the areawide coho salmon harvest this season (Appendix A18). The two sources split the Eastern District's cumulative total of just under 1,350 coho salmon at a ratio of 82% for the derby and 18% for CIAA (Table 4). It should be noted that the organizer of the sport fishing contest, the city of Seward, annually sells the derby entries to a commercial processor as a means to generate revenue, hence these derby entries are listed as "commercial" harvests. The remainder of the LCI coho salmon catch was primarily taken as incidental harvest by seiners in Kamishak Bay District (27%), followed by set gillnetters in the Southern District (8%), while seiners in the Outer District accounted for less than 20 fish.

Because the coho salmon resource in LCI, and assessment of it, is limited, commercial coho salmon harvests can rarely be used to accurately gauge run strength. Additionally, market conditions in recent years have discouraged directed effort, making the incidental commercial harvest of this species an unreliable indicator. Sport and personal use harvests generally provide the best indicators of run strength. The weak commercial catches, and other informal signs, indicated that coho salmon runs during 2010 were likely average or slightly below average, while catches in the personal use gillnet fishery reflected this same trend in Kachemak Bay coho salmon runs. However, aerial surveys flown specifically for coho salmon assessment at Clearwater Slough in the Northshore Subdistrict of the Southern District in 2010 showed good escapement (Table 4).

Pink Salmon

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered relatively weak this year, with an overall harvest of only 278,200 fish (Table 5; Figure 11). This figure represents 22% of the most recent 10-year average

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Pink Salmon

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered relatively weak this year, with an overall harvest of only 278,200 fish (Table 5; Figure 11). This figure represents 22% of the most recent 10-year average

and was the lowest catch of this species since 1987 (Appendix A19). However, it is important to note that the 10- and 20-year average pink salmon harvests in LCI include years when supplementary hatchery production contributed significant numbers of fish to commercial catches. Openings to target natural stocks this season were sparse in the Outer District, while the weak runs to Kamishak Bay District attracted no effort despite the numerous areas open to fishing. Harvests this season were comprised entirely of naturally produced fish for the third consecutive season. The suspension of operations in the Southern District at Tutka Hatchery, LCI's oldest hatchery, meant no hatchery-produced pink salmon returning to that facility for the fifth consecutive season, while Port Graham Hatchery has also suspended operations and no pink salmon returned there this season.

As is the norm for naturally produced pink salmon in LCI, the majority of the catch this season was taken in the Outer District. The commercial seine harvest there totaled approximately 272,400 pink salmon (Table 5; Appendix A19), which was slightly less than 70% of the recent 10-year district-wide average. The Outer District's entire catch came from Port Dick Subdistrict (Table 5) since runs to other subdistricts were deemed too weak to allow commercial effort.

In the Southern District, which had historically dominated LCI pink salmon catches because of the hatchery facilities, the pink salmon harvest totaled a paltry 3,300 fish (Table 5; Appendix A19), with 94% taken in the common property set gillnet fishery and the remainder coming as incidental harvest during hatchery sockeye salmon cost recovery operations. For the second consecutive season, no commercial seine harvest of pink salmon occurred in the Southern District since no common property seine openings targeting any species were allowed. In the Kamishak Bay District on the west side of LCI, the pink salmon harvest of 2,500 fish (Table 5; Appendix A19) came primarily from Douglas River and Kamishak Rivers Subdistricts during efforts directed at chum salmon. Despite the weak runs, pink salmon escapements to 14 of 17 monitored systems in the management area were sufficient to achieve or exceed SEG's (Appendix A25).

Chum Salmon

After a disappointingly weak chum salmon season in 2007, chum salmon runs have since rebounded and were once again a major bright spot for the LCI area in 2010. The chum salmon harvest of nearly 95,000 fish (Table 6; Appendix A22) was the fourth highest figure for the species in LCI during the past two decades and exceeded the recent 10-year average harvest of 87,000 fish by 9%. Approximately three-fourths of the LCI area-wide commercial chum salmon harvest this season was taken by seiners in Kamishak Bay District on the west side of LCI, followed by seine catches in the Outer District at 24%, with Southern District set gillnetters taking the remainder (Table 6; Appendix A22). Kamishak Rivers Subdistrict accounted for particularly noteworthy chum salmon catches totaling 45,600 fish this season, while Port Dick Subdistrict in the Outer District produced a harvest of 22,500 chum salmon (Table 6). Sustainable escapement goals were achieved at 9 of 12 monitored LCI chum salmon systems in 2010 (Appendix A26).

2010 EXVESSEL VALUE

The estimated exvessel value of the 2010 commercial salmon harvest in LCI, not including any postseason adjustments in price paid to fishermen, was approximately $1.78 million (Table 7; Appendix A2), or about 12% less than the average of $2.03 million during the past decade. Purse seine gear in the common property fishery, which normally generates the majority of the catch

and value, accounted for $1.01 million or approximately 57% of the overall exvessel total (Table 7), while set gillnets accounted for $162,000 or 9%. An estimated $599,000, or just over one-third of the entire exvessel value of the LCI salmon fishery, was utilized for hatchery cost recovery purposes, while the remainder (<1%) consisted of coho salmon entered into the Seward Silver Salmon Derby and subsequently sold by organizers of that event. The hatchery proportion of this season's exvessel value was considerably less than the previous year, primarily due to much weaker than anticipated sockeye salmon runs to major enhancement sites. Estimated average salmon prices paid to fishermen in 2010, not including any postseason adjustments, were as follows: Chinook–$3.57/pound; sockeye–$1.95/pound; coho–$1.05/pound; pink–$0.33/pound; and chum–$0.79/pound (Table 9; Appendix A3). The price for Chinook salmon set a new record in the management area, while prices for all other species were the highest in over twenty years.

2010 DISTRICT INSEASON MANAGEMENT SUMMARIES

Southern District

Set Gillnet Fishery

An Area H commercial 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 during open fishing periods (Figure 2). The limited area provides only enough productive fishing sites to accommodate up to 25 set net permits.

The 2010 LCI all-species set gillnet harvest totaled 19,600 fish (Table 1), representing less than half of the recent 10-year average of 44,200 (Appendix A7) and the lowest total for this gear group since 1963. The catch of only 14,800 sockeye salmon, the primary target species in this fishery, was the lowest since 1994 and fell far short of both the 10- and 20-year averages by considerable amounts. The greatest set gillnet catches of sockeye salmon this season occurred in Tutka Bay and Seldovia Bay Subdistricts (Table 3).

Salmon species composition in the 2010 LCI commercial salmon set gillnet fishery, with sockeye salmon at 75%, pink salmon at 16%, and chum salmon at 8%, was very near the average over the past decade, when typical salmon species composition in the fishery was 73% sockeye, 15% pink, 6% chum, 4% coho, and 2% Chinook salmon. However, the catch of Chinook salmon, at less than 30 fish, was far less than the recent 10-year average of 745 and was the lowest seasonal harvest since 1970.

Based on the lack of a preseason estimate of sockeye salmon returning to English Bay Lakes, the commercial set gillnet fishery in the Port Graham Subdistrict, including both the English Bay and Port Graham Sections, was kept closed at the start of the set gillnet season (early June) as a precautionary measure to protect fish for escapement. The run ultimately proved strong enough to support exploitation, and once achievement of the SEG could be projected, and local residents given an opportunity to begin fishing for subsistence needs, waters of Port Graham Subdistrict were opened to commercial set gillnet fishing in early July. Because of the late start, combined with a modest run of sockeye salmon, commercial set gillnetters in the two sections of this subdistrict harvested only about 1,900 sockeye salmon for the season (Table 3). The final estimated tally of sockeye salmon counted past the English Bay Lakes weir, at 12,300 fish (Table 3; Appendix A24), fell within the desired inriver goal (escapement plus broodstock) range of 7,300 to 15,000 fish. Local subsistence fishermen from the village of Port Graham reported

catching around 100 sockeye salmon for subsistence needs (Appendix A29), the lowest total since 2006, while the harvest figure for residents of Nanwalek was about three-fourths of the 20-year average at approximately 1,500 sockeye salmon (Appendix A30). The situation surrounding the English Bay Lakes sockeye salmon run this year was similar to the 2000, 2001, and 2004–2009 seasons, when complete fishing closures or severe restrictions were implemented until run strengths could be adequately assessed. It should also be noted that no sockeye salmon were predicted to return to the newer remote release project at Port Graham Hatchery this season and therefore that run did not contribute to local set gillnet catches in waters of Port Graham Subdistrict.

After the English Bay Lakes sockeye salmon run was over, waters of Port Graham Subdistrict remained open to commercial set gillnet fishing for the remainder of the regulatory season. Despite the open season in August and September, no actual effort or harvest occurred during these months. Escapement of pink salmon into Port Graham River was near the long-term average and fell within the SEG for that system (Appendix A25).

LCI set gillnet fishing effort in 2010 increased marginally over the previous two seasons with a total of 21 permits actively fished. This figure matched the 20-year average of 21 permits fished while slightly exceeding the recent 10-year average of 20 permits annually fished (Appendix A1).

Seine Fishery

Sockeye Salmon

For the second consecutive season, no common property seine openings were allowed in LCI's Southern District and hence no harvest from this gear group resulted there. Hatchery seining for cost recovery was allowed in several locations, however, cumulatively resulting in a catch of just over 39,000 sockeye salmon and (incidentally) 200 pink salmon (Table 1). The overall 2010 catch of sockeye salmon by all gear types in the Southern District, at 53,900 fish, was the lowest for this species since 2004 (Appendix A13) and the second lowest since 1986, representing only 30% of the recent 10-year average. Hatchery purse seiners accounted for about 73% of the sockeye salmon landed in the district in 2010, while the remaining 27% was taken in the previously described commercial set gillnet fishery (Table 1). The low overall sockeye salmon catch in 2010 continued a 7-year trend of below average harvests in this district. Poor production rates from the district's two major sockeye salmon stocking projects at Leisure and Hazel Lakes were major contributing factors to the ongoing low catches, but reasons for this poor production, other than isolated instances of below average annual stocking numbers, are unclear.

As previously mentioned, *5 AAC 21.373 Trail Lakes Sockeye Salmon Management Plan* was implemented for the second straight season during 2010, and its effects were once again profoundly felt by seiners in the Southern District. The majority of common property seine openings in the Southern District over the past two decades were intended to target enhanced runs of both sockeye and pink salmon. Since Tutka Bay and Port Graham Hatcheries were not operational in recent years, no pink salmon returned to those facilities in 2010. Additionally, the provisions of *5 AAC 21.373* dictated that no common property fishing be allowed in CIAA SHA's unless the Trail Lakes Hatchery revenue goal was achieved. Because CIAA's early run of sockeye salmon to Bear Lake in Resurrection Bay was effectively considered a failure, all sockeye salmon returning to their remaining LCI release sites were required for cost recovery in an effort to achieve the established revenue goal of $1.43 million, and no CIAA-produced

sockeye salmon were considered surplus to hatchery needs or available for common property seine harvest. Areas in the Southern District traditionally opened to common property seining to target these CIAA sockeye salmon runs were never opened in 2010.

Waters of the China Poot and Hazel Lake SHA (Figure 3) were opened to authorized agents of CIAA seven days per week beginning June 28, for the express purpose of hatchery cost recovery. Preseason combined harvest projections for sockeye salmon runs to the Leisure and Hazel Lakes' stocking sites totaled just over 71,000 fish, representing slightly more than 60% of the estimated annual 10-year average commercial catch attributed to these two projects (Appendix A15). Despite diligent efforts to monitor waters of the SHA during the season and conduct harvest operations whenever a buildup of sockeye salmon occurred, CIAA hatchery agents landed a cumulative total of only 1,000 sockeye salmon in the China Poot and Hazel Lake SHA in 2010 (Table 3; Appendix A15). This combined sockeye harvest estimate for Leisure and Hazel Lakes' runs was the second lowest for these projects since 1991 and comprised only a negligible proportion of the entire LCI sockeye salmon harvest, in stark contrast to the long-standing tradition of the significant contributions normally provided by these projects. Personal use dip net and sport fishermen were estimated to harvest another 5,500 sockeye salmon at the head of China Poot Bay based on average catches from the early 1990's. The 2010 total cumulative run from both projects was estimated at around 6,600 sockeye salmon (Appendix A15), and the hatchery harvest from this location generated less than one percent of the Trail Lakes Hatchery revenue goal for the second straight year.

CIAA forecasted a run of nearly 39,000 sockeye salmon to the relatively new remote release site for this species at Tutka Bay Lagoon. Once again, CIAA expected that all returning fish would be required in pursuit of the cost recovery objective, and no targeted common property seine openings were anticipated. Although waters of the Tutka Bay SHA (Figure 4) were opened to fishing on June 28, the first hatchery harvest of the season occurred on July 13, netting 8,400 sockeye salmon in waters of Tutka Bay Lagoon. Hatchery fishing continued for nearly a month, with the last delivery occurring on August 9. Because of overlapping run timing for pink salmon returning to Tutka Lagoon Creek, hatchery fishermen conscientiously attempted to avoid capturing pink salmon during cost recovery operations by manually sorting fish, which resulted in a harvest of less than 200 incidentally caught pink salmon. The cumulative hatchery harvest totaled 38,100 sockeye salmon for the season (Table 3), virtually achieving preseason expectations. Unfortunately, due to the major shortfall at Bear Lake, the seasonal proceeds from the hatchery efforts in Tutka Bay SHA comprised only about 14% of the established CIAA 2010 revenue goal. An additional 2,700 sockeye salmon were collected for use as hatchery broodstock from Tutka Bay Lagoon, with the resulting eggs incubated in Trail Lakes Hatchery.

As stated previously, no sockeye salmon were forecasted to return to Port Graham Hatchery in 2010 and therefore no harvest resulted.

Pink Salmon

The 2010 season marked the third consecutive year since approximately 1978 that no hatchery-produced pink salmon contributed to Southern District commercial salmon harvests. With no pink salmon returning to Tutka Hatchery for the fifth successive season, and none returning to Port Graham Hatchery, the final district-wide catch of only 3,300 pink salmon (Tables 1 and 5) was not surprising, especially when considering that no common property purse seine openings occurred in the Southern District this season. Of the pink salmon harvest in the district, the

commercial set gillnet fishery took approximately 94% of the total, primarily in Tutka Bay Subdistrict plus a smaller amount caught in Halibut Cove Subdistrict, while incidental harvest during hatchery seine cost recovery operations for sockeye salmon in Tutka Bay Subdistrict accounted for the remaining 6%.

Returns of natural pink salmon stocks to systems in the Southern District, as indicated by ground survey escapement counts, ranged from fair to good, but no seine openings directed at wild stock pink salmon occurred in the Southern District this season. Resulting pink salmon escapements into Seldovia and Port Graham Rivers and Humpy and Barabara Creeks fell within or slightly exceeded their established SEG ranges (Table 5; Appendix A25), while those to China Poot and Tutka Creeks failed to meet minimum escapement figures.

Other Species

The Southern District chum salmon harvest in 2010 cumulatively totaled just 1,500 fish for all gear types (Table 6; Appendix A22), the lowest total since 2004 and less than half of the recent 10-year average for this species in the district. Again because of no seine openings in the Southern District this season, set gillnetters caught the entire total, dominated by harvests in Tutka Bay and Seldovia Bay Subdistricts (Table 6) at about 83% of the district-wide catches. Escapements into Southern District chum salmon systems were considered poor, and escapement at Port Graham River failed to achieve the SEG range (Appendix A26).

Although minor in total numbers of fish, Southern District Chinook salmon harvests frequently consist of incidental catches of adult fish returning to two of three separate enhancement projects. The 2010 Southern District harvest of 29 Chinook salmon by all gear types was the lowest since 1965, representing less than 4% of the recent 10-year average of 855 fish (Appendix A12). Set gillnetters harvested the entire total, with the majority taken in Tutka Bay Subdistrict (Table 2).

The district-wide coho salmon catch of just under 200 fish by all gear types was the lowest on record since statehood and was only 6% of the recent 10-year average (Appendix A18). Set gillnetters once again took the entire total (Table 1), with the largest percentage coming from Tutka Bay Subdistrict (Table 4).

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 11th consecutive year, waters of Paint River Subdistrict were included in this district-wide opening because the stocking program at Paint River Lakes was discontinued (except for an experimental, one-time stocking in 2002), and no sockeye salmon were expected back to that location this season. The weekly fishing schedule for open waters within the district was set at seven days per week, also for the 11th successive year. This schedule was originally implemented because the complexion of the fishery had evolved after 1994, when fish processors ended the routine practice of stationing a tender(s) 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 reasoned that opening waters of Kamishak Bay District to commercial fishing on a continuous basis would allow seiners opportunity to harvest salmon without unduly jeopardizing spawning

escapement requirements. In 2010, the district-wide commercial sockeye salmon harvest totaled just 14,500 fish (Table 3; Appendices A10 and A13), the lowest total in the district since 1997 and less than one-fifth of the recent 10-year average of 80,300.

The earliest natural sockeye salmon run to Kamishak Bay District, at Mikfik Creek in McNeil River Subdistrict, normally appears in freshwater during the first few days of June. Similar to the 2006, 2007, and 2009 seasons, the run displayed distinctly late run timing characteristics in reference to first appearance in freshwater (lower reaches of Mikfik Creek), even though escapement into Mikfik Lake ultimately proved close to traditional timing. Sockeye salmon were first documented in freshwater via aerial survey on June 14, and at an estimated 4,000 fish this initial observation showed a dramatic increase over the previous survey four days earlier, when no fish were seen. Aerial escapement estimates increased over the next week, peaking on June 21 when 11,300 sockeye salmon were aerially estimated in freshwater. Since subsequent aerial estimates through early July showed fewer fish, this figure was used as the final index of escapement, falling near the upper end of the established SEG of 6,300 to 12,150 fish (Table 3; Appendix 24). Despite the continuous fishing time allowed in McNeil River Subdistrict during June, no effort directed at Mikfik sockeye salmon occurred this season, thus all returning fish entered freshwater. It should also be noted that a remote video enumeration project deployed by the department at the outlet of Mikfik Lake documented an escapement of only 5,200 sockeye salmon, suggesting a high predation rate by bears in downstream areas of the system this season.

After the Mikfik sockeye salmon run, seiners next normally turn their attention to the Chenik and/or Douglas River Subdistricts during the final days of June. Although the stocking program at Chenik Lake was suspended in the mid-1990s, and sockeye salmon runs to the system had been minimal in the late 1990s and early 2000s due to the lingering effects of an IHNV outbreak in previous years, surprisingly strong returns from 2003 through 2009 created continuing optimism for 2010. Aerial surveys began to detect fish in salt waters of Chenik Lagoon on June 21, but numbers were minimal and the early date precluded an estimate of run strength. Despite a buildup of sockeye salmon in saltwater over the next week, no fish were detected in fresh water until June 28, when just under 400 sockeye salmon were estimated in Chenik Lake. Aerial surveys in early July were plagued by high winds and poor observation conditions, but a department-operated remote video escapement recorder at the outlet of Chenik Lake showed a daylight escapement of approximately 11,000 sockeye salmon through July 15, including a strong surge of nearly 4,000 fish passing the site for the last two days of that period. Since the video estimate slightly exceeded the upper end of the established SEG range of 1,900 to 9,300, waters of Chenik Subdistrict south of 59° 16′ N. latitude were opened to commercial salmon seining seven days per week beginning July 17 (Table 8). Waters of Chenik Subdistrict north of 59° 16′ N. latitude were kept closed to seining to protect a small run of sockeye salmon to tiny Amekdedori Creek, just a few miles north of Chenik Lake Creek.

Initial catches from Chenik Subdistrict, reported on the first day of the opening (July 17), were quite disappointing at 2,700 sockeye salmon, suggesting that the run was not as strong as in previous years. In fact, fishermen were apparently discouraged by the early results and essentially left the area to explore other waters open to fishing in the district. Only minor effort occurred thereafter (late July), bringing the cumulative harvest in Chenik Subdistrict to approximately 5,500 sockeye salmon for the season (Table 3; Appendix A16). As had been the case during the previous four seasons, management of the fishery was aided by the department's video project, the seventh consecutive season for this annual project. Using the video counts, the

freshwater escapement into the lake totaled an estimated 17,300 sockeye salmon (Appendix A16 and A24). The overall run of sockeye salmon to Chenik Lake in 2010 cumulatively totaled approximately 22,800 (Appendix A16), which was less than the previous seven-year trend of strong returns averaging almost 85,000 fish annually, but nonetheless provided limited opportunity for common property harvest.

No effort was directed at sockeye salmon in the Douglas River (Silver Beach) Subdistrict during 2010. The next sockeye salmon run in Kamishak Bay District was to Kirschner Lake in Bruin Bay Subdistrict, the site of a traditional CIAA sockeye salmon lake stocking project. At this location, where a steep falls at tide line precludes escapement into the lake, the preseason prediction called for just over 11,000 sockeye salmon returning to the site. As previously described, *5 AAC 21.373 Trail Lakes Hatchery Sockeye Salmon Management Plan* directed the department to manage this as well as other CIAA SHA's in LCI to achieve the facility's 2010 revenue goal of $1.43 million prior to allowing any common property fishing effort in these waters. Because CIAA had already announced their intent to harvest the entire run of sockeye salmon to Kirschner Lake for cost recovery purposes in pursuit of the revenue goal, no directed common property effort on this stock was expected.

CIAA had arranged prior to the season for a small number of LCI seine vessels to act as authorized agents in order to conduct cost recovery in Kamishak Bay. Initiation of cost recovery fishing generally requires a substantial buildup of fish in salt water near the Kirschner falls, and 2010 was no exception. The first effort occurred in the Kirschner Lake SHA on July 14 but netted only about 1,700 fish. Unfortunately, the number of fish returning to the Kirschner Lake enhancement site proved less than the preseason forecast, and only two additional hatchery harvests occurred (July 23 and July 27). The cumulative hatchery harvest of sockeye salmon at Kirschner Lake for the year totaled 8,900 fish (Table 3), representing just over three-fourths of the preseason forecast. With the virtual failure of CIAA's largest and earliest sockeye run to Bear Lake in Resurrection Bay, the cumulative hatchery income generated from CIAA SHA's in LCI remained far below the seasonal revenue goal and waters of the Kirschner Lake SHA were never opened to common property seining. Since no unharvested fish were documented this season, the total run to Kirschner Lake was estimated at 8,900 sockeye salmon. Despite the weaker than expected run, the Kirschner Lake sockeye salmon enhancement project maintains a reputation as one of LCI's steadiest producers.

Pink Salmon

Preseason pink salmon projections for the Kamishak Bay District in 2010 were considered poor, with a cumulative harvestable surplus of slightly more than 65,000 fish forecasted primarily for Bruin Bay Subdistrict, and a lesser amount predicted for Ursus and Rocky Cove Subdistricts. Aerial surveys of the district first documented pink salmon in freshwater in mid/late July, considered relatively normal even though numbers were modest. As surveys continued into August, it became abundantly clear that pink salmon returns to all major systems were weak and were unlikely to provide significant opportunity for harvest.

Although the Bruin Bay Subdistrict remained open to continuous fishing, weak runs to major systems in Rocky Cove and Ursus Cove Subdistricts resulted in commercial fishing closures there beginning August 14 (Table 8). These closures were additionally designed to protect chum salmon for escapement purposes, since runs of that species in Ursus Cove were deemed insufficient to allow harvest. Although waters of Ursus Cove Subdistrict were reopened to

commercial fishing one week later to allow directed effort on chum salmon, the pink run there was past its peak. The weak runs, inseason closures, and lack of tender service to this remote district all combined to discourage directed effort on Kamishak Bay pink salmon stocks in 2010. The cumulative Kamishak Bay District pink salmon harvest for the season totaled just 2,500 fish (Table 5; Appendix A19), virtually all of which came as incidental catch during efforts directed at chum salmon runs in the southern portion of the district. Escapement at the three major monitored pink salmon systems in the district all fell within, but near the low end, of their respective SEG ranges (Table 5; Appendix A25).

Chum Salmon

After reasonably good chum salmon runs to Kamishak Bay systems in nine of the last ten seasons, chum salmon runs in 2010 were probably the brightest spot in the LCI commercial salmon fishery. The final 2010 Kamishak Bay District harvest totaled almost 71,000 chum salmon (Table 6; Appendix A22), exceeding the average catch of 64,300 fish over the past decade and the fifth highest during that time period. Chum salmon escapements throughout the district were considered good, and all but one system achieved or surpassed their respective SEG ranges.

Because annual chum salmon runs to McNeil River have not been strong for over two decades, waters of McNeil River Subdistrict were closed to commercial fishing as a precaution beginning June 26, even though no seiners were known to be present in area waters. Aerial surveys to monitor chum salmon runs in Kamishak Bay began in mid/late June, with the first fish of the season noted in freshwater at McNeil River on June 24, marginally early by historical run timing standards. The initial estimate of chum salmon on that first survey was very small at 150 fish, essentially foretelling the eventual outcome for the season at this system. Estimates increased with each survey over the next week, but very poor weather and/or observation conditions on the following two surveys prompted uncertainty about run strength. Once better weather and conditions prevailed during the latter part of July, escapement estimates at McNeil River did show an increase but not to levels that could possibly achieve the SEG range. The season's peak single aerial estimate of 6,700 chum salmon in freshwater occurred on July 22. Postseason analysis of aerial survey data using the revised area under the curve (AUC) method yielded a final estimated escapement index at McNeil River of just 10,500 chum salmon, falling far short of the SEG range of 24,000 to 48,000 fish (Appendix A26).

In late July, seiners began to target chum salmon in southern Kamishak Bay at both the Kamishak Rivers and Douglas River Subdistricts, both of which were open to commercial fishing seven days per week. Although freshwater systems in these subdistricts had yet to be assessed for escapement, the early catch rates suggested relatively strong chum runs that could sustain commercial harvest without jeopardizing biological requirements. Commercial effort continued for just over two more weeks, ending on August 10, and although catch rates never approached those experienced on the first day of effort, the cumulative combined catch for the two subdistricts totaled 52,400 chums for the season (Table 6), representing nearly three-fourths of the district-wide total for this species. The largest share of the chum harvest in these two subdistricts was taken in Kamishak Rivers Subdistrict at 87%.

Chum salmon runs to virtually all other Kamishak Bay systems were considered relatively strong. In the southern portion of the district, an aerial survey to document chum salmon escapement was conducted on August 10 but was hampered by extremely turbid water

conditions in Big Kamishak River, making escapement estimation impossible. However, the final estimate at Little Kamishak River fell near the upper end of its SEG range (Table 6; Appendix A26), suggesting that the run to Big Kamishak River likely fell within the established SEG as well. In the case of Little Kamishak River, the formal escapement estimate was believed to be quite conservative due to the single survey conducted.

Central and northern Kamishak Bay chum salmon runs were considered reasonably good this season as well. At Bruin Bay River, chum salmon were first observed in freshwater on July 12, peaking one week later when a single individual aerial survey estimate of 6,200 chum salmon in freshwater was made on July 19. This peak count was also used as the final index of escapement estimate for Bruin Bay River (Table 6, Appendix A26), falling near the lower end of the SEG range of 6,000 to 10,300 fish. Seiners apparently detected the lack of a harvestable surplus and did not target the chum salmon run to this system, thus no chum harvest was documented in Bruin Bay Subdistrict.

Because the run timing for the more northerly chum salmon systems is later than that in southern and central Kamishak areas, aerial evaluation of northern Kamishak systems typically begins in late July, but this season surveys were delayed until early August. Initial surveys revealed relatively low numbers of fish in fresh waters of Cottonwood Creek, Iniskin River, and Ursus Cove systems. Despite steady increases at Iniskin River that brought escapements into the SEG range, by August 12 estimates showed that the runs to the remaining two chum salmon systems appeared weak and that SEG's had not yet been achieved. Additionally, the pink salmon runs to Brown's Peak Creek in Ursus Cove Subdistrict and Sunday Creek in Rocky Cove Subdistrict were very weak. In an effort to protect fish of both species for escapement, waters of Rock Cove, Ursus Cove, and Cottonwood Bay Subdistricts were closed to commercial fishing by emergency order beginning August 14 (Table 8).

Up until this time, only light effort targeting chum salmon runs to northern Kamishak Bay systems had occurred, all within Cottonwood Bay Subdistrict, resulting in cumulative catches totaling about 8,400 chum salmon through August 11. The closure of the Ursus Cove and Cottonwood Bay Subdistricts had the desired effect on chum salmon, and by August 20 escapement estimates in these two locations had increased and fallen within the respective SEG ranges. As a result, waters of Ursus Cove and Cottonwood Bay Subdistricts were reopened to commercial fishing on a continuous basis by emergency order beginning August 21 (Table 8), but run strength did not warrant marker movements at any of the creek mouths. Although fishing effort remained light and was entirely concentrated once again in Cottonwood Bay Subdistrict, resultant catches were reasonably good for participants and brought the cumulative catch there to just under 18,000 chum salmon for the season (Table 6). Final harvest figures for Kamishak Bay District cumulatively totaled 70,800 chum salmon for the year (Table 6; Appendix A22), exceeding the recent 10-year average of 64,300 for the district. Escapement goals were met or exceeded at Little Kamishak River, Bruin Bay River, Ursus Cove systems, Cottonwood Creek, and Iniskin River (Appendix A26), while falling short at McNeil River. No estimate of escapement was possible at Big Kamishak River due to extremely poor survey conditions.

Other Species

Chinook salmon harvests in Kamishak Bay District historically have been insignificant (Appendix A12) and a total of only 10 fish were harvested this season (Table 2). On the other hand, coho salmon harvests within the district have at times been substantial (Appendix A18),

providing fishermen with some lucrative late season catches. Coho salmon assessment in LCI is very limited, but early signs from other areas within LCI suggested that runs were only fair. No directed effort occurred on this species in 2010, and the commercial harvest of less than 600 coho salmon in Kamishak Bay District (Tables 1 and 4; Appendix A18) was only about 20% of the recent 10-year average of approximately 3,000.

Outer District

Sockeye Salmon

Outer District sockeye salmon harvests have traditionally focused on natural runs to the Delight and Desire Lakes systems in East Nuka Bay Subdistrict. A lake stocking enhancement project in the Port Dick area during the late 1980s provided additional fish for harvest in the early 1990s, but stocking was discontinued after 1989 and a small harvest in 1993 was the last documented catch. Preseason projections, based solely on the long-term average catch, forecasted a harvest of up to 20,000 sockeye salmon for the entire Outer District this year. The actual harvest totaled only 3,000 fish (Table 3; Appendices A8 and A13), the fourth lowest catch in the past ten years and the fifth lowest in the past two decades.

Aerial surveys to assess the Delight and Desire Lake systems in East Nuka Bay began on June 25, but sockeye salmon were observed in freshwater only at Delight Lake and numbers were minimal. Subsequent assessment results suggested that the runs at both systems were building very slowly, but aerial surveys virtually all season were consistently hampered by poor survey conditions, including some combination of overcast skies, flat light, fog, rain, and wind. Aerial estimates remained below the SEG's at both systems throughout the season, but the department counting weir at the outlet of Delight Lake recorded surprisingly good escapement between July 18 and 22, bringing the cumulative number of sockeye salmon past the weir to over 17,000 fish. Since this figure exceeded the upper end of the SEG range (5,950 to 12,550), marine waters near Delight Lake (south of the latitude of the entrance to James Lagoon) were opened by emergency order to continuous commercial seining beginning July 24, and regulatory markers protecting the mouth of Delight Lake Creek were simultaneously rescinded (Table 8). Marine waters near Desire Lake were kept closed to fishing since escapement still appeared to be low. Unfortunately, the run at Delight Lake was well past its peak and the opening attracted only minimal effort. The cumulative catch in East Nuka Subdistrict totaled just under 3,000 sockeye salmon for the season (Table 3). Although aerial surveys to monitor the East Nuka Bay sockeye runs continued into late August, the peak single estimate of 6,300 sockeye salmon in freshwater at Desire Lake (Table 3), used as the final index of escapement, failed to achieve the established SEG of 8,800 to 15,200 (Appendix A24). However, observers felt that the actual escapement into Desire Lake was actually higher since surveys were hindered by very poor conditions throughout the season. At nearby Delight Lake, the final escapement of sockeye salmon totaled 23,800 fish (Table 3; Appendix A24) as estimated by a combination of weir and aerial assessment.

A third system of lakes known as Delusion (or Ecstasy or Delectable) Lakes in East Nuka Subdistrict has been monitored for approximately two decades to document sockeye salmon runs there. Located near the head of the East Arm of Nuka Bay, the two-lake system is relatively new, formed during the late 1970s and early 1980s by a receding glacier. A review of charts and maps drawn prior to the mid-1980s substantiated this fact as no lakes are indicated at the site of the present bodies of water. Before the 1980s, 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 department 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 2010 count of 580 sockeye salmon in freshwater (Table 3) was recorded during an aerial survey on July 27. Little is known of the origins of this return, although the predominant hypothesis suggests that sockeye salmon probably strayed from nearby Desire and/or Delight Lake to colonize this new lake system. Department personnel conducted sampling of sockeye salmon 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 (6 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

Relatively strong escapements during the 2008 parent year fostered optimism for reasonable pink salmon harvest opportunities in the Outer District in 2010, as reflected in the harvest projection of approximately 394,200 fish, which was equal to the recent 10-year average. The bulk of the harvestable surpluses were expected at Port Dick, with lesser amounts predicted at Windy and Rocky Bays. The actual catch of 272,400 pink salmon (Table 5; Appendix A19) failed to achieve the forecast but was still the eighth highest catch of this species in Outer District waters over the past 20 years.

For the eighth consecutive year, the department announced prior to the season that certain waters in Port Dick Subdistrict would open on a set calendar date, as opposed to a management strategy predicated upon real-time aerial assessment of pink salmon returns and escapements in the Outer District. Based on the forecast, as well as moderate levels of anticipated effort, waters of the South, Outer, and Taylor Bay Sections of Port Dick Subdistrict were opened to seining by emergency order on conservative schedule of two 40-hour periods per week, from 6:00 a.m. Monday until 10:00 p.m. Tuesday, and from 6:00 a.m. Thursday until 10:00 p.m. Friday, beginning July 19 (Table 8). This set opening date was intended to encourage effort early in the returns, normally dominated by males, and to promote product quality. The North Section of Port Dick Subdistrict was kept closed to fishing to protect the chum salmon run to Island Creek, which has historically displayed a slightly later run timing than chum salmon returning to Port Dick (head end) Creek, until the run could be adequately assessed.

Aerial surveys in Port Dick began on July 13, six days before the initial opening, but observations were discouraging and no pink salmon documented in any waters of Port Dick. Freshwater escapement of pink salmon into Port Dick (head end) Creek was considered mostly weak for the remainder of the month, and the buildup of fish normally observed on the saltwater flats near the creek mouth was practically nonexistent. Seiners nonetheless began catching relatively good numbers of pink salmon during the first week of fishing, with a cumulative total of over 51,000 pink salmon landed by the end of that week. Unfortunately, those levels were not maintained into the second week of fishing, and by the end of July the cumulative harvest totaled only 81,000 pink salmon. Catches rose during the third week of open fishing, and through August 10 the reported inseason harvest from waters of Port Dick Subdistrict totaled around 165,000 pink salmon.

Ground surveys of Port Dick (head end) Creek, normally conducted on a weekly basis inseason, were postponed due to weather and/or scheduling conflicts for over three weeks after July 20, while aerial surveys continued to document low freshwater numbers during this period. Despite

seine closures amounting to three days per week, which were expected to provide a sufficient number of pink salmon for escapement purposes, the peak department aerial survey estimate of pink salmon in freshwater at Port Dick (head end) Creek was approximately 10,000 fish on August 3, while very few fish were observed in saltwater adjacent to the creek mouth on the Port Dick head end "flats" during any aerial survey. The peak freshwater figure represented slightly over half of the low end of the sustainable escapement goal (SEG) range of 18,550 to 58,300 pink salmon, making attainment of the SEG questionable given the commercial fishing effort levels and harvest rates in Port Dick. In a precautionary attempt to protect pink salmon for escapement purposes and achieve the SEG in Port Dick (head end) Creek, all waters of Port Dick Subdistrict were closed to commercial salmon seining by emergency order beginning August 10 (Table 8).

The closure appeared to have the desired effect at the west end of Port Dick, as evidenced by a department ground survey on August 19 which showed an estimated freshwater escapement of just under 20,000 pink salmon at Port Dick Creek, falling within that system's SEG range. At Island Creek, however, freshwater escapement remained deficient as of August 20, when a department ground survey documented only 3,600 pink salmon in the system, or only about half of the system's lower bound of the SEG range of 7,200 to 28,300 pink salmon. Despite the low freshwater escapement at Island Creek, a department aerial survey on August 20 documented a significant "buildup" of pink salmon in saltwater near Island Creek, estimated to cumulatively total around 42,000 fish.

A subsequent department aerial survey of Island Creek on August 23 showed that more pink salmon had actively moved into freshwater at Island Creek over the previous weekend, increasing the total estimated escapement to about 9,000 pink salmon in the system. In addition, the same aerial survey estimated approximately 4,000 pink salmon as freshwater escapement into small Taylor Bay streams, a figure considered very good by historical standards. Because the Island Creek figure fell within the established SEG range for that system, and because escapement into Taylor Bay was considered satisfactory, commercial salmon seining in Port Dick waters near these systems were opened by emergency order to target surplus pink salmon five days per week beginning on August 24 (Table 8). This opening was expressly intended to target pink salmon returning to Island Creek as well as surplus fish destined for Taylor Bay systems, and the weekend closures, as well as the areas of normally closed waters near the creek mouths, were expected to allow limited additional escapement into the aforementioned systems over the remaining course of the runs. Prohibiting commercial fishing in those waters of the North and South Sections of Port Dick Subdistrict west of Island Creek in Port Dick was intended to protect pink salmon returning to Port Dick (head end) Creek, where escapement was within, but near the low end, of the established SEG range, and where additional escapement was desired.

Only light effort resulted from the latter opening in Port Dick Subdistrict, and this was reflected in the cumulative catch of about 54,000 pink salmon during the two days following the August 24 opening. On August 27, after a department ground survey of Island Creek unexpectedly documented 29,000 pink salmon in freshwater, the weekly fishing period in marine waters near Island Creek was expanded to seven days per week, and regulatory markers protecting the creek mouth at that location were simultaneously rescinded, in order to maximize harvest of surplus pink salmon destined for Island Creek. Disappointingly, the fleet had chosen to disperse prior to the opening and no further harvest took place in Port Dick despite the continuous fishing time allowed. The cumulative harvest from Port Dick Subdistrict in 2010 totaled 272,400 pink salmon

(Table 5; Appendix A21), which exceeded the preseason harvest projection of 218,000 pink salmon for these waters by about 25%.

Pink salmon runs were universally weak throughout the remainder of the Outer District and no directed openings were allowed in any location other than Port Dick. Pink salmon escapements into monitored Outer District systems were sufficient to achieve or exceed their SEG's at all but one system. The final escapement estimate of 41,100 pink salmon for Port Dick (head end) Creek fell slightly above the midpoint of the SEG range of 18,550–58,300 fish established for this system (Table 5; Appendix A25). The absence of late fishing effort, despite the continuous opening, at Island Creek caused the estimated escapement to balloon to 69,500 pink salmon, exceeding the upper end of the SEG range of 7,200–28,300 by nearly 150%. Interestingly, the twelve highest pink salmon escapement totals on record for Island Creek have all occurred after 1995. Smaller systems in Port Dick and Taylor Bay, though not having established SEG's, also experienced reasonable pink salmon escapements. At Windy Left Creek in Windy Bay Subdistrict, final escapement was estimated at 24,200 pink salmon, while the figure for Windy Right Creek was 6,400 pink salmon, both of which fell within the SEG's for the respective systems (Table 5; Appendix A25).

The final escapement at Rocky River totaled an estimated 27,000 pink salmon, or just under the midpoint of the SEG range for that system (Table 5; Appendix A25). Elsewhere in the Outer District, postseason analysis of aerial survey data indicated an estimated cumulative escapement of only 3,000 pink salmon into Port Chatham systems (Table 5; Appendix A25), or less than half of the low end of the SEG range. Desire Lake Creek, with an SEG range of 1,900 to 20,200 pink salmon, experienced a very weak pink salmon return, with an escapement also estimated at only 3,000 fish (Table 5; Appendix A25). At South Nuka Island Creek, no escapement estimate was attempted this season due to insufficient data.

Chum Salmon

Chum salmon runs to the Outer District in 2010 were considered weak but escapement goals were achieved at three of four monitored systems. Because chum salmon numbers have remained at relatively low levels in the Outer District since the peak harvest years of the late 1970s and early 1980s, except for the 2008 season, large runs were not anticipated this season. No specific commercial openings to target chum salmon occurred in the Outer District this season, thus the entire harvest came as a result of openings primarily designed to target pink salmon. The final harvest of 22,500 chum salmon (Table 6; Appendix A22) was still the fourth highest in the Outer District in the past two decades and also slightly exceeded the recent 10-year average. The entire Outer District chum salmon harvest came from seine efforts in Port Dick, which were intended to target pink salmon, marking a third consecutive season of well above average catches in those waters.

With the relative weakness of chum salmon runs, escapements fell within but near the low end of the SEG range at two Outer District systems, slightly above the SEG range at one system, and failed to achieve the low end of the range at the final monitored system. Port Dick (head end) Creek experienced an escapement of only 2,400 chum salmon (Table 6), falling just inside the SEG range of 1,900 to 4,500 chum salmon (Appendix A26). Chum salmon escapement at Island Creek failed to achieve its SEG range of 6,400 to 15,600 fish, with a final total of 3,400 fish (Table 6; Appendix A26). Rocky River escapement totaled 1,300 chum salmon (goal range of

1,200 to 5,400), while chum escapement at Koyuktolik (Dogfish) Bay streams, with a combined SEG range of 3,400–9,200 chum salmon, was estimated at 12,700 fish (Table 6; Appendix A26).

Eastern District

Sockeye Salmon

The Eastern District showed potential for harvestable surpluses of sockeye salmon in Aialik and Resurrection Bay Subdistricts during 2010, with a district-wide preseason projection totaling 181,200 fish. Actual harvest in the Eastern District totaled a paltry 21,700 sockeye salmon (Table 3; Appendix A13), representing just 12% of the preseason forecast and the lowest catch for the district since 2004. In conformance with the objectives set forth in *5 AAC 21.373 Trail Lakes Hatchery Sockeye Salmon Management Plan*, no common property seine openings were allowed in Resurrection Bay this season. Additionally, no openings to target naturally occurring sockeye salmon occurred in Aialik Bay Subdistrict. As a result, all commercially harvested sockeye salmon in the Eastern District this season, exclusively from Resurrection Bay North Subdistrict, were utilized for hatchery cost recovery by CIAA in pursuit of the Trail Lakes Hatchery revenue goal.

Sockeye salmon enhancement activities by CIAA at Bear Lake resulted in a projected total run ranging up to 187,000 fish assuming optimum survival of various smolt and fry releases. If the forecast proved true, the expected harvestable surplus was about 175,000 fish after accounting for the desired inriver escapement requirements for Bear Lake, established as a range of 5,600 to 13,200 sockeye salmon in the 2010 Trail Lakes Hatchery Annual Management Plan. Given the optimistic outlook, CIAA originally expected that not all sockeye salmon in Resurrection Bay would be required for cost recovery and that some level of common property opportunity was possible.

Due to CIAA's newly revised sockeye salmon release strategy for Resurrection Bay, the Bear Lake run in 2010 consisted of two separate components. One portion was released as fry into fresh waters of Bear Lake, where juveniles typically rear for one year prior to outmigrating as smolt, and would therefore attempt to reach the lake upon returning as adults. The second segment consisted of fish that were originally raised to the smolt stage in Trail Lakes Hatchery, transported to saltwater netpens at the head of Resurrection Bay, and reared for a short period in order to imprint before being released. This latter group was expected to home in to the netpens upon their return as adults.

Provisions of *5 AAC 21.373 Trail Lakes Hatchery Sockeye Salmon Management Plan*, first implemented in 2009, all carried over into the 2010 season. Because the plan dictated that all CIAA SHA's in Cook Inlet remain closed to common property fishing until the established Trail Lakes Hatchery revenue goal was achieved, only hatchery fishing was allowed at the start of the season in waters of the Resurrection Bay SHA, site of the management area's earliest sockeye salmon run. Closed waters markers, used during previous years' common property and hatchery openings, were once again posted at the mouth of the Resurrection River to better define the river's mouth and the fishing boundaries. In addition, a traditional area of closed waters along the west side of Resurrection Bay between Caines Head and the city of Seward was once again established by emergency order (Table 8) in order to protect enhanced runs of Chinook salmon, which are allocated entirely to the sport fleet and are illegal to retain in the commercial fishery. CIAA was also prepared to harvest fish in the freshwater SHA at the Bear Creek weir for cost

recovery purposes once achievement of the desired inriver goal was met or its attainment could be projected.

Waters of Bear Lake SHA, described as those Resurrection Bay waters north of the latitude of Caines Head, were opened to CIAA hatchery seining by emergency order beginning on May 24 five days per week (Table 8), in keeping with the traditional recent-year opening time of mid to late May. This fishing schedule was expected to theoretically allow sufficient opportunity to harvest sockeye salmon without jeopardizing the desired inriver escapement goal for Bear Lake. Historical catch information for the Bear Lake run showed that the majority of returning sockeye salmon appeared in marine waters at the head of Resurrection Bay during the first two weeks of June.

The two seiners acting as hatchery agents for CIAA in Resurrection Bay this season began to harvest fish on the first day of the opening, though catches were expectedly modest. As was the case for previous years' common property and hatchery openings, all effort was concentrated at the head (north) end of Resurrection Bay. Atypically, catch rates failed to increase over the next several days, and by the end of the first week's fishing period the cumulative catches had risen to less than 2,200 sockeye salmon. Catch rates once again inexplicably failed to rise the following week, which historically constitutes the peak period of seasonal harvests, and by June 4 catches cumulatively totaled just 4,500 sockeye salmon. Meanwhile, CIAA reported an escapement of only 700 sockeye salmon through the Bear Lake weir, representing approximately 6% of the upper end of the desired inriver goal range. Both the catch and escapement were considered extremely poor and suggested that the preseason forecast was overly optimistic.

Although catches picked up during the third week of open hatchery fishing in marine waters, the cumulative harvest in Resurrection Bay through June 10 totaled 14,100 sockeye salmon, or less than 10% of the preseason harvest forecast of 175,000 fish. The run was far weaker than originally anticipated, and despite a prediction by CIAA that limited common property opportunity to target this stock was likely in 2010, the meager numbers and lateness of the date indicated otherwise. The only positive sign up until this point was escapement into Bear Lake, totaling 3,850 sockeye salmon or about 32% of the desired inriver return target of 12,000 fish. Historical information collected from this sockeye salmon run suggested that the escapement rate was sufficient to attain the escapement objective, and as a result the weekly hatchery fishing period in marine waters of the Bear Lake SHA was liberalized by emergency order to seven days per week beginning June 11 (Table 8). This action was expected to allow additional opportunity for CIAA to obtain revenue from their Resurrection Bay stocking projects without jeopardizing sockeye salmon escapement into Bear Lake.

Despite the continuous hatchery fishing in marine waters of Resurrection Bay, hatchery catches remained very poor over the next several days. Meanwhile, the daily escapement rate into Bear Lake fell significantly after June 14, and by June 17 the cumulative escapement had risen to only 8,000 fish. Both department staff and CIAA concurred that all remaining sockeye salmon destined for Bear Lake might very well be required in order to achieve the inriver goal, so hatchery fishing in marine waters of Resurrection Bay was closed by emergency order beginning June 18 (Table 8) and was never reopened for the remainder of the season. The last delivery of sockeye salmon from marine waters of Bear Lake SHA was made on June 16, bringing the cumulative hatchery harvest in saltwater to 18,800 fish for the season (Table 3).

Beginning June 22, the number of sockeye salmon appearing at the Bear Creek weir finally increased, and CIAA elected to begin selectively harvesting fish for cost recovery there. Escapement totaled about 9,000 sockeye salmon at that time, or three-fourths of the desired goal. Unfortunately, the increased rate lasted only about four days before beginning a steady decline for the rest of the run. The final harvest of sockeye salmon from the Bear Creek weir totaled just under 3,000 fish for the season (Table 3), with peak catches coming between June 22 and June 25. The combined freshwater and saltwater harvests of Bear Lake and Resurrection Bay fish cumulatively totaled approximately 21,700 sockeye salmon (Table 3), and inclusion of the freshwater escapement (including broodstock) of 12,900 fish brought the total 2010 estimated Bear Lake/Resurrection Bay run to only 34,600 sockeye salmon (Table 3, Appendix A17). This was a huge disappointment considering that the run during the previous five seasons annually averaged over 87,000 fish. A recently developed sport fishery near saltwater at the mouth of the Resurrection River also harvested Bear Lake sockeye salmon, but catch estimates for that group were unavailable. The value of the Bear Lake sockeye salmon hatchery harvest was estimated at just $291,200, or approximately one-fifth of the 2010 Trail Lakes Hatchery revenue goal of $1.43 million.

At Aialik Lake in Aialik Subdistrict, department aerial surveys to assess the sockeye run began on June 25, but less than 200 sockeye salmon were documented in freshwater at the time. No increase in escapement was detected over the next two and one-half weeks, but surveys during this period were consistently hampered by some combination of dark overcast skies, rain, fog, and silty water. Nonetheless, the low numbers dictated that no commercial openings were announced to target this stock. Finally on July 16, a small increase in escapement was observed when nearly 900 sockeye salmon were estimated during a routine aerial survey. One week later, the number had jumped to just over 5,300 sockeye salmon, which proved to be the peak of the season. This figure was used as the final index of escapement at Aialik Lake (Table 3; Appendix A24), falling near the midpoint of the established SEG range of 3,700 to 8,000 sockeye salmon.

Pink Salmon

Given the erratic production from the small Eastern District systems in most recent years, and since no directed openings have been allowed in this district for many years, no harvestable surplus of pink salmon was forecasted in these waters for 2010. Because of the expensive nature to adequately assess the small streams there, and also because no openings were expected, surveys of Resurrection Bay systems tend to be of a low-priority nature. In 2010, ground surveys of Resurrection Bay streams were not scheduled and not conducted, making four consecutive seasons of no assessment for these systems. Nonetheless, due to the trend of primarily weak but highly variable returns during recent years, no openings for pink salmon were allowed in Resurrection Bay or in any other Eastern District location this season and therefore no harvest occurred.

Other Species

Chinook salmon have never played an important role in Eastern District commercial fisheries. Chum salmon, on the other hand, have occasionally been an important component of commercial catches in the Eastern District, but catches during the past 10 years have averaged only about 360 fish annually. Due to a pattern of weak Eastern District runs over the past 10–15 years, no directed openings for chum salmon were allowed there this season, and therefore no harvest of chum salmon occurred (Table 6; Appendix A22). As was the case for pink salmon, no ground

surveys of Resurrection Bay streams occurred this season, thus no escapement estimates for chum salmon were generated.

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 *5 AAC 21.376 Resurrection Bay Salmon Management Plan* specifically directs the department to manage coho salmon stocks 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 2010, a total of 1,100 coho salmon were entered into the Seward Silver Salmon Derby and subsequently sold (Tables 1 and 4). In addition, a portion of the returning adults from the enhancement project are normally harvested at the Bear Creek weir by CIAA as cost recovery for expenses incurred. During prior years when the salmon market was strong, CIAA customarily sold most hatchery-caught coho salmon to a commercial processor(s). Because market forces now make product quality a central issue, the majority of coho salmon taken at the weir are unmarketable due to excessive fresh water marking. As has become commonplace in recent seasons, most coho salmon harvested at the Bear Creek weir this year were donated to various individuals, many of whom were dog mushers, while only about 11% were sold. Total hatchery harvest from the Bear Creek weir was approximately 250 coho salmon (Tables 1 and 4), comprising only about 12% of the entire LCI coho salmon catch this season. Nearly 500 coho salmon were collected for hatchery broodstock, while an additional 500 fish were allowed into Bear Lake as escapement (Table 4). Commercial catch in the entire Eastern District totaled just under 1,400 coho salmon (Table 4; Appendix A18), falling far short of the recent 10-year average of 4,400 fish.

2010 SALMON ENHANCEMENT AND REHABILITATION

INTRODUCTION

Fisheries enhancement has played a major role in LCI salmon production for over three 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, all of which potentially lower overall survival rates. Since their inception in the mid 1970s, 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 very important in future years.

Projects initiated by the department and presently being undertaken by CIAA provided an estimated 15% (69,700 salmon) of the total 2010 LCI commercial harvest of 468,200 fish. The CIAA-operated sockeye salmon enhancement projects at Leisure/Hazel, Kirschner, and Bear Lakes and at Tutka Bay Lagoon, produced approximately 75% (69,700 fish) of the total LCI sockeye harvest of 93,100 fish in 2010. For the third year in a row, the entire pink salmon catch in 2010 was a result of only natural production.

Using average weights per fish and average prices per pound in LCI, salmon produced by CIAA contributed an estimated 34% ($0.60 million) to the $1.78 million total value of the 2010 LCI

commercial salmon harvest. Since CIAA utilized all fish returning to their enhancement sites in pursuit of revenue goals this season, and no common property harvest occurred on these stocks, the previously described exvessel figure also represents the proportion of the total exvessel value utilized for hatchery cost recovery (Table 7). A brief description of the current enhancement projects in LCI follows.

TUTKA BAY LAGOON HATCHERY AND REMOTE RELEASE SITE

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 1993–1994, increased its capacity to approximately 150 million eggs. Pink salmon were the primary species produced at the hatchery, while secondary chum enhancement during earlier years was ultimately discontinued in favor of experimental efforts directed toward sockeye salmon in later years. Although the hatchery had a sockeye salmon egg capacity of 1.8 million eggs, and raceways to accommodate the resulting fry, efforts to incubate and rear sockeye salmon to the smolt stage were plagued by the IHN virus, and the sockeye salmon program was relatively short lived. In 2004, CIAA announced suspension of all Tutka Hatchery operations, essentially ending the annual full-scale pink salmon incubation and release program. The last adult pink salmon return to the facility occurred in 2005, the result of brood collection in 2003 and subsequent fry release in 2004. However, CIAA announced in early 2010 their intent to restart the pink salmon program at Tutka Lagoon Hatchery and was prepared to collect broodstock from Tutka Creek. Unfortunately, the pink salmon run in 2010 was extremely weak and did not achieve the minimum parameters necessary to allow for brood collection. Nonetheless, CIAA continues to pursue resumption of the pink salmon hatchery program.

In a matter related to the LCI sockeye salmon lake stocking program, CIAA recently began to utilize Tutka Lagoon as a remote release site for sockeye salmon in an effort to develop an adult return to that location. The permit for this program is held by CIAA's Trail Lakes Hatchery, located in Moose Pass, and all incubation and rearing activities are conducted at that facility. Such a program became necessary when the original sockeye salmon brood source for the LCI lake stocking program, Tustumena Lake in Upper Cook Inlet, became unavailable due to a federal court ruling. To overcome this obstacle and continue the LCI sockeye salmon lake stocking program, CIAA applied for and successfully received a permit to temporarily collect and incubate sockeye salmon eggs from Hidden Lake, in the Kenai River drainage of Upper Cook Inlet, for use in this project. Plans allowed for an egg collection from that location for five years from 2006 through 2010, incubation of the eggs and rearing of fry at Trail Lakes Hatchery, and release of smolt at Tutka Lagoon. Ultimately CIAA expects to utilize sockeye salmon adults returning to Tutka Lagoon as the source of eggs to supply the LCI lake stocking program that includes Leisure, Hazel, and Kirschner Lakes.

The third year of adult sockeye salmon runs as a result of the Tutka Lagoon remote releases occurred in 2010. CIAA harvested approximately 38,100 sockeye salmon (Table 3) for hatchery cost recovery purposes in waters of the lagoon, while collecting an additional 2,700 sockeye salmon for the second full-scale remote egg take at this site. The combined figures produced an estimated adult return to Tutka Lagoon totaling 40,800 sockeye salmon. In 2010, CIAA released an estimated 278,000 sockeye salmon smolts from Tutka Lagoon as part of this program (Appendix A32) and collected approximately 3.35 million eggs from Tutka Lagoon broodstock.

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 evaluation of stocking 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 salmon stocking program was initiated at Hazel Lake, located approximately three miles south of Leisure Lake and emptying into Neptune Bay. Since their inception, these projects have produced over 3.1 million adult sockeye salmon, making significant contributions to the commercial, personal use, and recreational sockeye salmon 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 salmon return to Leisure and Hazel lakes in 2010 was estimated at 6,600 fish (Figure 10; Appendix A15), only slightly exceeding the dismal run in 2009 and therefore the second lowest figure since those two returns have been tallied together beginning in 1991. The cumulative estimated commercial harvest of 1,000 fish produced by the two projects comprised less than 2% of the Southern District sockeye harvest. The total Southern District sockeye salmon harvest of 53,900 fish was the seventh consecutive below average harvest over the past decade (Appendix A6).

Leisure Lake was stocked with 1.93 million sockeye salmon fry in 2010, about 15% higher than the recent 10-year average of 1.68 million, while Hazel Lake was stocked with 1.22 million sockeye salmon fry, or just over 25% greater than the recent average of 974,000 (Appendix A32).

As previously mentioned, the brood source for the LCI lake stocking programs, from Tustumena Lake, became unavailable to CIAA after 2004. CIAA initiated a remote sockeye salmon release program from Tutka Lagoon (described previously), utilizing sockeye salmon eggs collected from Hidden Lake broodstock in Upper Cook Inlet. Egg collections from this location continued through 2010. In the future, adult sockeye salmon returning to the Tutka Lagoon release site will be utilized as the permanent brood source to supply not only the Leisure/Hazel releases but the Kirschner Lake sockeye salmon enhancement project in Kamishak Bay as well. Due to a combination of factors regarding fish produced from Hidden Lake brood, including a perception of poor performance, small size of returning adults, and delayed emergence of juveniles, alternate brood sources are currently being explored for use in the Tutka Lagoon remote release project.

ENGLISH BAY LAKES SOCKEYE SALMON REHABILITATION

The English Bay Lakes system has the only significant stock of sockeye salmon native to the Southern District of LCI. Unfortunately, English Bay sockeye salmon runs declined to their lowest recorded levels in the last half of the 1980's decade. Sockeye salmon escapement estimates between 1985 and 1993 ranged from 2,500 to 8,900 fish, and all but one of those years (1993) was well below the 20-year average of 7,800 fish for the years 1973 through 1992. The decline of the English Bay sockeye salmon returns resulted in a very restrictive management

strategy for this area, with commercial, sport, and subsistence fisheries closed during the sockeye salmon run for most years mentioned. Efforts to rehabilitate this depressed stock were initiated by the department with an egg take in 1989 and the subsequent release of 350,000 sockeye salmon fry in 1990 (Appendix A32). 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, now known as the Nanwalek Salmon Enhancement Project (NSEP). NSEP has attempted to continue broodstock collection, egg collection and incubation, fry rearing, fry stocking, and operation of a smolt/adult enumeration weir. More recently, the necessary permits for transporting eggs and juvenile sockeye salmon for this project were transferred to CIAA's Trail Lakes Hatchery, where incubation and rearing has occurred under contract for several years.

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 with a counting weir, operated by CRRC/NSEP. The cumulative total that first year numbered 13,800 sockeye salmon (Appendix A24), up to that time 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 recorded figure since statehood.

In the early 1990s, optimum escapement for this system was estimated to be less than the original maximum goal of 20,000 sockeye salmon (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 department staff, representatives of CRRC/NSEP, and village residents from Nanwalek during meetings held over the winter of 1995–1996. This escapement goal remained in place during the years 1996–2001. After the 2001 season, the department conducted an escapement goal review for all salmon systems in the LCI management area and presented the results to the Alaska Board of Fisheries (BOF) at its Anchorage meeting in November 2001. The BOF approved the sustainable escapement goals (SEG's) proposed by department staff, and the new goals were implemented for the first time in 2002. Based on the department's analysis, the new SEG for English Bay Lakes was expressed as a range of 6,000 to 13,500 sockeye salmon. When the sockeye salmon enhancement project's annual broodstock requirements, which are removed from escapement into the lakes, were added onto the SEG, the desired inriver goal became a range of 7,450 to 14,950 sockeye salmon (midpoint 11,200) for the 2010 season.

Unfortunately, a formal preseason forecast for sockeye salmon returning to the English Bay Lakes system was not possible in 2010 because of incomplete smolt outmigration information. However, it should be noted that actual runs in recent seasons were significantly greater than expected. Nonetheless, in a proactive effort to preclude excessive harvest on the run prior to assessment of run strength, waters of Port Graham Subdistrict, including both Port Graham and English Bay Sections, were not allowed to open to commercial set gillnet fishing in early June this season. In addition, the subsistence fishing season in local waters, which initially opened by regulation on April 1, was restricted (but not completely closed) by emergency order beginning June 1 (Table 8) in order to encourage escapement of returning adults while still providing limited opportunity for subsistence users. An egg removal schedule for English Bay Lakes was included in the 2010 Trail Lakes Hatchery (TLH) Annual Management Plan as a contingency to

allow a limited egg take should the return prove strong enough to achieve parameters described in that schedule.

The CRRC/NSEP enumeration weir was installed and became operational on May 20, with an estimated 10 adult sockeye salmon already above the weir site. The first adult fish passage was documented on June 1, but passage rates remained relatively low over the next 9 days, with daily counts ranging from zero to 186. Counts began to show increases on June 11 when 464 sockeye salmon were counted, but didn't display consistently substantial daily escapements until June 19. Daily counts peaked on July 2 when 882 sockeye salmon were tallied, bringing the cumulative escapement total to just over 7,200 sockeye salmon, falling within the SEG range of 6,000 to 13,500 fish. As a result, the department issued an emergency order liberalizing subsistence set gillnet fishing in waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, to the regularly scheduled weekly fishing periods beginning July 2 (Table 8). Recognizing the greater harvesting potential of the commercial set gillnet fishery, department staff elected to keep that fishery closed.

Daily escapement passage remained relatively strong, and through July 6 the cumulative weir counts totaled just over 9,100 sockeye salmon. Since this figure approached the midpoint of the desired inriver goal, additional sockeye salmon could be made available for harvest without jeopardizing escapement requirements. As a result, the commercial set gillnet fishing in waters of Port Graham Subdistrict was opened by emergency order beginning July 8 on the regular schedule of two 48-hour fishing periods per week (Table 8).

The commercial set gillnet fishery in Port Graham Subdistrict remained opened to fishing for the remainder of the regulatory season in 2010. Due to the relatively late timing of the opening in relation to the sockeye salmon run to English Bay Lakes, the commercial harvest in the two sections of Port Graham Subdistrict totaled a modest 1,900 sockeye salmon (Table 3). The 2010 subsistence harvest by residents of Port Graham, annually compiled by the department's Division of Subsistence, was estimated at approximately 100 sockeye salmon (Appendix A29), while estimates for the village of Nanwalek showed a harvest of 1,500 sockeye salmon (Appendix A30). Since no sockeye salmon were expected to return to the nearby Port Graham Hatchery this season as a result of that facility's intermittent remote release program, it is logical to assume that this source did not contribute to catches in the local commercial and subsistence fisheries during 2010.

The English Bay River counting weir remained in operation through July 19, tallying a cumulative escapement figure of 12,300 sockeye salmon for the season (Table 3; Appendix A24), slightly greater than the midpoint of the desired inriver goal range. Because the sockeye salmon run was relatively strong and the escapement was sufficient, CIAA was authorized to collect broodstock from the English Bay Lakes system as outlined in the Trail Lakes Hatchery Annual Management Plan. A total of 1,023 sockeye salmon were harvested for broodstock, resulting in the collection of 1.11 million eggs. Eggs collected in 2010 from English Bay Lakes sockeye salmon broodstock were incubated, and fry subsequently reared, at Trail Lakes Hatchery near Seward.

An estimated 202,000 juveniles were released directly into English Bay "Second" Lake in 2010 as "fall fry" or "pre-smolt" (Appendix A32), while no juveniles were released from the Port Graham Hatchery facility.

BEAR LAKE AND RESURRECTION BAY 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 for over two decades. Since 1962, this system has also been the centerpiece of a Division of Sport Fish coho salmon enhancement program, part of which originally 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 sockeye salmon without adversely affecting coho salmon production, as mandated by regulatory management plans, CIAA undertook a sockeye salmon stocking program beginning in 1989 with the release of 2.2 million sockeye salmon fingerlings. Since then, additional releases of fry, fingerlings, and both accelerated growth ("zero check") and traditional smolts have occurred, cumulatively ranging from 0.2 to 3.4 million juvenile sockeye salmon each year (Appendix A32).

The first year of enhanced adult sockeye salmon runs in 1992 was discouraging, with a total of less than 2,000 fish, but returns increased during each of the following three seasons. The run in 1996 was almost identical to that of 1995, totaling nearly 53,000 sockeye salmon, but between 1996 and 2004, return totals diminished and were not meeting the system's hypothesized potential. Runs in both 2005 and 2006 displayed considerable improvement, totaling 70,000 and 75,000 sockeye salmon, respectively, while the 2007 return totaled a disappointing 36,700 sockeye (Appendix A17). In 2008 and 2009 the sockeye salmon runs to Bear Lake totaled 103,500 and 150,800 sockeye salmon respectively, the highest totals since the inception of the enhancement program. It should be noted that figures cited here do not include any recreational harvest numbers, estimates for which are unavailable.

Management objectives for the commercial salmon fishery in Resurrection Bay during 2010 were identical to those of 2009, but significantly different than those of the previous four seasons. During those years, management actions were designed to produce equal harvest shares of Bear Lake sockeye salmon to CIAA and the commercial seine user group. The management strategy at that time called for opening the commercial seine fishery in mid/late May, and continuously monitoring catches as well as escapement counts at the Bear Creek weir to determine if and/or when a hatchery opening in salt water was appropriate to equalize catches. Additionally, CIAA normally harvested sockeye salmon that were excess to escapement requirements at the Bear Creek weir. In March of 2009, the Alaska Board of Fisheries adopted a new Trail Lakes Hatchery Sockeye Salmon Management Plan that was implemented beginning with the 2009 season. This management plan directed the department to manage special harvest areas (SHA's) involving Trail Lakes Hatchery sockeye salmon enhancement programs to achieve hatchery financial and broodstock objectives prior to allowing any common property fishing in those waters. This management plan was also in place for the 2010 season.

The harvestable surplus of sockeye salmon bound for Bear Lake and Resurrection Bay was predicted to total approximately 175,000 fish in 2010. The actual commercial harvest totaled only 21,700 sockeye salmon for the season (Table 3), dismally short of the anticipated total. The final cumulative Bear Lake escapement (including 4,300 collected for broodstock) was 12,900 sockeye salmon (Table 3; Appendix A24). Combining these figures, the 2010 Bear Lake total run was estimated at 34,600 sockeye salmon (Appendix A17), representing only 18% of the preseason forecasted total run of approximately 188,000 fish.

The run to the head of Resurrection Bay this season was split into two components: 108,000 sockeye salmon were predicted to return to the fresh waters of the Bear Lake drainage, and for the first time since the Bear Lake sockeye salmon enhancement program began, an additional 80,000 fish were expected to return to the newly implemented Resurrection Bay marine netpen release site. Unfortunately very few sockeye salmon were observed returning to the saltwater release site in 2010. The 2010 run broke the recent five-year trend of strong sockeye salmon runs to the head of Resurrection Bay due to the virtual failure of the expected run to the saltwater release site and an unanticipated weak run to Bear Lake. Because the cost recovery goal for CIAA was not achieved, no common property openings to target sockeye salmon were allowed in Resurrection Bay in 2010.

A cumulative total of approximately 2.2 million sockeye salmon fry were released into Bear Lake/Creek during 2010 (Appendix A32), while an additional 1.7 million sockeye smolts were short-term reared in saltwater netpens and released into Resurrection Bay as part of CIAA's revamped release strategy. An estimated 5.4 million sockeye salmon eggs were collected for incubation over the 2010–2011 winter at Trail Lakes Hatchery in Moose Pass. Though runs this season were disappointing, the recently implemented release tactics for Bear Lake and Resurrection Bay are expected to improve survival rates and increase adult returns commensurately in future years.

PORT GRAHAM HATCHERY AND SOCKEYE SALMON SALTWATER RELEASE

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 (Figures 2 and 5). The hatchery conducted experimental pink salmon egg takes and fry releases via a scientific/educational permit from 1990 through 1992, but these activities have subsequently been permitted in the Port Graham Hatchery (PGH) Basic and Annual Management Plans (BMP/AMP). Original startup broodstock was collected from a natural run of pink salmon in Port Graham River, at the head of Port Graham, and the PNP permit for PGHC allows for continued pink salmon broodstock collection from this source. However, the Port Graham River pink salmon run has historically 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 broodstock collection schedule based on the sustainable escapement goal for Port Graham River, as well as historical escapement levels, was developed to offer maximum protection to the wild pink salmon stock during years of weak returns.

Historically, the PGH pink salmon program experienced quite variable success rates, with estimated adult returns ranging from 2,700 to 1.36 million fish between 1992 and 2007. Unfortunately, the facility has been without a manager for the past four seasons, while simultaneously encountering financial difficulties. As a result, the last pink salmon egg take for the facility occurred in 2006, but the release of the resultant fish in 2007 was much less than optimal since juveniles were allowed to outmigrate volitionally from the facility at emergence, with no enumeration and no short-term pen rearing as is customarily the practice. No pink salmon juveniles were released at Port Graham in 2009, making 2010 devoid of enhanced pink

salmon returns in Lower Cook Inlet. The future of the pink salmon program at Port Graham Hatchery remains uncertain at least until the hatchery manager position can be filled.

Although all efforts prior to 1993 were directed towards pink salmon, sockeye salmon production has also been undertaken at PGH. During some but not all years since 1993, the facility has incubated sockeye salmon eggs collected from English Bay Lakes broodstock as part of that enhancement project, with the resulting fry destined for eventual release back into the lake system (for additional information, see the previous "**English Bay Lakes Sockeye Salmon Rehabilitation**" section). Prior to 1993, eggs from this collection site were incubated at Big Lake Hatchery near Wasilla. Because the hatchery facility has not been operational more recently, PGHC has contracted with CIAA in some years to incubate sockeye salmon eggs and rear sockeye salmon fry originating from English Bay Lakes broodstock at Trail Lakes Hatchery in Moose Pass. Because of the questionable status of PGH, the permits necessary to transport English Bay Lakes sockeye salmon eggs and fry were transferred to Trail Lakes Hatchery in early 2010.

In 2003, PGH obtained a permit to collect sockeye salmon eggs from nearby English Bay Lakes for the purpose of developing an adult return to the hatchery facility. The returns are intended to provide additional subsistence and commercial fishing opportunities in area waters, as well as to generate revenue for hatchery cost recovery. An estimated 110,000 sockeye salmon smolts were released in 2004 (Appendix A32), but inconsistencies in funding, broodstock collection, and hatchery incubation/rearing have resulted in only two additional releases since that time.

The success of the first release in 2004 was considered very poor and few if any adults returned to the hatchery facility. Better success was anticipated from the 2006 release of almost a half-million sockeye smolts, returns from which began in 2008 and continued in 2009, resulting in a 2009 hatchery harvest of 8,300 sockeye salmon. No adults were expected to return to the Port Graham facility in 2010, and no juvenile sockeye salmon were released. However, a small release of 112,000 sockeye salmon smolts in 2009 is expected to result in very modest runs to the hatchery during 2011 and 2012.

2011 COMMERCIAL SALMON FISHERY OUTLOOK

SOCKEYE SALMON

Commercial sockeye salmon harvests in LCI during 2011 could approach 274,000 fish, which is about 90% of the recent 10-year average catch of 303,000. Approximately two-thirds of the total sockeye salmon harvest is expected to result from continuing enhancement and lake stocking projects in LCI. The 2011 sockeye salmon run to Bear Lake and Resurrection Bay, primarily the direct result of the enhancement project there, is expected to produce a harvest of around 130,000 fish after accounting for broodstock and escapement requirements. The management plan adopted by the Alaska Board of Fisheries (BOF) in March 2009 and utilized for the 2009 and 2010 seasons was allowed to "sunset" during the November 2010 BOF meeting and will not be in place for the 2011 season. Management of CIAA SHA's in LCI will be determined through a public process involving CIAA, the department, and the Cook Inlet Regional Planning Team (CIRPT), and will ultimately be outined in hatchery annual management plans prior to the field season. Factors affecting this process will include CIAA's 2011 revenue goal and input from the public.

Because of unexpectedly poor production in recent seasons, forecasted runs to enhancement sites at Leisure and Hazel Lakes in the Southern District during 2011 are expected to be below average once again, with a harvest projection of about 5,000 sockeye salmon anticipated at Leisure Lake/China Poot Bay and an additional 2,900 sockeye salmon expected at Hazel Lake/Neptune Bay. The enhanced run of sockeye salmon returning to CIAA's Tutka Bay Lagoon release site is expected to provide up to 30,000 fish for harvest. Kirschner Lake in the Kamishak Bay District is expected to produce a run totaling approximately 11,800 sockeye salmon in 2011, a projection based on actual stocking rates combined with average assumed 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 runs are expected back to these systems in 2011.

Despite the discontinuation of the stocking program at Chenik Lake in the Kamishak Bay District, the sockeye salmon run to that system, and potential harvest opportunities, remain cautiously optimistic in 2011 even though no formal forecast was generated. It should be noted that the adult sockeye salmon runs to that site over the past eight seasons, all entirely the result of natural production, were the strongest since 1993 and included a record harvest of over 171,000 sockeye salmon in 2008. This clearly suggests that a reasonably strong run could once again produce a harvestable surplus in 2011.

No formal preseason forecast for sockeye salmon returning to English Bay Lakes in the Southern District was prepared for 2011, due to a lack of sufficient information. Because recent years' sockeye salmon runs to this system have been sufficient to achieve established escapement objectives, the restrictive management measures imposed on local subsistence fisheries may not be required this season. However, due to increased efficiency and harvesting power, the commercial set gillnet fishery will likely remain closed in waters of Port Graham Subdistrict at the start of the season until run strength can be adequately assessed. It should be noted that the sockeye salmon run to English Bay Lakes during each of the past five seasons was stronger than initially anticipated and did allow for limited commercial fishery openings. At nearby Port Graham Hatchery, an estimated 4,100 sockeye salmon are expected back as a result of the intermittent saltwater release project conducted by that facility, but previous years' experience suggests that all fish will likely be necessary for hatchery cost recovery and no surplus is anticipated for commercial common property harvest.

Based solely on average historical harvests, natural sockeye salmon run projections for LCI could be expected to contribute up to 90,000 fish to commercial catches in 2011. Although not reaching preseason expectations during any recent year (with the exception of Chenik Lake in Kamishak Bay District), natural sockeye salmon runs in LCI have nevertheless been generally positive, with concurrently reasonable spawning escapements and, at times, harvestable surpluses at some 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 and/or Chenik Lakes in the Kamishak Bay District.

PINK SALMON

Harvest of pink salmon in LCI during 2011 is expected to total 949,000 fish, with natural production expected to provide the entire total for just the fourth time in over three decades. No adult pink salmon are expected to return to either Tutka Bay or Port Graham Hatcheries in the

Southern District because the former has suspended all activities, while the latter has not released any juveniles since 2007.

Natural pink salmon spawning escapement levels into most major LCI systems were considered good to excellent in 2009, contributing to the harvest projection of 949,000 pink salmon throughout the entire LCI management area (Otis *In prep* a). The bulk of the 2011 predicted surplus is expected to occur at Bruin Bay in Kamishak Bay District and Port Dick in the Outer District, with lesser contributions forecasted for Windy and Rocky Bays in the Outer District and Ursus and Rocky Coves in Kamishak Bay District. Southern District systems are not expected to produce surpluses in 2011. The pink salmon forecast, however, must be viewed with caution based on the recent history of erratic tender service, sometimes weak markets, a lack of consistently active buyers, and difficult fishing conditions in one remote district, and it therefore remains questionable whether the harvest forecast of naturally produced pink salmon will be realized in 2011.

CHUM SALMON

Based solely on average harvests after 1988, the total LCI commercial chum salmon catch is projected to reach up to 49,000 fish during 2011. Annual chum salmon runs were relatively strong between 2000 and 2006, and again between 2008 and 2010, however, resulting in commercial catches that exceeded the 2010 forecast figure during all but three of the past eleven seasons. This suggests that actual harvests during 2011 could be greater than the projection, and based on long-term historical patterns, the highest potential for harvest opportunities will likely occur in the Kamishak Bay District. The LCI chum salmon 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 either Chinook or coho salmon in LCI. However, average annual harvests since 1980 indicate that about 1,100 Chinook and 12,800 coho salmon can be expected to contribute to LCI commercial harvests in 2011.

The following table shows the projected harvest figures by species in the Lower Cook Inlet management area during 2011:

Species	Harvests of Natural Runs	Harvests of Enhanced Runs	Total Harvest
Chinook	[a]	[a]	1,100[a]
Sockeye	89,900[b]	183,800[c]	273,700
Coho	[a]	[a]	12,800[a]
Pink	949,300	0	949,300
Chum	49,000[b]	0	49,000
Total	**1,088,200**	**183,800**	**1,285,900**

[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.

2010 SUBSISTENCE AND PERSONAL USE SALMON NET FISHERIES

KACHEMAK BAY PERSONAL USE SALMON GILLNET 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 affected the status of this fishery during the 1980s and early 1990s, 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" classification, the subsistence fishery and the regulations governing it were no longer valid. The BOF readopted 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 personal use 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 Nick Dudiak Fishing Lagoon, located on the Homer Spit. A former coho enhancement project at Fox Creek/Caribou Lake, near the head of Kachemak Bay, provided additional fish for harvest in the 1980s and 1990s, but the program was eliminated and no adults from that project returned after 1997. The regulations governing the fishery are found in *5 AAC 77.549 Personal Use Coho Salmon Fishery Management Plan*. During its 1998 meeting in Homer, the BOF listened to the staff's concerns regarding the harvest of wild stocks of coho salmon and subsequently reduced 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 coho salmon. The lower GHR was implemented for the first time during the 1999 season. Incorporated into the management plan is a requirement that coho salmon taken during the earlier Seldovia area subsistence salmon fishery be included as part of the personal use guideline.

All regulations from the previous year's fishery remained essentially unchanged for the 2010 personal use fishery. Legal gear was limited to a single set gillnet not exceeding 35 fathoms in length, 45 meshes in depth, and six inches in mesh size. Nets were not allowed 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 department's 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. By regulation the Southern District personal use salmon set gillnet fishery opens August 16. 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. Beginning with the 1991 season, the fishery was intensively managed for the GHR, and fishing time allowed between 1991 and 2008 ranged from 72 to 216 hours. This changed dramatically in 2009 when the fishery was allowed to essentially remain open until the regulatory closing date, for a total of 421 hours fishing time.

In 2010, only 31 coho salmon were reported during the early August Seldovia subsistence fishery, thus having little impact on the GHR in the later 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. Catch information collected after the first three 48-hour periods indicated a catch of only 441 coho salmon harvested by 52 (46%) of the 113 permit holders. As reports continued to trickle in, it quickly became clear that both the catch rate and effort were extremely low. Normally, information showing such low catches would indicate a very weak coho salmon run and would prompt a fishery closure in order to protect natural stocks for escapement purposes. However, department aerial surveys of a prominent coho salmon system at the head of Kachemak Bay on August 20 and 26 showed adequate escapement, alleviating fears of insufficient escapement.

Cumulative catch information collected through September 11 showed a total of only 641 coho salmon reported by 68 (53%) of the 128 permit holders. However, an additional department aerial survey on September 13 verified excellent coho salmon escapement into the primary index stream at the head end of Kachemak Bay. As a result, and for the second consecutive year since intensive management began in 1991, the fishery was allowed to remain open up to the regulatory closing date of September 15th.

A total of 128 permits were issued for the 2010 fishery (Appendix A27), while 123 permit holders (96%) phoned in their catches or returned their permits. Of the total number issued, 82 permit holders (64%) actively fished, 41 (32%) did not fish at all, and the remaining 5 permit holders (5%) did not report or return their permit. Based on returned permits and voluntary catch reports, the estimated harvest was 875 coho salmon, 251 pink salmon, 149 sockeye salmon, 14 Chinook salmon, and 17 chum salmon (Appendix A27). The 2010 coho salmon total represents the third lowest catch recorded in the personal use gillnet fishery since 1974.

The coho salmon harvest total this season fell short of the low end of the GHR by approximately 13%. Similar to the last three years, the area from Fritz Creek to Swift Creek, located along the north shore of Kachemak Bay, produced the highest percentage of coho salmon harvest (53%) and received a high proportion of effort (31%). On average between 1999 and 2006, this area received less than 10% of the active effort and produced only 10% of the overall coho salmon catch each season. Prior to 2006, the majority of coho salmon catches in the personal use fishery came from the east side of the Homer Spit, but effort there this season produced only about 14% of the total coho salmon harvest.

At 432 hours, fishing time this season was the longest on record since 1990 (also 432 hours), before intensive management of this fishery began. While the number of permits issued this season (128) was only slightly lower than the previous 10-year average (131), it still fell significantly below the 1990–2009 average of 226 permits. The number of actively fished permits (82) came in below the recent 10-year average of 92 permits. (Appendix A27).

In an effort to provide additional sport fishing opportunities and continuity with the earlier return of Chinook salmon to the Nick Dudiak Fishing Lagoon on the Homer Spit, the Division of Sport Fish stocked coho salmon with both early (Ship Creek brood) and late (Bear Lake brood) run timing characteristics from 2001 through 2009. Adults resulting from the early run release return as early as the third week of July, shortly after the end of the enhanced Chinook salmon run. The early coho salmon run generally peaks during the first week of August and ends approximately August 15, closely corresponding with the regulatory opening date of the personal use fishery,

while the midpoint of the late coho salmon run is near the end of August. The potential for overlapping run timing windows from the tail end of the early coho salmon run and beginning of the late coho salmon run could potentially increase catch rates in the personal use fishery, particularly during the first 24-hour period.

Due to the abbreviated nature of the personal use fishery in most years since 1991, the staff annually makes 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. Although this prior knowledge of the brevity of the fishery has at times led to intense competition for desirable fishing sites along the east side of the Homer Spit, the reduced participation in the fishery, combined with rather poor returns of the late-run enhanced coho salmon component in recent seasons, appears to have tempered this competitive character. Nonetheless, this area continues to remain an extremely popular location to fish, undeniably due to the coho salmon enhancement project at the Nick Dudiak Fishing Lagoon. When enhancement on the Spit first began, the greatest fishing success in the personal use fishery traditionally occurred in those waters adjacent to the enhancement lagoon, but beginning in 2006 other areas produced total catches approaching or exceeding those of the area on the east side of the Spit. As would be expected, a shift in effort to other more productive areas, such as was observed during the past four seasons, will likely be influenced by the strength of each season's late-run coho salmon return to the Homer Spit.

Prior to enhancement, the Spit was considered only average in terms of harvest productivity. The Spit's easy road access and the enhanced coho salmon runs have frequently combined to incite fishermen to clamor for fishing sites on the Spit, a situation which resulted in numerous violations during some previous gillnet fisheries. Although Division of Alaska Wildlife Troopers (AWT) officers have formally cited very few individuals since the 1994 fishery, numerous verbal warnings have been issued, and many complaints received via telephone in the department's Homer office regarding infractions. This year AWT officers were on site for the beginning of the fishery, and as is usually the case, the presence of these uniformed officers generated relatively expedient voluntary compliance, and no formal citations were issued.

Although no tagged adult fish returned to the enhancement lagoon this year, tag recovery analysis from catches along the east side of the Spit during the 1999 and 2000 personal use fisheries indicated that approximately 80% of coho salmon caught in that area were of hatchery origin. In years when the coho salmon catches along the east side of the Spit made up the highest percentage of the harvest, this information would logically suggest that relatively small numbers of wild stock fish were presumably taken in the gillnet fishery. In 2010, however, the majority of the catch was reported from the north shore area between Fritz Creek and Swift Creek, and with no tagging study, it is impossible to estimate the catch composition.

Coho salmon returns to LCI for 2010 would normally be considered weak as indicated by the incidental catch in the commercial fishery at just 2,100 fish, the lowest since 1977. Similarly, coho salmon catches in the sport fishery at the Nick Dudiak fishing lagoon were considered extremely poor in 2010, also suggesting weak runs. However, an aerial survey of Clearwater Creek, the major natural run coho salmon index stream at the head of Kachemak Bay, flown on September 13, documented an estimated escapement of 900 coho salmon (Table 4). Although no coho salmon SEG exists for this system, the escapement figure was considered very good when compared to September surveys from previous years.

The 2010 catch of 14 Chinook salmon (Appendix A27) was considerably lower than the long term average (1969–2009) of 45 fish. The extremely low harvest of this species in the personal use fishery over the past 8 years can clearly be attributed to the discontinuation of the Division of Sport Fish program to stock late run juvenile Chinook salmon after 1999 at the Homer Spit. Because of this, catches of Chinook salmon are expected to remain low in future personal use fisheries.

It is difficult to predict harvest and duration of the 2011 personal use fishery, especially considering that the full allowable regulatory season length was utilized during the past two years yet cumulative coho salmon catches still failed to reach the GHL range. Enhanced coho salmon runs to the Nick Dudiak Fishing Lagoon in 2011 are expected to be below average once again due to the absence of a late-run component. Low participation and effort levels in the 2011 fishery could also result in lower harvest numbers and long duration. As observed in recent years, alternative personal use fisheries elsewhere in Cook Inlet could again impact effort levels in the LCI fishery. Although limited as an inseason management tool, voluntary catch reports will once again be employed to help determine an appropriate closure time in 2011. Based on experience gained during the past 20 years' fisheries, and especially that of the past 12 seasons, management for a harvest within the GHR is considered realistic and likely.

NANWALEK/PORT GRAHAM SUBSISTENCE FISHERY

One of LCI's two subsistence salmon fisheries during 2010 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 (Figures 2 and 6). Gear in this fishery is limited to set gillnets. Most fishing occurs within close proximity to the respective villages, primarily targeting Chinook salmon transiting area waters and sockeye salmon returning to the English Bay Lakes system early in the summer, although participants will occasionally target coho and/or pink salmon later in the summer. A newer but somewhat erratic saltwater release project at Port Graham Hatchery provides supplementary sockeye salmon harvest opportunities in some years. 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. Despite being open to fishing for each of the past nine seasons, waters of Port Chatham and Windy Bay Subdistricts have not experienced any known effort but do provide further opportunity for participants to meet subsistence requirements.

Sockeye salmon runs to English Bay Lakes were severely depressed for much of the late 1980s and early 1990s, with runs failing to achieve the minimum escapement goal for nine consecutive years between 1985 and 1993. More recently, runs have been bolstered in some years as a result of a rehabilitation/enhancement project initiated by the department and subsequently taken over by the Nanwalek Salmon Enhancement Project (NSEP) in conjunction with Chugach Regional Resources Commission (CRRC) and the village of Nanwalek. However, disease outbreaks in the lake-rearing portion of the program, erratic adult behavior that caused difficulty in capturing broodstock, and financial difficulties have combined to plague the program and led to inconsistent adult production from enhancement. In 2010, necessary permits for the transport of eggs and juvenile salmon for the English Bay Lakes enhancement program were transferred to CIAA and placed within the Trail Lakes Hatchery Annual Management Plan.

No forecast was possible for the English Bay Lakes sockeye salmon run in 2010 because of incomplete smolt outmigration information. With a desired inriver return range of 7,500 to

15,000 fish in place, the commercial set gillnet fishery in waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, was kept closed at the start of the commercial season in early June to conservatively manage for the uncertain run strength. Additionally, the subsistence set gillnet fishery, which opened in the same waters on April 1, was restricted (but not completely closed) by emergency order beginning June 1 (Table 8) in order to encourage escapement of returning adults while still providing limited opportunity for subsistence users. Early weir counts from English Bay River suggested an average run, and escapement rates generally tracked with historic run data. At the end of June, increased daily counts prompted the staff to project that an escapement within the desired inriver return range would be achieved. As a result, the subsistence salmon set gillnet fishing period in waters of Port Graham Subdistrict was liberalized by emergency order to the regular weekly fishing schedule starting July 2 (Table 8). Because of the increased harvesting power of the commercial set gillnet gear group, that fishery remained closed until July 8, when staff determined that the mid to upper end of the SEG range would most likely be attained.

A transition to a new resident village subsistence coordinator in 2010 resulted in incomplete data for end-of-year harvest and effort summaries for the village of Nanwalek, but the preliminary data set compiled by the department's Division of Subsistence indicated that the all-species salmon harvest cumulatively totaled just over 4,000 fish in 2010 (Appendix A30). Although this total is approximately equal to the recent 20-year average for the village, it is important to note that the 2010 harvest figures are based on the return of only 20 harvest calendars out of 53 issued (38%). For the village of Port Graham, the total all-species catch of 309 salmon was the second lowest total in the past two decades and well under the annual average of 1,700 (Appendix A29) during that time frame. Sockeye salmon comprised the highest proportion of the subsistence catches, in Port Graham at 38% of the harvest (116 fish) and in Nanwalek at 37% of the catch (1,514 fish), followed closely at both locations by coho salmon. The enumeration weir operated by NSEP at English Bay River monitored sockeye salmon escapement inseason as has been the case since 1994, with a final estimate of nearly 12,300 fish (Table 3; Appendix A24), falling within the desired inriver return range of 7,500–15,000. With sufficient escapement achieved in 2010, CIAA was authorized to collect broodstock from the English Bay Lakes system as outlined in the Trail Lakes Hatchery Annual Management Plan, and a total of 1,023 sockeye salmon were collected for broodstock, resulting in the collection of 1.11 million eggs.

Because of sub-par salmon returns to the Port Graham Subdistrict in some recent seasons, village residents have at times encountered difficulty meeting their subsistence salmon needs when restricted to fishing only in the Port Graham and Koyuktolik Subdistricts. Consequently, a proposal to add the previously mentioned waters of Port Chatham and Windy Bay to those areas open to subsistence fishing was submitted to the Alaska Board of Fisheries (BOF) at their November 2001 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 in those waters. No subsistence fishing effort or harvest has been known to occur in Port Chatham or Windy Bay Subdistricts since these areas were first opened to fishing in 2002.

SELDOVIA AREA SUBSISTENCE SALMON SET GILLNET FISHERY

The set gillnet fishery in waters near Seldovia on the south side of Kachemak Bay in 2010 was the fifteenth year of LCI's most recently created subsistence salmon fishery. Established by the BOF at their LCI meeting in the fall of 1995, the fishery primarily targets non-local stocks of Chinook salmon as they transit these waters. The BOF carefully restricted initial seasons and bag limits 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 governs the early season, with an annual possession limit of 20 Chinook per household. During the April/May season, fishing is allowed during two 48-hour periods each week, while in August the fishery is 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 is 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 is required prior to fishing, and catches are recorded on the permit and also reported to the Homer area office inseason so that cumulative harvest totals can be monitored.

In 2010, a total of 11 permits were issued for the early season, while only 5 permits were issued for the August season. Because most fishermen ignore the requirement to call in their catches during the open season, inseason harvests are typically underreported. At the close of the early season, 8 of the 11 permits were returned to the department as required by regulation, and catches were determined from records on each permit. For the early season, two of eleven permit holders (18%) actively fished, six (54%) did not fish, and three permit holders (27%) failed to return his/her permit (Appendix A31). The reported all-species catch for the early season totaled 54 sockeye salmon (Appendix A31). Of the five permits issued for the late season, three permit holders (60%) actively fished, one (20%) did not fish, and one (20%) failed to return his/her permit. The reported harvest for the late season totaled 2 Chinook, 46 sockeye, 31 coho, 66 pink, and 35 chum salmon, for a combined total of 180 salmon (Appendix A31).

The absence of any Chinook salmon harvest during the 2010 early season Seldovia subsistence harvest was notable when compared to the 1996-2009 average of 77 fish (Appendix A31). The harvest of 54 sockeye salmon, while the highest in the past 5 years, falls well short of the average of 81. The low early-season Chinook and sockeye salmon catches in 2010 are likely due in part to the low number of participants (two) that actually fished. The record catch for both species in the Seldovia subsistence fishery occurred in 2000 when 189 Chinook and 249 sockeye salmon were harvested by 17 permits actively fished (Appendix A31).

The harvest in the 2011 Seldovia early season subsistence fishery is difficult to predict given the low participation in the previous five fisheries. If the number of actively fishing permit holders increases next year to pre-2005 levels, then harvests could increase commensurately.

2010 COMMERCIAL HERRING FISHERY

INTRODUCTION

Similar to the salmon fishery, commercial Pacific herring *Clupea pallasi* fishing in LCI has historically occurred in four of the five management districts, with the Barren Islands District the sole area where commercial herring fishing has not occurred (Figure 1). LCI herring fishing first began in the Southern District in 1914 with the development of a gillnet fishery within Kachemak Bay. Eight saltries, including 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 hence 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, averaging 16,000 st each of those years. After this time period, stocks sharply declined, apparently due to over-exploitation.

HISTORY AND DEVELOPMENT OF THE HERRING SAC ROE FISHERY

Introduction

Japanese market demand for salted herring roe resulted in the 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, and efforts to manage the resource frequently encountered difficulty keeping pace with this strong market demand and growth. In order to decrease the risk of a stock collapse and to sustain the fishery in LCI, the department established conservative management strategies and guideline harvest levels. Following a period of suspected over-exploitation, 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.

Historically the only allowable gear type in the LCI herring sac roe fishery has been purse seine. The limited entry permit system for sac roe herring seining in Cook Inlet was implemented in 1977, and at the present time 75 permanent 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 was taken in Resurrection Bay. Only limited and sporadic harvests occurred in these two districts after 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 through 2001 and, consequently, the Outer and Eastern Districts were not opened to purse seining in any season during that 9-year period. At its November 2001 meeting, the BOF closed these districts to commercial herring fishing by regulation and simultaneously adopted a management plan containing seven specific criteria that must be addressed prior to allowing any commercial herring fishing in the Outer and/or Eastern Districts. Thus, no harvest or effort occurred in the Outer and Eastern Districts during the 2010 season.

Southern District

Sac roe herring seining in the Southern District began in the early 1960s, 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. Commercial harvests continued during the 1970s, although at much lower levels, but observed low abundance of herring during the past three decades has virtually precluded commercial openings in the Southern District. The only exception occurred in 1989, when 10 permits in a single 2.5-hour opening harvested 170 st of herring (Appendix B1) averaging 8.9% roe recovery.

Similar to the Outer and Eastern Districts, the BOF expressed concern for the herring stock in the Southern District and responded at their November 2001 meeting by closing the Southern District to commercial fishing by regulation, including it in the previously mentioned management plan adopted for the Outer and Eastern Districts. Under the new plan, the BOF must address seven specific management considerations prior to allowing a commercial herring fishery in this district.

Kamishak Bay District

Since 1973, the majority of LCI sac roe herring harvest and effort has occurred within Kamishak Bay District (Figures 1 and 7). Historical commercial harvests ranged from a low of 240 st taken in 1973 to a high of 6,100 st taken in 1987, with estimated exvessel values ranging from $70,000 to $9.30 million (Appendix B2). 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 the end of the decade the stock 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 relatively constant during the 1970s, roughly from late April through June, a significant management change occurred during this time. From 1973 through 1977, the fishery was essentially "open season until closed", but in 1978 it was changed to "closed season until opened by emergency order" (Appendix B3). This

change required more active assessment of the herring stock by the department in order to determine appropriate opening times and harvest levels.

The Kamishak Bay herring stock appeared to respond positively and rebuild rather quickly following the 5-year closure that began in 1980. Upon reopening in 1985, a harvest of 1,100 st resulted that season. Beginning in 1985, the commercial fishery in Kamishak Bay District was regulated to achieve a 10% to 20% exploitation rate mandated by the BOF. From 1985 through 1989, harvests annually averaged about 3,900 st, with a peak catch of 6,100 st in 1987. 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.

Management of 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 (Figure 13; Appendix B4), and by 1998 the cumulative commercial herring catch in 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 initial Kamishak Bay District Herring Management Plan (KBDHMP) was formally adopted into regulation beginning with the 1993 season. Highlights of the original 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.

At the November 2001 BOF meeting, department staff proposed amendments to the KBDHMP in order to make it more conservative. 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 (Hammarstrom and Otis 2001). After careful review, the BOF unanimously adopted the amended KBDHMP into regulation.

2010 HERRING 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. Because a commercial herring fishery has not occurred in the Outer and Eastern Districts in many years, and is not likely to occur in the near future, aerial surveys of these areas are no longer conducted. Additionally, the size of the area and the characteristically

poor weather in the Gulf of Alaska precludes surveys on a regular basis and makes aerial biomass estimation in these districts impractical and expensive. 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 spawning events and 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 the following water depth parameters: 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; Otis and Bechtol 1999).

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 since 1994 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: a time 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 run.

Another tool the department annually utilizes to aid in herring assessment in Kamishak Bay District, and opportunistically in the Southern District, is a chartered commercial seine vessel. In years when no commercial fishery occurs, the department is unable to utilize the fleet to collect samples for age composition analysis. By chartering a commercial purse seine vessel, samples and other related information can be collected and used 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 run. 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 2010 Season Summary

Aerial survey coverage to assess the Kamishak Bay herring stock was considered good in 2010, however overall observation conditions were often rated as poor for seeing fish due to periodic high turbidity. A total of 14 surveys were completed in the Kamishak Bay District between April 23 and June 4, and during this time several three- to four-day "gaps" in coverage, or periods during which no surveys were flown due to poor weather, occurred. The highest daily biomass estimation of the season coincidentally occurred on the first day fish were recorded (April 30), when a cumulative total of 2,267 st were estimated throughout the district. Although the majority of these fish were observed in the Bruin Bay Subdistrict, a substantial number were also observed in the Chenik Subdistrict. Unfortunately, observations of herring were intermittent over the remainder of the

season, and estimated individual survey quantities were significantly below the April 30 seasonal peak. Coverage in 2010 resulted in a cumulative total of approximately 3,000 st of herring observed by department aerial surveyors in the Kamishak Bay District. This figure is considerably less than that observed during 2009 (7,100 st) and only marginally higher than any of the preceding six seasons, thus continuing an overall trend of low abundances seen over the past decade.

Department staff documented twelve sightings of spawning activity during surveillance flights in 2010, as follows: April 30 (five sightings totaling an estimated 1 linear mile of spawn); May 1 (one sighting for 0.5 mi); May 28 (three sightings for 0.1 mi); and June 4 (three sightings for 0.2 mi). The grand total of an estimated 1.8 miles of observed spawn was significantly below the 2009 total of 3.2 miles observed but higher than the recent years' average. Though increased sightings are encouraging, correlation between documented spawning and herring abundance has traditionally not been attempted, due to the often sporadic schedule of surveillance flights and survey conditions.

Two spring vessel charters to collect age composition samples during May 1-7 and May 15-20 were conducted successfully by department staff despite periods of poor weather. The early sampling period roughly coincided with the arrival of the first fish on the grounds, which normally corresponds to the traditional timing of the commercial fishery, while the second charter collected age composition samples during the latter portion of the return in 2010. During the 13 days spent in the district, the contracted vessel collected over 2,800 fish for age, weight, and length (AWL) analysis. The majority of the data from the two charters corroborated the overall low abundance of the population observed by department aerial surveyors, while also confirming the low recruitment of new fish. However, additional hydroacoustic observations from the early-season charter identified approximately 2,000 st of herring in deep water of Iniskin Bay on May 6-7, not observed by aerial surveyors.

One hypothesis for the lack of herring recruitment in Kamishak Bay originates from the relatively poor condition of the fish observed recently, characterized by low average weights-at-age, which can lead to higher than normal mortality. Another theory speculates that herring may not always return to their birthplace to spawn. This premise is based on the concept that, upon first achieving sexual maturity, the younger herring may simply follow older repeat spawners in a given school back to a spawning area, even if that area is not where the younger fish were originally spawned (McQuinn 1997). Finally, up to 52% of herring collected in Kamishak Bay during previous years were positive for *Ichthyophonus*, a protozoan pathogen that has been linked to population declines of Atlantic herring. Encouragingly, the incidence of *Ichthyophonus* has diminished to background levels (1%- 3%) the past two years, and no cases of viral infection (VHS or VEN) were documented. While it is uncertain what role these diseases play in recruitment and survival, their presence in the Kamishak herring stock is concurrent with the loss of older age classes (> age-8) from the population.

Based on hindcast estimates, herring biomass steadily declined in Kamishak Bay between 1985 and 2001 and has now stabilized at a very low level over the past 10 years. The ASA model estimated the total 2010 return at just over 3,900 st (Table 10; Figure 13; Appendix B4), the highest figure since 2002 but noticeably lower than the 1990-2009 average of 6,600 st. Recruitment into the spawning population did occur in 2010, but the magnitude of this recruitment was still relatively low. Nonetheless, postseason data analysis of test fishing samples indicate that the overall return this season was dominated by fish ages 5 through 7 at 18.3%, 26.0%, and 16.9% of the biomass by weight, respectively (Table 10; Figure 14). The 2010

season marked the first time in many years that the Kamishak Bay herring population contained significant percentages of fish greater than age 5, suggesting that the reduced disease incidence may be contributing to better survival rates.

Southern District 2010 Season Summary

A total of nine aerial assessment surveys for herring in the Southern District were flown between April 22 and May 27 in 2010, all conducted under fair to good conditions. The number of surveys conducted this season was higher than the annual average of seven flights made during the past five seasons. The 2010 run biomass, estimated as the simple sum of all daily biomass estimates, totaled only 219 st, which was well below the recent 5-year average of 1,748 st and the previous year's sum of 2,480 st. The observed total in 2010 continued to follow an overall pattern of low herring abundances documented in the Southern District during the past three decades. The peak 2010 individual biomass figure occurred on the sixth survey of the season, May 10, when a cumulative total of 170 st were estimated. Peak survey totals in areas where herring historically have been observed were as follows: Mallard Bay, 22 st on May 27; Glacier Spit/Halibut Cove, 157 st on May 10; west side Homer Spit, no herring observed; and east side of the Homer Spit and in Mud Bay, 20 st on May 4. As has been the persistent trend over the past 30 years, low abundance levels in the Southern District, combined with the regulatory management plan mentioned previously, precluded any commercial fishing during the 2010 season.

Outer/Eastern Districts 2010 Season Summary

As in previous recent seasons, no herring assessment occurred in the Outer and Eastern Districts during 2010. 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. Formal sampling has not occurred in recent years and was very limited in previous years. However, 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 the 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.

2011 HERRING SEASON OUTLOOK

Kamishak Bay District

The forecasted herring biomass generated by the ASA model for 2011 in Kamishak Bay District is 3,830 st (Table 10; Figure 13; Otis *In prep* a). This total falls below the KBDHMP regulatory threshold of 6,000 st for which a commercial harvest can be considered. Additionally, nearly 31% of the predicted return by weight in 2010 should be comprised of fish age 5 and younger (Table 10; Figure 14). Since the KBDHMP directs the department to limit the harvest of fish age 5 and younger, and because the forecasted abundance falls below threshold, the sac roe fishery in the Kamishak Bay District will remain closed for the 2011 season. The resource, and hence the commercial fishery, is best served by protecting the remaining spawning population in order to promote both a larger abundance and a more favorable age structure.

Without a commercial fishery in 2011, the department's ability to collect age composition information will be greatly reduced. Unfortunately, lack of funds will preclude any chartered

sampling in 2011. The department will continue to conduct comprehensive aerial surveys throughout the spawning season, from mid-April to early June, as conditions permit, but a 50% reduction in funding for this program in 2011 will translate into fewer surveys and less extensive coverage.

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, as well as the stipulations contained within the Eastern, Outer, and Southern Districts Management Plan, the commercial herring fishery in these areas will remain closed during 2011. Due to the issue of reduced funding as previously described for Kamishak Bay District, monitoring of the Southern District herring stocks through the use of aerial surveys will be severely reduced and/or eliminated, and test fish sampling is highly unlikely.

RECENT HERRING RESEARCH IN LOWER COOK INLET

Three additional research projects were recently completed to better understand Kamishak Bay herring stock structure and its 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. *Unpublished*). The extent to which these stocks intermix is poorly understood, however, and the ramifications of their mixing complicate the assessment and management of each stock. Therefore, in 2001 the department successfully applied for a grant from the Exxon Valdez Oil Spill 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 among 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 was completed during 2002. Results showed that fatty acid composition of heart tissue has the potential to become a reliable stock identification biomarker. Using discriminate analysis, 157 of the 163 samples taken were correctly identified to their original herring stock. Unfortunately, stocks within the North Gulf of Alaska could not be reliably distinguished using the elemental composition of otoliths (Otis and Heintz 2003).

The second research project undertaken by the department also stems from an alternative funding source. In 2002, the National Marine Fisheries Service funded 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, previously existed only in hard copy form on aerial survey field maps. Those data were captured into electronic maps, making them available for a variety of more in-depth analyses. Otis and Spahn (2003) reported on the results of this project, and the completed database (ADF&G 2002) is available on CD-ROM.

The latest research project was a follow-up to the promising pilot study that demonstrated the ability to discriminate Alaska's herring stocks at relatively fine spatial scales (> 100 km) based on the fatty acid composition of heart tissue. Also funded by the EVOS-TC, this project attempted to assess the temporal stability and biological variability of stock discrimination criteria derived from fatty acid analysis of herring cardiac tissues. Samples were collected during the spring and/or fall/winter of 2005, 2006, and 2007 from putative herring stocks in Sitka, PWS,

Kamishak, Kodiak, Dutch Harbor, Togiak, and Kuskokwim Bay. Along with heart tissue for fatty acid analysis, the department also collected otoliths and fin clips for further microchemistry and genetic analysis, respectively. Additional funding was secured from the EVOS-TC to process the otolith samples using a laser-ablation, inductively-coupled plasma mass-spectrometer (LA-ICPMS), a far more precise instrument than was used in the otolith pilot study. Chemical analysis of the heart tissues and otoliths was completed during the winter of 2008-09. Results from the latest project corroborate those of the pilot study. Fatty acid analysis of heart lipids was a reliable method for discriminating putative herring stocks at multiple spatial scales (region, area, site) corresponding to linear separations among sample centroids of > 750 km (region), 250-750 km (area), and sometimes even 75-250 km (sample sites), as long as samples were compared within and not across years. DFA cross-validation success varied among the locations sampled, ranging from 70-89% at the area scale, and from 86-99% at the region scale. However, fatty acid compositions were not temporally stable across years or even across seasons within years for most stocks sampled. That lack of temporal stability will limit the practical application of fatty acid analysis as a stock identification tool, particularly for identifying the stock composition of mixed stock samples collected outside of the spawning season (e.g., fall/winter food/bait fisheries). Also similar to the pilot study, little evidence was found of stock structure based on the elemental composition of otoliths, despite using the LA-ICPMS. A comprehensive review of the results of this latest study can be found in Otis *et al.* (2010 a).

ALASKA BOARD OF FISHERIES MEETING

REGULATORY ACTIONS

The Alaska Board of Fisheries (BOF) met between November 15 and 18, 2010, in Homer to consider changes to existing regulations governing LCI commercial, sport, and personal use salmon and herring fisheries. A total of 15 submitted proposals fell within the LCI Division of Commercial Fisheries' purview. Twelve proposals were submitted for commercial salmon fishing in the LCI area, two were proposed for personal use and sport salmon fishing in hatchery special harvest areas (SHA's), and one proposal addressed personal use herring fishing. There were no proposals targeting commercial herring or subsistence salmon fishing. Members of the general public submitted 7 of 15 proposals, while United Cook Inlet Drift Association (UCIDA) submitted 5, Cook Inlet Aquaculture Association (CIAA) submitted 1 and the department submitted the remaining three. A brief summary, including the nature of the proposals, authors, and BOF resultant action on each, appears in Table 11.

Proposal #1, submitted by a member of the public, sought to change the boundary line describing the Seldovia Bay Subdistrict. The proposer contended that the regulatory definition of Point Naskowhak had been changed over time and that the current definition in regulation inadvertently rendered his setnet site (leased for 16 years from the state) illegal because it fell outside of waters open to commercial fishing in Seldovia Bay Subdistrict. This proposal would amend the definition of Point Naskowhak with new coordinates at the end of a reef extending into intertidal waters, thus including the proposer's fishery lease in the legal fishing area. During testimony, it was deemed more appropriate to amend the proposal to include a 'dogleg' from the coordinates described in the proposal back to dry land effectively closing the subdistrict boundary. The BOF decided that this traditional site, in use for 40 years, should be included in the allowable fishing area of the Seldovia Bay Subdistrict and voted unanimously to adopt proposal #1 as amended.

Proposal #2, submitted by a LCI seine permit holder, sought to create a season opening date of June 1 for commercial salmon fishing in the Outer District. The proposer contended that current regulations result in inconsistent salmon openers, loss of fishing opportunity, and damaging 'overescapement'. An opening on June 1 would allow fishermen the opportunity to target salmon early in the run resulting in higher prices. During discussion, department staff pointed out that a blanket salmon opening in all areas of the Outer District on a date as early as June 1 would put smaller stocks (difficult to assess due to their numbers and geographic spread) at risk and could put some larger stocks in danger of overharvest before adequate assessment could be achieved. As a result, the department might be forced to immediately close all areas by EO after any such opening date due to lack of real-time information. The BOF decided that the risks to salmon stocks outweighed any potential benefit and unanimously opposed proposal #2.

Proposal #3, submitted by the same proposer as the previous proposal, suggested an identical opening date of June 1 should be added to regulations affecting the Eastern District. The supporting argument was much the same as for proposal #2, with added emphasis on the lack of department assessment in the Eastern District and harvestable surpluses going unrecognized and unutilized there. Opposition to the proposal included the same concerns voiced for Proposal #2 with a note that most pink and chum salmon systems in the Eastern District, and the respective runs to them, are small and therefore more susceptible to overharvest. Additionally, many of the systems historically assessed by the department in the Eastern District have not demonstrated significant identifiable surpluses in recent years. Some concern was voiced that a regulatory June 1 opening would preclude the traditional late May opening targeting Bear Lake sockeye salmon in Resurrection Bay. The BOF unanimously opposed proposal #3.

Proposal #4, submitted by UCIDA, sought to establish drift gillnets and set gillnets as legal gear for commercial salmon fishing in the Southern, Barren Islands, Kamishak Bay and Outer Districts of LCI. During committee discussion the representative from UCIDA indicated his organization's withdrawal of the proposal because the wording as legally noticed in the proposal booklet did not appear as originally intended. The BOF voted "No Action" on proposal #4 based on this withdrawal.

Proposal #5, submitted by a member of the public, sought to establish drift gillnets as legal gear for commercial salmon fishing in the Outer District and Resurrection Bay of the Eastern District. Supporters of this proposal cited a failure to utilize available harvestable surpluses and the ability of gillnet vessels to more efficiently harvest available surpluses due to lower operating costs. Additionally, language in the proposal pointed out that drift gillnet gear was historically allowed in Resurrection Bay. Opposition to the proposal contended that the fisheries in the Outer and Eastern Districts were already fully allocated and that the currently allowable gear is sufficient to harvest available surpluses. Concern was also expressed that coho and Chinook salmon, which are specifically allocated by regulation to the sport fishery in Resurrection Bay and therefore illegal to harvest commercially, would be difficult or impossible to release unharmed from gillnet gear. Also discussed was the fact that drift gillnetting had only been allowed in Resurrection Bay for a small number of years to specifically target an unusually large run of sockeye salmon that could not be adequately harvested at the time with hand purse seines. With the implementation of power purse seines as a legal gear type, the capability of this gear type is believed adequate to harvest identifiable surpluses. The BOF unanimously opposed proposal #5.

Proposal #6, submitted by a LCI seiner, sought to repeal the Kirschner Lake SHA in Kamishak Bay from regulation. The intent of this proposal was to allow directed common property fishing effort to target pink salmon returning to nearby Bruin Bay River in the area that is currently designated as a CIAA SHA. In years with large pink salmon runs to Bruin Bay River, it is difficult for fisherman to effectively harvest pink salmon in the common property area of the Bruin Bay Section due to dangerous conditions, resulting in higher than optimal escapements into Bruin Bay River and reduced harvest potential for fishermen. Discussion revealed that the department already has authority to alter the Kirschner Lake SHA inseason to allow opportunity for pink salmon harvest in years of large runs. Representatives from CIAA indicated that it was not their intent to hinder or preclude common property fisheries targeting natural stocks, as long as these efforts did not negatively impact CIAA's ability to harvest sockeye salmon for cost recovery purposes. Since the department already possesses the tools needed to achieve the intent of the proposal, the BOF voted "No Action" on proposal #6 but instead unanimously supported 'intent language' that the department work together with CIAA to determine appropriate inseason management action to adjust the Kirschner Lake SHA boundaries in order to balance the cost recovery needs of CIAA with common property opportunity to harvest pink salmon bound for Bruin Bay River.

Proposal #7, submitted by UCIDA, sought to establish gillnets as legal gear for commercial salmon fishing in the Southern, Barren Islands, Outer and Eastern Districts and in the Chinitna Bay Subdistrict of Upper Cook Inlet. In light of discussion about the previous gillnet proposals, little support was voiced for proposal # 7. In addition to concerns raised during discussion of proposal #5, set gillnet fishermen in the Southern District felt the addition of drift gillnets would reduce catch to setnetters. Although the department remained neutral on allocative aspects of the proposal, it opposed any intent to allow drift gillnetting to occur in offshore areas or off capes and islands since such activities would most likely result in catch of salmon bound for other areas, which is in direct conflict with the LCI Salmon Management Plan contained in regulation. Barren Islands District, for example, contains no documented anadromous salmon runs, therefore any salmon caught there are bound for other areas. The BOF voted unanimously against proposal #7.

Proposal #8, submitted by UCIDA, sought to establish gillnets as legal gear in the Eastern District of LCI. Supporters for this proposal cited currently unexploited stocks of pink and chum salmon in the Eastern District that gillnetters could harvest. Arguments against #8 included many of the same discussion points brought up on the previous gillnet proposals. Reiterated were the assertions that seiners can adequately harvest available surpluses and that gillnet gear would not be compatible with the requirement to release Chinook and coho salmon unharmed in Resurrection Bay. The BOF unanimously opposed proposal #8.

Proposal #9, submitted by the department, sought to update published regulatory coordinates for closed waters boundaries in 3 subdistricts. This proposal incorporated the most up to date and accurate global positioning system (GPS) coordinates available and was part of the department's efforts to ensure that the commercial finfish regulations specifically and accurately describe referenced closed water markers in LCI. There was no opposition voiced to this proposal. During committee discussions, fishermen added that there are other markers besides those in this proposal where updated coordinates would be helpful. The BOF voted unanimously to adopt proposal #9.

Proposal #10, submitted by the department, sought to update the published regulatory description for closed waters in Resurrection Bay to correspond to those actually used during the active

commercial sockeye salmon fishery. The closed waters currently in regulation were originally designed to protect streams at the extreme north end of Resurrection Bay during commercial fisheries targeting pink and chum salmon. Because the primary commercial fishery in Resurrection Bay since the early 1990's has shifted to target an enhanced sockeye salmon run, the closed area in current regulation is no longer appropriate. However, to preclude gear conflicts between commercial fishing operations and sport fishing along the west side of Resurrection Bay, the department has annually amended the closed area by Emergency Order (EO) for the past 14 seasons, shifting closed waters from the head of the bay to the west side. In an effort to obviate the need for an annual EO, this proposal was designed to incorporate this shift into regulation. Some opposition was voiced during discussion that precise determination of long closure lines when fishing in small "jitneys" without plotters is difficult at best. One seiner proposed an amendment that would shrink the proposed closure area to several smaller closures directly corresponding to specific streams. Supporters of the proposal as written contended that it was not unreasonable to expect fisherman to determine a line between two points and that shrinking of the closed area could result in conflicts with popular sport fisheries along the western side of Resurrection Bay. The BOF voted unanimously to adopt proposal #10 as written.

Proposal #11, submitted by the department, sought to establish accurate coordinates for closed waters markers in the Southern District personal use (PU) coho salmon fishery. During review of regulatory closed waters, department staff noted that coordinates for closure markers at Mud Bay, near the base of the Homer Spit, were absent (airport marker) or inaccurate (Green Timbers marker) in the Subsistence and Personal Use Statewide Fisheries Regulations. This proposal supplied updated coordinates for these two markers. Additionally, at the BOF meeting, substitute language was added to match the PU setnet regulations with commercial setnet regulations regarding prohibition of gillnets set at lagoon openings and at stream mouths. There was little discussion about this proposal and no opposition was voiced. The BOF voted unanimously to adopt proposal #11 as amended.

Proposal #12, submitted by CIAA, sought to repeal the sunset provision in the Trail Lakes Hatchery Sockeye Salmon Management Plan. This plan, which became a regulation as a result of the March 2009 BOF meeting, essentially prioritized management of CIAA SHA's in LCI for hatchery cost recovery and broodstock purposes. Since the regulation contained a defined expiration date, the management plan would no longer be in effect beginning May 1, 2011, without action by the BOF.

The majority of discussion on this proposal centered around the balance between CIAA's financial (cost recovery) needs and common property fishing opportunity on enhanced stocks. Opinions on the matter covered a wide range, including frustration with the recent trend of CIAA harvesting all enhanced sockeye salmon runs to meet their financial needs, thus precluding common property opportunity to target these runs. Others contended that CIAA needed guaranteed allocation of enhanced runs only while times were lean, but that that sacrifice in the near term would result in much more common property opportunity in the future. Also mentioned was the concept that harvest potential for common property sockeye salmon fishing in LCI would be dramatically reduced without the contributions of enhancement. The department stated that, in the absence of a Management Plan, tools were already in place to effectively address all of the issues contained in the current plan through the public process of the Cook Inlet Regional Planning Team and a hatchery annual management plan. During deliberation, one BOF member pointed out that hatchery-produced fish are no longer considered common property once they enter a designated SHA, and therefore are outside of the Board's authority to allocate. References were also made to

the fact that the needs of CIAA could be addressed independent of BOF regulation through the aforementioned public process. The BOF failed to adopt proposal #12, with 2 in support and 5 opposed.

Proposal #13, a public proposal, sought to amend two regulatory management plans by allowing restrictions on noncommercial fisheries (targeting enhanced stocks) in order to achieve CIAA broodstock requirements. This proposal specifically referred to sport harvest of enhanced runs of salmon bound for the Bear Lake system at the head of Resurrection Bay. Supporters of this proposal contended that without a directive by the BOF to implement management restrictions on noncommercial fisheries, the Bear Lake escapement goal and Trail Lakes Hatchery broodstock objectives for sockeye and coho salmon might not be achieved during years of low returns. Supporters felt that the burden of restriction should be shared between all users, while opponents of the proposal pointed out that the department already possesses EO authority to close the sport fishery, and that the Bear Lake escapement goal has been consistently achieved for the last decade without restrictions to any non-commercial fisheries. The BOF voted unanimously against proposal #13.

Proposal #14, submitted by UCIDA, sought to close or restrict the PU salmon fishery at China Poot Creek until CIAA was able to achieve cost recovery goals at the site. The premise of this proposal was that the PU fishery at China Poot Creek, solely targeting CIAA produced runs, prevents CIAA from conducting effective cost recovery harvests on sockeye salmon returning to China Poot Bay. However, during discussion most commenters agreed that the PU dipnet fishery at China Poot Creek has minimal impact on cost recovery operations because it takes place in fresh water, after salmon have already passed through the SHA where hatchery harvest occurs. Several comments suggested that a proposal restricting saltwater sport fisheries in China Poot Bay and Tutka Lagoon would be more appropriate and effective since those fisheries directly impact cost recovery operations. The BOF voted unanimously against proposal #14.

Proposal #15, another public proposal, sought to establish cast nets as legal gear in the Cook Inlet personal use herring fishery. Support for this proposal centered on appreciation of opportunity for an additional gear type available to the public that would not negatively impact the resource or management of it. Some concern was expressed that a new gear type might be used to intentionally target other species. During deliberation, the BOF learned that their action on this proposal applied only to the LCI management area, and voted 4 in support and 3 opposed to proposal #15.

LCI ESCAPEMENT GOAL REVIEW

As part of the standard order of business during each BOF meeting, department staff at the November 2010 meeting presented a brief review of LCI salmon escapement goals. The existing goals for all species were originally adopted at the 2001 BOF meeting, while three additional changes were made during the escapement goal review process at the 2004 BOF meeting and one change added at the 2007 BOF meeting. The 2010 meeting provided an appropriate forum to present escapement information collected during the most recent three seasons and make new recommendations, if appropriate.

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, staff determined that SEG's were much more appropriately applied to LCI salmon streams than BEG's, and the BOF formally adopted this as policy in 2001.

A more thorough and detailed discussion of the escapement goal review and analysis is presented in ADF&G Fishery Manuscript No. 10-07 (Otis *et al.* 2010 b). Because the low end of the current area-wide escapement goals were met approximately 85% of the time during the last three seasons, and they provided a harvestable surplus in most cases, the Division of Commercial Fisheries expressed no need for adjusting escapement goals to promote a change in escapement. However, the Division of Commercial Fisheries staff did recommend changes to six LCI salmon escapement goals. Staff recommended eliminating goals for 4 pink salmon stocks in Resurrection Bay experiencing modest returns and supporting limited commercial fishing opportunity. Because significant harvestable surpluses to these systems during the past 20 years have been absent, monitoring resources have increasingly been shifted to more consistently productive systems.

The remaining recommendations outline recalibration of escapement goals resulting from more accurate monitoring methods currently utilized at two systems. These recommendations update the escapement goal ranges for sockeye salmon stocks at Chenik Lake in the Kamishak Bay District and Delight Lake/Creek in the Outer District, both of which were originally derived primarily from aerial survey indices but are now monitored by weir and/or remote video projects. Based solely on weir and remote video data, the department calculated a new escapement goal range of 3,500 to 14,000 fish for Chenik Lake (previous aerial survey-based goal: 1,900 to 9,300 fish index) and 7,600 to 17,700 fish at Delight Lake/Creek (previous aerial survey-based goal: 5,900 to 12,600 fish index). These increases are simply a recalibration of the goal to allow use of the more accurate monitoring methods now available.

ACKNOWLEDGEMENTS

2010 DIVISION OF COMMERCIAL FISHERIES STAFF

The finfish operations for the Division of Commercial Fisheries in Lower Cook Inlet employed five permanent full-time employees and eight permanent/seasonal employees in various area management and research programs during the 2010 season. Appreciation is extended to all personnel for a successful program during 2010.

Permanent Employees during the 2010 season:

Lee Hammarstrom	Area Finfish Management Biologist
Ethan Ford	Fishery Biologist I
Edward O. “Ted” Otis	LCI Finfish Research Project Leader
Marnee Beverage	Program Technician
Mark Hottmann	Boat Officer III

Seasonal Employees:

Sigfus T. “Tom” Sigurdsson	Fish & Wildlife Technician III
Carla Armstrong	Fish & Wildlife Technician III
Robert “Bo” Fusco	Fish & Wildlife Technician III
Joe Loboy	Fish & Wildlife Technician II
Theresa Woldstad	Fish & Wildlife Technician II
Fred Woldstad	Boat Officer I
Carolyn Bunker	Administrative Clerk II

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TABLES AND FIGURES

Table 1.–Commercial, hatchery, and derby salmon catches in numbers of fish by species, district, and gear type, Lower Cook Inlet, 2010.

District Harvest Type Gear Type	Chinook	Sockeye	Coho	Pink	Chum	Total
Southern						
Commercial						
Set gillnet	29	14,765	171	3,106	1,503	19,574
Purse seine	0	0	0	0	0	0
Hatchery						
Purse seine	0	39,094	3	188	4	39,289
Total	***29***	***53,859***	***174***	***3,294***	***1,507***	***58,863***
Outer						
Commercial						
Purse seine	***0***	***3,003***	***16***	***272,427***	***22,463***	***297,909***
Eastern						
Commercial:						
Purse seine	0	0	0	0	0	0
Hatchery:						
Purse seine	0	18,759	0	0	0	18,759
Weir	0	2,973	248	0	0	3,221
Derby[a]						
Hook & Line			1,100			1,100
Total	***0***	***21,732***	***1,348***	***0***	***0***	***23,080***
Kamishak Bay						
Commercial						
Purse seine	10	5,612	573	2,432	70,782	79,409
Hatchery						
Purse seine	0	8,858	0	58	3	8,919
Total	***10***	***14,470***	***573***	***2,490***	***70,785***	***88,328***
LCI Total	**39**	**93,064**	**2,111**	**278,211**	**94,755**	**468,180**
Percent	0.01%	19.88%	0.45%	59.42%	20.24%	100.00%
1990–2009 Avg.	857	303,335	10,025	1,288,544	86,988	1,689,750

Note: Figures for 2010 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[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 or section, Lower Cook Inlet, 2010.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove (set gillnet)	4		4
Tutka/Kasitsna Bays (set gillnet)	13		13
Barabara Creek (set gillnet)	3		3
Seldovia Bay (set gillnet)	9		9
SOUTHERN DISTRICT TOTAL	***29***		***29***
OUTER DISTRICT			
Port Dick / Slide Creek		1	1
OUTER DISTRICT TOTAL	***0***	***1***	***1***
EASTERN DISTRICT TOTAL	***0***		***0***
KAMISHAK BAY DISTRICT			
Douglas River (seine)	10		10
SOUTHERN DISTRICT TOTAL	***10***		***10***
TOTAL LOWER COOK INLET	***39***	***1***	***40***

[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 or section, Lower Cook Inlet, 2010.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove (set gillnet)	320		320
China Poot Bay			
Hatchery Cost Recovery (seine)	1,007		
China Poot Creek		45[b]	
Total			1,052
Tutka/Kasitsna Bays			
Common Property (set gillnet)	6,307		
Hatchery Cost Recovery (seine)	38,087		
Hatchery Broodstock		2,730[c]	
Total			47,124
Barabara Creek (set gillnet)	1,312		1,312
Seldovia Bay (set gillnet)/Seldovia R.	4,929	9	4,938
Port Graham Sec. (set gillnet) / River	740	2	742
English Bay Section			
Common Property (set gillnet)	1,157		
English Bay Lakes Escapement		11,230[d]	
Hatchery Broodstock		1,023[e]	
Total			13,410
SOUTHERN DISTRICT TOTAL	***53,859***	***15,039***	***68,898***
OUTER DISTRICT			
Koyuktolik (Dogfish) Bay / Creeks		3	3
Windy Bay			
Windy Left Creek		2	
Windy Right Creek		1	
Total			3
Port Dick – South Section (seine)	47		
Port Dick (head end) Creek		6	
Total			53
East Nuka Bay	2,956		
Delight Lake		23,775[f]	
Desire Lake		6,320	
Delusion Lake		580	
Total			33,631
OUTER DISTRICT TOTAL	***3,003***	***30,687***	***33,690***

-continued-

Table 3.–Page 2 of 3.

Subdistrict/System	Catch	Escapement[a]	Total Run
EASTERN DISTRICT			
Aialik Bay / Aialik Lake		5,315	5,315
Resurrection Bay North			
Hatchery (seine)	18,759		
Hatchery (weir–sold)	2,508		
Hatchery (weir–donated)	465		
Bear Lake Escapement		8,564[g]	
Hatchery Broodstock		4,320[h]	
Total Run			34,616
EASTERN DISTRICT TOTAL	***21,732***	***18,199***	***39,931***
KAMISHAK BAY DISTRICT			
Iniskin Bay / North Head Creek		5	5
Kirschner Lake / Hatchery CR (seine)	8,858		8,858
Chenik Lake (seine)	5,471		
Amakdedori Creek		1,210	
Chenik Creek/Lake		17,312[i]	
Total			23,993
McNeil Cove / Mikfik Lake & Creek		11,330[j]	11,330
Kamishak Bay / Big Kamishak R.	109	15	124
Douglas River / Silver Beach	32		
Douglas Reef Creek		20	
Douglas Clearwater Tributary		120	
Total			172
KAMISHAK BAY DISTRICT TOTAL	***14,470***	***30,012***	***44,482***
TOTAL LOWER COOK INLET	***93,064***	***93,937***	***187,001***

Note: Figures for 2010 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Escapement estimates derived from limited aerial surveys; numbers represent unexpanded aerial live counts unless otherwise noted.
[b] No freshwater escapement, prevented by barrier falls.
[c] Tutka Bay Lagoon sockeye broodstock figure includes 226 fish collected for broodstock but not utilized..
[d] Weir counts for English Bay Lakes sockeye include 12,253 sockeye actually counted, minus the broodstock harvest of 1,023 sockeye (taken from lake escapement).
[e] English Bay Lakes sockeye broodstock total includes 25 fish collected for broodstock but not utilized.
[f] Escapement estimates derived from a combination of weir and aerial counts.
[g] Weir counts for Bear Lake sockeye include 12,884 sockeye actually counted, minus the broodstock harvest of 4,320 sockeye (taken from lake escapement).
[h] Bear Lake sockeye broodstock total includes 316 fish collected for broodstock but not utilized.
[i] Escapement estimate derived from video counts.
[j] Aerial estimate, but video counts at lake outlet totaled 5,221; high consumption by bears suspected.

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 or section, Lower Cook Inlet, 2010.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Northshore Subdistrict			
Clearwater Slough		900	
Clay Creek		20	
Total			920
Halibut Cove (set gillnet)	33		33
Tutka/Kasitsna Bays			
Common Property (set gillnet)	117		
Hatchery Cost Recovery (seine)	3		
Total			120
Barabara Creek (set gillnet)	10		10
Seldovia Bay (set gillnet)	11		11
SOUTHERN DISTRICT TOTAL	***174***	***920***	***1,094***
OUTER DISTRICT			
Port Dick / South Section (seine)	16		16
East Nuka Bay / Desire Lake		75	75
OUTER DISTRICT TOTAL	***16***	***75***	***91***
EASTERN DISTRICT			
Resurrection Bay North			
Hatchery (sold)	28		
Hatchery (weir–donated)	220		
Sport Derby[b]	1,100		
Bear Lake Escapement (weir)		492	
Hatchery Broodstock		490[c]	
Total			2,330
EASTERN DISTRICT TOTAL	***1,348***	***982***	***2,330***
KAMISHAK BAY DISTRICT			
Douglas River (seine)	567		567
Cottonwood / Iliamna (seine)	6		6
KAMISHAK BAY DISTRICT TOTAL	***573***		***573***
TOTAL LOWER COOK INLET	***2,111***	***1,977***	***4,088***

Note: Figures for 2010 do not include a small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Coho escapement estimates in Lower Cook Inlet are very limited; unless otherwise noted, escapement figures represent unexpanded peak aerial live counts.

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

[c] Bear Lake coho salmon broodstock includes 232 fish utilized by ADF&G, 240 fish utilized by CIAA, and 18 fish collected for broodstock but not utilized.

Table 5.–Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2010.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		70,686	70,686
Halibut Cove (set gillnet)	570		570
China Poot Bay (hatchery) / China Poot Cr.	27	2,220	2,247
Tutka/Kasitsna Bays			
Common Property (set gillnet)	2,536		
Hatchery (seine)	161		
Tutka Lagoon Creek		2,141	
Total			4,838
Barabara Creek		13,935	13,935
Seldovia Bay / River		25,886	25,886
Port Graham Section / Port Graham R.		16,586	16,586
SOUTHERN DISTRICT TOTAL	***3,294***	***131,454***	***134,748***
OUTER DISTRICT			
Dogfish Bay / Creeks		6,320	6,320
Port Chatham / Creeks		2,992	2,992
Windy Bay			
Windy Right Creek		6,408	
Windy Left Creek		24,241	
Total			30,649
Rocky Bay / Rocky River		27,045	27,045
Port Dick			
South Section (seine)	218,387		
North Section (seine)	53,984		
Port Dick (head end) Creek		41,090	
Slide Creek		16,939	
Middle Creek		2,438	
Island Creek		69,525	
Taylor Bay Creeks		13,800	
Total			416,163
Nuka Island / S. Nuka Island Creek		[b]	
E. Arm Nuka Bay (seine) / Desire Lake	56	2,978	3,034
OUTER DISTRICT TOTAL	***272,427***	***213,776***	***486,203***
EASTERN DISTRICT TOTAL	***0***	[c]	***0***
KAMISHAK BAY DISTRICT			
Iniskin Bay			
Sugarloaf Creek		1,355	
North Head Creek		705	
Ursus Cove / Brown's Peak Creek		3,092	3,092
Rocky Cove / Sunday Creek		6,607	6,607

-continued-

Table 5.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT (cont'd)			
Kirschner Lake Section – Hatchery (seine)	58		58
Bruin Bay / Bruin Bay River		40,256	40,256
Chenik Lake / Amakdedori Cr.		691	691
Kamishak Rivers	955		955
Douglas River	1,477		1,477
KAMISHAK BAY DISTRICT TOTAL	***2,490***	***52,706***	***55,196***
TOTAL LOWER COOK INLET	***278,211***	***397,936***	***676,147***

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied, unless otherwise noted.
[b] Insufficient information to generate escapement estimate at South Nuka Island Creek.
[c] No escapement surveys for pink salmon conducted in Eastern District in 2010.

Table 6.–Commercial chum salmon catches and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2010.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		1,487	1,487
Halibut Cove (set gillnet)	32		32
China Poot Section - Hatchery (seine)	2		2
Tutka/Kasitsna Bays			
Common Property (set gillnet)	674		
Hatchery (seine)	2		
Total			676
Barabara Creek (set gillnet)	118		118
Seldovia Bay (set gillnet) / River	581	997	1,578
Port Graham (set gillnet)/Port Graham R.	69	1,395	1,464
English Bay (set gillnet)	29		29
SOUTHERN DISTRICT TOTAL	***1,507***	***3,879***	***5,386***
OUTER DISTRICT			
Dogfish Bay		12,703	12,703
Port Chatham		180	180
Windy Bay			
Windy Right Creek		74	
Windy Left Creek		65	
Total			139
Rocky Bay / River		1,271	1,271
Port Dick			
South Section (seine)	22,238		
North Section (seine)	224		
Port Dick (head end) Creek		2,439	
Slide Creek		985	
Middle Creek		167	
Island Creek		3,408	
Total			29,461
Nuka Island / Petrof River		150	150
East Arm Nuka Bay (seine)	1		1
OUTER DISTRICT TOTAL	***22,463***	***21,442***	***43,905***
EASTERN DISTRICT TOTAL	***0***	[b]	***0***
KAMISHAK BAY DISTRICT			
Iniskin Bay			
Iniskin River		19,252	
Sugarloaf Creek		879	
North Head Creek		496	
Total			20,627
Cottonwood Bay (seine) / Cottonwood Cr.	17,919	15,848	33,767

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Table 6.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT (cont'd)			
Ursus Cove (seine)	450		
Brown's Peak Creek		810	
Ursus Lagoon Righthand Creek		7,746	
Ursus Lagoon Creek		4,019	
Total			13,025
Rocky Cove / Sunday Creek		271	271
Kirschner Lake Section – Hatchery (seine)	3		3
Bruin Bay / River		6,200	6,200
McNeil River		10,520	10,520
Kamishak River / Reef (seine)	45,560		
Big Kamishak River		[c]	
Little Kamishak River		18,414	
Strike Creek		2,171	
Total			66,145
Douglas River / Silver Beach (seine)	6,853		
Douglas Reef River		651	
Douglas Beach Creek		2,019	
Douglas Clearwater Tributary		217	
Total			9,740
KAMISHAK BAY DISTRICT TOTAL	***70,785***	***89,513***	***160,298***
TOTAL LOWER COOK INLET	***94,755***	***114,834***	***209,589***

Note: Figures for 2010 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

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

[b] No escapement surveys conducted in Eastern District in 2010.

[c] Insufficient information to generate escapement estimate at Big Kamishak River.

Table 7.–Exvessel value of the commercial salmon catch in numbers of dollars by species, gear type, and harvest type, Lower Cook Inlet, 2010.

	Chinook	Sockeye	Coho	Pink	Chum	Total
COMMON PROPERTY – PURSE SEINE						
No. of Fish	10	8,615	589	274,859	93,245	377,318
Pounds	30	39,965	3,825	996,511	783,930	1,824,261
Price/lb.	$0.50	$1.46	$1.08	$0.33	$0.79	
Value	$15	$58,349	$4,131	$328,849	$619,305	$1,010,649
COMMON PROPERTY – SET GILLNET[a]						
No. of Fish	29	14,765	171	3,106	1,503	19,574
Pounds	477	80,416	1,148	10,911	10,579	103,531
Price/lb.	$3.76	$1.88	$1.27	$0.25	$0.47	
Value	$1,794	$151,182	$1,458	$2,728	$4,972	$162,134
HATCHERY – PURSE SEINE & WEIR						
No. of Fish		69,684	251	246	7	70,188
Pounds		296,487	1,776	848	42	299,153
Price/lb.		$2.03[b]	$0.55[b]	$0.32	$0.55	
Value		$598,196[b]	$113[b]	$271	$23	$598,603
SPORT FISHING DERBY[c] **– HOOK & LINE**						
No. of Fish			1,100			1,100
Pounds			7,751			7,751
Price/lb.			$1.02			
Value			$7,906			$7,906
TOTAL ALL GEARS						
No. of Fish	39	93,064	2,111	278,211	94,755	468,180
Pounds	507	416,868	14,500	1,008,270	794,551	2,234,696
Price/lb.	$3.57	$1.95[b]	$1.05[b]	$0.33	$0.79	
Value	$1,809	$807,727[b]	$13,608[b]	$331,848	$624,300	$1,779,292

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

[a] 2010 set gillnet totals do not include a very small number of fish not sold but retained for personal use.

[b] Average prices per pound for hatchery cost recovery sockeye and coho salmon, and average price for the all gears' total, reflect only those fish actually sold and do 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, 2010.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-001-10 May 24	Opens the fresh waters of the Bear Lake Special Harvest Area (SHA; see **5 AAC 21.373 (e) (4)**) to the harvest and sale of salmon seven days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, May 24, 2010, while additionally opening marine waters of the Bear Lake SHA to hatchery fishing five days per week, from 6:00 a.m. Monday until 10:00 p.m. Friday, also effective at 6:00 a.m. Monday, May 24, 2010, all until further notice. Based on the provisions of this emergency order, 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 all seining.
2-F-H-002-10 May 27	Restricts subsistence salmon fishing in all waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, to one 48-hour fishing period per week, from 9:00 p.m. Friday until 9:00 p.m. Sunday, effective at 9:00 p.m. Sunday, May 30, 2010, until further notice.
2-F-H-003-10 May 28	Establishes a seven-days-per-week fishing schedule in the Kamishak Bay District commercial salmon seine fishery, which opens by regulation on June 1, 2010. Waters of 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-004-10 May 28	Modifies the boundary line defining Seldovia Bay Subdistrict in the Southern District of Lower Cook Inlet, moving it slightly northward at the westernmost end of the line. In addition, this emergency order opens Halibut Cove, Tutka Bay, Barabara Creek, and Seldovia Bay Subdistricts in the Southern District to commercial salmon set gillnet fishing effective at 6:00 a.m. Thursday, June 3, 2010. Finally, this emergency order closes the Port Graham Subdistrict in the Southern District, including both the Port Graham and English Bay Sections, to commercial salmon set gillnet fishing until further notice. The fishing schedule in areas of the Southern District open to commercial set gillnet fishing is two 48-hour periods per week, from 6:00 a.m. Monday until 6:00 a.m. Wednesday, and from 6:00 a.m. Thursday until 6:00 a.m. Saturday, as set forth in regulation.
2-F-H-005-10 June 11	Liberalizes the weekly fishing period for Cook Inlet Aquaculture Association hatchery seining in marine waters of the Bear Lake SHA to seven days per week, effective at 10:00 p.m. Friday, June 11, 2010, until further notice.
2-F-H-006-10 June 18	Closes hatchery seining for Cook Inlet Aquaculture Association in marine waters of the Bear Lake Special Harvest Area in the Eastern District of Lower Cook Inlet, effective at 10:00 p.m. Friday, June 18, 2010, until further notice.
2-F-H-007-10 June 25	Closes waters of McNeil River and Paint River Subdistricts in Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Saturday, June 26, 2010, until further notice. In addition, this emergency order closes the Kirschner Lake Special Harvest Area (SHA) in Kamishak Bay District to the common property salmon seine fishery effective at 6:00 a.m. Saturday June 26, 2010, while opening waters of the Kirschner Lake SHA in the Kamishak Bay District, and the China Poot and Hazel Lake SHA and the Tutka Bay SHA in the Southern District, to the harvest of salmon seven days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, June 28, 2010, until further notice. Finally, this emergency order 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.

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Table 8.–Page 2 of 3.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-008-10 July 2	Allows subsistence salmon fishing in all waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, on the standard regulatory weekly fishing period from 10:00 p.m. Thursday until 10:00 a.m. Wednesday, effective at 9:00 p.m. Friday, July 2, 2010, until further notice.
2-F-H-009-10 July 6	Opens waters of the Port Graham Subdistrict, including both the Port Graham and English Bay Sections, in the Southern District of the Lower Cook Inlet management area to commercial salmon set gillnet fishing, effective at 6:00 a.m. Thursday, July 8, 2010, until further notice. Fishing time for these waters, set in regulation at two 48-hour periods per week, from 6:00 a.m. Monday until 6:00 a.m. Wednesday, and from 6:00 a.m. Thursday until 6:00 a.m. Saturday, is not altered by this emergency order.
2-F-H-010-10 July 16	Opens waters of Chenik Subdistrict in the Kamishak Bay District south of 59° 16′ N. latitude to commercial salmon seining seven days per week, effective at 10:00 a.m. Saturday, July 17, 2010, until further notice. Waters north of 59° 16′ N. latitude in Chenik Subdistrict will remain closed to fishing. Provisions of this emergency order also rescind the regulatory markers near the mouth of Chenik Lake Creek, and fishing is therefore allowed in waters of Chenik Lagoon seven days per week, also effective at 10:00 a.m. Saturday, July 17, 2010, until further notice. In addition, this emergency order opens waters of the South, Outer, and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06, 232-07, and 232-08, in the Outer District, to commercial salmon seining on a schedule of two 40-hour periods per week, from 6:00 a.m. Monday until 10:00 p.m. Tuesday, and from 6:00 a.m. Thursday until 10:00 p.m. Friday, effective at 6:00 a.m. Monday, July 19, 2010, until further notice. All normal regulatory markers and closed waters in all subdistricts, including those in Taylor Bay and Tacoma Cove, will be in effect for this opening. Waters of the North Section of Port Dick Subdistrict, or statistical reporting area 232-09, will remain closed to fishing.
2-F-H-011-10 July 20	Allows subsistence salmon fishing in waters of the Port Graham Subdistrict, including both the Port Graham and English Bay Sections, seven days per week, effective at 10:00 a.m. Wednesday, July 21, 2010, until further notice.
2-F-H-012-10 July 23	Opens those waters of East Nuka Subdistrict *south* of the latitude of the entrance to James Lagoon at 59° 33.50' N. latitude in the Outer District of Lower Cook Inlet to commercial salmon seining on a weekly schedule of seven days per week, effective from 4:00 p.m. Saturday, July 24, 2010, until 10:00 p.m. Sunday, August 15, 2010, or until superseded by subsequent emergency order. In addition, provisions of this emergency order repeal the regulatory closed waters markers near the mouth of Delight Lake Creek in East Nuka Subdistrict, also effective from 4:00 p.m. Saturday, July 24, 2010, until 10:00 p.m. Sunday, August 15, 2010, or until superseded by subsequent emergency order. As a result, commercial salmon seine fishing will be allowed up to freshwater at the stream mouth of Delight Lake Creek and inside waters of McCarty Lagoon on a continuous basis from 4:00 p.m. July 24 until 10:00 p.m. August 15. Commercial salmon fishing remains prohibited inside freshwater of any water body, including Delight Lake Creek and the lagoon at Delight Lake Creek, and also in marine waters north of 59° 33.50' N. latitude in East Nuka Bay. Effective at 10:00 p.m. Sunday, August 15, 2010, all waters of East Nuka Subdistrict will close to commercial salmon fishing until further notice.

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Table 8.–Page 3 of 3.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-013-10 August 2	Corrects inaccurate latitude and longitude coordinates for a regulatory closed waters marker used in the Southern District (Kachemak Bay) personal use set gillnet fishery for coho salmon, as published in the 2009-2010 Subsistence and Personal Use Statewide Fisheries Regulations booklet. The marker is located on the Homer Spit near a local landmark known as "Green Timbers" and constitutes the southernmost marker delineating the closed waters at Mud Bay. The correct coordinates for this marker are 59° 37.67′ N. latitude, 151° 28.38′ W. longitude. These corrected coordinates will remain in effect for the duration of the 2010 Southern District personal use fishery.
2-F-H-014-10 August 10	Closes all waters of Port Dick Subdistrict and East Nuka Bay Subdistrict in the Outer District of Lower Cook Inlet to commercial salmon fishing, effective at 10:00 p.m. Tuesday, August 10, 2010, until further notice.
2-F-H-015-10 August 13	Closes waters of Rocky Cove, Ursus Cove, and Cottonwood Bay Subdistricts in Kamishak Bay District to commercial salmon seining, effective at 12:00 noon Saturday, August 14, 2010, until further notice.
2-F-H-016-10 August 20	Opens waters of Ursus Cove and Cottonwood Bay Subdistricts in Kamishak Bay District to commercial salmon seining, effective at 4:00 p.m. Saturday, August 21, 2010, until further notice. The weekly fishing period, previously established at seven days per week for areas open to seining in Kamishak Bay District (see ***LCI Emergency Order #2-F-H-03-10***), remains unchanged and is not altered by provisions of this emergency order.
2-F-H-017-10 August 23	Opens those Outer District waters of the North and South Sections of Port Dick Subdistrict, or statistical reporting areas 232-07 and 232-09, *east of 151° 10' W. longitude only,* and waters of the Outer and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06 and 232-08, to commercial salmon seining five days per week, from 6:00 a.m. Monday until 10:00 p.m. Friday, effective at 4:00 p.m. Tuesday, August 24, 2010, until further notice. All regulatory closed waters markers in Port Dick remain in effect during open fishing periods, and fishing west of 151° 10' W. longitude in Port Dick is also prohibited. This opening is expressly intended to target pink salmon returning to Island Creek.
2-F-H-018-10 August 27	Extends the fishing period in those waters of Port Dick Subdistrict currently open to commercial salmon seining (see ***Lower Cook Inlet Emergency Order #2-F-H-017-10***) to a continuous basis, effective from 10:00 p.m. Friday, August 27, 2010, until 11:59 p.m. Tuesday, August 31, 2010. In addition, this emergency order rescinds the closed waters markers protecting the mouth of Island Creek in Port Dick, and seining is therefore allowed up to freshwater at Island Creek, also on a continuous basis beginning at 10:00 p.m. Friday, August 27, until 11:59 p.m. Tuesday, August 31. Waters currently open to seining in Port Dick include those waters of the South and North Sections of Port Dick Subdistrict, or statistical reporting areas 232-07 and 232-09, *east of 151° 10' W. longitude only,* as well as waters of the Outer and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06 and 232-08. Fishing west of 151° 10' W. longitude in Port Dick remains prohibited. This fishing period extension and repeal of closed waters markers is expressly intended to provide maximum opportunity to harvest surplus pink salmon returning to Island Creek.

Table 9.–Commercial salmon catch (in numbers and pounds of fish) and effort (in number of permits fished and number of landings) by district, Lower Cook Inlet, 2010.

DISTRICT	# of Permits Fished	# of Landings	Chinook		Sockeye		Coho		Pink		Chum	
			Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Eastern (231)	2	77	0	0	21,732	92,803	1,348	9,506	0	0	0	0
Outer (232)	10	101	0	0	3,003	14,650	16	123	272,427	988,868	22,463	183,482
Southern (241)	22	154	29	477	53,859	247,112	174	1,169	3,294	11,597	1,507	10,602
Kamishak Bay (249)	10	58	10	30	14,470	62,303	573	3,702	2,490	7,805	70,785	600,467
LCI Grand Total	**37**	**390**	**39**	**507**	**93,064**	**416,868**	**2,111**	**14,500**	**278,211**	**1,008,270**	**94,755**	**794,551**
Avg. Wt.				12.99		4.48		6.87		3.62		8.39
Avg. Price				$3.57		$1.95[a]		$1.05[a]		$0.33		$0.79

Note: Figures for 2010 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Average price per pound reflects only those fish actually sold and does not include hatchery fish that were donated.

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, 2010, and 2011 forecast.

Age	2010 Est. Spawning Biomass	Percent by Weight	2010 Commercial Harvest[a]	Percent by Weight	2010 Total Biomass	Percent by Weight	2011 Forecast Biomass	Percent by Weight
1								
2								
3	206	5.2%	--	--	206	5.2%	263	6.9%
4	440	11.1%	--	--	440	11.1%	354	9.2%
5	721	18.3%	--	--	721	18.3%	558	14.6%
6	1,025	26.0%	--	--	1,025	26.0%	774	20.2%
7	667	16.9%	--	--	667	16.9%	826	21.6%
8	461	11.7%	--	--	461	11.7%	459	12.0%
9	220	5.6%	--	--	220	5.6%	399	10.4%
10	87	2.2%	--	--	87	2.2%	93	2.4%
11	85	2.2%	--	--	85	2.2%	58	1.5%
12	16	0.4%	--	--	16	0.4%	34	0.9%
13+	16	0.4%	--	--	16	0.4%	9	0.2%
TOTALS	3,942	100.0%	--	--	3,942	100.0%	3,830	100.0%

[a] Due to the low forecasted biomass, the commercial herring fishery in Kamishak Bay was not opened in 2010.

Table 11.–Proposed regulatory changes for the Lower Cook Inlet commercial and personal use salmon fisheries, or proposed changes that could impact commercial or hatchery fishing, and resultant actions taken, at the Alaska Board of Fisheries meeting held in Homer, November, 2010.

PROPOSAL NUMBER	PROPOSED BY	DESCRIPTION	BOARD ACTION	BOARD VOTE
1	David Chartier	**5 AAC 21.200 (d) (2).** Change boundary line describing Seldovia Subdistrict.	Amended and adopted (see text)	7 – 0
2	Thomas Buchanan	**5 AAC 21.310 (b) (6).** Create a season opening date of June 1 for commercial salmon fishing in the Outer District.	Failed (see text)	0 – 7
3	Thomas Buchanan	**5 AAC 21.310 (b) (7).** Create a season opening date of June 1 for commercial salmon fishing in the Eastern District.	Failed (see text)	0 – 7
4	United Cook Inlet Drift Association	**5 AAC 21.310.** Establish gillnets as legal gear for commercial salmon fishing.	No Action; withdrawn (see text)	
5	John McCombs	**5 AAC 21.200.** Establish drift gillnets as legal gear for commercial salmon fishing.	Failed (see text)	0 – 7
6	Leroy Cabana	**5 AAC 21.3XX.** Create a "terminal harvest area" by repealing the Kirschner Lake Special Harvest Area in regulation.	No Action; adopted 'BOF Intent' language (see text)	
7	United Cook Inlet Drift Association	**5 AAC 21.330.** Establish gillnets as legal gear for commercial salmon fishing.	Failed (see text)	0 – 7
8	United Cook Inlet Drift Association	**5 AAC 21.350 (g).** Establish gillnets as legal gear for commercial salmon fishing.	Failed (see text)	0 – 7
9	ADF&G	**5 AAC 21.350.** Update published coordinates for closed waters in 3 subdistricts.	Adopted (see text)	7 – 0

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Table 11.–Page 2 of 2.

PROPOSAL NUMBER	PROPOSED BY	DESCRIPTION	BOARD ACTION	BOARD VOTE
10	ADF&G	**5 AAC 21.350.** Amend waters closed to commercial salmon fishing in Resurrection Bay.	Adopted (see text)	7 – 0
11	ADF&G	**5 AAC 77.549.** Establish accurate coordinates for closed waters markers in the Southern District personal use coho salmon fishery.	Amended and adopted (see text)	7 – 0
12	Cook Inlet Aquaculture Association	**5 AAC 21.21.373.** Repeal the sunset clause in the Trail Lakes Hatchery Sockeye Salmon Management Plan.	Failed (see text)	2 – 5
13	David Martin	**5 AAC 21.373.** and **5 AAC 21.376.** Amend 2 management plans to allow restrictions on non-commercial fisheries.	Failed (see text)	0 – 7
14	United Cook Inlet Drift Association	**5 AAC 77.545.** Close or restrict a personal use dipnet fishery.	Failed (see text)	0 – 7
15	Dave Lyon	**5 AAC 27.430.** ***[Note: appropriate regulation is 5 AAC 77.531.]*** Establish cast nets as legal gear in the Cook Inlet personal use herring fishery.	Adopted for LCI only (see text)	4 – 3

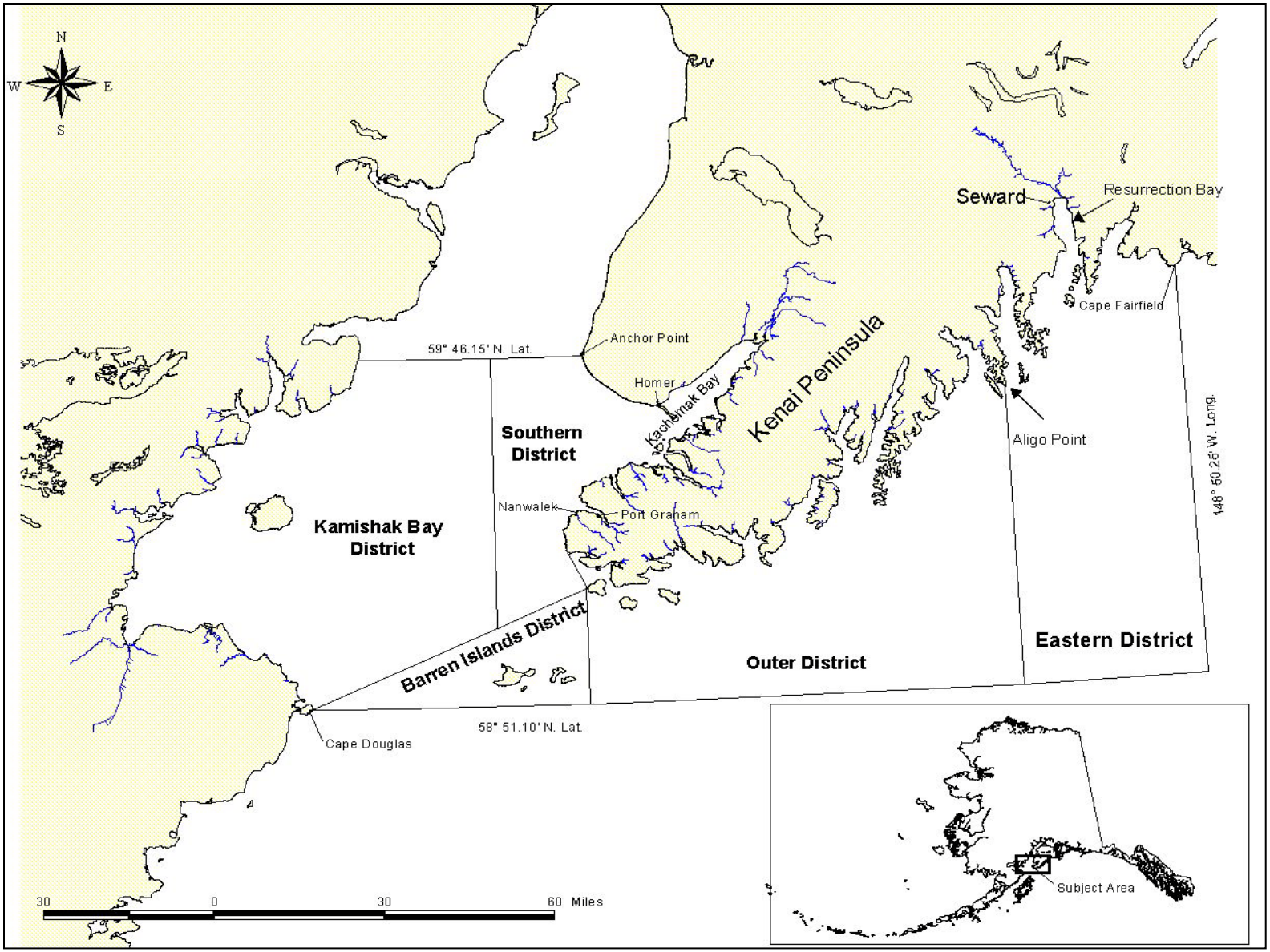

Figure 1.–Lower Cook Inlet management area for commercial salmon and herring fisheries.

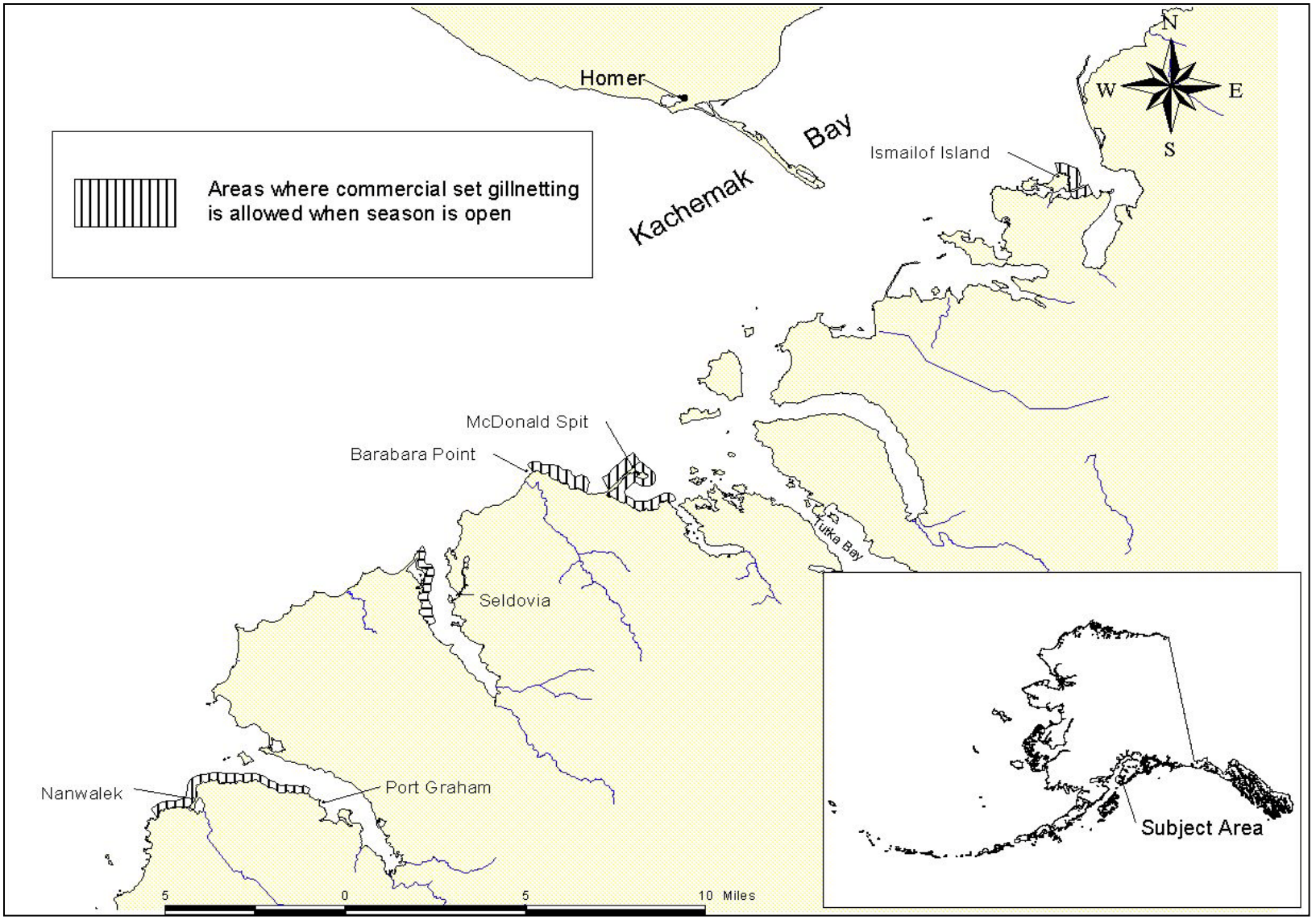

Figure 2.–Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

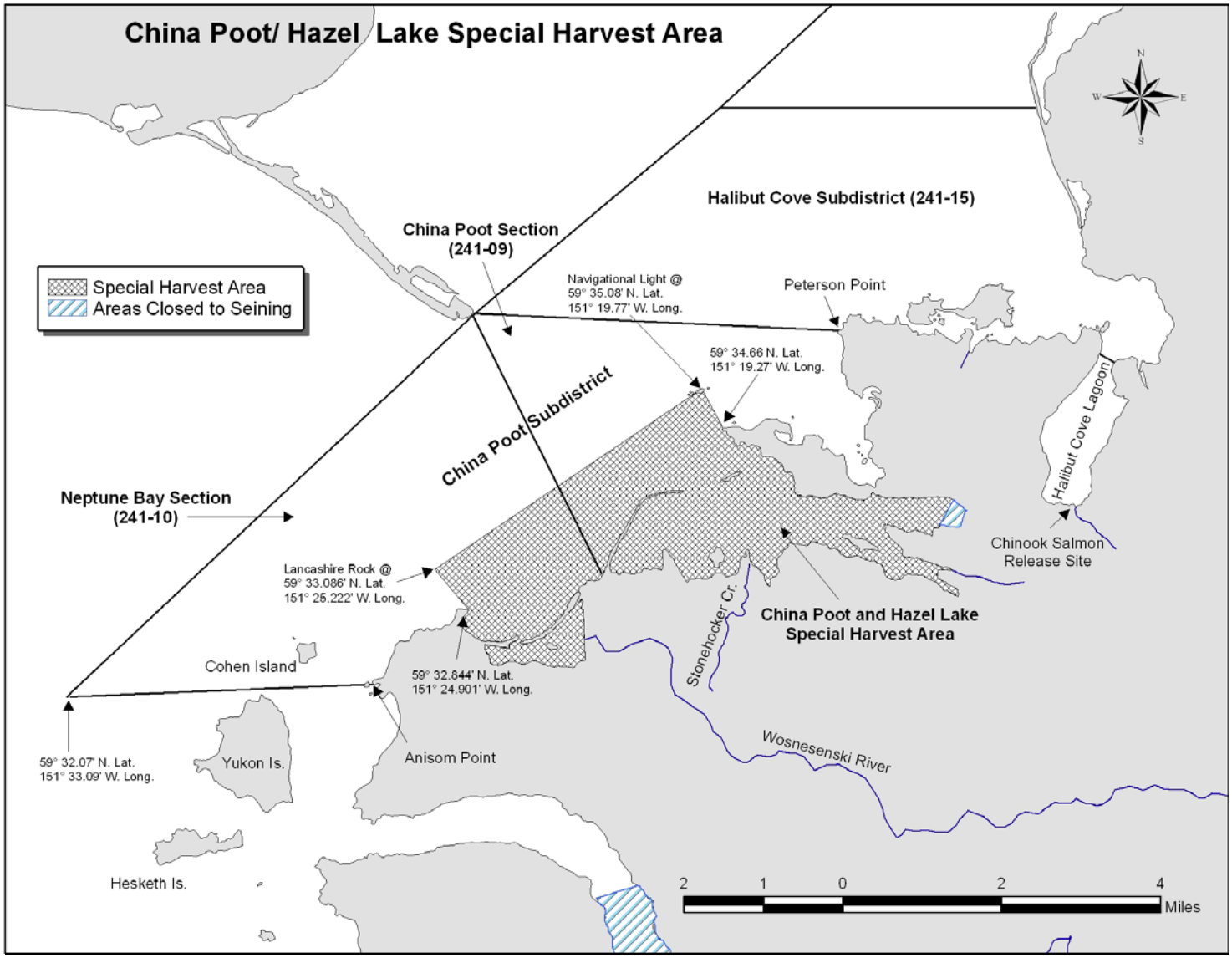

Figure 3.–China Poot / Hazel Lake Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

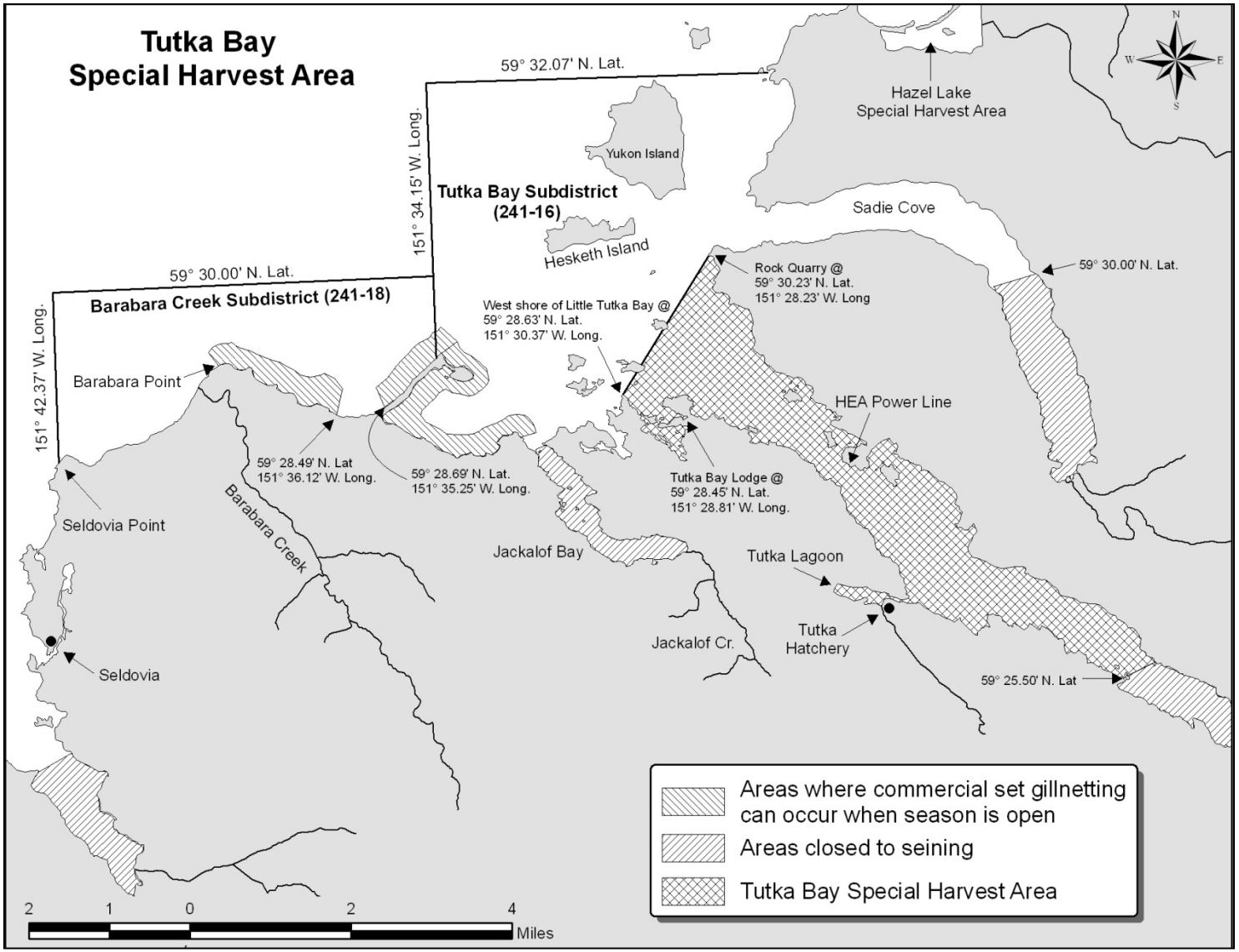

Figure 4.–Tutka Bay Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

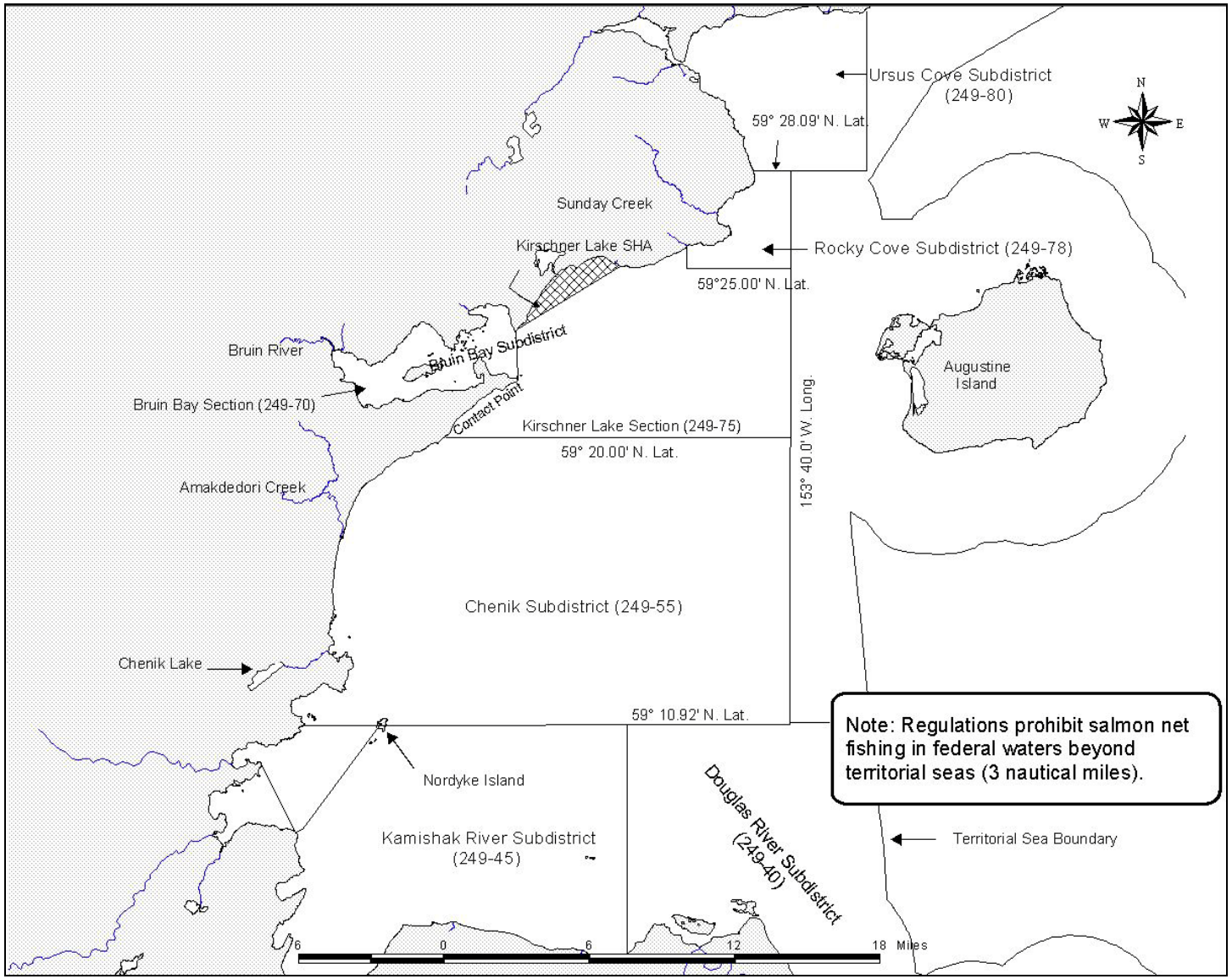

Figure 5.–Kirschner Lake Special Harvest Area for salmon hatchery cost recovery in Kamishak Bay District of Lower Cook Inlet.

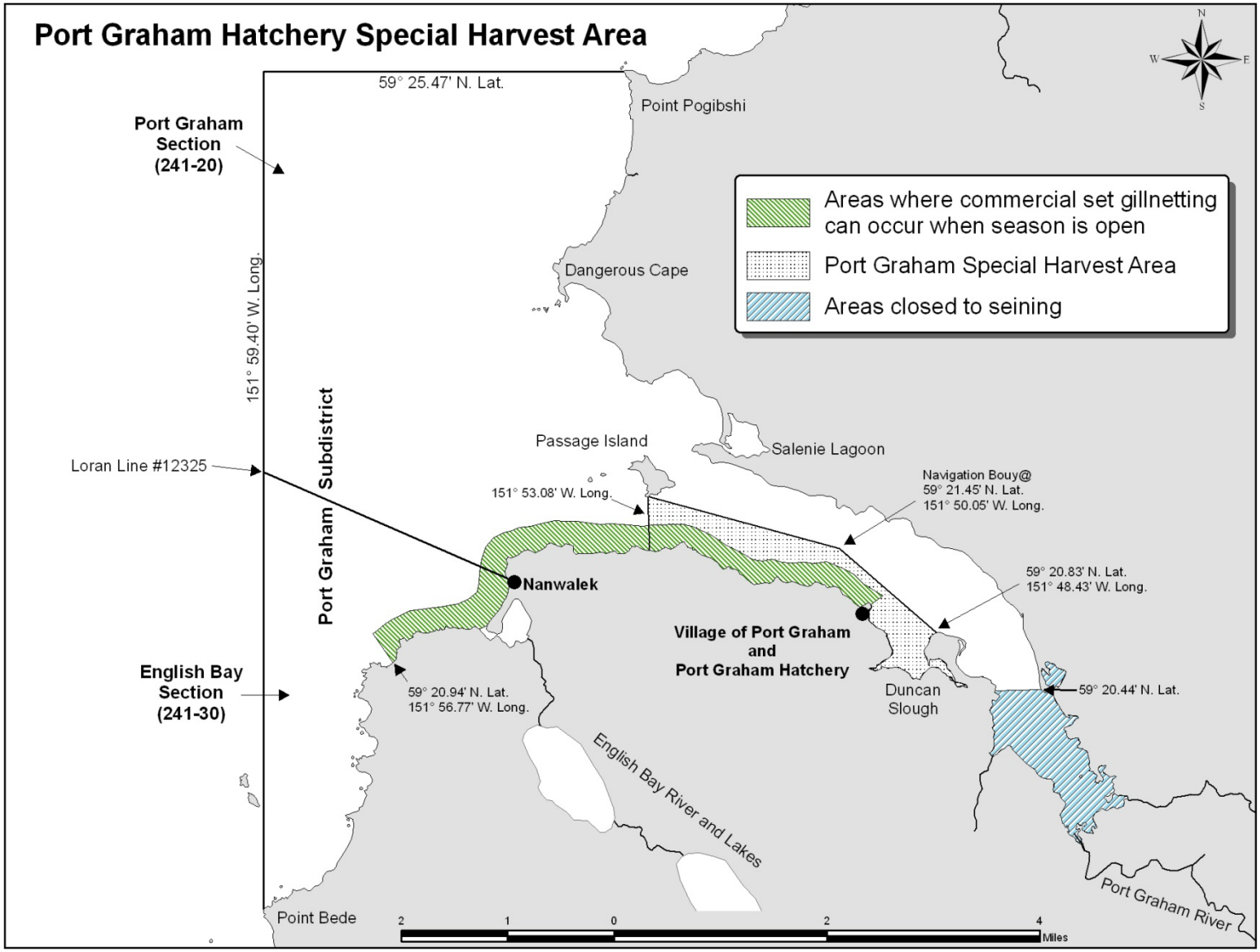

Figure 6.–Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

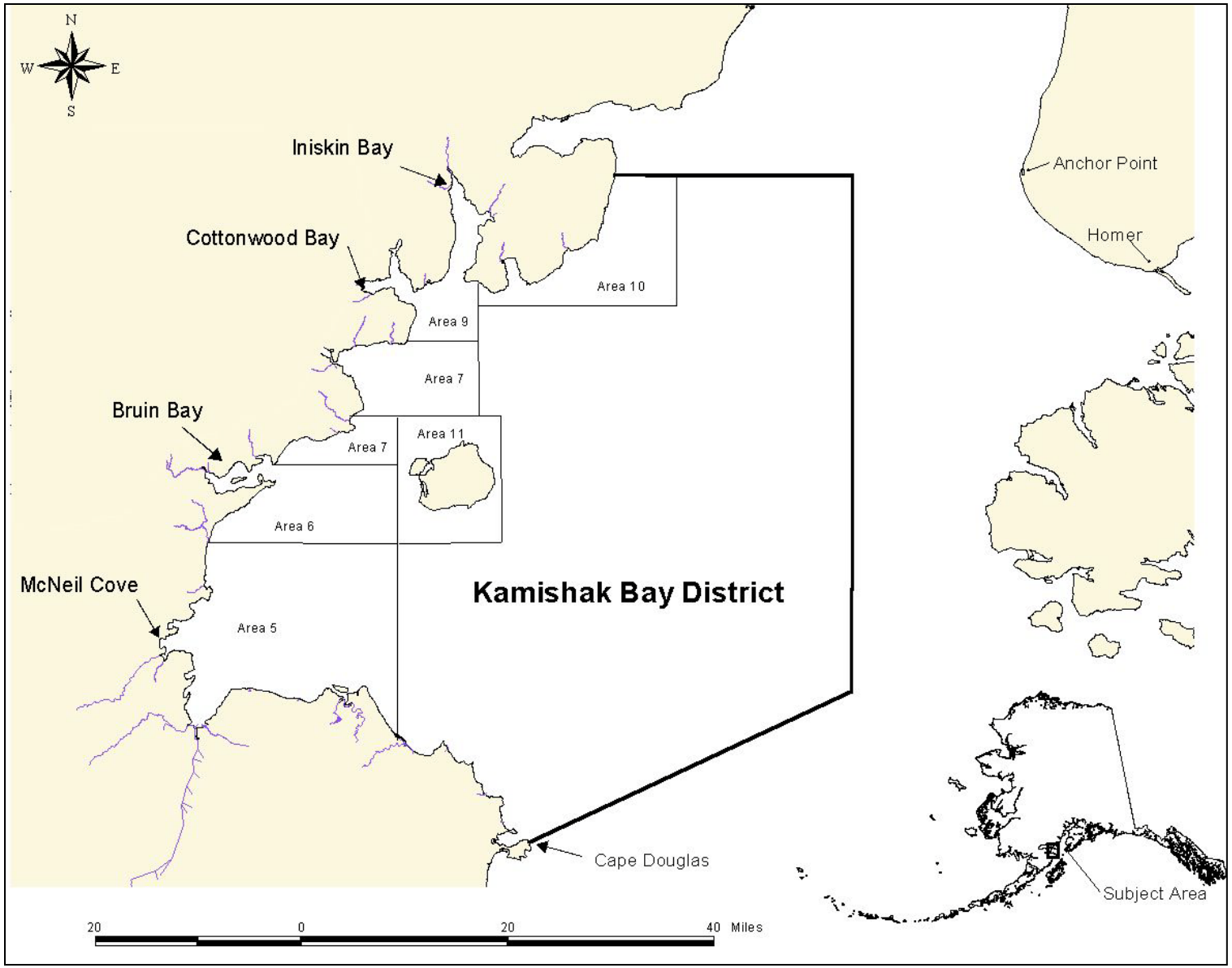

Figure 7.–Commercial fishing areas for herring management purposes in Kamishak Bay District of Lower Cook Inlet.

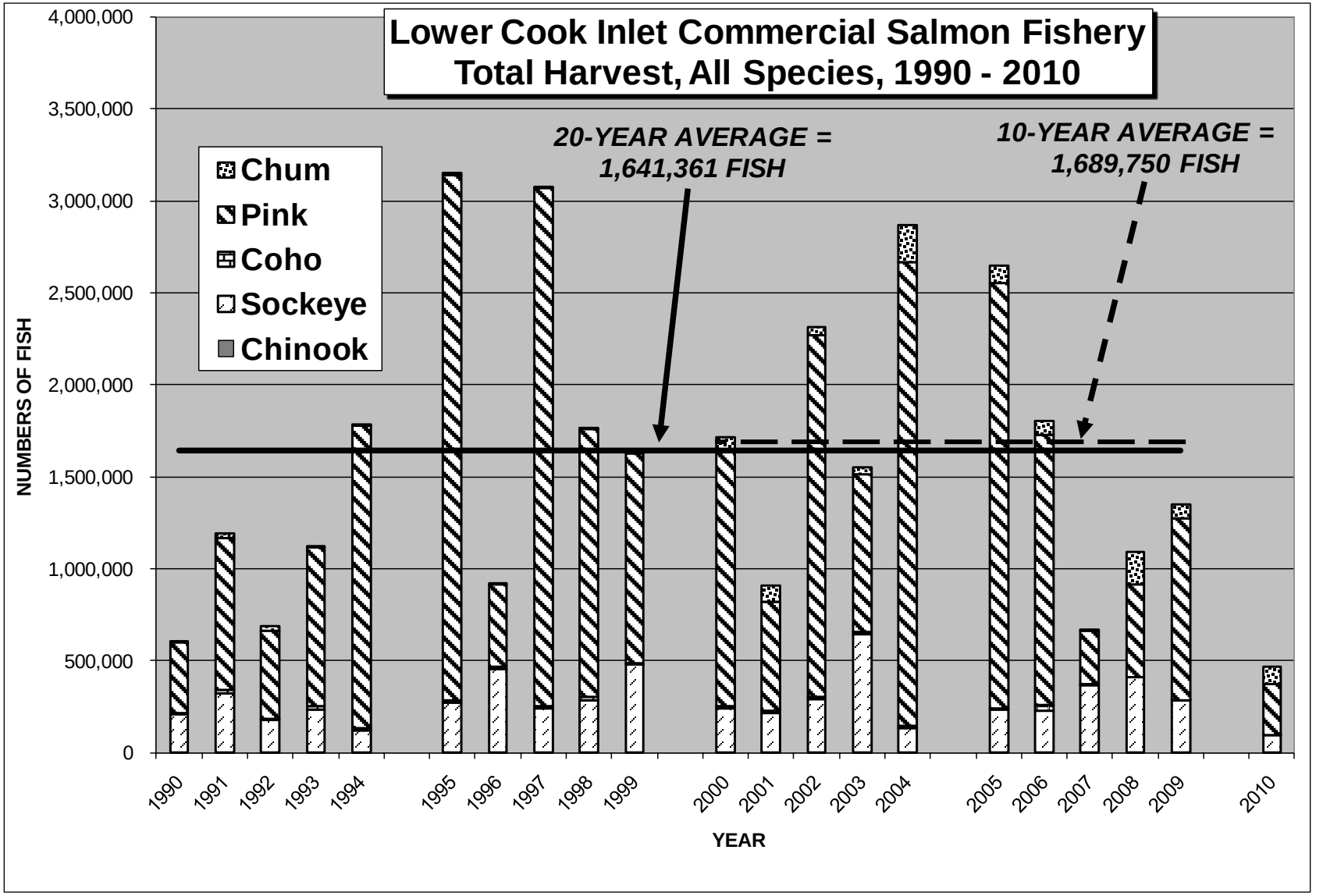

Figure 8.–Total commercial salmon catch, Lower Cook Inlet, 1990–2010.

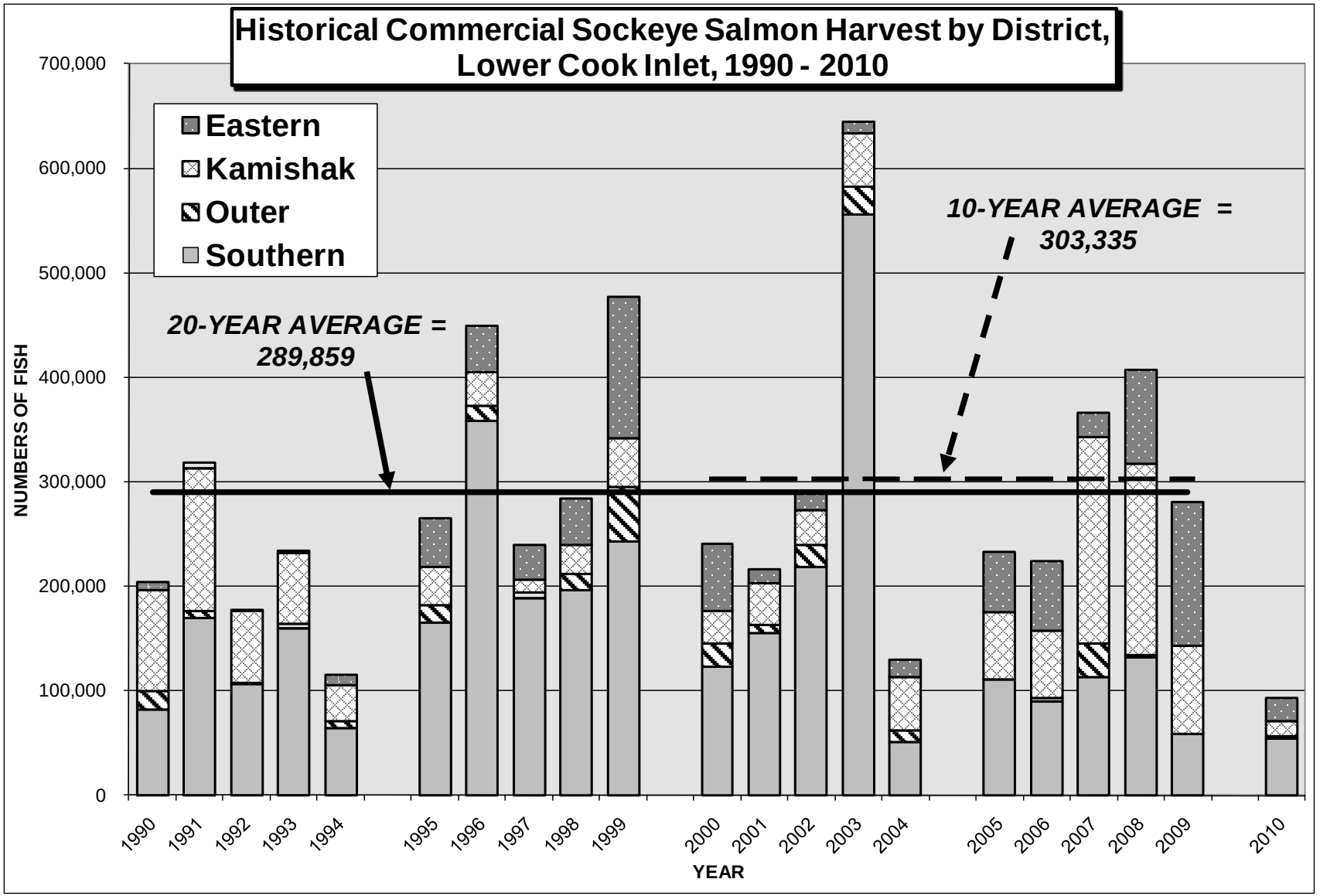

Figure 9.–Commercial sockeye salmon catch by district, Lower Cook Inlet, 1990–2010.

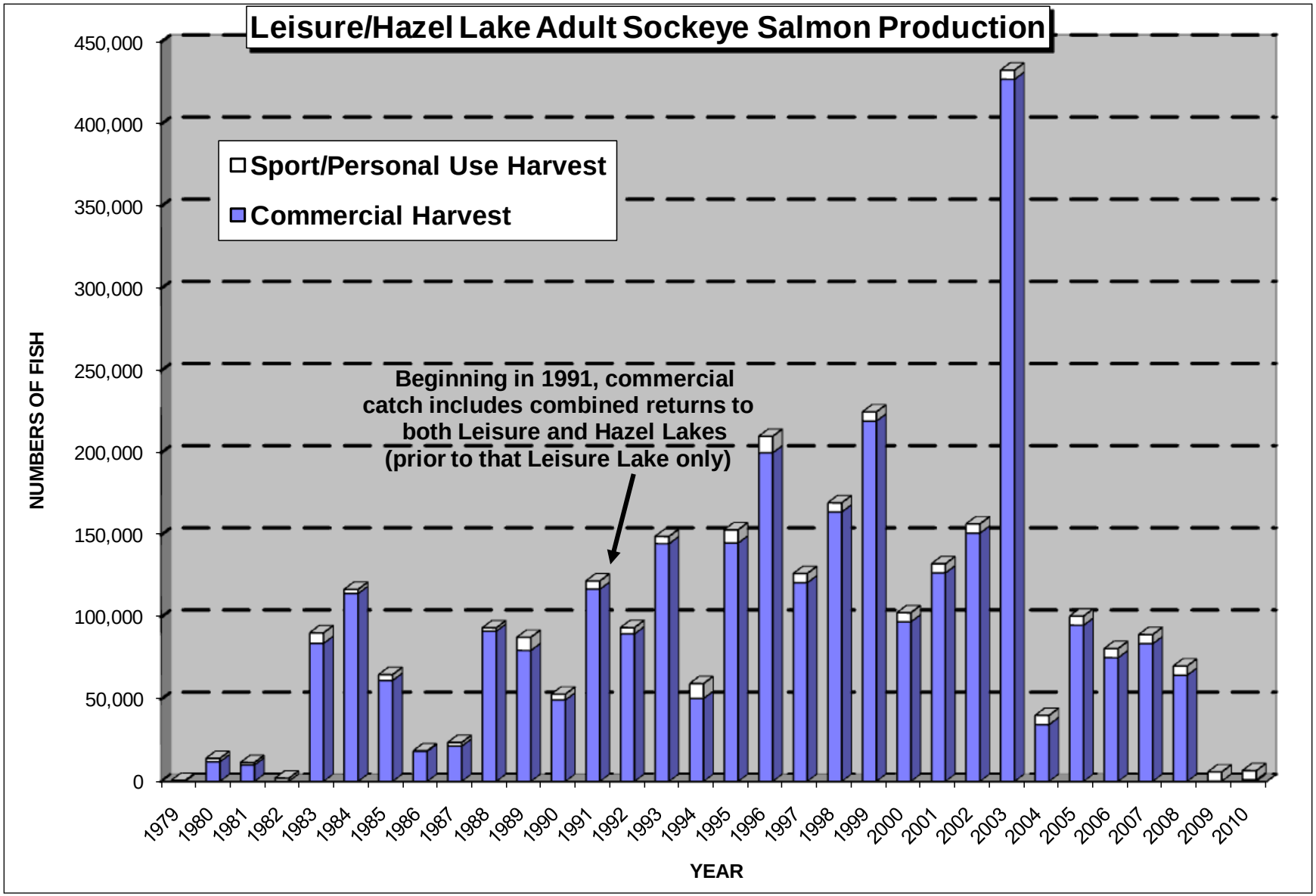

Figure 10.–Sockeye salmon runs to Leisure and Hazel Lakes in the Southern District of Lower Cook Inlet, 1979–2010.

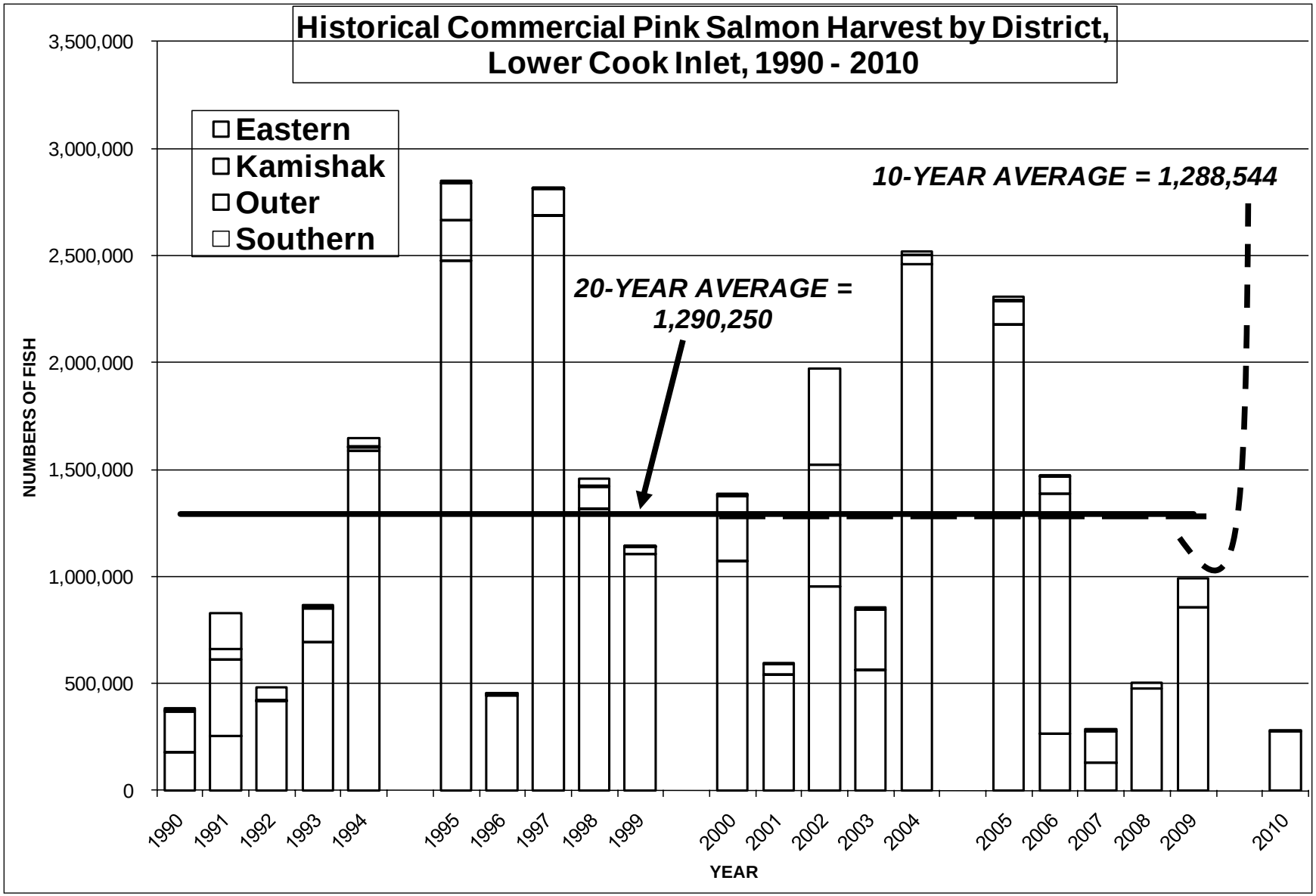

Figure 11.–Commercial pink salmon catch by district, Lower Cook Inlet, 1990–2010.

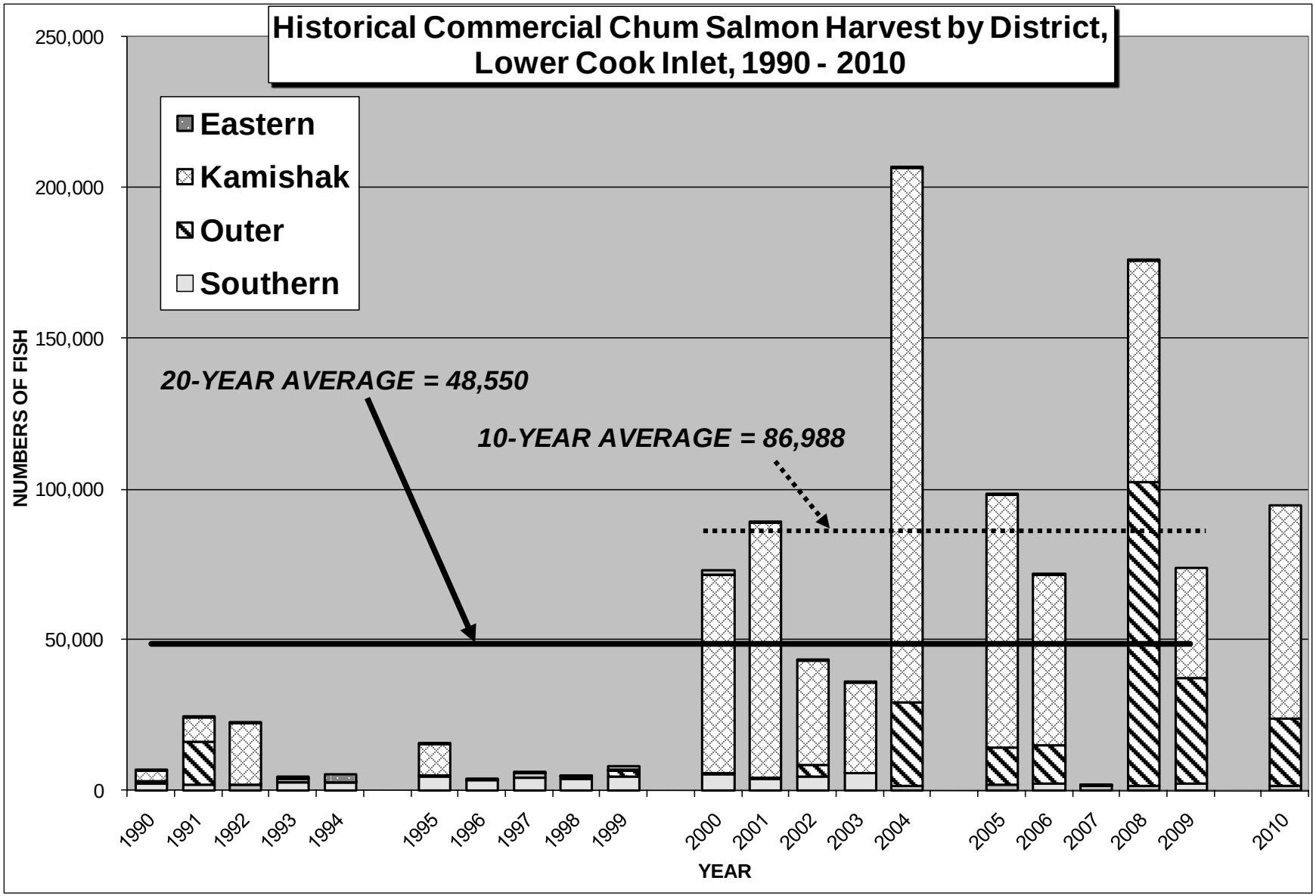

Figure 12.–Commercial chum salmon catch by district, Lower Cook Inlet, 1990–2010.

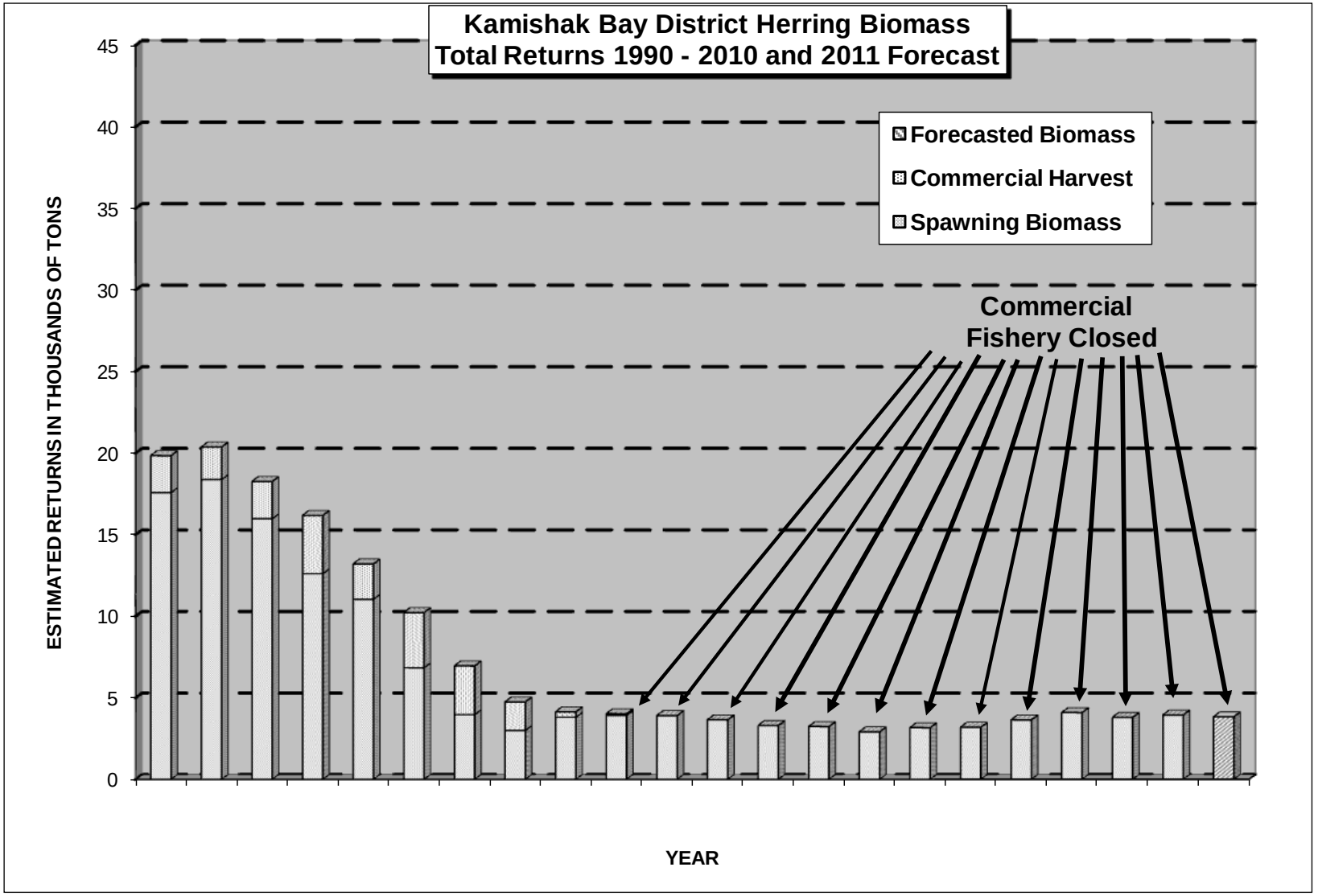

Figure 13.–Biomass estimates and commercial harvests of Pacific herring *Clupea pallasi* in the sac roe seine fishery, Kamishak Bay District, Lower Cook Inlet, 1990–2010, and 2011 projection.

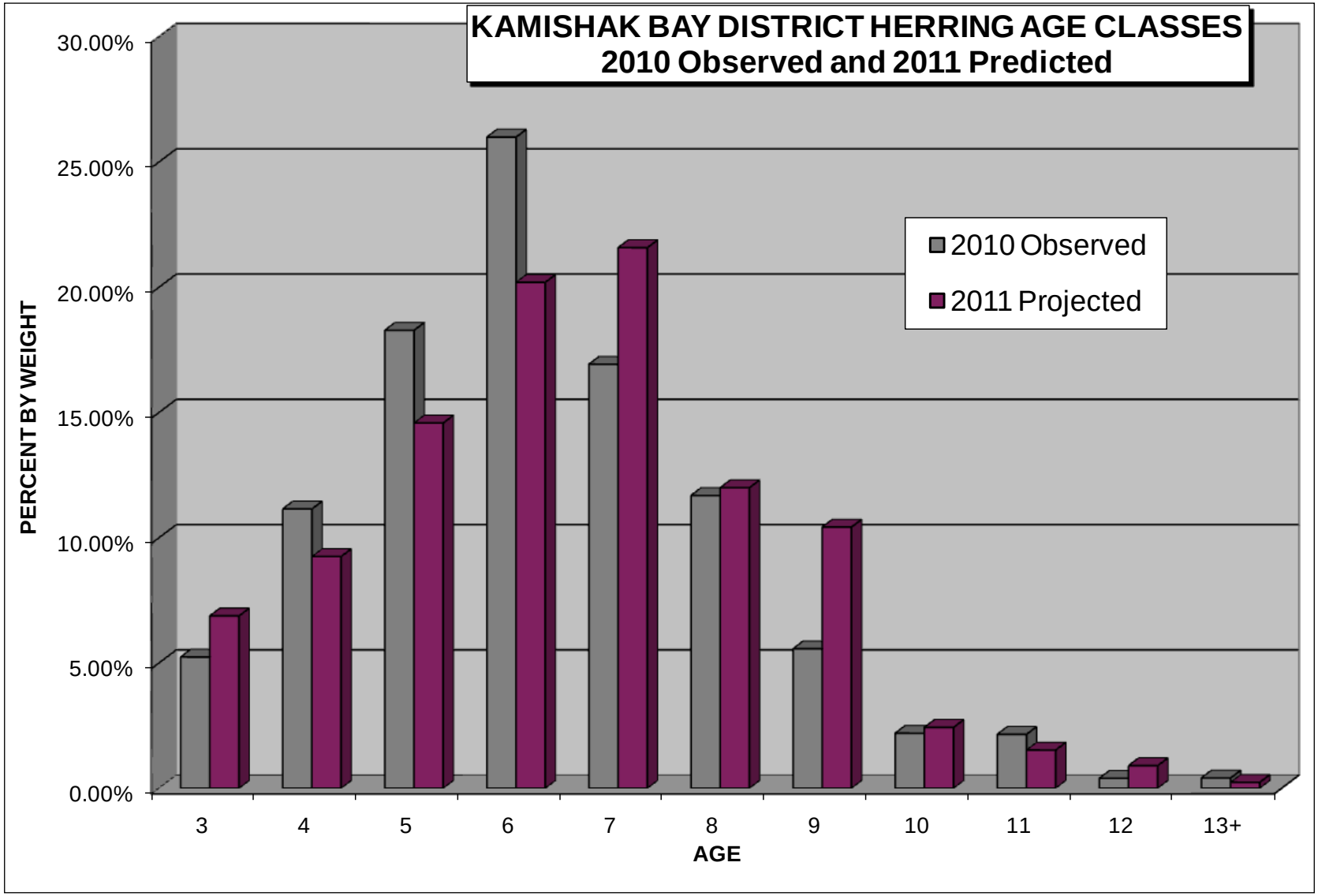

Figure 14.–Herring age composition from samples collected in Kamishak Bay District, Lower Cook Inlet, 2010, and 2011 forecast.

APPENDIX A:
HISTORICAL SALMON TABLES

Appendix A1.–Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1990–2010.

Year	Seines				Set Net Permits Fished
	Permanent Permits	Interim Permits	Total Issued	Actively Fished	
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	2	85	41	24
1999	84	2	86	45	20
2000	84	2	86	36	24
2001	84	2	86	25	18
2002	84	2	86	25	24
2003	84	2	86	27	24
2004	84	2	86	24	19
2005	84	2	86	29	17
2006	85	1	86	24	22
2007	85	0	85	19	16
2008	85	0	85	27	18
2009	85	0	85	13	19
2010	85	0	85	14	21
1990–2009 Avg.	84	1	85	36	21
2000–2009 Avg.	84	1	86	25	20

Source: ADF&G fish ticket database *Unpublished*. Commercial Fisheries Entry Commission License Statistics, 1974-2010, Juneau.

Appendix A2.–Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1990	29	1,287	28	306	31	1,681
1991[a]	19	1,115	36	275	48	1,493
1992[a]	30	1,152	19	212	53	1,466
1993[a]	27	802	41	287	7	1,164
1994[a]	18	496	93	745	9	1,361
1995[a]	48	1,381	62	1,245	24	2,760
1996[a]	26	2,113	42	100	5	2,286
1997[a]	23	1,066	36	1,286	10	2,421
1998[a]	20	1,224	37	712	9	2,002
1999[a]	51	2,459	23	470	20	3,023
2000[a]	31	1,112	19	431	192	1,786
2001[a]	24	627	15	277	295	1,238
2002[a]	24	817	18	441	58	1,359
2003[a]	15	1,965	18	154	40	2,192
2004[a]	32	503	40	352	339	1,266
2005[a]	14	848	27	542	196	1,627
2006[a]	19	1,018	124	576	185	1,922
2007[a]	20	1,502	25	89	3	1,639
2008[a]	15	2,728	14	413	788	3,958
2009[a]	5	2,317	16	673	318	3,329
2010[a]	2	808	14	332	624	1,780
20 Year Avg.	25	1,327	37	479	132	1,999
1990–1999 Avg.	29	1,310	42	564	22	1,966
2000–2009 Avg.	20	1,344	32	395	241	2,032
2010 % of Total	0.11%	45.39%	0.79%	18.65%	35.06%	100.00%

Source: 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.

[a] Includes hatchery cost recovery.

Appendix A3.–Average salmon price in dollars per pound by species, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum
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[a]	0.50[a]	0.15	0.23
1998	1.45	0.96[a]	0.36[a]	0.16	0.27
1999	1.96	1.22[a]	0.45[a]	0.16	0.32
2000	1.86	0.87[a]	0.60[a]	0.12	0.28
2001	1.76	0.62[a]	0.41[a]	0.15	0.28
2002	1.11	0.55[a]	0.33[a]	0.07	0.16
2003	1.03	0.60[a]	0.28[a]	0.06	0.16
2004	1.56	0.77[a]	0.47[a]	0.04	0.20
2005	1.54	0.86[a]	0.53[a]	0.07	0.23
2006	2.25	1.01[a]	0.54[a]	0.11	0.31
2007	2.62	0.91[a]	0.60[a]	0.10	0.25
2008	3.42	1.45[a]	0.76[a]	0.23	0.55
2009	3.45	1.55[a]	0.83[a]	0.22	0.53
2010	3.57	1.95[a]	1.05[a]	0.33	0.79
20-Year Avg.	1.68	1.00	0.50	0.14	0.29
1990–1999 Avg.	1.29	1.08	0.46	0.15	0.28
2000–2009 Avg.	2.06	0.92	0.54	0.12	0.30

Note: Average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

[a] Average price for sockeye and coho include only those fish actually sold and therefore does not include fish retained for personal use or hatchery cost recovery fish that were donated.

Appendix A4.–Salmon average weight in pounds per fish by species in the commercial fishery, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum
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
2002	14.0	5.2	7.8	3.4	8.3
2003	12.6	5.1	6.8	3.2	7.2
2004	12.4	5.0	7.5	3.4	8.2
2005	14.5	4.3	6.7	3.4	8.6
2006	13.5	4.5	7.4	3.6	8.3
2007	16.6	4.5	6.7	3.2	7.0
2008	22.5	4.7	7.1	3.6	8.2
2009	18.8	5.3	7.4	3.1	8.1
2010	13.0	4.5	6.8	3.6	8.4
20-Year Avg.	14.8	4.7	7.4	3.1	7.9
1990–1999 Avg.	14.2	4.5	7.6	2.9	7.5
2000–2009 Avg.	15.3	4.9	7.3	3.2	8.3

Source: Values obtained from ADF&G fish ticket database *Unpublished.*

Appendix A5.–Commercial salmon catch for all gear and harvest types in numbers of fish by species, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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	1,261	240,173	11,004	2,814,431	5,908	3,072,777
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	8,203	1,387,307	73,254	1,710,884
2001	988	216,271	6,667	592,931	88,969	905,826
2002	1,553	290,654	8,329	1,970,061	43,259	2,313,856
2003	1,180	644,257	11,302	856,711	35,686	1,549,136
2004[a]	1,658	130,083	12,426	2,517,555	206,679	2,868,401
2005[a]	622	232,678	9,126	2,306,842	98,602	2,647,870
2006[a]	639	224,345	32,230	1,471,578	71,954	1,800,746
2007[a]	467	366,225	6,319	287,411	1,777	662,199
2008[a]	190	407,591	2,966	505,700	175,730	1,092,177
2009[a]	84	280,312	2,686	989,347	73,974	1,346,403
2010[a]	39	93,064	2,111	278,211	94,755	468,180
20-Year Avg.	1,221	289,859	11,481	1,290,250	48,550	1,641,361
1990–1999 Avg.	1,585	276,383	12,937	1,291,956	10,112	1,592,972
2000–2009 Avg.	857	303,335	10,025	1,288,544	86,988	1,689,750
2010 % of Total	0.01%	19.88%	0.45%	59.42%	20.24%	100.00%

Source: ADF&G fish ticket database *Unpublished.*

[a] 2004–2010 totals do not include a very small number of fish retained for personal use.

Appendix A6.–Commercial salmon catch for all gear and harvest types in numbers of fish by species in the Southern District, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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	1,261	188,402	5,597	2,685,764	4,260	2,885,284
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
2002	1,553	218,203	3,769	953,960	4,803	1,182,288
2003	1,179	556,037	5,408	563,043	5,730	1,131,397
2004[a]	1,656	50,699	1,431	2,461,950	1,372	2,517,108
2005[a]	621	110,739	2,722	2,175,386	1,750	2,291,218
2006[a]	636	89,522	3,036	263,749	2,182	359,125
2007[a]	466	112,672	3,351	128,551	1,584	246,624
2008[a]	188	132,279	1,320	9,949	1,579	145,315
2009[a]	83	58,301	969	3,012	2,274	64,639
2010[a]	29	53,859	174	3,294	1,507	58,863
20-Year Avg.	1,215	167,111	3,441	966,492	3,149	1,141,408
1990–1999 Avg.	1,575	173,478	4,335	1,115,719	3,258	1,298,365
2000–2009 Avg.	855	179,258	2,727	927,490	3,275	1,113,605
2010 % of Total	0.05%	91.50%	0.30%	5.60%	2.56%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2010 totals do not include a very small number of fish retained for personal use.

Appendix A7.–Commercial set gillnet catch of salmon in numbers of fish by species in the Southern District, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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	1,135	59,401	4,475	64,162	4,166	133,339
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
2002	1,513	46,812	2,393	6,741	4,681	62,140
2003	878	81,722	2,291	7,325	4,998	97,214
2004[a]	1,400	16,087	1,164	834	1,234	20,719
2005[a]	525	15,669	1,905	341	1,326	19,766
2006[a]	580	14,219	2,426	12,289	2,019	31,533
2007[a]	439	28,870	1,616	0	1,437	32,362
2008[a]	148	26,819	599	1,884	1,394	30,844
2009[a]	83	38,220	968	2,136	2,274	43,681
2010[a]	29	14,765	171	3,106	1,503	19,574
20-Year Avg.	992	30,377	2,155	14,268	2,864	50,656
1990–1999 Avg.	1,239	28,411	2,732	21,857	2,922	57,160
2000–2009 Avg.	745	32,342	1,579	6,679	2,806	44,152
2010 % of Total	0.15%	75.43%	0.87%	15.87%	7.68%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2010 totals do not include a very small number of fish retained for personal use.

Appendix A8.–Commercial salmon catch for all gear and harvest types in numbers of fish by species in the Outer District, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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
2002	0	21,154	74	569,955	3,810	594,993
2003	1	26,615	4	281,663	137	308,420
2004	2	11,082	13	42,636	27,911	81,644
2005	0	1	3	110,195	12,524	122,723
2006	3	3,198	1,139	1,121,892	12,883	1,139,115
2007	1	32,461	113	147,409	49	180,033
2008	0	1,704	0	467,592	100,819	570,115
2009	1	8	9	853,037	35,126	888,181
2010	0	3,003	16	272,427	22,463	297,909
20-Year Avg.	2	13,306	277	256,765	10,741	281,091
1990–1999 Avg.	2	14,093	416	118,582	2,086	135,178
2000–2009 Avg.	1	12,519	138	394,949	19,397	427,004
2010 % of Total	0.00%	1.01%	0.01%	91.45%	7.54%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

Appendix A9.–Commercial salmon catch for all gear and harvest types in numbers of fish by species in the Eastern District, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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	7,408	4,473	1,540	77,521
2001	0	13,809	3,947	0	6	17,762
2002	0	17,376	4,432	0	5	21,813
2003	0	10,352	5,886	0	19	16,257
2004	0	16,645	5,615	0	1	22,261
2005[a]	0	56,951	6,309	13,500	385	77,145
2006	0	67,048	3,786	3,460	270	74,564
2007	0	23,834	2,850	0	53	26,767
2008	0	90,096	1,625	0	35	91,756
2009	0	137,469	1,708	0	0	139,177
2010	0	21,732	1,348	0	0	23,080
20-Year Avg.	0	41,342	5,680	18,445	375	65,842
1990–1999 Avg.	0	32,914	7,003	34,747	518	75,181
2000–2009 Avg.	0	49,771	4,357	2,143	231	56,502
2010 % of Total	0.00%	94.16%	5.84%	0.00%	0.00%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2005 totals do not include a very small number of fish retained for personal use.

Appendix A10.–Commercial salmon catch for all gear and harvest types in numbers of fish by species in the Kamishak Bay District, Lower Cook Inlet, 1990–2010.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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
2002	0	33,921	54	446,146	34,641	514,762
2003	0	51,253	4	12,005	29,800	93,062
2004	0	51,657	5,367	12,969	177,395	247,388
2005	1	64,987	92	7,761	83,943	156,784
2006	0	64,577	24,269	82,477	56,619	227,942
2007	0	197,228	5	11,451	91	208,775
2008	2	183,512	21	28,159	73,297	284,991
2009	0	84,534	0	133,298	36,574	254,406
2010	10	14,470	573	2,490	70,785	88,328
20-Year Avg.	4	68,100	2,083	48,548	34,285	153,020
1990–1999 Avg.	8	55,898	1,184	22,908	4,250	84,247
2000–2009 Avg.	1	80,302	2,983	74,188	64,320	221,793
2010 % of Total	0.01%	16.38%	0.65%	2.82%	80.14%	100.00%

Source: ADF&G fish ticket database *Unpublished.*

Appendix A11.–Total commercial salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1990–2010.

Year	Southern	Outer	Kamishak	Eastern	Total
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	2,885,284	136,266	12,033	39,194	3,072,777
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
2002	1,182,288	594,993	514,762	21,813	2,313,856
2003	1,131,397	308,420	93,062	16,257	1,549,136
2004	2,517,108[a]	81,644	247,388	22,261	2,868,401
2005	2,291,218[a]	122,723	156,784	77,145[a]	2,647,870
2006	359,152[a]	1,139,115	227,942	74,564	1,800,746
2007	246,624[a]	180,033	208,775	26,767	662,199
2008	145,315[a]	570,115	284,991	91,756	1,092,177
2009	64,639[a]	888,181	254,406	139,177	1,346,403
2010	58,863[a]	297,909	88,328	23,080	468,180
20-Year Avg.	1,141,408	281,091	153,020	65,842	1,641,361
1990–1999 Avg.	1,298,365	135,178	84,247	75,181	1,592,972
2000–2009 Avg.	984,451	427,004	221,793	56,502	1,689,750
2010 % of Total	12.57%	63.63%	18.87%	4.93%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2010 totals do not include a very small number of fish retained for personal use.

Appendix A12.–Commercial Chinook salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1990–2010.

Year	Southern	Outer	Kamishak	Eastern	Total
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	1,261	0	0	0	1,261
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
2002	1,553	0	0	0	1,553
2003	1,179	1	0	0	1,180
2004	1,656[a]	2	0	0	1,658
2005	621[a]	0	1	0	622
2006	636[a]	3	0	0	639
2007	466[a]	1	0	0	467
2008	188	0	2	0	190
2009	83[a]	1	0	0	84
2010	29[a]	0	10	0	39
20-Year Avg.	1,215	2	4	0	1,221
1990–1999 Avg.	1,575	2	8	0	1,585
2000–2009 Avg.	855	1	1	0	857
2010 % of Total	74.36%	0.00%	25.64%	0.00%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2007 and 2009–2010 totals do not include a very small number of fish retained for personal use.

Appendix A13.–Commercial sockeye salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1990-2010.

Year	Southern	Outer	Kamishak	Eastern	Total
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	188,402	6,255	11,733	33,783	240,173
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
2002	218,203	21,154	33,921	17,376	290,654
2003	556,037	26,615	51,253	10,352	644,257
2004	50,699[a]	11,082	51,657	16,645	130,083
2005	110,739[a]	1	64,987	56,951[a]	232,678
2006	89,522[a]	3,198	64,577	67,048	224,345
2007	112,672[a]	32,461	197,228	23,864	366,225
2008	132,279[a]	1,704	183,512	90,096	407,591
2009	58,301[a]	8	84,534	137,469	280,312
2010	53,859[a]	3,003	14,470	21,732	93,064
20-Year Avg.	167,111	13,306	68,100	41,342	289,859
1990–1999 Avg.	173,478	14,093	55,898	32,914	276,383
2000–2009 Avg.	160,744	12,519	80,302	49,771	303,335
2010 % of Total	57.87%	3.23%	15.55%	23.35%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2010 totals do not include a very small number of fish retained for personal use.

Appendix A14.–Commercial sockeye salmon catch for all gear and harvest types in thousands of fish by subdistrict, Lower Cook Inlet, 1959–2010.

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
East 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
East 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

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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
East 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[a]				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

Location	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Resurrection Bay	35.0	135.2	64.1	13.8	16.2	10.4	16.6	56.7	62.4	23.9	90.1	137.5	21.7
Aialik Bay	8.6	0.1	T	0	1.2	0	0	0.3	4.6	0	0	0	0
East Nuka Bay	16.0	51.1	21.6	7.3	21.2	26.6	11.1	0	3.1	32.5	1.4	0	3.0
Port Dick	0	0	T	T	0	0	T	T	0.1	T	T	T	T
Halibut Cove & Lagoon	62.3	42.9	24.3	5.8	27.5	74.2	2.7	7.6	1.9	3.0	4.1	1.4	0.3
China Poot[a]	100.2	170.6	78.3	117.7	126.5	366.2	33.4	90.6	73.8	83.8	64.1	0.2	1.0
Tutka/Barabara	9.8	22.9	12.4	23.0	19.4	33.4	7.2	9.2	7.6	12.4	24.0	24.6	45.7
Seldovia Bay	6.0	6.3	6.4	9.0	9.5	13.8	4.9	3.4	6.4	9.2	8.5	14.2	4.9
Port Graham Bay	17.9	0.7	2.1	0	35.3	68.5	2.6	0	0	4.3	31.7	17.8	1.9
Kamishak/Douglas	0	0	T	0.5	1.4	0.8	2.1	2.9	1.0	0.2	0.7	0	0.1
McNeil (Mikfik)	0	7.2	0	0.3	0	0	0	0	1.3	0	0	0	0
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	33.2	47.0	11.8	161.6	171.3	65.7	5.5
Bruin/Kirschner	27.5	39.8	31.6	38.9	32.5	50.4	16.4	15.0	50.4	35.4	11.6	18.8	8.9
Miscellaneous	0.7	0	T	0	0	0	T	0.1	T	0	0	0	0
Totals	284.0	476.8	240.9	216.3	290.7	644.3	130.1	232.8	224.3	366.2	407.6	280.3	93.1

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish caught.

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

Appendix A15.–Harvest of sockeye salmon returning to China Poot and Neptune Bays in the Southern District of Lower Cook Inlet, by user group, 1990–2010.

Year	Sport Harvest	Personal Use Harvest	Commercial Harvest	Unharvested Fish	Total Run
1990	500	3,000	49,587	0	53,087
1991	1,000	4,000	117,000[a]	0	122,000
1992	300	3,500	89,791[a]	0	93,591
1993	400	4,000	144,677[a]	0	149,077
1994	500	8,500	50,527[a]	0	59,527
1995	1,000	7,000	145,392[a]	450	153,842
1996	1,000	9,000	200,000[a]	441	210,441
1997	650[b]	4,900[c]	120,900[a]	1,130	127,620
1998	650[b]	4,900[c]	164,000[a]	380	170,542
1999	650[b]	4,900[c]	219,300[a]	522	225,983
2000	650[b]	4,900[c]	97,100[a]	256	102,906
2001	650[b]	4,900[c]	126,900[a]	57	132,507
2002	650[b]	4,900[c]	151,100[a]	51	156,701
2003	650[b]	4,900[c]	427,327[a]	121	432,998
2004	650[b]	4,900[c]	34,612[a]	448	40,610
2005	650[b]	4,900[c]	95,070[a]	1	100,621
2006	650[b]	4,900[c]	75,303[a]	820	81,673
2007	650[b]	4,900[c]	83,802[a]	501	89,853
2008	650[b]	4,900[c]	64,668[a]	103	70,321
2009	650[b]	4,900[c]	205	223	5,978
2010	650[b]	4,900[c]	1,007	45	6,602
1990–2009 Average	658	5,138	122,851	275	128,921

Note: Through 1990, "Commercial Harvest" and "Total Run" include runs only to Leisure Lake in China Poot Bay; after 1990, these figures include combined runs to both Leisure Lake in China Poot Bay and Hazel Lake in Neptune Bay.

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

[b] The final "Sport Harvest" figures for 1997–2010 represent the estimated previous 10-year average.

[c] The final "Personal Use Harvest" figures for 1997–2010 represent the statewide sport fish harvest survey average for the years 1990–1995.

Appendix A16.–Commercial catch and escapement of sockeye salmon at Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1990–2010.

Year	Commercial Harvest	Escapement[a]	Total Run
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[b]	808	808
1995	0[b]	1,086	1,086
1996	0[b]	2,990	2,990
1997	0[b]	2,338	2,338
1998	0[b]	1,880	1,880
1999	0[b]	2,850	2,850
2000	0[b]	4,800	4,800
2001	0[b]	250	250
2002	0[b]	4,650	4,650
2003	0[c]	13,825	13,825
2004	33,177	17,000	50,177
2005	47,013	14,507[d]	61,520
2006	11,783	13,868[d]	25,651
2007	161,630	18,230[d]	179,860
2008	171,255	11,284[d]	182,539
2009	65,727	15,264[d]	80,991
2010	5,471	17,312[d]	22,783
1990-2009 Avg.	32,984	8,304	41,289

[a] Estimated from aerial surveys between 1988–1990 and 1998-2004, weir counts between 1991–1997, unless otherwise noted.

[b] Due to weak runs, the Chenik Subdistrict was kept closed to fishing for the entire season.

[c] Due to the previous decade of weak runs to Chenik Lake, the Chenik Subdistrict was kept closed to all fishing to protect fish for escapement.

[d] Estimated from a combination of weir, video counts, and/or aerial counts.

Appendix A17.–Historical commercial catch and escapement of "early run" sockeye salmon to Bear Lake and Resurrection Bay in the Eastern District of Lower Cook Inlet, 1991–2010.

Year	Commercial Seine Fishery # of Permits	Commercial Seine Fishery Harvest	Cost Recovery Harvest	Total Combined Harvest	Escapement plus Broodstock	Total Run
1991					748	748
1992					1,921	1,921
1993	[a]	[a]	[a]	1,654	5,033	6,687
1994	[a]	987	8,051	9,038	8,592	17,630
1995	18	23,655	20,930	44,585	8,328	52,913
1996	17	35,944	7,944	43,888	8,004	51,892
1997	9	8,933	10,056	18,989	7,945	26,934
1998	[a]	1,229	21,000	22,229	8,431	30,660
1999	11	22,630	8,600	31,230	7,814	39,044
2000	13	19,145	1,670	20,815	11,904	32,719
2001	[a]	2,629	400	3,029	12,801	15,830
2002	7	13,447	2,729	16,176	12,473	28,649
2003	10	7,341	3,011	10,352	13,233	23,585
2004	8	16,645	0	16,645	11,923	28,568
2005	15	19,018	37,654	56,672	13,407	70,079
2006	13	27,793	34,655	62,448	12,398	74,846
2007	11	15,407	8,457	23,864	12,841	36,705
2008	11	57,060	33,036	90,096	13,444	103,540
2009	CLOSED	CLOSED	137,469	137,469	13,318	150,787
2010	CLOSED	CLOSED	21,732	21,732	12,884	34,616
All Years Average	10	16,992	19,947	35,051	9,872	41,418

[a] To comply with **AS 16.05.815 CONFIDENTIAL NATURE OF CERTAIN REPORTS AND RECORDS**, effort (and in one case catch) data has been masked where fewer than 4 vessels fished in a given area.

Appendix A18.–Commercial coho salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1990–2010.

Year	Southern	Outer	Kamishak	Eastern	Total
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	7,408	8,203
2001	2,706	5	9	3,947	6,667
2002	3,769	74	54	4,432	8,329
2003	5,408	4	4	5,886	11,302
2004	1,441[a]	13	5,367	5,615	12,436
2005	2,722[a]	3	92	6,309	9,126
2006	3,036[a]	1,139	24,269	3,786	32,230
2007	3,351[a]	113	5	2,850	6,319
2008	1,320[a]	0	21	1,625	2,966
2009	969[a]	9	0	1,708	2,686
2010	174[a]	16	573	1,348	2,111
20-Year Avg.	3,441	277	2,083	5,680	11,481
1990–1999 Avg.	4,335	416	1,184	7,003	12,937
2000–2009 Avg.	2,548	138	2,983	4,357	10,025
2010 % of Total	8.24%	0.76%	27.14%	63.86%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2010 totals do not include a very small number of fish retained for personal use.

Appendix A19.–Commercial pink salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1990–2010.

Year	Southern	Outer	Kamishak	Eastern	Total
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
2002	953,960	569,955	446,146	0	1,970,061
2003	563,043	281,663	12,005	0	856,711
2004	2,461,950[a]	42,636	12,969	0	2,517,555
2005	2,175,386[a]	110,195	7,761	13,500	2,306,842
2006	263,749[a]	1,121,892	82,477	3,460	1,471,578
2007	128,551[a]	147,409	11,451	0	287,411
2008	9,949[a]	467,592	28,159	0	505,700
2009	3,012[a]	853,037	133,298	0	989,347
2010	3,294	272,427	2,490	0	278,211
20-Year Avg.	966,492	256,765	48,548	18,445	1,290,250
1990–1999 Avg.	1,115,719	118,582	22,908	34,747	1,291,956
2000–2009 Avg.	817,264	394,949	74,188	2,143	1,288,544
2010 % of Total	1.18%	97.92%	0.90%	0.00%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2009 totals do not include a very small number of fish retained for personal use.

Appendix A20.–Commercial pink salmon catch for all gear and harvest types in thousands of fish by subdistrict during odd-numbered years, Lower Cook Inlet, 1959–2009.

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 & Lagoon	ND	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	ND	ND	ND	ND	ND	ND	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	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 & Lagoon	27.1	11.1	18.8	5.9	30.5	254.4	91.1	100.2	1.9	2.6
China Poot[a]	[a]	[a]	[a]	[a]	[a]	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	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

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LOCATION	1999	2001	2003	2005	2007	2009
Humpy Creek	0	0	0	0.0	0.0	0.0
Halibut Cove &	3.4	0.2	6.5	0.8	0.0	0.0
China Poot[a]	19.6	4.8	41.3	26.6	10.6	T
Tutka/Barabara	1,080.8	533.1	511.8	1,637.0	0.0	2.1
Seldovia Bay	1.5	4.9	2.7	0.3	0.0	0.0
Port Graham Bay	0	0	0.7	510.9	118.0	0.9
Dogfish Bay	0	0	0	0.0	0.0	0.0
Port Chatham	0	0	0	0.0	0.0	21.7
Windy Bay	0	9.4	119.8	24.0	0.0	201.4
Rocky Bay	0	0	0	5.2	23.5	111.4
Port Dick Bay	0	16.7	137.4	81.0	90.7	518.5
Nuka Island	0	0	0	0.0	0.0	0.0
E. Nuka Bay	32.5	22.4	24.5	0.0	33.2	0.0
Resurrection Bay	0	0	0	0.4	0.0	0.0
Bruin Bay	0.8	0	12.0	3.0	9.8	13.2
Rocky/Ursus Coves	0	0.1	0	0.0	0.0	118.6
Iniskin/Cottonwood	0	0	0	4.7	0.0	0.0
Miscellaneous	1.9	1.3	0	13.1	1.6	1.6
Total	1,140.5	592.9	856.7	2,307.1	287.4	989.3

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish harvested.

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

Appendix A21.–Commercial pink salmon catch for all gear and harvest types in thousands of fish by subdistrict during even-numbered years, Lower Cook Inlet, 1960–2010.

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 & 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	ND	ND	ND	ND	ND	ND	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 & Lagoon	4.7	1.0	10.9	14.0	106.8	91.0	58.4	105.6	2.3	2.4
China Poot[a]	[a]	[a]	[a]	[a]	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

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Location	2000	2002	2004	2006	2008	2010
Humpy Creek	0	0	0	0	0	0
Halibut Cove & Lagoon	0.5	0.3	T	0	T	0.6
China Poot[a]	4.0	4.7	1.5	3.4	5.0	T
Tutka/Barabara	1,055.4	709.0	1,176.8	12.3	2.3	2.7
Seldovia Bay	10.2	1.3	0.1	0	0	0
Port Graham Bay	0	238.7	1,283.5	248.0	2.7	0
Dogfish Bay	0	0	0	0	0	0
Port Chatham	0	0	0	0	0	0
Windy Bay	0	0	0	26.7	114.7	0
Rocky Bay	0	0	0	0	0	0
Port Dick Bay	306.6	454.1	41.6	1,093.7	344.5	272.4
Nuka Island	0	0.0	0	0	8.3	0
E. Nuka Bay	0.3	115.9	1.1	1.4	T	0.1
Resurrection Bay	0.4	0	0	0	0	0
Bruin Bay	5.5	333.7	1.5	52.8	1.8	0.1
Rocky/Ursus Coves	0	110.1	4.5	11.2	6.4	0
Iniskin/Cottonwood Bays	0	0.1	6.4	13.1	0.1	0
Miscellaneous	4.4	2.2	0.6	9.0	19.8	2.3
Total	1,387.3	1,970.1	2,517.5	1,471.6	505.7	278.2

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish harvested

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

Appendix A22.–Commercial chum salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1990–2010.

Year	Southern	Outer	Kamishak	Eastern	Total
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
2002	4,803	3,810	34,641	5	43,259
2003	5,730	137	29,800	19	35,686
2004	1,372[a]	27,911	177,395	1	206,679
2005	1,750[a]	12,524	83,943	385	98,602
2006	2,182[a]	12,883	56,619	270[a]	71,954
2007	1,584	49	91	53	1,777
2008	1,579[a]	100,819	73,297	35	175,730
2009	2,274[a]	35,126	36,574	0	73,974
2010	1,507[a]	22,463	70,785	0	94,755
20-Year Avg.	3,149	10,741	34,285	375	48,550
1990–1999 Avg.	3,258	2,086	4,250	518	10,112
2000–2009 Avg.	3,040	19,397	64,320	231	86,988
2010 % of Total	1.59%	23.71%	74.70%	0.00%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004–2006 and 2008–2010 totals do not include a very small number of fish retained for personal use.

Appendix A23.–Commercial chum salmon catch for all gear and harvest types in thousands of fish by subdistrict, Lower Cook Inlet, 1959–2010.

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Tutka Bay	0.1	2.4	1.8	2.9	2.4	5.6	1.1	3.9	4.0	1.3	0.7
Port Graham	2.3	1.8	0.5	4.0	3.8	2.1	0.9	5.3	3.0	2.3	1.3
Dogfish Bay	4.9	0.4	0.1	0	0.2	0	0	7.0	15.3	0.1	0
Port Chatham	1.0	2.5	0	2.8	4.3	5.2	0	17.8	0	1.0	0
Rocky/Windy Bays	14.9	6.4	2.2	8.5	0.3	33.8	8.1	1.7	0	0.5	0
Port Dick	42.4	51.0	36.8	112.0	110.8	227.4	14.2	60.9	36.0	10.9	5.4
E. Nuka Bay	1.7	8.4	1.7	0.5	1.5	0	0	0	1.5	6.9	0
Resurrection Bay	0.1	0.5	0	0	0	0	0	0	0.1	0.7	0
Douglas River	0.2	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
McNeil River	0	0.4	0	0	0	2.7	0.9	0	0.4	8.3	4.4
Bruin Bay	0	0.3	0.5	0	0.1	0	0.4	0	1.0	7.5	0
Ursus/Rocky Coves	8.5	8.6	1.8	1.1	2.8	1.2	0	4.0	2.9	1.0	3.6
Cottonwood/Iniskin	12.1	33.4	10.2	41.7	10.9	38.4	0	0	19.0	25.5	44.4
Miscellaneous	22.6	0	0	5.8	1.4	6.9	2.5	28.5	2.2	5.4	1.0
Totals	110.8	116.1	55.6	179.3	138.5	323.3	28.1	129.1	85.4	75.1	61.2

Location	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Tutka Bay	1.6	0.5	1.3	0.8	1.4	2.0	0.9	0.8	2.6	2.7	1.8
Port Graham	4.8	2.0	3.2	2.6	1.0	2.2	0.5	5.0	2.4	4.3	2.5
Dogfish Bay	50.9	114.5	41.1	0.4	0	0	0	9.4	0	8.5	2.1
Port Chatham	0.1	2.4	0	0.4	0	0.6	0	0.1	0	1.7	1.3
Rocky/Windy Bays	39.4	1.4	0	0.9	0	0.3	0	17.7	0	76.7	2.1
Port Dick	41.2	0.7	0	33.4	8.1	6.8	0	25.6	10.3	79.0	19.0
E. Nuka Bay	5.9	0.1	2.3	40.8	3.9	3.6	0.4	17.4	0.4	14.7	7.8
Resurrection Bay	0.6	0.4	0.7	0	0	0	0	0	0.1	0	0.7
Douglas River	0	0	0	0	0	0.1	7.1	4.0	2.9	0.7	10.0
Kamishak River	0	0	2.4	0	1.8	0	10.5	0	23.9	17.8	2.8
McNeil River	1.9	0	2.3	0	2.0	0	16.9	38.5	4.9	6.5	6.3
Bruin Bay	12.8	1.6	1.8	0	0.7	0	0	0	0	4.0	11.0
Ursus/Rocky Coves	8.9	10.3	0.2	5.7	0	2.0	2.8	7.8	1.9	0.5	0.3
Cottonwood/Iniskin	71.9	14.5	19.7	29.9	0	2.8	11.5	15.3	14.9	0.2	5.4
Miscellaneous	2.4	0.2	0.5	0.6	0.3	1.2	0.2	4.2	9.2	1.2	0.4
Totals	242.4	148.6	75.5	115.5	19.2	21.6	50.8	145.8	73.5	218.5	73.5

Location	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Tutka Bay	7.9	8.3	9.9	3.4	3.2	3.9	3.9	4.7	2.5	1.5	0.8
Port Graham	11.2	7.4	1.7	3.6	1.3	0.8	0.4	1.2	0	0	0
Dogfish Bay	71.8	15.6	2.8	1.1	0	0	0	0	0	0	0
Port Chatham	59.5	14.1	2.1	0	1.3	0	0	0	0	0.1	0.1
Rocky/Windy Bays	7.4	0	3.2	0	0	0	0	0	0	0	0.5
Port Dick	95.8	32.5	18.0	1.9	9.6	10.4	27.1	64.4	0	0.5	13.7
E. Nuka Bay	3.8	0.9	0.8	0.2	0.8	1.3	1.6	6.8	0	T	T
Resurrection Bay	2.4	7.7	6.9	3.0	3.0	3.5	13.9	23.9	0	0	0
Douglas River	46.7	37.1	27.2	9.2	8.0	11.6	23.7	24.8	0	0.1	3.0
Kamishak River	8.6	9.2	23.9	16.2	0.1	0.1	24.6	26.7	0	T	0.7
McNeil River	11.6	32.6	67.9	12.0	0	13.7	32.9	104.0	0.1	0.1	0.1
Bruin Bay	1.7	1.3	2.6	5.9	0	5.4	0.1	2.8	4.4	1.6	2.6
Ursus/Rocky Coves	1.5	7.2	0	3.7	0	22.1	17.2	20.7	3.4	0	0
Cottonwood/Iniskin	3.5	21.6	21.4	23.0	0	8.8	9.7	39.2	0	0	1.0
Miscellaneous	2.7	2.5	3.9	9.3	3.3	1.1	1.9	2.7	0.9	3.0	1.7
Totals	336.1	198.0	192.3	92.5	30.6	82.7	157.0	321.9	11.3	7.0	24.2

-continued-

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Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Tutka Bay	0.6	0.9	0.8	1.6	1.0	1.1	0.9	1.5	1.8	1.4	2.7
Port Graham	0	0	0	0.7	0.7	2.0	0.8	0	T	0	0.4
Dogfish Bay	0	0	0	0	0	0	0	0	0	0	0
Port Chatham	0	0.1	0	T	0	0	0.1	0	0	0	0
Rocky/Windy Bays	0	0.1	0	0.4	0	1.6	0.3	0	0	0.3	0
Port Dick	0.2	0.7	T	0	0	0	0.1	0	0.1	0.1	3.8
E. Nuka Bay	0	T	T	0.1	T	T	T	2.1	0.2	T	0.1
Resurrection Bay	0	0	2.5	0.3	0.2	0	0	0	1.5	T	T
Douglas River	12.5	T	T	0.7	0	0	0	0	19.9	10.3	7.0
Kamishak River	1.5	0	0	0.1	0	0	0	0	43.7	73.0	5.1
McNeil River	2.0	0.4	0	0	0	T	0	0	0	T	0
Bruin Bay	0.8	T	0	4.9	T	T	T	T	2.4	0	2.0
Ursus/Rocky Coves	2.7	0	0	2.2	0	0	0	0	0	1.5	3.4
Cottonwood/Iniskin	0.2	0	0	2.3	0	0	0	0	0	0	17.0
Miscellaneous	1.6	2.1	2.1	2.3	1.9	1.2	2.3	4.4	3.6	2.4	1.8
Totals	22.2	4.4	5.5	15.6	3.8	5.9	4.6	7.9	73.3	89.0	43.3

Location	2003	2004	2005	2006	2007	2008	2009	2010
Tutka Bay	2.6	0.7	0.8	0.7	0.6	0.4	0.6	0.7
Port Graham	0.1	0.2	0	0	T	0.1	T	0.1
Dogfish Bay	0	0	0	0	0	0	0	0
Port Chatham	0	0	0	0	0	0	T	0
Rocky/Windy Bays	0.1	0	5.6	0.9	T	3.0	1.7	0
Port Dick	T	27.8	5.3	11.9	T	87.5	33.5	22.5
E. Nuka Bay	T	0.1	0	T	T	T	0	T
Resurrection Bay	T	T	0.1	T	0.1	T	0	0
Douglas River	T	6.7	2.8	15.2	0	1.7	0	6.9
Kamishak River	0	0	0	0	0	53.5	0	45.6
McNeil River	0	0	0	0	0	0	0	0
Bruin Bay	0.1	7.0	7.0	1.9	0.1	0	11.9	T
Ursus/Rocky Coves	0	1.8	0	3.3	0	10.5	23.2	0.5
Cottonwood/Iniskin	29.7	161.9	74.1	36.2	0	7.3	1.5	17.9
Miscellaneous	3.1	0.5	2.9	1.8	0.9	11.5	1.7	0.6
Totals	35.7	206.7	98.6	72.0	1.8	175.7	74.0	94.8

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish harvested.

Appendix A24.–Estimated sockeye salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1990–2010.

Year	English Bay Lakes	Delight Lake	Desire Lake	Delusion Lake	Bear Lake[a,b,c]	Aialik Lake	Mikfik Lake	Chenik Lake	Amakdedori Creek	Kamishak Rivers	Total
1990	3.0	5.2	9.5	0.3	0.1	5.7	8.8	17.0	1.8	0.2	51.6
1991	6.6	4.1	8.2	0.3	0.7	3.7	9.7	10.2[b]	1.9	0.7	46.1
1992	5.6	5.9	11.9	1.0	1.9	2.5	7.8	9.3[b]	1.9	4.9	52.7
1993	8.1	5.6	11.0	1.3	5.0	3.0	6.4	4.0[b]	2.0	4.1	50.5
1994	12.7[c]	5.6	10.5	1.3	8.6	7.3	9.5	0.8[b]	0.8	[d]	57.1
1995	20.7[c]	15.8	15.8	1.5	8.3	2.6	10.1	1.1[b]	2.4	[d]	78.3
1996	11.1[c]	7.7	9.4	0.7	8.0	3.5	10.5	3.0[b]	2.9	1.8	54.6
1997	14.4[c]	27.8[b]	14.7[b]	1.4	7.9	11.4	8.5	2.3[b]	1.5	[d]	89.9
1998	14.1[c]	9.2[b]	7.9	1.1	6.5	4.9	12.6	1.9	4.1	[d]	62.3
1999	14.6[c]	17.0[e]	14.6	1.1	6.1	3.8	15.7	2.9	8.8	2.2	86.9
2000	11.2[c]	12.3	4.0	2.1	8.2	4.3	10.9	4.8	3.3	1.5	62.7
2001	10.5[c]	10.1	5.5	2.8	8.6	5.1	5.4	0.3	2.7	2.5	53.6
2002	15.6[c]	19.6[b]	16.0	3.6	8.4	6.1	16.7	4.7	3.2	3.3	96.9
2003	19.4[c]	7.5[e]	8.4	2.0	9.5	5.4	12.8	13.8	11.8	2.6	93.2
2004	15.4[c]	7.3[e]	10.7	1.0	8.2	10.1	14.0	17.0	7.2	0.8	91.7
2005	8.2[c]	15.2[e]	4.8	1.1	10.3	5.3	6.0	14.5[e]	1.7	3.9	71.0
2006	15.5[c]	10.9[e]	18.6	1.0	8.3	4.8	17.7	13.9[e]	0.3	[d]	91.0
2007	16.1[c]	44.0[e]	10.0	2.1	8.4	5.4	11.2	18.2[e]	3.8	0.1	119.4
2008	12.0[c]	23.9[e]	10.7	1.8	9.0	4.2	5.6	11.3[e]	3.2	0.2	81.9
2009	18.2[c]	12.7	16.0	1.3	10.0	3.1	15.1	15.3[e]	2.2	T	93.8
2010	11.2[c]	23.8[e]	6.3	0.6	9.0	5.3	11.3	17.3	1.2	T	86.1
20-year Average	12.6	13.4	10.9	1.4	7.1	5.1	10.6	8.3	3.4	2.1	74.9
1990–1999 Average	11.1	10.4	11.4	1.0	5.3	4.8	9.6	5.3	2.8	2.3	63.9
2000–2009 Average	14.2	16.4	10.5	1.9	8.9	5.4	11.5	11.4	3.9	1.9	85.9
Sustainable Esc. Goal[f]	6.0 –13.5	5.95 –12.55	8.8 –15.2	[g]	0.7 –8.3	3.7 –8.0	6.3 –12.15	1.88 –9.3	1.25 –2.6	[g]	34.58 –81.6

Note: Unless otherwise noted, estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.
"T" denotes trace, less than 50 fish estimated.

[a] Escapement limited by Bear Lake Management Plan since 1971.
[b] Weir counts.
[c] Beginning in 1994 at English Bay Lakes and 1998 at Bear Lake, escapement figures are derived from total weir count MINUS number of fish collected for hatchery broodstock.
[d] Insufficient survey data to generate escapement estimate.
[e] Combination of weir, video, and/or aerial counts.
[f] New sustainable escapement goals (SEG's) implemented for the first time beginning with the 2002 season.
[g] No formal escapement goal established.

Appendix A25.–Estimated pink salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1960–2010.

	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[a]	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 Creek	---	---	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-

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[a]	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 Creek	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-

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	[c]
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[a]	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	---	---	[c]
Bear Creek	7.9	0.8	7.7	4.1	14.0	3.5	0.2	1.7	4.4	15.4[b]	2.3
Salmon Creek	21.0	0.5	10.2	2.1	8.3	1.7	0.1	1.6	---	[b]	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	---	[c]
Tonsina Creek	7.5	5.4	6.0	48.2	11.2	3.4	0.1	0.5	1.2	0.3	[c]
Big Kamishak River	5.0	---	---	---	5.0	---	1.0	---	---	---	[c]
Little Kamishak River	2.2	---	0.1	1.6	2.0	---	0.5	---	---	0.9	[c]
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 Creek	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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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	37.1	90.9
China Poot Creek	1.6	5.7	2.0	2.8	2.8	5.7	0.7	7.5	6.6	6.5	6.7
Tutka Lagoon Creek	27.4	14.5	15.9	3.5	45.0	17.5	27.9	19.0	4.5	15.9	30.9
Barabara Creek	11.9	4.5	10.8	2.4	12.5	2.8	3.9	5.6	2.3	3.2	5.1
Seldovia River	43.4	24.4	48.5	17.8	39.1	31.5	12.2	53.5	12.3	26.9	35.1
Port Graham River	12.8	7.6	10.0	7.0	12.5	12.6	9.7	15.6	10.3	58.5	14.9
Dogfish Lagoon	0.3	1.3	13.3	2.3	20.0	6.7	12.4	11.1	2.0	1.3	5.2
Port Chatham Creeks	22.2	3.3	14.0	8.6	42.7	22.2	10.7	16.7	17.9	18.1	35.0
Windy Right Creek	13.6	2.2	11.4	9.9	13.9	19.5	5.2	23.0	10.3	14.4	23.3
Windy Left Creek	25.9	3.0	31.6	2.5	64.6	12.9	24.0	20.1	61.8	28.9	82.8
Rocky River	70.0	17.1	56.3	80.1	48.1	165.0	17.2	131.6	73.0	112.5	287.4
Port Dick Creek[a]	37.0	18.1	6.6	23.2	36.9	59.1	8.5	124.4[d]	44.7	108.0	107.7
Island Creek	12.1	28.3	10.6	40.1	71.1	83.6	8.6	70.8	81.8	44.1	118.6
South Nuka Island Creek	34.3	1.4	6.2	6.8	9.3	14.0	2.4	13.6	20.7	14.8	41.4
Desire Lake Creek	19.3	---	---	---	6.2	6.2	6.8	21.1	67.5	78.4	34.8
James Lagoon	3.3	0.8	0.6	---	---	---	---	3.9	2.3	3.1	---
Aialik Lagoon	---	---	1.1	---	---	0.4	0.9	---	---	---	---
Bear Creek	6.6[b]	34.8[b]	38.6[b]	8.0[b]	6.3[b]	13.2[b]	7.8[b]	35.6[b]	3.0[b]	2.7[b]	4.4[b]
Salmon Creek	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
Thumb Cove	5.5	10.8	9.3	9.5	4.7	21.0	9.2	8.5	3.1	3.7	5.1
Humpy Cove	0.9	2.2	1.8	3.4	2.2	1.2	4.0	1.7	0.3	1.8	2.6
Tonsina Creek	3.2	7.0	0.5	0.4	0.4	2.3	0.5	6.6	2.8	6.9	5.2
Big Kamishak River	---	---	---	16.7	---	2.0	5.7	14.9	---	---	---
Little Kamishak River	---	---	---	---	---	---	4.2	13.0	---	3.4	---
Amakdedori Creek	1.7	0.7	4.5	---	1.7	---	---	---	6.0	0.9	---
Bruin Bay River	86.4	5.9	307.3	27.5	162.7	134.9	2.9	176.7	18.5	1,598.5	138.7
Sunday Creek	57.8	3.1	95.9	2.8	52.5	24.0	5.3	39.8	26.2	81.9	346.7
Brown's Peak Creek	41.6	1.3	96.7	2.4	42.3	7.9	2.6	9.8	19.2	27.5	285.0
Totals	574.8	212.1	882.8	286.7	775.8	683.7	205.9	865.0	527.6	2,299.0	1,707.5

-continued-

Location	YEAR							1960–2009 Average	Sustainable Escapement Goal[e]
	2004	2005	2006	2007	2008	2009	2010		
Humpy Creek	28.9	93.8	48.4	54.0	90.9	5.2	70.7	47.4	21.65–85.55
China Poot Creek	3.3	9.2	7.2	6.2	5.1	1.1	2.2	6.2	2.9–8.2
Tutka Lagoon Creek	17.8	133.6	25.8	5.7	14.1	3.8	2.1	17.7	6.5-17.0
Barabara Creek	5.4	14.4	3.6	25.2	16.6	2.6	13.9	5.6	1.9–9.0
Seldovia River	56.8	98.6	70.0	69.4	53.5	14.6	25.9	36.0	19.05–38.95
Port Graham River	44.0	69.1	31.2	25.6	24.7	14.0	16.6	17.8	7.0–19.85
Dogfish Lagoon	3.2	22.3	8.0	4.1	8.0	9.2	6.3	4.9	---
Port Chatham Creeks	26.4	44.4	24.2	14.5	16.4	25.3	3.0	14.6	7.8–21.0
Windy Right Creek	12.0	22.2	17.1	18.3	12.5	15.0	6.4	8.7	3.35–10.95
Windy Left Creek	23.3	72.0	65.2	37.3	64.1	57.3	24.2	22.4	3.65–29.95
Rocky River	53.8	198.7	67.8	190.0	90.9	173.6	27.0	54.1	9.35–54.25
Port Dick Creek[a]	13.3	122.2	51.5	44.2	34.2	41.7	41.1	45.0	18.55–58.3
Island Creek	33.6	26.4	107.7	87.2	49.7	44.5	69.5	25.1	7.2–28.3
South Nuka Island Cr.	6.4	11.2	5.1	6.6	12.3	19.9	[c]	11.0	2.7–14.25
Desire Lake Creek	24.3	46.0	74.8	11.8	9.5	73.9	3.0	20.6	1.9–20.2
James Lagoon	---	---	---	---	---	---	---	4.2	---
Aialik Lagoon	---	0.8	---	---	---	---	---	3.6	---
Bear Creek	1.2[b]	34.5[b]	9.0[b]	---	---	---	---	9.1	2.95–8.45
Salmon Creek	[b]	[b]	[b]	---	---	---	---	7.3	1.9–13.25
Thumb Cove	4.3	8.7	5.2	---	---	---	---	5.6	2.35–8.85
Humpy Cove	1.0	14.6	1.9	---	---	---	---	2.4	0.9–3.2
Tonsina Creek	3.5	9.9	6.5	---	---	---	---	4.9	0.5–5.85
Big Kamishak River	---	---	---	---	---	10.4	---	20.6	---
Little Kamishak River	3.0	---	77.0	5.1	34.3	0.8	---	13.2	---
Amakdedori Creek	---	---	---	---	---	9.2	0.7	7.7	---
Bruin Bay River	66.5	98.3	515.1	350.4	150.7	1,067.4	40.3	175.2	18.65–155.75
Sunday Creek	31.5	116.2	70.0	394.8	20.4	106.3	6.6	43.2	4.85–28.85
Brown's Peak Creek	18.1	61.0	35.7	249.4	17.4	63.6	3.1	30.6	2.45–18.8
Totals	481.6	1,328.1	1,328.1	1,599.8	725.3	1,759.3	362.7	591.2	153.15–660.65

Note: 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.

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

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

[c] Insufficient data for escapement estimates.

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

[e] New sustainable escapement goals (SEG's) implemented for the first time beginning with the 2002 season.

Appendix A26.–Estimated chum salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1990–2010.

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
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	[a]	[a]	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
2002	5.3	10.1	5.7	12.3	15.3	17.4	16.4	11.3	9.9	17.1	42.2	28.5	191.6
2003	2.9	13.3	5.5	5.6	16.3	16.4	22.2	23.3	13.1	30.4	72.8	18.7	240.5
2004	1.2	3.6	17.2	8.6	15.1	57.9	45.3	11.2	15.9	16.0	16.3	22.0	230.3
2005	0.7	2.7	6.1	4.8	20.7	25.7	12.1	17.4	21.2	12.2	17.9	16.5	158.0
2006	2.2	5.4	11.2	2.8	5.6	58.2	42.9	28.2	7.0	15.7	13.2	15.6	208.1
2007	1.9	4.9	1.6	2.8	3.1	14.8	15.6	13.6	3.1	20.9	12.5	5.3	100.0
2008	1.8	6.2	3.8	11.8	12.9	4.5	21.3	9.8	17.5	6.5	11.6	20.0	130.0
2009	1.0	4.4	2.5	5.6	9.3	15.0	4.2	18.8	10.1	12.9	19.4	30.8	140.3
2010	1.4	12.7	1.3	2.4	3.4	[a]	18.4	10.5	6.2	11.8	15.8	19.3	103.2
20-Year Avg.	3.5	7.5	4.2	4.6	9.8	20.4	16.4	16.7	10.7	14.1	16.9	16.5	141.2
1990–1999 Avg.	3.6	7.4	2.1	3.2	7.8	7.8	7.7	16.5	8.1	7.1	9.2	13.5	93.9
2000–2009 Avg.	3.4	7.6	6.1	5.9	11.7	29.1	23.4	16.9	13.3	21.1	24.6	19.5	182.8
Sustainable Esc. Goal[b]	1.45–4.8	3.35–9.15	1.2–5.4	1.9–4.45	6.4–15.6	9.35–24.0	6.55–23.8	24.0–48.0	6.0 –10.25	6.05–9.85	5.75–12.0	7.85– 13.7	69.6 –158.75

Note: 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.

[a] Insufficient data to generate escapement estimates.

[b] New sustainable escapement goals (SEG's) implemented for the first time beginning with the 2002 season, except for McNeil River, which was revised in 2007 and implemented beginning with the 2008 season.

Appendix A27.–Personal use/subsistence set gillnet salmon catches, in numbers of fish by species, and effort, Southern District (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery), Lower Cook Inlet, 1969–2010.

Year	Permits Issued	Permits Returned		Permits		Harvest by Species						
		Number	%	Did Fish	Not Fished	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[a]	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
2002	122	113	92.6	93	20	61	33	1,521	251	12	0	1,878
2003	104	96	92.3	72	24	17	57	1,071	170	9	0	1,324
2004	91	83	91.2	65	18	7	56	1,554	172	16	0	1,805
2005	108	96	88.9	69	27	8	57	833	296	13	0	1,207
2006	89	82	92.1	62	20	15	41	1,295	221	5	0	1,577
2007	141	133	94.3	95	38	10	113	1,431	641	34	0	2,229
2008	146	142	97.3	107	35	2	92	1,844	687	14	0	2,639
2009	145	142	97.9	90	52	9	273	646	101	4	1	1,034
2010	128	122	95.3	82	40	14	149	875	251	0	0	1,289
69–09 Avg.	260	244	93.6	171	72	45	64	2,649	614	37	20	3,430
00–09 Avg.	131	124	94.5	92	32	32	78	1,384	299	13	0	1,806

Note: Figures after 1991 include information from both returned permits and inseason oral reports.

[a] Steelhead trout *Oncorhynchus mykiss*.

Appendix A28.–Summary of personal use/subsistence salmon gillnet permit holders in the Southern District of Lower Cook Inlet (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery) by area of residence, 1990–2010.

Year	Homer/ Fritz Cr.		Anchorage Area[a]		Halibut Cove		Anchor Pt./ Ninilchik		Seldovia		Pt. Graham/ Nanwalek		Kenai/ Soldotna		Other		Total Permits Issued
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
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
2002	85	69.7	7	5.7	3	2.5	14	11.5	6	4.9	0	0.0	6	4.9	1	0.8	122
2003	74	71.2	9	8.7	2	1.9	11	10.6	4	3.8	0	0.0	4	3.8	0	0.0	104
2004	70	76.9	9	9.9	2	2.2	7	7.7	2	2.2	0	0.0	1	1.1	0	0.0	91
2005	80	74.1	12	11.1	2	1.9	8	7.4	1	0.9	0	0.0	3	2.8	2	1.9	108
2006	74	83.1	6	6.7	1	1.1	4	4.5	0	0.0	0	0.0	2	2.2	2	2.2	89
2007	116	82.3	11	7.8	3	2.1	7	5.0	0	0.0	0	0.0	1	0.7	3	2.1	141
2008	121	82.9	3	2.1	2	1.4	13	8.9	2	1.4	0	0.0	3	2.1	2	1.4	146
2009	107	73.8	11	7.6	1	0.7	19	13.1	2	1.4	0	0.0	5	3.4	0	0.0	145
2010	103	80.5	8	6.3	1	0.8	9	7.0	2	1.6	0	0.0	5	3.9	0	0.0	128
20-Year Avg.	177	78.4	15	6.7	3	1.5	22	9.7	3	1.5	0	0.0	3	1.2	2	1.0	226
1990–1999 Avg.	254	79.1	21	6.5	5	1.5	32	9.8	4	1.3	0	0.0	3	0.8	3	1.0	321
2000–2009 Avg.	100	76.6	9	7.1	2	1.6	12	9.5	3	2.0	0	0.0	3	2.2	2	1.1	131

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

Appendix A29.–Subsistence and sport salmon catch in numbers of fish by species for the village of Port Graham, Lower Cook Inlet, 1990–2010.

Year	Salmon Harvest						Dolly Varden	Households Reporting
	Chinook	Sockeye	Coho	Pink	Chum	Total		
1990	211	524	803	1,013	102	2,653	666	32
1991	155	58	541	1,494	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[a]
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	382	427	150	214	1,556	64	21
2000	241	784	252	355	483	2,115		35
2001	104	176	57	20	32	389		15
2002	250	417	90	150	74	981		23
2003	321	1,991	425	266	150	3,153	87	16
2004	283	572	514	363	130	1,862		50[b]
2005	265	192	51	349	52	909		46
2006	192	31	1	26	24	274	207	14
2007	92	552	0	74	63	781	12	24
2008[c]	77	550	0	36	22	685	37	18
2009	33	1,982	132	49	69	2,265	40	25
2010	30	116	124	24	37	331		16
1990–2009 Average	218	519	306	450	170	1,664	228	31

Source: ADF&G, Division of Subsistence, data files; gear types include set gillnet, rod/reel, and handline.

[a] Salmon totals and permits include 3 reports from non-residents of Port Graham Village.
[b] ADF&G Division of Subsistence estimate.
[c] Harvest reports for 2008 incomplete.

Appendix A30.–Subsistence and sport salmon catch in numbers of fish by species for the village of Nanwalek (formerly English Bay), Lower Cook Inlet, 1990–2010.

Year	Salmon Harvest						Dolly Varden	Households Reporting
	Chinook	Sockeye	Coho	Pink	Chum	Total		
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	2,775	1,320	1,873	890	6,960	631	32
2000	18	3,880	1,579	1,251	471	7,199		32
2001	29	909	1,238	1,434	196	3,806		34
2002	96	10,203	967	1,681	414	13,441	230	56
2003	144	3,221	513	1,306	381	5,565	102	35
2004	52	2,968	842	1,277	95	5,234	291	24
2005	27	1,934	1,142	1,259	128	4,490	605	23
2006	111	2,215	1,179	2,038	207	5,750	679	39
2007[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
2008	46	3,615	1,345	2,646	76	7,728	315	53
2009	11	1,515	396	865	71	2,858	420	19
2010	0	1,514	1,324	1,030	271	4,139	365	20
1990–2009 Average	52	2,053	798	1,319	172	4,393	591	30

Source: ADF&G, Division of Subsistence, data files; gear types include set gillnet, rod/reel, and handline.

[a] Harvest figures for 2007 unavailable.

Appendix A31.–Salmon set gillnet catch in numbers of fish by species and permit/effort information for the Seldovia area subsistence fishery, Lower Cook Inlet, 1996–2010.

	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
2002	20	18	12	6	123	222	0	0	3	348
2003	19	13	10	3	67	210	0	1	54	332
2004	13	10	9	1	91	63	0	0	15	169
2005	15	13	4	9	46	0	0	0	0	46
2006	15	12	6	6	12	10	0	1	0	23
2007	15	12	5	7	19	27	0	0	0	46
2008	10	8	3	5	3	15	0	0	0	18
2009	6	5	1	4	14	0	0	0	0	14
2010	11	8	2	6	0	54	0	0	0	54
Average	18	15	9	7	72	79	0	1	8	160
Late Season: August[b]										
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									
2002	1	1	1	0	0	9	13	31	6	59
2003	1	1	1	0	0	10	1	12	1	24
2004	1	1	1	0	0	0	4	0	0	4
2005	3	2	2	0	0	70	13	93	12	188
2006	2	2	1	1	0	0	0	21	0	21
2007	4	4	3	1	0	24	9	80	27	140
2008	2	2	2	0	0	16	41	65	5	127
2009	12	9	8	1	0	78	10	44	14	146
2010	5	4	3	1	2	46	31	66	35	180
Average	3	3	2	1	0	21	10	34	8	74

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

[b] Late season dates are restricted to the first two weekends in August.

Appendix A32.–ADF&G, CIAA, CRRC, and/or ASLC salmon stocking projects and releases of salmon fry, fingerling, and smolt, in millions of fish, Lower Cook Inlet, 1990–2010 (currently active projects highlighted in gray).

	Juvenile Sockeye Salmon														
YEAR	Leisure Lake	Hazel Lake	Tutka Lagoon	English Bay Lakes	Port Graham Hatchery	Chenik Lake	Paint River Lakes Upper	Paint River Lakes Lower	Paint River Lakes Elusivak	Kirschner Lake	Bruin Lake	Ursus Lake	Bear Lake	Grouse Lake	Resur-rection Bay	Total Sockeye
1990	1.750	1.250	---	0.350	---	3.250	1.000	0.500	0.500	0.250	0.500	---	2.400	---	---	11.750
1991	2.000	1.300		0.241		2.200	0.500	0.250	---	0.250	0.250	---	1.619	---		8.610
1992	2.000	1.000		0.290		2.750	0.500	0.250	---	0.250	0.250	0.250	2.370	---		9.910
1993	2.000	1.000		0.581		1.400	0.500	0.250	---	0.250	0.250	0.250	1.813	---		8.294
1994	0	0		0.800		0	0	0	---	0.300	0	0	0.170	0.570		1.327
1995	1.632	1.061		0		1.129	0.337	0.251	---	0.251	0.251	0.252	0.360	0.793		6.287
1996	1.490	1.030		0.155		0.951	0.500	0	---	0.250	0.250	0.250	0.864	0		5.657
1997	2.000	1.000		0.199		0	---	---	---	0.250	---	---	0.788	1.966		6.203
1998	2.005	1.302		0		---	---	---	---	0.250	---	---	0.265	1.288		5.610
1999	0.265	0.453		1.149[a]		---	---	---	---	0.173	---	---	1.380	0		3.420
2000	1.708	1.248		1.006[b]		---	---	---	---	0.248	---	---	1.794	---		6.004
2001	0.089	0		0		---	---	---	---	0	---	---	0.145	---		0.234
2002	2.249	1.280		0		---	0.500[c]	---	---	0.302	---	---	2.407	---		6.738
2003	2.240	1.547		0.695		---	---	---	---	0.298	---	---	1.801	---		6.581
2004	2.002	0.351		0.050	0.110	---	---	---	---	0.251	---	---	3.012	---		5.776
2005	2.252	1.558	0.096	0.203	0	---	---	---	---	0.316	---	---	3.422	---		7.846
2006	0.680	0	0.260	0	0.455	---	---	---	---	0	---	---	3.393	---		4.750
2007	2.315	1.411	0.144	0	0	---	---	---	---	0.253	---	---	3.056	---		7.179
2008	2.053	1.161	0.483	0.246[c]	0	---	---	---	---	0.300	---	---	2.400	---	1.600	8.240
2009	1.225	1.186	0.301	0	0.112	---	---	---	---	0	---	---	2.543	---	1.675	7.042
2010	1.933	1.218	0.278	0.202	0	---	---	---	---	0.255	---	---	2.200	---	1.650	7.736
’90–09 Average	1.591	0.953	0.257	0.298	0.107	1.460	0.480	0.214	0.500	0.221	0.250	0.200	1.794	0.762	1.638	6.398
’00–09 Average	1.681	0.974	0.257	0.220	0.107		0.500			0.197			2.397		1.638	6.040

-continued-

	Juvenile Pink Salmon					Juvenile Chinook Salmon						Juvenile Coho Salmon					
YEAR	Tutka Bay Hatchery	Halibut Cove Lagoon	Homer Spit	Port Graham Hatchery	Total Pink Salmon	Seldovia Bay	Halibut Cove Lagoon	Homer Spit		Resurrection Bay[d]	Total Chinook	Caribou Lake	Seldovia Bay[e]	Homer Spit		Resurrection Bay[d]	Total Coho
								Early	Late					Early	Late		
1990	23.600	6.000	0.303	---	29.903	0.099	0.112	0.212	---	0.329	0.752	0.180	0.050	---	0.123	1.540	1.893
1991	23.600	6.000	0.303	0.255	30.158	0.091	0.092	0.191	---	0.466	0.840	0.180	0.050	---	0.100	0.599	0.929
1992	23.600	6.000	0.300	1.800	31.700	0.113	0.117	0.226	0.126	0.370	0.952	0.150	---	---	0.100	0.265	0.515
1993	43.000	6.000	---	0	49.000	0.107	0.100	0.212	0.100	0.290	0.818	0.150	---	---	0.116	0.843	1.109
1994	61.000	---	---	1.295	62.295	0.106	0.107	0.192	0.157	0.270	0.832	0.064	---	---	0.156	0.560	0.780
1995	63.000	---	---	0.358	63.358	0.113	0.036	0.228	0.124	0.315	0.816	---	---	---	0.110	0.701	0.811
1996	105.000	---	---	6.470	111.470	0.109	0.103	0.101	0.121	0.415	0.849	---	---	---	0.150	0.676	0.826
1997	89.000	---	---	0.910	89.910	0.092	0.078	0.216	0.105	0.521	1.012	---	---	---	0.120	0.807	0.927
1998	90.000	---	---	0	90.000	0.079	0.073	0.137	0.120	0.307	0.716	---	---	---	0.148	0.726	0.874
1999	60.132	---	---	4.617	64.749	0.074	0.079	0.163	0.059	0.174	0.549	---	---	---	0.137	0.529	0.666
2000	65.120	---	---	1.144	66.264	0.068	0.083	0.220	---	0.322	0.693	---	---	---	0.122	0.618	0.740
2001	99.336	---	---	27.299	126.635	0.103	0.107	0.208	---	0.228	0.646	---	---	0.125	0.100	0.681	0.906
2002	100.000	---	---	6.604	106.604	0.083	0.106	0.190	---	0.194	0.573	---	---	0.096	0.121	0.770	0.987
2003	67.967	---	---	57.158	125.125	0.108	0.107	0.206	---	0.220	0.641	---	---	0.223	0.103	0.903	1.229
2004	47.964	---	---	36.283	84.247	0.089	0.104	0.169	---	0.216	0.578	---	---	0.130	0.113	0.955	1.198
2005	---	---	---	26.568	26.568	0.115	0.113	0.221	---	0.312	0.761	---	---	0.126	0.091	1.153	1.370
2006	---	---	---	13.864	13.864	0.114	0.118	0.224	---	0.303	0.759	---	0.114	0.125	0.324	0.971	1.534
2007	---	---	---	[f]	[f]	0.054	0.055	0.227	---	0.118	0.454	---	0.097	0.127	0.101	1.022	1.347
2008	---	---	---	---	0	0.054	0.060	0.227	---	0.142	0.483	---	0.088	0.125	0.095	0.735	1.043
2009	---	---	---	---	0	0.044	0.035	0.164	---	0	0.243	---	---	0.113	0.043	0.523	0.679
2010	---	---	---	---	0	0.114	0.111	0.213	---	0.220	0.658	---	---	0.130	0	0.703	0.833
'90–09 Average	64.155	6.000	0.302	10.257	68.932	0.091	0.089	0.197	0.114	0.276	0.698	0.145	0.067	0.132	0.124	0.779	1.018
'00–09 Average	76.077			18.769	78.472	0.083	0.089	0.206		0.206	0.583		0.100	0.132	0.121	0.833	1.103

[a] Sockeye release at English Bay consisted of 918,000 fry released in November 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 release in spring 2001.
[c] Fall fry ("pre-smolt") release.
[d] Chinook and coho salmon releases in Resurrection Bay are each a cumulative total for all locations.
[e] Coho releases in Seldovia Bay were from Seldovia Lake between 1985 and 1991 and from Seldovia (Fish Creek) Reservoir beginning in 2006.
[f] Pink salmon were released volitionally from Port Graham Hatchery upon emergence in 2007 but were not enumerated.

APPENDIX B:
HISTORICAL HERRING TABLES

Appendix B1.–Catch of Pacific herring *Clupea pallasi* in short tons and effort in number of permits by district in the commercial sac roe seine fishery, Lower Cook Inlet, 1990–2010.

	Southern		Kamishak		Eastern		Outer		Total	
Year	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits
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[a]	45[a]	---	---	---	---	1,746	45
1998	---	---	331[a]	20[a]	---	---	---	---	331	20
1999	---	---	100[b]	1[b]	---	---	---	---	100	1
2000	---	---	---	---	---	---	---	---	---	---
2001	---	---	---	---	---	---	---	---	---	---
2002	---	---	---	---	---	---	---	---	---	---
2003	---	---	---	---	---	---	---	---	---	---
2004	---	---	---	---	---	---	---	---	---	---
2005	---	---	---	---	---	---	---	---	---	---
2006	---	---	---	---	---	---	---	---	---	---
2007	---	---	---	---	---	---	---	---	---	---
2008	---	---	---	---	---	---	---	---	---	---
2009	---	---	---	---	---	---	---	---	---	---
2010	---	---	---	---	---	---	---	---	---	---
20-Year Average	---	---	2,081	50	0	0	0	0	2,081	50
1990–1999 Average	---	---	2,081	50	0	0	0	0	2,081	50
2000–2009 Average	---	---	---	---	---	---	---	---	---	---

Source: ADF&G fish ticket database *Unpublished*. Commercial Fisheries Entry Commission License Statistics, 1974-2010, Juneau.

[a] Includes both commercial harvest and ADF&G test fish harvest.
[b] Commercial fishery closed, ADF&G test fish harvest only.

Appendix B2.–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, 1990–2010.

Year	Preseason		Actual Commercial Harvest (st)[a]	Average Roe %	No. of Permits w/Landings	Exvessel Value[b] ($ millions)
	Forecasted Biomass (st)	Projected Harvest (st)[a]				
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[c]
1997	25,300	3,420	1,746	9.3	45	0.40
1998	19,800	1,780	331	8.5	20	0.07
1999	[d]	---	- CLOSED[e] -	---	---	---
2000	6,330	---	- CLOSED -	---	---	---
2001	11,352	---	- CLOSED -	---	---	---
2002	9,020	---	- CLOSED -	---	---	---
2003	4,771	---	- CLOSED -	---	---	---
2004	3,554	---	- CLOSED -	---	---	---
2005	3,058	---	- CLOSED -	---	---	---
2006	2,650	---	- CLOSED -	---	---	---
2007	2,286	---	- CLOSED -	---	---	---
2008	2,069	---	- CLOSED -	---	---	---
2009	[f]	---	- CLOSED -	---	---	---
2010	2,963	---	- CLOSED -	---	---	---
1990-2009 Average	13,865	2,418	2,302	10.0	55	2.07

[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] Includes retroactive adjustment.
[d] 1999 preseason biomass calculated as a range of 6,000 to 13,000 st.
[e] ADF&G test fishing harvested 100 st.
[f] No forecast of abundance generated for 2009 due to lack of samples in 2008.

Appendix B3.–Summary of herring sac roe seine fishery openings and commercial harvests in the Kamishak Bay District of Lower Cook Inlet, 1969–2010.

Year	Dates of Openings	Total Hours Open	Harvest (short tons)	Catch Rate (short tons/ hour open)	Number of Permits w/Landings
1969–1972	No closed periods				
1973	Same		243		8
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	5/12–5/24	112	415	3.7	36
1980–1984	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	1,992	1,992.0	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]	---
1999–2010	CLOSED	0	100[e]		

[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 4 vessels fished in a given area.

[d] ADF&G test fish harvest.

Appendix B4.–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, 1990–2010.

Year	Aerial Survey Total Biomass Estimate (st)[a]	ASA Model Total Biomass Estimate (st)[b,c]	Actual Commercial Harvest (st)	Estimated Exploitation Rate (%)[b]
1990	19,664	19,841	2,264	13.8
1991	18,163[d]	20,369	1,992	10.9
1992	24,077	18,257	2,282	13.8
1993	32,439	16,176	3,570	24.6
1994	25,344[d]	13,203	2,167	18.5
1995	25,115	10,220	3,378	36.8
1996	27,640	6,950	2,984	45.4
1997	---	4,742	1,746	38.7
1998	---	4,137	331	9.0
1999	---	4,015	- CLOSED[e] -	---
2000	---	3,904	- CLOSED -	---
2001	---	3,643	- CLOSED -	---
2002	---	3,296	- CLOSED -	---
2003	---	3,233	- CLOSED -	---
2004	---	2,906	- CLOSED -	---
2005	---	3,162	- CLOSED -	---
2006	---	3,193	- CLOSED -	---
2007	---	3,641	- CLOSED -	---
2008	---	4,087	- CLOSED -	---
2009	---	3,790	- CLOSED -	---
2010	---	3,942	- CLOSED -	---
1990–2009 Average	24,635	7,462	2,302	17.7

Source: Otis 2004; Otis and Cope 2004; Yuen 1994.

[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 supersede 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.

[e] ADF&G test fishing harvested 100 st.

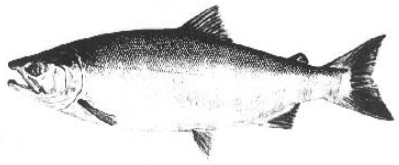
APPENDIX C:
2010 LOWER COOK INLET SALMON OUTLOOK AND MANAGEMENT STRATEGY

Appendix C1.–Lower Cook Inlet 2010 outlook for commercial salmon fishing.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

Denby S. Lloyd, Commissioner

John Hilsinger, Director



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Date Issued: 5/19/10
Time: 4:00 p.m.

2010 LOWER COOK INLET COMMERCIAL SALMON FISHERY OUTLOOK AND MANAGEMENT STRATEGY

In anticipation of the upcoming commercial salmon season, the Alaska Department of Fish and Game has completed its annual salmon forecast and outlook for the Lower Cook Inlet (LCI) management area. This news release is intended to provide basic information for fishermen and processors as they prepare for the 2010 season. Salmon management strategies in LCI are designed to insure continued health of the resource through adequate spawning escapements while providing for an orderly harvest of identifiable surpluses.

Because salmon enhancement plays a major role in LCI fisheries, hatchery cost recovery has become an integral component of the management strategy. Cost recovery revenue goals for the private non-profit (PNP) organizations have now been finalized, and management schemes to attain them are published in the Annual Management Plans (AMP's) for Trail Lakes and Port Graham Hatcheries. Rough outlines of the expected management strategies for the SHA's can be found under ***GENERAL INFORMATION*** beginning on page 3. Of particular interest once again this season is the hatchery management plan now in regulation for Trail Lakes Hatchery.

The overall 2010 LCI commercial all-species salmon harvest, originally predicted to total about 1.04 million fish, was revised early this spring to a new total of approximately 1.02 million fish. The revised figure, based on a decrease in the forecast of the enhanced sockeye salmon component, is approximately 75% of the actual harvest taken during 2009. It should be noted that the forecast figure represents only the potential harvestable surplus, with no consideration given to market conditions, tender availability, and other similar influences on fishing activity. Enhancement efforts and resulting production are expected to contribute about 76% of the area-wide commercial sockeye salmon harvests this season, while no hatchery pink salmon production will contribute to LCI harvests. Hatchery cost recovery is anticipated to once again account for a significant portion of the sockeye salmon harvests. The following table summarizes the projected harvest by species in numbers of fish:

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	Natural	Enhanced	Total
CHINOOK	[a]	[a]	1,200[a]
SOCKEYE	92,200[b]	318,900[c, d]	411,100[c, d]
COHO	[a]	[a]	13,100[a]
PINK	567,000	0	567,000
CHUM	46,800[b]	0	46,800
Total	706,000	318,900[c, d]	1,039,200[d]

[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] Forecasts for naturally-produced sockeye and chum salmon are simply average annual commercial harvests since 1980 and 1989 (respectively).
[c] Includes common property plus cost recovery harvests.
[d] Revised sockeye totals are: 296,500 (enhanced) and 388,700 (total); revised all-species total is 1,016,800 – see footnote "b" in table below.

The preceding numbers include the following natural and enhanced components:

ENHANCED RUNS

SOCKEYE SALMON		PINK SALMON
Kirschner Lake	11,400	
Leisure Lake	44,300	
Hazel Lake	27,000	
Tutka Lagoon	38,800	
Bear Lake	175,000	
English Bay Lakes	0[a]	
Port Graham Hatchery	*22,400*[b]	
TOTAL	318,900[b]	

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NATURAL RUNS

SOCKEYE SALMON[c]		PINK SALMON	
Southern District[e]	40,900	Southern District	106,400
Outer District	19,800	Outer District	395,200
Eastern District	6,200	Eastern District	0
Kamishak Bay District	25,300	Kamishak Bay District	65,400
TOTAL	92,200	TOTAL	567,000

[a] No forecast possible due to incomplete smolt outmigration information.
[b] The figure for Port Graham Hatchery sockeye salmon was revised AFTER release of the original preseason forecast, to a new total of 0 (zero); as a result, the revised LCI enhanced-only sockeye salmon TOTAL is 296,500.
[c] Numbers for natural sockeye harvests are not forecasts but simply represent 1980-2009 average commercial catches.
[d] Incidental harvest of fish not originating from the Southern District.

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SUMMARY BY SPECIES

Sockeye Salmon

The original forecasted 2010 LCI sockeye salmon harvest of 411,100 fish is approximately 47% greater than the 2009 catch of 280,300 fish and about 27% greater than the most recent 10-year average catch of 323,000. However, the sockeye salmon forecast estimate for the run to Port Graham Hatchery was revised to zero, resulting in a new projected sockeye salmon harvest estimate of 389,000 fish for the LCI area. Cook Inlet Aquaculture Association (CIAA) has established a sockeye salmon revenue goal of $1.434 million for Trail Lakes Hatchery in 2010, to be split in the following tentative proportions: 86% ($1.234M) from Resurrection Bay, 5% ($70K) from Bear Creek weir, and 9% ($130K) from Tutka Lagoon. At Bear Lake in Resurrection Bay of the Eastern District, CIAA has forecasted a harvest of about 175,000 sockeye salmon. *CIAA expects that the majority (but not all) of the sockeye salmon returning to the Bear Lake and Resurrection Bay enhancement sites will be targeted for escapement and hatchery harvest, thus a limited common property fishery to target remaining fish may be possible during the latter stages of that run*. The combined harvests of adult runs to CIAA enhancement projects at Leisure and Hazel Lakes in the Southern District are expected to total just over 71,000 sockeye salmon, which is considerably less than the recent 10-year average harvest of 116,000 fish. Although CIAA does not expect to harvest sockeye salmon returning to the Leisure/Hazel enhancement sites for cost recovery purposes, inseason management decisions will be dependent on the status of the CIAA hatchery revenue goal. At Tutka Bay Lagoon, site of another CIAA sockeye enhancement project in the Southern District, the harvestable surplus is forecasted to total almost 39,000 sockeye salmon, and *CIAA expects to harvest the entire run to this site for cost recovery and/or broodstock purposes, thus no common property openings to target these fish are anticipated*. At English Bay Lakes, where runs have contributed to Southern District commercial harvests in some recent years, opportunities for commercial sockeye harvest are questionable due to the lack of a preseason forecast. However, runs to this system have been stronger than anticipated during the last four seasons and have been sufficient to support limited commercial and subsistence harvest opportunities despite weak preseason predictions. Kirschner Lake on the west side of Cook Inlet in the Kamishak Bay District, another CIAA-enhanced sockeye salmon system, is expected to produce an adult run totaling approximately 11,000 fish, which *may* be available for targeted common property harvest depending on status of the CIAA revenue goal. After seven successive seasons of relatively strong runs, as well as targeted commercial harvests during the past six years, the sockeye salmon run to Chenik Lake in the Kamishak Bay District is questionable but could once again produce harvest opportunities in 2010. Other lake systems in the Outer, Eastern, and Kamishak Bay Districts, plus incidental harvest of fish not originating from the Southern District, in combination could provide up to 92,000 sockeye salmon for harvest (based solely on historical averages) as a result of natural production.

Pink Salmon

Harvestable surpluses of pink salmon in LCI during 2010 are anticipated to total approximately 567,000 fish, and for the third consecutive year the entire catch should be a result of only natural production. The 2010 pink salmon projected harvest figure represents about 57% of the 2009 commercial catch of 989,300 fish and about 43% of the recent 10-year average (a time period during which pink salmon hatcheries were still operational in LCI). Natural pink salmon spawning escapement levels into most major systems were considered good in 2008, contributing to the reasonably optimistic harvest projection. Outer District systems are expected to have the greatest potential for harvest with a combined total of around 395,000 pink salmon, returning primarily to Port Dick, while Windy and Rocky Bays hold potential for lesser amounts. Bruin Bay, Ursus Cove, and Rocky Cove in the Kamishak Bay District are anticipated to contribute only

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modest harvest opportunities, with a cumulative projected total of about 65,000 pink salmon in that district. In the Southern District, surpluses could potentially occur at Humpy Creek, Seldovia Bay, and Port Graham. No hatchery-produced pink salmon will be returning to any LCI facilities in 2010.

Chum Salmon

Based only on average catches since 1989, the total LCI commercial chum salmon harvest could be expected to total as much as 47,000 fish during 2010. However, chum salmon runs to LCI in nine out of the past ten years were strong, and the resurgence of commercial catches during those seasons resulted in the highest harvest totals for this species since 1988. Such encouraging signs suggest that the potential for a chum salmon harvest could be greater than the forecast in 2010. This season's chum salmon harvest will again consist exclusively of natural production since chum salmon enhancement has been discontinued in LCI.

GENERAL INFORMATION

1) In March 2009, the Alaska Board of Fisheries adopted a new regulatory management plan for CIAA's Trail Lakes Hatchery, directing ADF&G to manage waters of all CIAA Special Harvest Areas (SHA's) in LCI for the purpose of attaining hatchery revenue and broodstock goals. The forecasted harvestable surplus for Resurrection Bay/Bear Lake in 2010 is approximately 175,000 sockeye salmon. Because CIAA has indicated that the majority, but not all, forecasted sockeye salmon returning to Bear Lake will be utilized to meet hatchery and escapement objectives in 2010, a modest surplus could be available and a common property opening to target these fish in Resurrection Bay may be possible during latter stages of that run. Waters of the Bear Lake SHA (marine waters north of the latitude of Caines Head) will open only to hatchery cost recovery fishing beginning Monday, May 24, on a schedule of five days per week, from 6:00 a.m. Monday until 10:00 p.m. Friday. Hatchery seine catches, as well as escapement at the Bear Creek weir, will be continuously monitored to assess the progress of the return and proportion of the hatchery revenue goal achieved. The Trail Lakes Hatchery revenue goal for 2010 has been established at $1.434 million, and CIAA expects to take approximately 86% ($1.234M) from saltwater in Resurrection Bay and 5% ($70K) from Bear Creek weir. Weekly hatchery fishing periods in marine waters of Resurrection Bay will be adjusted inseason if necessary. Management considerations must take into account the Bear Lake desired inriver return goal of 12,000 sockeye salmon. Accurate and timely catch reporting and escapement counts will be critical in order to achieve the intent of the regulatory management plan. Closed waters during the hatchery fishing periods will be the same as during the past eleven seasons for seine groups fishing in marine waters and will include those 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. Waters of Resurrection Bay will only be opened to commercial common property seining for sockeye salmon in 2010 if the Resurrection Bay and Bear Creek weir revenue goals are achieved or their attainment can be projected. Anyone fishing as a hatchery agent or commercially is also reminded that, by regulation, Chinook and coho salmon may not be taken in waters of Resurrection Bay.

2) The Kamishak Bay District commercial salmon seine season opens by regulation on Tuesday, June 1. At that time, all areas, with the exception of the Chenik Subdistrict and waters of the Kirschner Lake SHA, will open by emergency order on a fishing schedule of seven days per week. Waters of the Kirschner Lake SHA will open to fishing for hatchery cost recovery by authorized agents of CIAA beginning on June 28. However, this SHA could be opened to commercial seining if some or all of the returning sockeye salmon are not required for cost recovery purposes. Thus, if the Trail Lakes Hatchery revenue goal of $1.434 million is achieved or its attainment can be projected, the Kirschner Lake SHA will be closed to CIAA cost recovery harvest and opened to common property seining. At Kirschner Lake,

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no escapement is necessary and all returning fish will be available for harvest. Additional and more detailed information concerning hatchery cost recovery and SHA management can be found in the 2010 Trail Lakes Hatchery Annual Management Plan (AMP).

Fishermen are advised that fishery openings in Chenik Subdistrict will be based upon observed inseason sockeye salmon run strength and estimated escapement. Similar to the last eight seasons, the Paint River Subdistrict will open to fishing on June 1 and likely remain open for the entire month of June. Beginning at the end of June or first of July, both the McNeil River and Paint River Subdistricts will be closed in order to afford maximum protection to chum salmon returning to McNeil River and, potentially, sockeye salmon returning to Chenik Lake. The seven day per week fishing schedule for open areas in the Kamishak Bay District could be restricted on relatively short notice inseason based on effort levels and escapement rates.

3) In the Southern District, guidelines for management of the enhanced sockeye salmon returns to China Poot, Neptune, and Tutka Bays are now included in the recently adopted Trail Lakes Hatchery management plan. As was the case last season, the formerly separate SHA's for the Leisure and Hazel Lakes sockeye salmon runs are now combined into a single China Poot and Hazel Lake SHA, which also includes those waters formerly closed to all seining along McKeon Flats. Waters of this SHA will open to hatchery cost recovery fishing seven days per week beginning June 28, but because CIAA has indicated that sockeye salmon returning to the China Poot and Neptune Bay sites may not be required for hatchery cost recovery, a common property seine opening to target these fish is possible in 2010. Such an opening is dependent on the inseason status of the Trail Lakes Hatchery revenue goal and would only occur if the hatchery revenue goal is achieved or its attainment can be projected. As in recent years, a Dungeness crab sanctuary at the head of China Poot Bay will remain closed to all seining for the duration of the season. Additional and more detailed information concerning hatchery cost recovery and SHA management can be found in the 2010 Trail Lakes Hatchery Annual Management Plan (AMP).

   Because operations at Tutka Bay Hatchery were suspended in 2004, no hatchery-produced pink salmon returns will occur at that location in 2010. As a result, the Department will manage nearby waters for achievement of the sustainable escapement goal (SEG) of 6,500 to 17,000 pinks (natural production) into Tutka Creek. The management strategy to attain this objective will include opening waters of the Tutka Bay SHA, which now includes waters of Tutka Bay enclosed by the "offshore" seine restriction line that has been used in past years, to hatchery-only seining seven days per week beginning June 28. Escapement into Tutka Creek will be monitored inseason, as will the hatchery's progress towards achievement of the revenue goal. Once again, *CIAA has indicated that the entire harvestable surplus of sockeye salmon returning to Tutka Lagoon in 2010 (39,000 forecast) will be required for cost recovery and/or broodstock purposes, and therefore a common property seine opening to target these fish is not anticipated.*

4) Provided aerial surveys indicate adequate sockeye salmon run strengths, the Nuka Bay Subdistrict in the Outer District could open to commercial salmon seining by emergency order in late June or early July. An opening in Aialik Subdistrict, possibly including Aialik Lagoon, in the Eastern District also could be allowed in early July if the run appears strong. However, sockeye returns to the Aialik system have been marginal during the past several seasons.

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5) In a conservative strategy to protect adult sockeye salmon returning to English Bay Lakes until run strength can be determined this season, the Port Graham Subdistrict will not open to commercial set gillnet fishing at the beginning of June. Additionally, the subsistence set gillnet fishery in the same waters will also be restricted (but not completely closed) near the end of May or the first of June. The system's desired inriver return range is 7,450 to 14,950 sockeye salmon, and if inseason information suggests this range will be achieved, a liberalization of the subsistence fishery, and potentially a commercial opening, would be considered. The staff intends to closely monitor the escapement counts at the English Bay weir to assess run strength and determine potential inseason modifications to fishing schedules in the aforementioned fisheries. Because of the questionable run strength, the availability of broodstock for the English Bay Lakes enhancement project remains unclear.

   If the commercial set gillnet fishery in Port Graham Subdistrict remains closed for the duration of the sockeye salmon return to English Bay Lakes due to a weak return there, and with no hatchery-produced return of pink salmon to Port Graham this season, the commercial set gillnet fishery in Port Graham Subdistrict could remain closed for an undetermined time after the sockeye salmon run to English Bay Lakes is over in order to protect naturally-produced pink salmon returning to Port Graham River until that return can be assessed.

   Port Graham Hatchery is not expecting any sockeye salmon to return to the facility in 2010 as a result of past smolt releases. The Port Graham Hatchery sockeye salmon revenue goal for the 2010 season is $126,000, while the sockeye salmon broodstock goal for English Bay Lakes is up to 1,500 fish. No prediction on whether any cost recovery harvest will be allowed is possible, since no preseason forecast for the adult sockeye run to English Bay Lakes was generated.

6) In the Outer District, waters of the Outer, South, and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06, 232-07, and 232-08, will open to commercial seining for pink salmon beginning Monday, July 19, on a schedule of two 40-hour periods per week, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m. Modifications to areas open to seining and weekly fishing periods could occur on short notice inseason depending on run strength, amount and efficiency of the effort, and the observed escapement rates. Closed waters in Taylor Bay, Tacoma Cove, and Sunday Harbor, as defined in the Commercial Fishing Regulations **5 AAC 21.350. CLOSED WATERS (f) (3), (4)** will remain in effect in this subdistrict. The projected runs to Port Dick are not as strong as some recent seasons, with a harvest forecast totaling about 218,000 pink salmon.

   Elsewhere in the Outer District, other areas will be opened to commercial seining for pink salmon by emergency order based on inseason assessment of run strengths. Areas open to seining and weekly fishing periods will be modified inseason depending on run strength, efficiency of the fleet, and the observed escapement rates. Preseason forecasts for pink salmon suggest that harvestable surpluses in the Outer District could occur at Rocky and Windy Bay Subdistricts, but actual openings will be determined by inseason run strength assessment.

   Seiners should take note that waters of Windy Bay and Port Chatham Subdistricts will be open to ***subsistence set gillnet fishing*** on a weekly fishing schedule of 132 hours per week, from Thursday 10:00 p.m. until Wednesday 10:00 a.m., up until August 1 (closed to subsistence fishing after August 1). Should these waters be simultaneously opened to commercial fishing, seiners are cautioned to remain alert for subsistence set gillnet gear in order to avoid potential gear conflicts.

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7) Because of a regulatory change adopted by the Alaska Board of Fisheries at their November 2004 meeting, ADF&G has been directed to open commercial set gillnetting in the Southern District by emergency order on or after June 1. As a result, commercial set gillnetting in the Halibut Cove, Tutka Bay, Barabara Creek, and Seldovia Bay Subdistricts will open by Emergency Order beginning at ***6:00 a.m. THURSDAY, JUNE 3*** on the regular schedule of two 48-hour periods per week. As stated previously, commercial set gillnetting in Port Graham Subdistrict, including both the English Bay and Port Graham Sections, will remain closed at the start of the season.

8) CFEC set gillnet permit holders are reminded that they **MUST REGISTER WITH ADF&G PRIOR TO FISHING IN WATERS OF COOK INLET**. Registrations can be completed in person at ADF&G offices in Homer, Soldotna, or Anchorage. Alternatively, set gillnet registration forms for "Greater Cook Inlet", of which the Southern District is a part, are available on the ADF&G web site at: *http://www.cf.adfg.state.ak.us/region2/finfish/salmon/uci/gcireg10.pdf*. These forms may be printed out, completed, and then mailed to the Department's Homer, Soldotna, or Anchorage offices. At the time of registration, a valid CFEC permit number for the current fishing year must be known and entered onto the registration form. The permit holder need not be present at the time of registration. Mailing address for the Homer office is:

   ADF&G
   Div. of Commercial Fisheries
   3298 Douglas Place
   Homer, AK 99603

9) Seiners are reminded that latitudes and longitudes for LCI announcements and emergency orders will be published in **DEGREES AND TENTHS OF MINUTES**. This conforms to established standards in the latest commercial salmon fishing regulations booklet.

10) The Homer ADF&G office will again be utilizing specific radio frequencies during 2010. Marine VHF channel 10 will be used to issue emergency order announcements and informational updates concerning the LCI area. In addition, the same information will be broadcast on SSB frequency 2512 kHz. Announcements are also relayed to public radio station KBBI. A 24-hour telephone recording in the Homer office may be reached by dialing (907) 235-7307 to obtain the most current information on the status of the fishery. ***This recording will be updated whenever any new information becomes available or management action affecting the LCI fishery is taken***.

    For the eighth consecutive season, announcements will be published in real time at the following web site:
    http://csfish.adfg.state.ak.us/newsrelease/select.php?year=2010&dist=HOM&species=400&submit=Go

    Each time a new announcement is issued, it will be made available to and can be viewed (along with other fishing area announcements) at this site. Fishermen should note this Internet address as another source of LCI commercial salmon fisheries information.

    For the sixth consecutive season, members of the public can view the preliminary inseason LCI catches on the internet as they become available. The web address for these catches is: *http://csfish.adfg.state.ak.us/mariner/lci/lcicatchxarea.php*. Whenever possible, the public is encouraged to frequently check this site for updated LCI catch information.

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11) The Homer ADF&G staff once again emphasizes the importance of fish ticket catch reporting, especially the accuracy of the location/area of the catch. Such reporting has remained reasonably good during recent seasons, and continued cooperation from fishermen and processors is essential to effective management in LCI. Salmon management programs rely heavily on accurate and timely catch reporting in order to effect practical decisions, which ultimately benefit both the resource and the user groups. Fish ticket data are used by the staff to evaluate inseason run strength, attribute catches to various streams, evaluate enhancement projects, measure long-term production, establish and modify escapement goals, and generate forecasts.

    Charts of the LCI fishing district and subdistrict boundaries, complete with a statistical numbering scheme identifying distinct bays and specific fishing areas, are available at the Homer ADF&G office. Fishermen, dock foremen, and tendermen are requested to accurately record the sub-statistical area on the fish ticket at the time of delivery, ***showing where the catch actually occurred***. Additionally, including the name of the nearest bay or headland on the fish ticket will significantly improve catch records. ***Please DO NOT merely record the location of the tender vessel where the catch was delivered***. If the catch from a particular delivery is from more than one area, please include each sub-statistical area on the fish ticket and provide the estimated catch from each area. If there are any questions concerning fish tickets and/or catch reporting, please do not hesitate to call the Homer ADF&G office at (907) 235-8191.

The ADF&G staff in Homer wishes to extend its appreciation to fishermen and processors for their past support and cooperation in the management of Lower Cook Inlet salmon fisheries, and we look forward to a successful season in 2010.

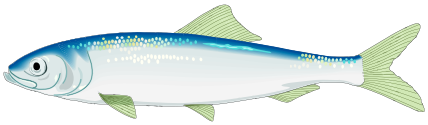
APPENDIX D:
2010 LOWER COOK INLET HERRING FISHERY INFORMATION

Appendix D1.–2010 Lower Cook Inlet herring fishery information.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

Denby S. Lloyd, Commissioner

John Hilsinger, Director



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Homer, AK 99603

2010 LCI Herring Announcement #1
Date Issued: 1/29/10
Time: 9:00 a.m.

2010 Lower Cook Inlet Herring Fishery Information

This notice provides detailed information to fishermen and processors on the 2009 herring run to Kamishak Bay District in Lower Cook Inlet (LCI) and the outlook for 2010. The 2010 commercial sac-roe herring fishery in Kamishak Bay will not open because the forecasted run is less than the established regulatory threshold of 6,000 short tons (st; 1 short ton = 2,000 pounds) necessary to consider allowing commercial exploitation. Because Kodiak and Kamishak herring stocks mix, regulations require that Kodiak food/bait harvest guidelines consider the status of Kamishak herring stocks.

The Kamishak Bay District Herring Management Plan (KBDHMP) specifies that the spawning biomass must exceed a threshold of 6,000 st before a commercial sac roe harvest can be considered for Kamishak Bay. Earlier this winter, the Department of Fish & Game (department) completed analyses of abundance and age composition data collected in 2009. The result is a projected biomass of 2,963 st of herring returning to Kamishak Bay in 2010, continuing a trend of low abundance estimates observed during the past 9 seasons. For over 10 years, the department has forecasted Kamishak herring abundance and set future harvest guidelines using an age-structured analysis (ASA) model. This assessment technique integrates current and historical age composition information from the catch and total return, as well as estimates of survival and recruitment, to track trends in herring abundance. Actual herring biomass estimates from this type of analysis depend heavily upon the availability of periodic, independent measures of total spawning biomass to properly scale abundance trends based on age composition data. The department uses aerial survey information to provide these independent measures of herring biomass. Unfortunately, Kamishak Bay is a very difficult area to survey due to poor water clarity resulting from frequent storms. Aerial survey coverage to assess the Kamishak Bay herring stock in 2009 was excellent, however, overall observation conditions were considered fair due to periodic high turbidity.

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Management regulations governing commercial harvests in Kamishak Bay target older repeat spawners, protecting recruit-class herring representing future populations and fisheries. In 2009, department staff observed a cumulative total of 7,061 st of herring in Kamishak Bay District, a substantial increase over recent seasons. However, several large schools were observed in the same area on consecutive surveys, suggesting a portion of the total observed biomass consisted of repeat sightings of the same fish. After removing presumed repeat sightings from the original total, the revised cumulative estimate of observed herring was just over 4,000 st for the 2009 season. Next, department staff removed an additional 1,850 st of the latter total from the forecast model because: 1) the schools occurred close to the southern border of the LCI management area (implying they may not have been Kamishak Bay stock); 2) they were present in Kamishak District for just a few days; 3) they were not sampled to verify they were adults; and 4) they were not observed spawning. Consequently, the 2009 survey biomass estimate of 2,161 st continued a lengthy trend of sub-threshold totals documented by aerial assesment. Despite the increase in the cumulative total herring biomass observed in 2009, the last 9 consecutive years of disappointingly low aerial survey abundance indices indicate the lack of a recent significant recruitment event in Kamishak Bay. This contrasts with nearby Kodiak area stocks, which have generally experienced population growth due to strong recruitment events in recent years. Nonetheless, the department made other encouraging observations in the Kamishak herring stock in 2009, such as the very low infection rate of *Ichthyophonus*, a protozoan pathogen linked to population declines of Atlantic herring. In previous years, infection rates for this pathogen ranged as high as 55% for Kamishak herring, while in 2009 the incidence averaged less than 3%. Additionally, department staff documented no signs of viral infection (VHS or VEN) in 2009. While it is uncertain what role these diseases play in recruitment and survival, their prevalence in the Kamishak stock is concurrent with the loss of older age classes (> age-8) from the population. Finally, in 2009 department staff observed the highest level of herring spawn since 1999, with 20 documented events cumulatively totaling 3.2 miles in linear length.

The department also completed 2 vessel charters to collect representative age composition samples during the periods 6 - 12 May and 20 - 25 May, 2009. Both charters were considered successful, with a cumulative total of 2,316 herring collected throughout Kamishak Bay District between McNeil Cove in the south and Iniskin Bay in the north. This allowed the staff to generate an age composition estimate of the overall season biomass observed by department aerial surveyors. The charters allowed for additional hydroacoustic observations. The following table contains age composition information, as well as the 2010 forecast:

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Age	2009 Est. Spawning Biomass (st)	Percent by Weight	2009 Commercial Harvest (st)[a]	Percent by Weight	2009 Total Biomass (st)	Percent by Weight	2010 Forecast Biomass (st)	Percent by Weight
1								
2								
3	372	13.1%	---	---	372	13.1%	318	10.7%
4	567	20.0%	---	---	567	20.0%	455	15.4%
5	799	28.2%	---	---	799	28.2%	627	21.2%
6	367	12.9%	---	---	367	12.9%	754	25.5%
7	212	7.5%	---	---	212	7.5%	302	10.2%
8	238	8.4%	---	---	238	8.4%	172	5.8%
9	115	4.1%	---	---	115	4.1%	180	6.1%
10	96	3.5%	---	---	96	3.5%	62	2.1%
11	17	0.6%	---	---	17	0.6%	68	2.3%
12	27	1.0%	---	---	27	1.0%	7	0.3%
13+	27	1.0%	---	---	27	1.0%	17	0.6%
TOTALS	**2,837**	**100.0%**	**---**	**---**	**2,837**	**100.0%**	**2,963**	**100.0%**

Note: st = short ton = 2,000 lbs.

[a] Due to the low forecasted biomass, the commercial herring fishery in Kamishak Bay was not opened in 2009.

The forecasted herring biomass generated by the ASA model for 2010 in Kamishak Bay District is 2,963 st, failing to achieve the KBDHMP regulatory threshold of 6,000 st necessary to consider a commercial harvest. Additionally, the predicted age structure of the population shows that 47% of the biomass should consist of herring age-5 and younger. The second research charter in 2009 that collected age composition samples during the latter portion of the return (mid to late May) documented a weak recruitment, similar to the previous 13 seasons. The 2009 data and resulting forecast model suggest that a high proportion of returning fish in 2010 will be relatively young and newly recruited into the spawning population. Because the KBDHMP directs the department to minimize the harvest of fish age-5 and younger during any directed fishery, it is in the best interest of the resource and the commercial fishery to protect the remaining spawning population to promote both greater abundance and a more favorable age structure for the future.

2010 Kamishak Bay Herring Test Fishing Charters

The department is once again soliciting bids from herring purse seine fishermen to test fish Kamishak Bay during two 7-10 day surveys between May 1 and June 15, 2010. This project will assist the department in collecting representative herring samples for age composition to assess population abundance and forecast future returns. Herring will not be sold during this season's test fishing charters. Interested parties should submit bid forms for 1-2 surveys, available from the department office in Homer.

SCOPE OF TEST FISHING: As in past seasons, test fishing will be conducted between Oil Bay and Cape Douglas. Two trips of up to 10 days duration each are annually timed to coincide with the "early" and "late" segments of the herring migration. Due to the recent trend towards later spawning timing, this

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year's surveys will be tentatively scheduled for approximately May 5 – 13 and May 18 – 25. Specific dates for the surveys will be mutually determined by the staff and the successful bidder(s) after the bids are awarded. The project will be terminated on June 15. Exact times of daily fishing activity during each survey cannot be accurately predetermined but will be governed by on-grounds weather and tide-driven current conditions. Although fishing activity is expected to occur during daylight hours between approximately 6:00 a.m. and 9:00 p.m., it may not be limited to these hours only. Additionally, since Kamishak Bay District encompasses an extensive area of marine waters, a significant amount of non-fishing time is spent traveling and/or actively searching for schools of herring. The purpose of this test fishing is primarily to harvest representative samples of Kamishak Bay herring for onboard pathology lab preparation and to estimate age/weight/sex composition. Secondarily, hydroacoustic observations of herring, climatic and water parameters, and other information as determined by the onboard department observer, will also be recorded. Because Kamishak Bay, located approximately 75 nautical miles from Homer on the west side of Lower Cook Inlet, is considered remote, the charter vessel will remain on the grounds for the charter duration without overnighting in a formal harbor. Prospective bidders should realize that little commercial fishing effort occurs in Kamishak Bay during this time of year, equating to very limited nearby support from other fishing vessels.

CONDITIONS OF THE BID: The successful bidder(s) will be required to provide the following:

1. A seine vessel with a minimum keel length of 40 feet capable of safely navigating and fishing in waters of Kamishak Bay. Each survey will begin and end at the Homer small boat harbor.
2. A full crew consisting of a captain and a minimum of 3 deckhands (including a "skiff man" with at least one season's experience). Consideration will be given to applicants who can demonstrate they routinely and competently fish in Alaska's commercial herring fisheries with only 2 deckhands due to specialized equipment. The successful bidder(s) must be able to demonstrate at least 10 years of participation in Alaska commercial herring sac roe fisheries, including at least 5 years in the Kamishak herring sac roe fishery.
3. All fishing equipment, including: purse seine vessel, seine skiff, herring seine net, and all necessary fishing gear and equipment.
4. Onboard accommodations (including individual bunk space) for one department observer, in addition to accommodations for the entire crew.
5. All personal and fishing related expenses including food, fuel, and living arrangements for all personnel onboard, including the department observer, for a charter lasting 10 days.
6. Information relating to protection and indemnity insurance. The State of Alaska will not be held liable for any damage to the vessel, the seine, or any personal injuries incurred during the fulfillment of this contract.

Note: Although a department-chartered aircraft with an onboard department surveyor may be available on an opportunistic basis to locate and set the vessel on herring schools, aerial spotter support will not be provided by the state during the contract period. One department observer, whose primary objectives are to collect herring and pathology samples and record data on water depth, temperature, location, etc., will be present on the purse seine vessel throughout the duration of the charter. The observer will not be expected to act as, and/or perform all duties of, a regular crewmember, but may assist in the operation of gear as required.

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EVALUATION OF BIDS: Bids for the 2 charters will be evaluated separately, and separate contracts will be issued for each charter. The department will evaluate all bids on the basis of their dollar amount using the following criteria: maximum 10 day charter consisting of 8 days of functional fishing activity to be paid at the daily bid rate plus 2 days of no fishing activity ("weather" days) to be paid at the daily standby rate. The State of Alaska reserves the right to request that the United States Coast Guard, Marine Safety Detachment make an inspection of the charter vessel's systems integrity. Should serious systems defects be identified upon inspection, the State of Alaska reserves the right to reject a bid.

Bid packets for these charters may be obtained from the Homer area office. Any questions regarding the bid procedure should be directed to Ted Otis or Lee Hammarstrom at 907-235-8191. Interested bidders must submit bids to the Homer area office by the close of business (5:00 p.m.) on Wednesday, April 14, 2010. The winning bidder will be notified on April 15.