Fishery Management Report No. 10-17

2009 Lower Cook Inlet Annual Finfish Management Report

by

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and

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April 2010

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)

Measures (fisheries)

fork length	FL
mideye to fork	MEF
mideye to tail fork	METF
standard length	SL
total length	TL

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 2009 Lower Cook Inlet commercial salmon fishery was characterized by below 10-year-average harvests of sockeye *Oncorhynchus nerka*, pink *O. gorbuscha*, chum *O. keta*, Chinook *O. tshawytscha*, and coho *O. kisutch* salmon. The all-species commercial harvest totaled approximately 1.346 million fish, dominated by pink salmon at 73% and sockeye salmon at 21%. The commercial fishery exvessel value was approximately $3.33 million, the highest figure in the last 20 years. Participation remained at relatively low levels for the only two allowable gear groups, purse seine and set gillnet, with seine effort reaching an all-time low. Seine catches and effort were significantly affected by a newly adopted 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 2009 for the second consecutive 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 13% in numbers of fish and 49% in exvessel value for the season, the latter figure considerably more than the past few seasons.

The Southern District personal use set gillnet fishery in Kachemak Bay produced an estimated harvest of 646 coho salmon, failing to achieve the guideline harvest range of 1,000 to 2,000 coho salmon. Participation in the fishery, at 90 permits actively fished, was slightly less than the recent 10-year average of 94.

The commercial Pacific herring *Clupea pallasi* fishery in Lower Cook Inlet was closed during 2009 for the 11th consecutive 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.

2009 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 2009 LCI all-species commercial salmon harvest of 1.35 million fish (Table 1, Figure 7) was the fourth lowest during the past decade, representing approximately 78% of the recent 10-year average of 1.72 million (Appendix A5). However, the overall harvest nearly achieved the cumulative preseason forecast of 1.36 million fish (revised to 1.39 million; Appendix C1), in large part due to the good harvests of natural runs of pink salmon *Oncorhynchus gorbuscha*. Unfortunately, harvests of sockeye salmon *O. nerka*, totaling about 280,000 fish (Tables 1 and 3; Figure 8), were considerably less than anticipated. Commercial harvests of chum salmon *O. keta*, at 74,000 fish (Tables 1 and 6; Figure 11), were slightly less than the recent 10-year average but significantly greater than 20-year average (Appendix A22). Modestly higher prices paid for sockeye salmon over the previous season, combined with relatively unchanged prices for pink and chum salmon, yielded an estimated exvessel value of approximately $3.33 million (Table 7), making the value of the 2009 LCI harvest over 60% greater than the recent 10-year average (Appendix A2) and the fifth highest since statehood. Seine fishing effort decreased markedly over the previous year, with only 13 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 2009 was 19 (Appendix A1), a slight increase over the 2008 level but still less than the recent 10-year average.

For the fourth consecutive season, LCI commercial salmon harvests in 2009 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 made significant contributions to sockeye salmon catches, with approximately 60% 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 recent seasons, however, the newly adopted 5 AAC 21.373 *Trail Lakes Hatchery Sockeye Salmon Management Plan* (see section entitled "**ALASKA BOARD OF FISHERIES PETITION**" below) dictated that all CIAA Special Harvest Areas (SHA's) in LCI be managed primarily to achieve CIAA's corporate cost recovery and broodstock goals for that facility. Because CIAA had announced prior to the season that all surplus sockeye salmon returning to their stocking projects would be required to achieve their hatchery revenue goal, virtually all common property fishing targeting these runs was precluded this season. Another sockeye salmon enhancement project, conducted by the Port Graham Hatchery Corporation (PGHC) in the Southern District, contributed an additional 3% to LCI sockeye catches, but all returning fish were utilized for hatchery cost recovery there as well. The overall area-wide commercial harvest of sockeye salmon in LCI, at just over 280,000 fish, represented approximately 87% of the recent 10-year average of 323,000 fish (Appendix A13).

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered very good this year, and the overall catch of 989,000 fish (Tables 1 and 5, Figure 10) nearly achieved the preseason harvest forecast of 998,000 pink salmon. Nonetheless, the total pink salmon harvest in 2009 represents only about 75% of the average over the past two decades (Appendix A5), a time period that was dominated by LCI hatchery production. Numerous and fairly liberal openings to target relatively strong natural returns of pink salmon resulted in good catches in some areas (Port Dick-Outer District) but low catches in others (Bruin Bay-Kamishak Bay District).

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 slightly increased over the previous three seasons 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 13% of the all-species salmon harvest in numbers of fish to support the LCI lake stocking and remote release programs this season, CIAA and Port Graham Hatchery Corporation (PGHC) generated approximately 49% of the overall exvessel value of the LCI commercial fishery (Table 7) through cost recovery, a very significant increase over recent seasons. The reasons for the rise in this statistic were that all fish harvested for hatchery cost recovery this season were higher valued sockeye salmon, combined with the fact that 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, and ensuing harvest of salmon, in LCI over the past decade,

seemed to have only a minor impact on overall harvests during 2009. 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. Relatively strong markets for all salmon species in 2009, and pink salmon in particular, seemed to reduce processors' apprehension about providing remote tender service, contributing to the reasonably good catches in the Outer District.

After sharp increases were experienced during 2008, prices paid for salmon in LCI remained relatively stable in 2009 (Appendix A3), with modest increases for Chinook *O. tshawytscha*, sockeye, and coho *O. kisutch* salmon, and very minor decreases for pink and chum salmon. Nonetheless, despite these relatively high prices, the majority of seine permit holders in LCI chose to refrain from participating in 2009, thus contributing to a record low amount of seine effort.

PRESEASON SUMMARY

The projected 2009 LCI all-species salmon harvest of approximately 1.36 million fish was approximately 17% less than 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 1.39 million fish due to the addition of sockeye salmon predicted to return to Port Graham Hatchery in 2009, a figure which was not available when the forecast was originally generated. 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 2009 are listed below:

Species	Original Projected Harvest	Revised Projected Harvest	Actual Harvest	20-year (1989–2008) Average
Chinook	1,200	1,200	84	1,311
Sockeye	304,600	328,000	280,312	284,007
Coho	13,500	13,500	2,686	11,951
Pink	997,800	997,800	989,347	1,305,629
Chum	45,400	45,400	73,974	45,417
Total	**1,362,500**	**1,385,900**	**1,346,403**	**1,648,315**

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 2003–2008 were surprisingly strong, resulting in the first directed effort at this stock in over a decade and annual commercial harvests ranging from 12,000 to 162,000 sockeye salmon between 2004 and 2008. Because of the unexpectedly strong runs the previous six seasons, the outlook for the adult sockeye salmon run at Chenik Lake in 2009 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 2009. Thus, for the second consecutive season, no hatchery-produced pink salmon were expected to contribute to LCI catches this season.

Reasonably good pink salmon escapements to major systems in 2007 contributed to a harvest projection of nearly 998,000 naturally produced pink salmon throughout the entire LCI management area this season. Port Dick, Rocky Bay, and Windy Bay Subdistricts in the Outer District, and Bruin Bay, Ursus Cove, and Rocky Cove Subdistricts in the Kamishak Bay District, all figured to provide good potential for harvestable surpluses, but the projected fishing effort in these remote districts was debatable due to uncertain markets and questionable levels of available tender service.

Because eight of the past nine seasons' chum salmon runs and commercial catches in LCI were relatively strong, the chum salmon harvest outlook in 2009 once again appeared reasonably bright. Most west-side LCI systems experienced good to excellent escapements during the 2004 and 2005 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 runs to the larger Big and Little Kamishak Rivers have also been comparatively strong during eight of the past nine years. The good catches during this time period, as well as the recent overall trend, suggested that harvest opportunities for chum could be numerous in 2009.

2009 SEASON SUMMARY

Chinook Salmon

The 2009 harvest of Chinook salmon, not normally a commercially important species in LCI, totaled less than 100 fish (Table 2), or only 8% of the average during the last decade (Appendix A12) and the lowest figure for this species since 1971. The entire catch, with the exception of a single fish, was taken in the Southern District by commercial set gillnetters. The majority of the Southern District total was harvested from Tutka Bay Subdistrict.

Sockeye Salmon

The 2009 sockeye salmon harvest of 280,300 fish (Table 3; Figure 8) was the sixth lowest for LCI in the last decade but very near the 20-year average of 284,000 fish (Appendix A13). Sockeye salmon accounted for 21% of the LCI salmon harvest in total numbers of fish, yet provided 70% of the exvessel value of the entire salmon fishery this season (Table 7). The 2009 LCI commercial sockeye salmon harvest was heavily influenced by *5 AAC 21.373 Trail Lakes Hatchery Sockeye Salmon Management Plan*, a newly adopted regulation which directed the ADF&G (department) to manage all CIAA hatchery SHA's to achieve the facility's preseason

revenue goal of $1.5 million. As a result, approximately 63% of the commercially harvested sockeye salmon in LCI was taken for hatchery cost recovery, versus only 37% for the common property fishery. In addition, extremely weak runs to key enhanced systems at Leisure and Hazel Lakes in the Southern District contributed to lower than anticipated sockeye salmon catches. In contrast, natural sockeye salmon runs within the management area ranged from fair to outstanding, with five of six major systems achieving or exceeding their respective sustainable escapement goals (SEG's). Of particular note was the formerly enhanced system of Chenik Lake, located in the Kamishak Bay District on the west side of LCI, where the sockeye salmon run this season was strong for the seventh consecutive year, producing a commercial catch in nearby waters totaling nearly 66,000 fish (Appendix A16). Stocking of Chenik Lake was discontinued after the 1996 season, thus all present production is considered natural, and this season's total run was estimated at approximately 81,000 sockeye salmon, continuing a recent trend of excellent runs to the system.

At Bear Lake in Resurrection Bay of the Eastern District, the management strategy this season was dictated by the previously discussed new 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 2009, CIAA expected that all sockeye salmon returning to CIAA enhancement sites would be required to achieve the revenue goal, and therefore no common property openings were anticipated. In Resurrection Bay, the cumulative hatchery catch of "early run" sockeye salmon destined for Bear Lake totaled approximately 137,500 fish (Table 3; Appendix A17), falling short of the preseason harvest forecast of 173,800 sockeye salmon. Nonetheless, the catch this season was the highest ever recorded for sockeye salmon returning to Bear Lake and the desired inriver sockeye salmon goal for Bear Lake was easily achieved despite the weaker than predicted run.

Sockeye salmon runs to major Southern District enhancement sites, which have at times provided the bulk of the annual LCI sockeye salmon catch, were weak for the sixth consecutive season, continuing a recent pattern of disappointing runs to these release locations. Although harvests of enhanced runs of sockeye salmon returning to Leisure and Hazel Lakes were originally predicted to cumulatively total only 26,000 fish in 2009, considered weak by historical standards, the estimated combined actual commercial harvest amounted to a paltry 200 fish (Figure 9; Appendix A15). This figure represented a new low that was last experienced during the early 1980's for the then-fledgling Leisure Lake project and was far short of the combined average annual total catch of 134,000 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).

Also in the Southern District, the sockeye salmon run to English Bay Lakes was reasonably good for the fourth consecutive year, achieving the desired inriver escapement goal while also 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 June 30 after the escapement goal was assured, while the commercial fishery opened two days later on July 2, resulting in a seasonal harvest of approximately 9,500 sockeye salmon for the latter user group (Table 3). Sockeye salmon runs to the English Bay Lakes system could potentially 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. 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. For the 2009 season, no juvenile sockeye salmon were released back into the English Bay Lakes system as "fall fry", the third time in the past four seasons for zero juvenile releases. However, just over 250 sockeye salmon adults were collected for use as broodstock this season.

In Kamishak Bay District, the enhanced run of sockeye salmon to Kirschner Lake produced a catch of just under 19,000 fish (Table 3), representing over nine times the original preseason harvest forecast of 2,000 fish. All of the sockeye salmon harvested at Kirschner Lake in 2009 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 2009, while the sixth system has no formal escapement goal. In East Nuka Bay Subdistrict of the Outer District, aerial and weir assessments of the run to Delight Lake indicated insufficient strength to allow commercial exploitation, and the commercial fishery was kept closed. The situation at Desire Lake, as assessed by aerial surveys, was similar. The escapement estimates of nearly 13,000 sockeye salmon for Delight Lake and 16,000 for Desire Lake slightly exceeded the SEG's established for each of those systems (Appendix A24), while no commercial harvest occurred. 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 1,300 sockeye salmon in 2009 (Table 3).

Targeted fishing effort was allowed on sockeye salmon returning to Chenik Lake in the Kamishak Bay District for the sixth consecutive season in 2009. 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 stocking program at Chenik Lake after the 1996 season. The sockeye salmon run to Chenik this year was considered excellent, the seventh consecutive strong run, with a total estimate of 81,000 sockeye salmon returning. The run consisted of a commercial seine harvest of 65,700 fish (Table 3) and an approximate escapement of 15,300 as documented by video and aerial surveillance (Appendix A16). The latter figure slightly 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 seven 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 third consecutive season in 2009 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 3,100 fish, failing to achieve the SEG range of 3,700 to 8,000 sockeye salmon (Table 3; Appendix A24). At Mikfik Lake in the Kamishak Bay District, a relatively strong run

resulted in an escapement estimated by aerial surveys at about 15,100 sockeye salmon (Table 3; Appendix A24), surpassing the established goal range of 6,300 to 12,200. 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 2009 commercial harvest of 2,700 coho salmon (Table 4) was only about 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 over 1,700 coho salmon at a ratio of 92% for the derby and 8% for CIAA (Table 4). It should be noted that the organizer of the derby, 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 by set gillnetters in the Southern District (36%), while seiners in the management area accounted for less than 10 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 coho salmon 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 2009 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 2009 showed good to excellent escapement (Table 4).

Pink Salmon

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered very good this year, with an overall harvest of 989,300 fish (Table 5; Figure 10). This figure is just over three-fourths of the most recent 10-year average and represents the highest catch of this species since 2006 (Appendix A19). Despite the numerous and fairly liberal openings to target relatively strong natural stocks this season, erratic tender service in some remote areas kept pink salmon catches lower than potentially possible. Harvests this season were comprised entirely of naturally produced fish for the second 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 fourth consecutive season, while Port Graham Hatchery has also suspended operations and no pink salmon were expected to return 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, where the commercial seine harvest totaled approximately 853,000 pink salmon (Table 5; Appendix A19), over two and one-half times the recent 10-year district-wide average. The majority of this district's catch came from Port Dick Subdistrict,

totaling 518,500 pink salmon, while directed effort in Windy and Rocky Bay Subdistricts produced an additional total of approximately 312,800 pink salmon (Table 5).

In the Southern District, which had historically dominated LCI pink salmon catches because of the hatchery facilities, the pink salmon harvest totaled a paltry 3,000 fish (Table 5; Appendix A19), with 71% taken in the common property set gillnet fishery and the remainder coming as incidental harvest during hatchery sockeye salmon cost recovery operations. For the first time in many seasons, 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 majority of the pink salmon harvest of 133,300 fish (Table 5; Appendix A19) came from Rocky Cove Subdistrict, with a much smaller proportion taken in Bruin Bay Subdistrict. Pink salmon escapements to all monitored systems in the Outer and Kamishak Bay Districts were sufficient to achieve or exceed SEG's, while those to Southern District systems were considered fair to poor (Appendix A25).

Chum Salmon

After a disappointingly weak chum salmon season in 2007, chum salmon runs have since rebounded and were a major bright spot for the LCI area in 2009. The chum salmon harvest of 74,000 fish (Table 6; Appendix A22) was the fifth highest figure for the species in LCI during the past two decades but was only 92% of the average harvest over the past 10 years. In sharp contrast to years prior to 2008, when Kamishak Bay District totals dominated catches, the LCI area-wide commercial chum salmon harvest this season was almost equally divided between Kamishak Bay District on the west side of LCI (49%) and the Outer District (47%), with Southern District making up the remaining 3% (Table 6; Appendix A22). Port Dick Subdistrict, which unexpectedly produced much higher than average chum harvests in 2008, once again accounted for particularly noteworthy chum salmon catches totaling 33,500 fish this season (Table 6). Escapements into most LCI chum salmon systems were sufficient to achieve goals (Appendix A26), including McNeil River in Kamishak Bay District.

2009 EXVESSEL VALUE

The estimated exvessel value of the 2009 commercial salmon harvest in LCI, not including any postseason adjustments in price paid to fishermen, was approximately $3.33 million (Table 7; Appendix A2), or about 66% greater than the average during the past decade and the second highest figure since 1988. Purse seine gear in the common property fishery, which normally generates the majority of the catch and value, accounted for about $1.33 million or approximately 40% of the overall exvessel total (Table 7), while set gillnets accounted for $347,000 or 10%. An estimated $1.64 million, or about 49% 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 thought to be one of the highest on record. Estimated average salmon prices paid to fishermen in 2009, not including any postseason adjustments, were as follows: Chinook–$3.45/pound; sockeye–$1.55/pound; coho–$0.83/pound; pink–$0.22/pound; and chum–$0.53/pound (Table 9; Appendix A3). Prices for all species remained at or near twenty year highs.

2009 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 2009 LCI all-species set gillnet harvest totaled 43,700 fish (Table 1), equaling the recent 10-year average (Appendix A7) and breaking a five-year trend of poor all-species totals for this gear group. The sockeye salmon catch of 38,200 fish was the highest since 2003 and exceeded both the 10- and 20-year averages by considerable amounts. The greatest set gillnet catches of sockeye salmon this season occurred in Seldovia Bay, Port Graham, and Tutka Bay Subdistricts (Table 3).

Salmon species composition in the 2009 LCI commercial salmon set gillnet fishery, with sockeye salmon at 88%, pink salmon at 5%, and chum salmon at 5%, was considerably different than the average over the past decade, when typical salmon species composition in the fishery was 71% sockeye, 16% pink, 7% chum, 4% coho, and 2% Chinook salmon. The catch of Chinook salmon, at less than 100 fish, was far less than the recent 10-year average of 890 and was the lowest harvest since 1971. The highest Chinook salmon catches in the 2009 LCI set gillnet fishery occurred in Tutka Bay Subdistrict.

Based on a questionable preseason estimate of run strength for 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 for exploitation, and once achievement of the SEG could be projected, and local residents were given an opportunity to harvest fish for subsistence needs, waters of Port Graham Subdistrict were opened to commercial set gillnet fishing in early July. Despite the late start, commercial set gillnetters in the two sections of this subdistrict still managed to harvest about 9,500 sockeye salmon for the season (Table 3), while the final estimated escapement of just over 18,000 fish at English Bay Lakes (Table 3; Appendix A24) fell slightly above desired inriver goal range of 7,300 to 15,000 sockeye salmon. Local subsistence fishermen from the village of Port Graham reported catching 2,000 sockeye salmon for subsistence needs (Appendix A29), the highest total since 1993, while harvest figure for residents of Nanwalek was considered below average at 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 2004–2008 seasons, when complete fishing closures or severe restrictions were implemented until run strengths could be adequately assessed. It should also be noted that sockeye salmon returning to a remote release project at Port Graham Hatchery also likely contributed to both commercial and subsistence set gillnet catches in waters of Port Graham Subdistrict, but estimated contributions from this source could not be determined.

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 slightly below the long-term average, but still fell within the SEG for that system (Appendix A25).

LCI set gillnet fishing effort in 2009 increased marginally over the previous two seasons with a total of 19 permits actively fished. This figure fell below both the 10- and 20-year averages of 20 and 21 permits annually fished, respectively (Appendix A1).

Seine Fishery

Sockeye Salmon

For perhaps the first time on record, no common property seine openings were allowed in LCI's Southern District and therefore 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 20,000 sockeye salmon and (incidentally) 900 pink salmon (Table 1). The overall 2009 catch of sockeye salmon by all gear types in the Southern District, at 58,300 fish, was the lowest for this species since 2004 (Appendix A13) and the second lowest since 1986, representing less than one-third of the recent 10-year average. Hatchery purse seiners accounted for about 34% of the sockeye salmon landed in the district in 2009, while the remaining 66% was taken in the previously described commercial set gillnet fishery (Table 1). The low overall sockeye salmon catch in 2009 continued a 6-year trend of below average harvests in this district. Poor production rates from the district's two major sockeye salmon enhancement 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 first time during the 2009 season, and its effects were 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 2009. 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 stated that all sockeye salmon returning to their various LCI release sites would be required to achieve the established revenue goal of $1.5 million, no CIAA-produced sockeye salmon were considered surplus to hatchery needs and therefore none would be available for common property harvest. Areas in the Southern District traditionally opened to common property seining to target these CIAA sockeye salmon runs were never opened in 2009.

Waters of the China Poot and Hazel Lake SHA (Figure 3) were opened to authorized agents of CIAA seven days per week beginning June 22, 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 under 26,000 fish, representing only about one-fifth 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 200 sockeye salmon in the China Poot and Hazel Lake SHA in 2009 (Table 3; Appendix A15). The 2009 sockeye harvest estimate for Leisure and Hazel Lakes' runs was easily the smallest since combined adult runs from the two lakes' projects began in

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 2009 total cumulative run from both projects was estimated at around 5,700 sockeye salmon (Appendix A15), and the hatchery harvest from this location generated less than one percent of the Trail Lakes Hatchery revenue goal.

CIAA forecasted a run of just over 11,000 sockeye salmon to the relatively new remote release site for this species at Tutka 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. The first hatchery harvest of the season occurred on July 16, netting almost 1,400 sockeye salmon in waters of Tutka Lagoon, with four additional deliveries occurring over the next month. Because of overlapping run timing for pink salmon returning to Tutka Lagoon Creek, hatchery fishermen were unable to avoid capturing pink salmon during cost recovery operations and were forced to manually sort fish in order to keep the incidental harvest of non-target species low. The final hatchery harvest of the season came on August 13, bringing the cumulative total catch to 11,600 sockeye salmon for the season (Table 3). The seasonal proceeds from the hatchery efforts in Tutka Bay SHA comprised about 3% of the CIAA revenue goal. An additional 3,100 sockeye salmon were collected for use as hatchery broodstock from Tutka Bay Lagoon, and although all fish were lost due to a mechanical pump failure, about 140 were successfully spawned and the resulting eggs incubated in Trail Lakes Hatchery.

At Port Graham Hatchery, a run of over 23,000 sockeye salmon was forecasted as a result of the facility's saltwater release project, which uses broodstock originating from nearby English Bay Lakes. PGHC established a 2009 revenue goal of $200,500 for this project, and with the magnitude of the projected run, combined with anticipated average weights and prices, the facility anticipated that all returning fish would be required for cost recovery purposes plus a modest broodstock collection of up to 1,500 fish. Sockeye salmon adults began to appear in waters around the hatchery in early July, although in small numbers, and a portion of the Port Graham SHA was opened to hatchery seining on a continuous basis beginning on July 7. The first hatchery harvest, however, occurred three weeks later on July 28, netting about 5,100 sockeye salmon. Only one other hatchery harvest occurred, and the season's hatchery cost recovery catch in the Port Graham SHA cumulatively totaled 8,300 sockeye salmon (Table 3) at an estimated value of approximately $26,000, or about 13% of the established revenue goal.

Pink Salmon

The 2009 season marked the second 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 fourth successive season, and none returning to Port Graham Hatchery, the final district-wide catch of only 3,000 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 71% of the total, all in Tutka Bay Subdistrict, while incidental harvest during sockeye salmon hatchery cost recovery operations, primarily in Port Graham Subdistrict, accounted for the remainder.

Returns of wild pink salmon stocks to systems in the Southern District, as indicated by ground survey escapement counts, were considered fair to poor, thus 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 Barabara Creek fell within or exceeded their established SEG ranges (Table 5; Appendix A25), while those to Humpy, China Poot, and Tutka Creeks failed to meet minimum escapement figures.

Other Species

The Southern District chum salmon harvest in 2009 cumulatively totaled just under 2,300 fish for all gear types (Table 6; Appendix A22), the highest total since 2003 but still less than 70% 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 Seldovia Bay Subdistrict (Table 6) at about 64% of the district-wide catches. Escapements into Southern District chum salmon systems were considered fair to 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 2009 Southern District harvest of 83 Chinook salmon by all gear types was the lowest since 1972, representing less than 10% of the recent 10-year average of 1,023 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 1,000 fish by all gear types was the lowest since 1969 and was only 36% 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 10th 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 10th 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 2009, the district-wide commercial sockeye salmon harvest totaled 84,500 fish (Table 3; Appendices A10 and A13), the fifth highest total recorded in the district over the past two decades and approximately 10% greater than the recent 10-year average.

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 and 2007 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. The first sockeye salmon of the season were documented in freshwater via aerial survey on June 11, and at an estimated 6,000 fish, this initial observation showed a dramatic increase over the previous survey three days earlier, when no fish were seen. Aerial escapement estimates continued to slowly increase through the end of the month, when 15,100 sockeye salmon were observed in freshwater. This figure proved to be the peak daily estimate for the season and was therefore used as the index of escapement, falling slightly above 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 be noted that a remote video enumeration project conducted by the department at the outlet of Mikfik Lake documented an escapement of nearly 21,000 sockeye salmon, or about 5,900 more fish than estimated by aerial surveys.

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 2008 created continuing optimism for 2009. Aerial surveys began to detect fish in salt waters of Chenik Lagoon on June 26, and with an estimate of over 2,500 sockeye salmon the run was displaying indications of reasonable strength. During the next survey on June 29, the estimated figure jumped to 8,000 sockeye salmon in salt water, and four days later the saltwater observation increased dramatically to over 28,000 sockeye salmon. However, over the course of these three consecutive surveys, no fish were detected in freshwater as escapement. Despite the lack of fish in freshwater, historical run timing for the Chenik sockeye salmon stock indicated that the run was still in its earliest stages, and a significant number of fish were expected to appear over the ensuing weeks. Given these excellent saltwater figures, commercial salmon seining was allowed by emergency order in Chenik Subdistrict south of 59° 16′ N. latitude beginning July 6 on a conservative five-days-per-week fishing schedule (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. Marker placements around the mouth of Chenik Lake Creek, combined with typically harsh weather conditions in Kamishak Bay and the weekend closures, were expected to limit fishing activity and allow adequate numbers of fish into freshwater for escapement.

Initial catches from Chenik Subdistrict were reported on July 6, the first day of the opening, and at over 34,000 sockeye salmon taken for that single day, the run continued to appear quite strong. As expected, steady fishing effort persisted for the remainder of that week's fishing period, and by July 10 the reported harvest had reached over 60,000 sockeye salmon in Chenik Subdistrict. However, catch rates showed a steady decline with each passing day that week. Meanwhile, escapement as tallied by aerial surveys was proceeding slowly, with 2,100 sockeye salmon estimated in fresh water on July 10. However, as had been the case during the previous three seasons, management of the fishery was aided by a department-operated remote video escapement recorder near the outlet of Chenik Lake, the sixth consecutive season for this annual

project. Using a combination of aerial surveys and video counts, the estimated freshwater escapement into the lake had actually increased to approximately 4,500 sockeye salmon by July 10, near the middle of the SEG range of 1,900–9,300 sockeye salmon. Since an escapement near the upper end of the range was desired, no changes to the fishing schedule or the markers in Chenik Subdistrict were made. Seining north of 59° 16′ N. latitude remained closed to protect sockeye salmon returning to small Amakdedori Creek, where escapement was not strong.

The declining catch rates during the first week of the Chenik opening, as well as on-grounds observations, must have convinced seiners that the run could not continue to produce adequately profitable harvests, and most opted to leave area waters. Another delivery during the second open week of fishing brought the cumulative catch in Chenik Subdistrict for the season to over 65,000 sockeye salmon, but by this time escapement as monitored by the video project totaled only around 6,400 sockeye salmon. A department aerial survey on July 16 showed an estimated 5,500 sockeye salmon protected by markers in saltwaters of Chenik Lagoon. With up to seven vessels targeting the Chenik sockeye salmon run this season, the staff reasoned that the upper end of the SEG range might not be achieved if commercial seining was allowed to continue. As a result, waters of Chenik Subdistrict were closed to seining by emergency order on July 18 (Table 8) to protect fish for escapement. Aerial surveys and video analysis over the next week showed that the latter stages of the run did not appear sufficiently strong to allow commercial fishing to resume, and the subdistrict therefore remained closed for the rest of the season. The final commercial catch in waters of Chenik Subdistrict totaled 65,700 sockeye salmon (Table 3), the third highest figure in the last 20 years for these waters (Appendix A16). Escapement into Chenik Lake continued into August, and the remote video escapement recorder project remained operational through the end of the month, tallying a total of 15,300 sockeye salmon, which was also used as the final index of escapement for the system (Table 3, Appendix A24). Interestingly, the peak individual aerial survey count for the season was a nearly identical 15,200 sockeye salmon. The overall run of sockeye salmon to Chenik Lake in 2009 cumulatively totaled approximately 81,000 (Appendix A16), continuing a seven-year trend of strong returns to this system.

No effort was directed at sockeye salmon in the Douglas River (Silver Beach) Subdistrict during 2009. Not surprisingly, the excellent run to Chenik Lake kept seiners occupied during the peak of the normally smaller sockeye runs to other subdistricts and discouraged any additional effort in those waters.

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 only 2,000 sockeye salmon returning to the site. As previously mentioned, 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 2009 revenue goal of $1.5 million prior to allowing any common property fishing effort in these waters. Because CIAA anticipated harvesting 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 2009 was no exception. The first effort occurred in the Kirschner Lake SHA on July 11, netting only about 700 fish. However, the number of fish returning to the Kirschner Lake enhancement

site proved far better than the preseason forecast, and five additional hatchery harvests occurred between July 16 and August 12. The cumulative hatchery harvest of sockeye salmon at Kirschner Lake for the year totaled 18,800 fish (Table 3). Since the cumulative hatchery income generated from CIAA SHA's in LCI remained below the seasonal revenue goal, waters of the Kirschner Lake SHA were never opened to common property seining. When the hatchery harvest was combined with an estimated 350 unharvested fish, the total run to Kirschner Lake was estimated at 19,100 sockeye salmon, or nearly ten times the preseason prediction for the system. This helped to maintain the Kirschner Lake sockeye salmon enhancement project's reputation as one of LCI's steadiest producers.

Pink Salmon

Preseason pink salmon projections for the Kamishak Bay District in 2009 were considered quite good, with a cumulative harvestable surplus totaling approximately 422,000 fish forecasted primarily for Ursus and Rocky Cove Subdistricts, and with a lesser amount predicted for Bruin Bay Subdistrict. Aerial surveys of the district first documented pink salmon in freshwater in late July, considered relatively normal. As surveys continued into August, it quickly became clear that the pink salmon return to Bruin Bay River in Bruin Bay Subdistrict was exceptionally strong and would allow ample opportunity for harvest, while returns of this species to Sunday Creek in Rocky Cove Subdistrict and Brown's Peak Creek in Ursus Cove Subdistrict were both strong given the size of these smaller systems. By August 6, pink salmon escapements had already been met or exceeded at all three aforementioned systems, and as a result marker restrictions at the mouth of each system were rescinded by emergency order beginning August 9 (Table 8), allowing seiners to fish up to freshwater at each location on a continuous basis.

Despite continuous openings in the vicinity of major pink salmon systems, the lack of tender service to this remote district and difficult fishing conditions in Bruin Bay resulted in very little directed effort on Kamishak Bay pink salmon stocks in 2009. The cumulative Kamishak Bay District pink salmon harvest for the season totaled 133,300 fish (Table 5; Appendix A19), the majority of which came from Rocky Cove, while most of the remainder came as incidental catch during efforts directed at the chum salmon run to Bruin Bay River. Escapement at the three major monitored pink salmon systems in the district all exceeded their respective SEG ranges by substantial margins (Table 5; Appendix A25), as exemplified by the final estimated escapement of an astounding 1.1 million pink salmon for Bruin Bay River.

Chum Salmon

After reasonably good chum salmon runs to Kamishak Bay systems in eight of the last nine seasons, chum salmon runs in 2009 provided a number of harvest opportunity for seiners in this remote district. The final 2009 Kamishak Bay District harvest totaled 36,600 chum salmon (Table 6; Appendix A22), representing about 60% of the average catch in the past decade and the third lowest during that time period. Chum salmon escapements throughout the district were considered good, and all but one system achieved their SEG's.

Because annual chum salmon runs to McNeil River have not been strong for 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 observations of chum salmon on that first survey were small at 800 fish,

but estimates steadily increased with each survey over the next nine days, and by July 3 about 6,900 chum salmon were aerially estimated during a single survey. Escapement estimates at McNeil River then stabilized at a decreased level for the remainder of the month, but aerial surveys during this period were continuously plagued by poor observation conditions, due primarily to high water levels and extreme water turbidity. Because of poor weather, only one survey of McNeil River was conducted in August, resulting in the season's peak single aerial estimate of 7,300 chum salmon in freshwater. 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 25,000 chum salmon, falling just within the SEG range of 24,000 to 48,000 fish (Appendix A26).

Chum salmon runs to nearly all other Kamishak Bay systems were considered reasonably strong. In the southern portion of the district, which had been opened to fishing seven days per week at the beginning of the season, aerial surveys to document chum salmon escapement were attempted in August, but only one was considered marginally successful, hampered by very turbid water conditions. Final estimates indicated that the chum salmon run at Big Kamishak River fell within its SEG range, while that of Little Kamishak River failed to achieve the established SEG (Table 6; Appendix A26), but in both instances actual escapements were believed to be higher than the formal estimates due to the less than optimal observation conditions and low number of successful surveys. Seiners did not target chum salmon in nearby marine waters this season, thus no harvest was reported from southern Kamishak Bay subdistricts.

Central and northern Kamishak Bay chum salmon runs were considered good to excellent this season. At Bruin Bay River, chum salmon were first observed in freshwater in mid-July, peaking in early August when a single individual aerial survey estimate of 8,500 chum salmon was made on August 6. The final index of escapement estimate for Bruin Bay River was 10,100 chum salmon (Table 6, Appendix A26), falling near the upper end of the SEG range of 6,000 to 10,300 fish. Seiners only very briefly targeted the chum salmon run to this system in mid-July, resulting in a harvest of nearly 12,000 fish from the Bruin Bay Section of Bruin Bay Subdistrict (Table 6; Appendix A23).

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. Initial surveys in 2009 revealed a relatively small number of fish in fresh waters of Cottonwood Creek, but chum salmon escapement at Iniskin River was characterized as good for the early date with an estimate of over 2,400 fish made on July 30. Subsequent aerial surveys showed small increases to the former system in early August, but a noticeable "spike" in escapement was documented at Iniskin River on August 6, when over 14,000 chum salmon were estimated in freshwater. Chum salmon runs to streams at the head end of Ursus Cove seemed considerably weaker, although freshwater escapement looked sufficient to achieve SEG's. Because of the excellent chum salmon escapement at Iniskin River, markers protecting the mouth of that system were rescinded by emergency order beginning August 7 (Table 8), allowing seining up to freshwater seven days per week. Very limited seine fishing effort directed at chum salmon occurred in the central and northern portions of Kamishak Bay District during 2009, netting a cumulative total of about 24,700 chum salmon for Rocky Cove Subdistrict and only 1,500 chum salmon for Cottonwood Bay Subdistrict (Table 6). Final harvest figures for Kamishak Bay District cumulatively totaled 36,600 chum salmon for the season (Table 6;

Appendix A22). Escapement goals were met or exceeded at Big Kamishak River, McNeil River, Bruin Bay River, Ursus Cove systems, Cottonwood Creek, and Iniskin River (Appendix A26), while falling short at Little Kamishak River (primarily due to low estimates resulting from poor survey conditions and a low number of surveys).

Other Species

Chinook salmon harvests in Kamishak Bay District historically have been insignificant (Appendix A12) and no harvest occurred 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 2009, and no commercial harvest of coho salmon in Kamishak Bay District was reported (Tables 1 and 4).

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 20,500 sockeye salmon for the entire Outer District this year. The actual harvest totaled less than 10 fish (Table 3; Appendices A8 and A13), the second lowest harvest in the district since statehood.

Aerial surveys to assess the Delight and Desire Lake systems in East Nuka Bay began on June 18, but the first sockeye salmon of the season were observed in freshwater at Delight Lake lagoon on the second survey June 23. The runs at both systems appeared to be building slowly, and by June 30, approximately 2,200 sockeye salmon were aerially estimated in freshwater at Desire Lake, while just over 1,600 were observed at Delight Lake. Because both figures for the respective lakes were well short of the SEG ranges (8,800 to 15,200 sockeye salmon for Desire Lake; 5,950 to 12,550 for Delight Lake), no openings were announced as aerial surveys continued to assess the runs. Additionally, a department-operated counting weir at the outlet of Delight Lake became operational on July 2, but no fish were passed during its first week of operation.

An aerial survey of the two systems on July 6 was conducted under very good conditions, but escapement into freshwater at both lakes was still considered insufficient to allow commercial exploitation, with only 1,300 sockeye salmon estimated at Delight Lake and 3,900 sockeye salmon at Desire Lake. In addition, water levels at Delight Lake Creek appeared very low, and fish access to the lake was questionable. The counting weir at the outlet of Delight Lake had yet to pass a single fish by this time.

By July 13, the lack of precipitation caused both the inlet and outlet creeks of Delight Lake lagoon to completely dry up, essentially trapping an estimated 2,500 sockeye salmon in that water body. No increase in escapement at nearby Desire Lake was noted, thus commercial fishing in waters of East Nuka Bay was kept closed to protect fish for escapement. Rain finally began to fall on July 17, and as expected the quickly rising water levels caused sockeye salmon

in Delight Lake lagoon to begin ascending the creek. The department field crew registered 900 sockeye salmon past the weir on July 19 and 3,800 sockeye salmon on July 20, but torrential rains during that time, coupled with extreme winds, soon inundated the weir and rendered it completely inoperable. These conditions persisted for the remainder of July, and the weir never became operational again this season. The poor weather additionally precluded aerial surveys until July 24, but even then viewing conditions were considered marginal. Weather conditions failed to improve in early August, plaguing aerial surveys and keeping resultant escapement estimates at both lakes low.

No commercial seine openings were allowed in East Nuka Bay to target sockeye salmon this season. Aerial surveys to monitor the East Nuka Bay sockeye runs continued into late August, finally detecting a reasonably strong escapement into Desire Lake on August 17, estimated at 16,000 sockeye (peak estimate, used as final index of escapement; Table 3; Appendix A24). At nearby Delight Lake, the peak aerial survey estimate of the season was also made on August 17 when 12,700 sockeye were observed (Table 3; Appendix A24).

A third system of lakes known as Delusion (or Ecstasy or Delectable) Lakes in East Nuka Subdistrict has been monitored for nearly 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 the staff for the first time. Each year since then, aerial surveys have revealed sockeye salmon as well as pink salmon in the system. The peak 2009 aerial count of 1,300 sockeye salmon in freshwater (Table 3) was recorded during an aerial survey on August 17. 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

Good to excellent escapements during the 2007 parent year fostered optimism for significant pink salmon harvest opportunities in the Outer District in 2009, as reflected in the harvest projection of nearly 496,000 fish, which was almost 60% greater than the recent 10-year average of 313,000 pink salmon. The bulk of the harvestable surpluses were expected at Port Dick, with lesser amounts predicted at Rocky and Windy Bays. The actual catch of 853,000 pink salmon (Table 5; Appendix A19) exceeded the forecast by over 70% and was the second highest catch of this species in Outer District waters over the past 20 years.

For the seventh 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 low to 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 20 (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, a week before the initial opening, but observations were discouraging, with no pink salmon documented in any waters of Port Dick. Solid overcast skies and near-steady rain characterized the weather for the rest of July, canceling or hampering aerial surveys, and very few pink salmon were aerially observed in Port Dick during that time period. Seiners nonetheless began catching relatively good numbers of pink salmon during the first week of fishing, with a cumulative total of over 50,000 pink salmon landed by the end of that week. Through the first week of August, cumulative catches had risen to nearly 297,000 pink salmon from waters of Port Dick Subdistrict, but despite fishing closures totaling three days per week, freshwater escapement into Port Dick (head end) Creek was seriously deficient, as demonstrated by a department ground survey estimate of only 1,000 pink salmon in fresh water on August 6. A department aerial survey that same day estimated only 1,000 pink salmon in adjacent salt waters of Port Dick "flats". Since the documented escapement was only a small fraction of the SEG for Port Dick Creek (18,600 to 58,300 pink salmon), commercial seining in waters of Port Dick Subdistrict was closed by emergency order beginning August 7 (Table 8).

The fishing closure in Port Dick induced the desired effect, and pink salmon escapements into all systems increased over the next ten days. By August 17, aerial surveys showed that sufficient numbers of pink salmon were either already in freshwater, or were in salt waters protected by regulatory markers, to achieve SEG's in Port Dick systems. As a result, all waters of Port Dick Subdistrict east of 151° 17' W. longitude were opened to commercial salmon seining seven days per week by emergency order beginning August 19 (Table 8). All regulatory markers remained in place for this opening, except for those in Taylor Bay, which were rescinded for the opening because of excellent freshwater escapement of pink salmon to the small systems there. Waters west of 151° 17' W. longitude in Port Dick were kept closed to fishing due to an upcoming series of extreme low tides, which could easily force fish out from behind the protective regulatory markers on the head end "flats" and therefore make them vulnerable to harvest, in turn jeopardizing the SEG for Port Dick Creek.

Only modest effort resulted from the latter opening in Port Dick Subdistrict, with fishermen primarily targeting the pink salmon return to Island Creek in the North Section, but catches were nonetheless quite good. A total of about 222,000 pink salmon were harvested during the three days following the August 19 opening, after which time the fleet dispersed and no further harvest took place in Port Dick despite the continuous fishing time allowed. The cumulative harvest from Port Dick Subdistrict in 2009 totaled 518,500 pink salmon (Table 5; Appendix A20), which was over 80% greater than the preseason harvest projection of 281,300 pink salmon for these waters.

Elsewhere in the Outer District, relatively strong pink salmon runs also occurred at Rocky Bay and Windy Bay. Waters of Rocky Bay Subdistrict were opened to seining by emergency order on a conservative schedule of two 40-hour periods per week beginning August 3 (Table 8), after a department aerial survey estimated that freshwater escapement of pink salmon fell within (but

near the low end) of the SEG for Rocky River. Waters of Windy Bay Subdistrict were opened to seining by emergency order on August 11 on a five-days-per-week basis, while on the same day fishing in Rocky Bay Subdistrict was liberalized to seven days per week based on aerial escapement estimates (Table 8). Markers protecting the mouth of Rocky River were also rescinded at that time, allowing seine fishing up to freshwater at that location. Seine fishing in waters of Windy Bay Subdistrict was expanded by emergency order to seven days per week beginning August 14, while waters of Port Chatham Subdistrict were opened to commercial fishing on a continuous basis beginning August 15 (Table 8). Markers protecting the small streams in Port Chatham were also repealed on the latter date, allowing seine fishing up to freshwater there.

Seiners took advantage of the numerous Outer District openings to harvest 201,000 pink salmon from Windy Bay Subdistrict, 111,000 pink salmon from Rocky Bay Subdistrict, and 22,000 pink salmon from Port Chatham Subdistrict (Table 5; Appendix A20). When combined with the harvest from Port Dick, the cumulative Outer District pink salmon harvest totaled 853,000 fish this season (Table 5; Figure 10; Appendix A8), or almost three times the recent 10-year average harvest of 313,000 pink salmon.

Pink salmon escapements into monitored Outer District systems were considered good to excellent, with all achieving or exceeding their SEG's. The final escapement estimate of 41,700 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 pink salmon return to Island Creek in Port Dick was stronger, with a final estimate of escapement totaling 44,500 pink salmon (Table 5; Appendix A25), or nearly 60% greater than the upper end of the SEG range of 7,200–28,300. Interestingly, the eleven 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 good pink salmon escapements. At Windy Left Creek in Windy Bay Subdistrict, final escapement was estimated at 57,300 pink salmon, while the figure for Windy Right Creek was 15,000 pink salmon, both of which exceeded the SEG's for the respective systems (Table 5; Appendix A25).

The final escapement at Rocky River totaled an estimated 174,000 pink salmon, or over three times greater than the upper end of the SEG range for that system (Table 5; Appendix A25) despite the liberal seine openings there. Elsewhere in the Outer District, postseason analysis of ground survey data indicated an estimated cumulative escapement of 25,300 pink salmon into Port Chatham systems (Table 5; Appendix A25), slightly exceeding the SEG range. Desire Lake Creek, with an SEG range of 1,900 to 20,200 pink salmon, experienced a strong pink salmon return, with an escapement estimated at nearly 74,000 fish (Table 5; Appendix A25), but seining in East Nuka Subdistrict was kept closed this season to protect sockeye salmon for escapement purposes at Delight and Desire Lakes. At South Nuka Island Creek, escapement was estimated at 19,900 pink salmon, falling slightly above the upper end of the established SEG of 2,700 to 14,300 (Table 5; Appendix A25).

Chum Salmon

Chum salmon runs to the Outer District in 2009 were down from the previous season's exceptionally strong runs but escapement goals were nonetheless achieved at all 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 just over 35,000 chum salmon (Table 6; Appendix A22) was still the second highest in the Outer District in the past two decades and was over twice the recent 10-year average.

The majority of chum salmon harvest in the Outer District came from efforts in Port Dick, which were originally intended to target pink salmon. The final harvest of 33,500 chum salmon from Port Dick Subdistrict (Table 6) was the second highest harvest from these waters since 1988 (Appendix A23) and marked a second consecutive season of well above average catches there.

An escapement within or slightly above the established range was achieved at each of the four chum salmon systems with formal SEG's in the Outer District. Port Dick (head end) Creek experienced an escapement of approximately 5,600 chum salmon (Table 6), falling just above the SEG range of 1,900 to 4,500 chum salmon (Appendix A26). Chum salmon escapement at Island Creek fell slightly below the midpoint of its SEG range of 6,400 to 15,600 fish, with a final total of 9,300 fish (Table 6; Appendix A26). Rocky River escapement totaled 2,500 chum salmon, while chum escapement at Koyuktolik (Dogfish) Bay systems, with a combined SEG range of 3,300–9,200 chum salmon, was estimated at 4,400 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 2009, with a district-wide preseason projection totaling 180,000 fish. Actual harvest in the Eastern District totaled about 137,500 sockeye salmon (Table 3; Appendix A13), falling below the preseason forecast but nonetheless the highest catch on record for the district since statehood. In an effort to achieve the objectives contained in 5 AAC 21.373 *Trail Lakes Hatchery Sockeye Salmon Management Plan*, no common property seine openings were allowed in Resurrection Bay this season, and no openings to target 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 run ranging up to 183,000 fish assuming optimum survival of various smolt and fry releases. If the forecast proved true, the expected harvestable surplus was about 174,000 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 2009 Trail Lakes Hatchery Annual Management Plan.

Provisions of 5 AAC 21.373 *Trail Lakes Hatchery Sockeye Salmon Management Plan* were implemented for the first time in 2009. Because the plan dictated that all CIAA SHA's in Cook Inlet remain closed to common property fishing until the Trail Lakes Hatchery revenue goal was achieved, only hatchery fishing was allowed to occur 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 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 again utilized 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 25 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 sockeye salmon appeared in marine waters at the head of Resurrection Bay during the first two weeks of June.

The four seiners acting as hatchery harvest agents for CIAA in Resurrection Bay this season began to harvest fish the day after area waters opened, though catches were expectedly modest. As was the case for previous common property openings, all effort was concentrated at the head (north) end of Resurrection Bay. By the end of the first week's fishing period, the cumulative catches had risen to over 10,000 sockeye salmon. Catch rates continued to rise the following week, which historically constitutes the peak harvesting time of the season, and by June 4 catches had increased to nearly 40,000 sockeye salmon. Meanwhile, CIAA reported an escapement of 1,900 sockeye salmon through the Bear Lake weir, representing approximately 15% of the upper end of the desired inriver goal range. Both the catch and escapement were considered excellent and suggested that the preseason forecast might be accurate. Given the relatively low amount of saltwater fishing effort, the potential to allow significantly more sockeye salmon into fresh water than was necessary for escapement and broodstock requirements was a very real possibility. In an effort to slow the freshwater entry of sockeye salmon returning to Bear Lake, the weekly fishing period for hatchery agents in marine waters of Bear Lake SHA was expanded by emergency order to seven days per week beginning June 5 (Table 8).

Continuous hatchery fishing in marine waters continued for almost three more weeks, but by June 16 sockeye salmon catches were becoming less consistent and much more sporadic. With hatchery agents eyeing more lucrative fishing opportunities elsewhere, the last delivery of sockeye salmon from marine waters of Bear Lake SHA was made on June 25, bringing the cumulative hatchery harvest in saltwater to almost 105,000 fish for the season (Table 3).

At the Bear Creek weir, escapement proceeded rather rapidly this season, and through June 10 the cumulative count through the weir totaled nearly 7,900 sockeye salmon, or about 60% of the upper end of the desired inriver goal range. CIAA began to selectively harvest fish for cost recovery at the weir beginning June 11 and continued to steadily do so for the remainder of June and through the month of July, with peak catches coming between June 14 and June 29. The combined freshwater and saltwater harvests of Bear Lake fish cumulatively totaled approximately 137,500 sockeye salmon (Table 3), and inclusion of the freshwater escapement brought the total 2009 estimated Bear Lake run to nearly 151,000 sockeye salmon (Appendix A17), the largest run since the inception of the enhancement program at that location. 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 are unavailable. The value of the Bear Lake sockeye salmon hatchery harvest was estimated at $1.308 million, or approximately 87% of the 2009 Trail Lakes Hatchery revenue goal of $1.5 million.

At Aialik Lake in Aialik Subdistrict, aerial surveys to assess the sockeye run began on June 23, but sockeye salmon were not documented in freshwater until one week later when less than 50 fish were seen. Although escapement increased over the next two weeks, numbers remained below the established SEG and no commercial openings were announced to target this stock. Poor weather prevented aerial surveys that were planned for the latter part of July, and the season's peak single aerial estimate of escapement came on July 13 when 3,100 sockeye salmon were observed. This figure was used as the final index of escapement at Aialik Lake (Table 3; Appendix A24), falling short of the established SEG range of 3,700 to 8,000 sockeye salmon.

Pink Salmon

No harvestable surplus of pink salmon was forecasted in Eastern District waters for 2009, not surprising since no directed openings have been allowed in this district for many years and given the erratic production from the small systems in most recent years. Because of the expensive nature to adequately assess the small streams there, and also because no directed openings are expected, surveys of Resurrection Bay systems are of a low-priority nature. In 2009, ground surveys of Resurrection Bay streams were scheduled but were subsequently cancelled for the third consecutive season due to poor weather and conflicts with other, higher priority surveys. 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 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 due to poor weather and conflicts with other, higher priority surveys, 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 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 2009, a total of just under 1,600 coho salmon were entered into the Seward Silver Salmon Derby (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 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, all coho caught at the Bear Creek weir this year were donated to various individuals,

many of whom were dog mushers. Total hatchery harvest from the Bear Creek weir was approximately 140 coho salmon (Tables 1 and 4), comprising only about 5% of the entire LCI coho catch this season. Approximately 570 coho salmon were collected for hatchery broodstock, while an additional 360 fish were allowed into Bear Lake as escapement (Table 4). Total commercial catch in the entire Eastern District amounted to just over 1,700 coho salmon (Table 4; Appendix A18), falling far short of the recent 10-year average of 4,600 fish.

2009 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 and/or PGHC provided an estimated 13% (176,500 salmon) of the total 2009 LCI commercial harvest of 1.35 million fish. The CIAA-operated sockeye salmon enhancement projects at Leisure/Hazel, Kirschner, and Bear Lakes, and Tutka Bay Lagoon, produced approximately 60% (168,000 fish) of the total LCI sockeye harvest of 280,300 fish in 2009. PGHC sockeye salmon enhancement efforts contributed an additional 8,300 sockeye salmon (3%) to LCI commercial harvests. For the second year in a row, the entire commercial pink salmon catch in 2009 was a result of only natural production.

Using average weights per fish and average prices per pound in LCI, salmon produced by CIAA and PGHC contributed an estimated 49% ($1.64 million) to the $3.33 million total value of the 2009 LCI commercial salmon harvest. Since LCI's two main hatcheries utilized all fish returning to their respective 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 Bay 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 salmon 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 Bay Lagoon 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.

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 run 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. In an effort 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 allow 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 second year of adult sockeye salmon runs as a result of the Tutka Lagoon remote releases occurred in 2009. CIAA harvested approximately 11,600 sockeye salmon (Table 3) for hatchery cost recovery purposes in waters of the lagoon, while collecting an additional 3,100 sockeye salmon in pursuit of the first full-scale remote egg take at this site. Despite a mechanical pump failure that caused 100% mortality of adults, a total of 136 fish were successfully utilized for egg collection and fertilization. Department ground survey personnel estimated that just over 50 sockeye salmon remained unharvested in Tutka Creek at the conclusion of the 2009 field efforts. The combined figures produced an estimated run to Tutka Lagoon totaling 14,700 sockeye salmon. In 2009, CIAA released an estimated 301,000 sockeye salmon smolts from Tutka Lagoon as part of this program (Appendix A32). While the originally planned full-scale egg take was unsuccessful, CIAA was able to collect approximately 140,000 eggs in 2009.

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, runs to Leisure and Hazel Lakes cannot be separately identified through sampling within the commercial catches and are therefore presented as a combined total. Due to severely reduced stocking numbers in 2006, the run to this area in 2009 was expected to be poor. The cumulative total sockeye salmon run to Leisure and Hazel lakes in 2009 was estimated at just under 6,000 fish (Figure 9; Appendix A15), easily the lowest figure since fish returning to

those two sites have been tallied together beginning in 1991. The cumulative estimated commercial harvest of 205 fish produced by the two projects comprised less than 1% of the Southern District sockeye salmon harvest. The total all-gear-types Southern District sockeye salmon harvest of 58,300 fish was the sixth consecutive below average harvest over the past decade (Appendix A6).

Leisure Lake was stocked with 1.23 million sockeye salmon fry in 2009, about 23% fewer than the recent 10-year average of 1.59 million, while Hazel Lake was stocked with 1.19 million sockeye salmon fry, or slightly more than 32% greater than the recent average of 901,000 (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 are expected to continue through 2010, after which time the 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.

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 runs declined to their lowest recorded levels in the last half of the 1980's decade. Sockeye escapement estimates between 1985 and 1993 ranged from 2,500 to 8,900 fish; all but one of 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 runs resulted in a very restrictive management strategy for this area, with commercial, sport, and subsistence fisheries closed during the sockeye 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.

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 largest run 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 new 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 2009 season.

Unfortunately, the formal preseason forecast for sockeye salmon returning to the English Bay Lakes system was only 2,600 fish for 2009. However, it should be noted that actual runs in recent seasons were significantly greater than the preseason forecasts. 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 to meet their needs. The poor run forecast this year was once again due to low overall smolt emigration numbers. The prevailing hypothesis for the discrepancy between consistently low preseason forecasts and subsequently greater runs suggests that outmigrating smolt are being "missed" by the current conventional counting methods and/or the timing of those methods. An egg removal schedule for English Bay Lakes was included in the 2009 Port Graham Hatchery (PGH) Annual Management Plan as a contingency to allow a limited egg take should the return be stronger than forecast.

The CRRC/NSEP enumeration weir was installed and became operational on May 12, but the first adult fish passage was not documented until May 29. Fish passage remained very low over the next 11 days, with daily counts ranging from 0 to 7. Counts began to increase on June 10 and 11, when 85 and 59 sockeye salmon were passed, but didn't start showing consistently substantial escapements until June 15. Daily counts peaked on June 28 when 2,700 sockeye salmon were tallied, bringing the cumulative escapement total to nearly 6,500 sockeye salmon and falling within the SEG range of 6,000–13,500 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 the morning of June 30 (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 June 30 the cumulative weir counts totaled 9,100 sockeye salmon. Additionally, on-grounds observation by NSEP personnel indicated good numbers of sockeye salmon present in saltwaters of Port Graham Subdistrict. Since the cumulative number of sockeye salmon escapement approached the midpoint of the desired inriver goal, additional sockeye salmon could be made available for harvest without jeopardizing escapement requirements. As a result, commercial set gillnet fishing in waters of

Port Graham Subdistrict was opened by emergency order beginning July 2 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 for the rest of the regulatory season in 2009. Commercial set gillnet harvest in the two sections of Port Graham Subdistrict totaled over 9,500 sockeye salmon (Table 3), considered quite good given the late start in this fishery. The 2009 subsistence harvest by residents of Port Graham, annually compiled by the department's Division of Subsistence, was estimated at nearly 2,000 sockeye salmon (Appendix A29), while estimates for the village of Nanwalek showed a harvest of around 1,500 sockeye salmon (Appendix A30). Because of the close geographic proximity of the sockeye salmon runs to English Bay Lakes and the Port Graham Hatchery saltwater release project, and the lack of a mark/recapture program, definitive proportions contributed by each source to the commercial and/or subsistence harvests cannot be determined. However, it is logical to assume that both sources contributed to the respective catches in each fishery.

The English Bay River counting weir remained in operation through July 22, tallying a cumulative escapement figure of 18,400 sockeye salmon for the season (Table 3; Appendix A24), which was slightly greater than the upper end of the desired inriver goal range. Because the sockeye salmon run was stronger than forecasted and the escapement was sufficient, NSEP was authorized to collect a full permitted complement of broodstock from the English Bay Lakes system as outlined in the hatchery's Annual Management Plan. A total of 256 sockeye salmon were harvested for broodstock (including 16 fish not utilized), resulting in the collection of 307,000 eggs. Under contract to CIAA, eggs collected in 2009 from English Bay Lakes sockeye salmon broodstock were incubated, and fry subsequently reared, at Trail Lakes Hatchery near Seward. No juvenile sockeye salmon were stocked into English Bay Lakes in 2009 (Appendix A32).

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 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 accelerated growth ("zero check") smolts have occurred, 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 run size 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, numbers of returning fish 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 run totaled a disappointing 36,700 sockeye (Appendix A17). In 2008, over 103,000 sockeye salmon returned to Bear Lake, the highest total since the inception of the enhancement program (Appendix A17).

It should be noted that figures cited here do not include any recreational harvest numbers, estimates for which are unavailable.

Management objectives in the commercial salmon fishery in Resurrection Bay during 2009 were 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 between 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 the new 5 AAC 21.373 *Trail Lakes Hatchery Sockeye Salmon Management Plan*, first implemented beginning with the 2009 season. This regulatory plan directs the department to manage 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.

The harvestable surplus of sockeye salmon bound for Bear Lake was predicted to total nearly 174,000 fish in 2009. The actual commercial harvest, which was entirely utilized for hatchery cost recovery based on the new management objectives, totaled just over 137,000 sockeye salmon for the season (Table 3), the highest total on record for waters of Resurrection Bay since statehood (Appendix A14). The final cumulative Bear Lake escapement, which included 3,300 fish collected for broodstock, was 13,300 sockeye salmon (Table 3; Appendix A24). Combining these figures, the 2009 Bear Lake total run was estimated at nearly 151,000 sockeye salmon (Appendix A17), representing about 78% of the preseason forecasted total run of approximately 192,500 fish. Nonetheless, the 2009 run was the largest since the inception of the Bear Lake enhancement project. Because the cost recovery goal for CIAA was not achieved, no common property openings were allowed in Resurrection Bay in 2009.

A cumulative total of approximately 2.5 million sockeye salmon fry were released into Bear Lake/Creek during 2009 (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 5.0 million sockeye salmon eggs were collected for incubation over the 2009–2010 winter at Trail Lakes Hatchery in Moose Pass. The newly implemented release tactics for Bear Lake and Resurrection Bay are expected to improve survival rates and increase run sizes 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 if necessary. 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 stock. 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 three seasons, while the corporation has simultaneously encountered 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 2008, making 2009 devoid of hatchery-produced pink salmon returns in Lower Cook Inlet. The future of the pink salmon program at Port Graham Hatchery remains in doubt 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 underway 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 Sockeye Salmon Rehabilitation**" section). Prior to 1993, eggs from this collection site were incubated at Big Lake Hatchery near Wasilla. 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.

In 2003, PGH obtained a permit to collect sockeye salmon eggs from nearby English Bay Lakes for the express purpose of developing an adult run to the hatchery facility. Returning sockeye salmon 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 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. The 2009 preseason forecast for sockeye salmon returning to PGH as the result of their recently established saltwater release program was 12,500 to 34,600 fish (midpoint 23,600). PGH officials expected to utilize up to 1,450 of the returning sockeye salmon as broodstock to continue the program, while the remainder was to be harvested and sold for cost recovery and value added market development. Informal reports from PGH personnel on July 6 suggested that sockeye numbers were building near the hatchery facility. The department subsequently designated a SHA around the PGH facility, opening it to continuous hatchery fishing by emergency order on July 7 (Table 8).

Hatchery agents began their efforts to harvest sockeye salmon on July 28 and continued through July 31. Catches over that time totaled approximately 8,300 sockeye (Table 3), falling well short of the preseason forecast. As previously described, adult sockeye salmon resulting from the PGH saltwater release project also likely contributed to both subsistence and commercial harvests in area waters, but estimates of these contributions could not be definitively determined. Although eggs were collected from English Bay Lakes this season by CIAA, under contract to PGH, it is unclear whether any of the resultant juveniles will be utilized by PGH in their saltwater release program. However, 112,000 sockeye juveniles, reared under contract by CIAA at their Trail Lakes Hatchery facility, were released as smolts from PGH in the early summer of 2009 (Appendix A32).

2010 COMMERCIAL SALMON FISHERY OUTLOOK

SOCKEYE SALMON

Commercial sockeye salmon harvests in LCI during 2010 could approach 411,000 fish, which is over 25% greater than the recent 10-year average catch of 323,000. Nearly 80% of the total sockeye salmon harvest is expected to result from continuing enhancement and lake stocking projects in LCI. The 2010 sockeye salmon run to Bear Lake (18th year of enhanced runs), the majority of which is a direct result of the enhancement project there, is expected to produce a harvest of around 175,000 fish after accounting for broodstock and escapement requirements. The new management plan adopted by the Alaska Board of Fisheries in March 2009 and implemented for the first time that summer specifies that all CIAA SHA's in LCI be kept closed to common property fishing and open only to CIAA harvest until the Trail Lakes Hatchery revenue goal is achieved or its achievement can be projected. During the 2009 season, this effectively precluded any targeted common property fishing on the Bear Lake sockeye salmon run or to any other CIAA-produced sockeye salmon in LCI. The impact of the plan in 2010 will not be known until CIAA releases its revenue goal for the upcoming season.

Because of unexpectedly poor production in recent seasons, forecasted runs to enhancement sites at Leisure and Hazel Lakes in the Southern District during 2010 are expected to be below average once again, with a harvest projection of about 44,300 sockeye salmon anticipated at Leisure Lake/China Poot Bay and an additional 27,000 sockeye salmon expected at Hazel Lake/Neptune Bay. Kirschner Lake in the Kamishak Bay District is expected to produce a run totaling approximately 11,400 sockeye salmon in 2010. This projection is 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 2010.

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 2010 even though no formal forecast was generated. It should be noted that the adult sockeye salmon runs to that site over the past seven seasons, all entirely the result of natural production, were unexpectedly 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 2010.

No formal preseason forecast for sockeye salmon returning to English Bay Lakes in the Southern District was prepared for 2010, due to a lack of sufficient information. In keeping with recent

years' precautionary management strategies intended to protect fish for escapement, very restrictive management measures, including the potential for total closures, will likely be implemented in both the commercial and subsistence set gillnet fisheries of Port Graham Subdistrict 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 four seasons was stronger than initially anticipated and did allow for limited fishery openings. At nearby Port Graham Hatchery, an estimated 22,000 sockeye salmon are expected back as a result of the intermittent saltwater release project conducted by that facility, but PGHC has indicated that all fish will likely be necessary to satisfy hatchery requirements 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 92,000 fish to commercial catches in 2010. 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 most systems. The Southern District is expected to contribute the most to the harvest of non-enhanced stocks, while additional catches could come from the East Nuka Bay systems of Delight and Desire Lakes in the Outer District, Aialik Lake in the Eastern District, and Mikfik and/or Chenik Lakes in the Kamishak Bay District.

PINK SALMON

Harvest of pink salmon in LCI during 2010 is expected to total 567,000 fish, with natural production expected to provide the entire total for just the third time in the past 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 2008, contributing to the harvest projection of 567,000 pink salmon throughout the entire LCI management area (Otis *In prep* a). The bulk of the 2010 predicted surplus is expected to occur at Port Dick in the Outer District, with lesser contributions forecasted for Windy and Rocky Bays. In Kamishak Bay District, harvest expectations for Bruin Bay and Rocky and Ursus Coves are modest at best, while equally moderate surpluses in the Southern District could be available at Humpy Creek and Seldovia Bay in 2010. The pink salmon forecast, however, must be viewed with caution based on the recent history of erratic tender service, sometimes weak markets, and a lack of consistently active buyers, and it therefore remains questionable whether the harvest forecast of naturally produced pink salmon will be realized in 2010.

CHUM SALMON

Based solely on average harvests after 1988, the total LCI commercial chum salmon catch is projected to reach nearly 47,000 fish during 2010. Annual chum salmon runs were relatively strong between 2000 and 2006, and again in 2008 and 2009, however, resulting in commercial catches that exceeded the 2010 forecast figure during all but three of the past ten seasons. This suggests that actual harvests during 2010 could be greater than the projection, and based on long-term historical patterns, the greatest 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 1,200 Chinook and 13,100 coho salmon can be expected to contribute to LCI commercial harvests in 2010.

The following table shows the projected harvest figures by species in the Lower Cook Inlet management area during 2010:

Species	Harvests of Natural Runs	Harvests of Enhanced Runs	Total Harvest
Chinook	[a]	[a]	1,200[a]
Sockeye	92,200[b]	318,900[c]	411,100
Coho	[a]	[a]	13,100[a]
Pink	567,000	0	997,800
Chum	46,800[b]	0	46,800
Total	**706,000**	**318,900**	**1,039,200**

[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.

2009 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.* In 1998, the BOF reduced the regulatory guideline harvest range (GHR) from a former level of 2,500 to 3,500 coho salmon to a new range of 1,000 to 2,000 coho after hearing the department staff's concerns regarding the harvest of wild stocks of 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 season remained essentially unchanged for the 2009 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, however, this year the 16th fell on a Sunday (normal closed period). Therefore, the 2009 fishery began on the next regularly scheduled opening at 6:00 a.m. Monday, August 17. Prior to 1991, little department management interaction occurred and the fishery often proceeded until the regulatory closing date of September 15, regardless of the harvest level. Between 1991 and 2008, years of intensive management for the GHR, fishing time allowed in this fishery ranged from 72 to 216 hours.

In 2009, only 10 coho salmon had been 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 17, 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 two 48-hour periods indicated a catch of only 412 coho salmon harvested by 56 (41%) of 138 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 run and would prompt a fishery closure in order to protect natural stocks for escapement purposes. However, a department aerial survey of a prominent coho salmon system at the head of Kachemak Bay on August 26 showed excellent numbers of fish in freshwater, alleviating fears of insufficient escapement, and the personal use fishery remained open.

Cumulative catch information collected through September 10 showed a total of only 512 coho salmon reported by 95 (66%) of the 144 permit holders. For the first time since intensive management began in 1991, the fishery was allowed to remain open up to the regulatory closing date of September 15th. In order to assure compliance with the closure and to make gear retrieval easier, the 2009 Southern District personal use coho salmon gillnet fishery was closed by emergency order at 7:00 p.m. Tuesday, September 15th (Table 8), which coincided with a low tide, daylight hours, and a time after the end of a normal workday for many individuals.

A total of 145 permits were issued for the 2009 fishery (Appendix A27), while 142 permit holders (98%) phoned in their catches or returned their permits. Of the total number issued, 90 permit holders (63%) actively fished, 52 (37%) did not fish at all, and the remaining 3 permit

holders (2%) did not report or return their permit. Based on returned permits and voluntary catch reports, the harvest estimate was 646 coho salmon, 101 pink salmon, 273 sockeye salmon, 9 Chinook salmon, and 4 chum salmon (Appendix A27). The 2009 coho salmon total represents the lowest catch recorded in the personal use gillnet fishery since 1974.

The coho salmon harvest total this season failed to achieve the 1,000 to 2,000 fish GHR for only the second time since that range was implemented in 1999. Similar to the last two years, the area from Fritz Creek to Swift Creek, located along the north shore of Kachemak Bay, produced the highest percentage of coho harvest (48%) and received a high proportion of effort (36%). 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 6% of the total coho salmon harvest.

At 421 hours, fishing time this season was the longest on record since 1990, before intensive management of this fishery began. While the number of permits issued this season (145) was only one permit less than the highest recorded since 2001, it still fell significantly below the 1990–2008 average of 230 permits. The number of actively fished permits (90) was slightly fewer than the average of 94 over the past 10 years (Appendix A27).

In an effort to provide additional sport fishing opportunities and continuity with the earlier run of Chinook salmon to the Nick Dudiak Fishing Lagoon on the Homer Spit, the Division of Sport Fish has stocked coho salmon with both early (Ship Creek brood) and late (Bear Lake brood) run timing characteristics since 2001. 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 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 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 this season, will likely be influenced by the strength of each season's coho salmon run 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 Homer ADF&G office regarding infractions. This year AWT officers were on site at the Homer Spit for the beginning of the fishery, and as is usually the case, the presence of these uniformed officers generated relatively expedient voluntary compliance, thus 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 infer that relatively small numbers of wild stock fish were presumably taken in the gillnet fishery. In 2009, 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 runs to Lower Cook Inlet for 2009, as indicated by the incidental catch in the commercial fishery, would normally be considered poor based on the catch of just 2,700 fish, the lowest since 1977. Similarly, coho salmon catches in the sport fishery at the Nick Dudiak fishing lagoon were considered extremely poor in 2009, also suggesting a weak run to that location. However, an aerial survey of Clearwater Creek, the major natural-run coho salmon index stream at the head of Kachemak Bay, flown on August 26, documented an estimated 1,400 coho salmon (Table 4). When compared to August surveys from previous years, this escapement was considered good to excellent. An additional survey conducted on September 15 documented 525 coho salmon in the viewable area, indicating that the bulk of the natural coho salmon run at Clearwater Creek may have been slightly early this season.

The 2009 personal use catch of 9 Chinook salmon (Appendix A27) was considerably lower than the long term average (1969–2008) of 46 fish. The extremely low harvest of this species in the personal use fishery over the past 7 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.

Though 2009 coho salmon harvest numbers were below average, catches in the 2010 personal use fishery are expected to be comparable to the previous 10-year period, 1999–2008. However, the length of open fishing time necessary to achieve a harvest within the GHR is difficult to forecast. The total amount of fishing time allowed in recent years has varied considerably, ranging from 72 to 421 hours. Additionally, the overlapping run timing of the two stocked coho salmon runs on the Homer Spit could hypothetically serve to reduce the length of time needed to achieve a harvest within the GHR. This in turn would provide further protection to the wild stocks of coho salmon bound primarily for the Fox River drainage at the head of Kachemak Bay, which generally exhibit a slightly later run timing. However, low participation and effort levels in, and thus a longer duration of, the 2010 fishery could easily mitigate the previous statement. 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 2010. Based on experience gained during the past 19 years' fisheries, and especially that of the past 11 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 2009 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 5). 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 pink salmon returning to Port Graham and English Bay Rivers later in the summer. A newer saltwater release project at Port Graham Hatchery likely provides added sockeye salmon harvest opportunities. Some additional fishing also occurs in Koyuktolik ("Dogfish") Bay, located about seven nautical miles south of English Bay, targeting non-local stocks of Chinook salmon as well as local stocks of chum salmon. Despite being open to fishing for each of the past eight seasons, waters of Port Chatham and Windy Bay Subdistricts have not experienced any known effort but do provide additional 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 production from enhancement.

With fewer than 2,600 adult sockeye salmon formally forecasted to return to English Bay Lakes in 2009, and a desired inriver return range of 7,500 to 15,000 fish, 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. 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 promote escapement of returning adults while still providing limited opportunity to subsistence users. Early weir counts from English Bay River suggested a weak run, but as the run progressed towards the middle of June, it appeared to be stronger than originally predicted. Near the end of June, increased counts prompted the staff to project that an escapement within the desired inriver return range would be achieved. As a result, subsistence salmon set gillnet fishing in waters of Port Graham Subdistrict was liberalized by emergency order to the regular weekly fishing schedule starting June 30 (Table 8). Because of the increased harvesting power of the commercial set gillnet gear group, that fishery was kept closed until July 2, when staff determined that the mid to upper end of the desired inriver range would most likely be attained.

The transition to a new resident village subsistence coordinator in 2009 resulted in incomplete data for end-of-year harvest and effort summaries in the Port Graham/Nanwalek subsistence fishery. The preliminary data set compiled by the department's Division of Subsistence indicated that the all-species salmon harvest for the village residents of Port Graham cumulatively totaled just under 2,300 fish in 2009, the second highest figure in the past 10 years (Appendix A29). For the village of Nanwalek, the reported total all-species salmon catch of 2,900 fish is only about

three-fourths of the 1989–2008 average of 4,300 and was considerably less than the record high of 13,400 fish in 2002 (Appendix A30). Sockeye salmon comprised the bulk of this year's subsistence catch, in Port Graham at 88% of the salmon harvest (2,000 fish) and in Nanwalek at 53% of the salmon catch (1,500 fish). 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 over 18,400 fish past the weir (Table 3; Appendix A24), a figure that includes the collection of 250 fish for hatchery broodstock, slightly exceeding the desired inriver return range of 7,000–15,000. With a sockeye salmon run stronger than forecasted and a sufficient escapement achieved in 2009, NSEP was authorized to collect a full permitted complement of broodstock from the English Bay Lakes system as outlined in Port Graham Hatchery's Annual Management Plan. A total of 256 sockeye salmon were gathered for broodstock from lake escapement, including 16 fish not utilized, resulting in the collection of 307,000 eggs.

Because of sub-par salmon runs 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 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 2009 was the fourteenth 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 include 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 include 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 (sometimes 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 2009, a total of 6 permits were issued for the early season, while 12 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, five of the six permits were returned to the department as required by regulation, and catches were determined from records on each permit. For the early season, one of six permit holders (17%) actively fished, four (67%) did not fish, and one permit holder (17%) failed to return his/her permit (Appendix A31). The reported all-species catch for the early season totaled only 14 Chinook salmon. In the late season, 9 of the 12 permits were returned, with eight permits (67%) actively fished, one (8%) not fished, and three permit holders (25%) failing to return his/her permits. The reported harvest for the late season totaled 78 sockeye, 10 coho, 44 pink, and 14 chum salmon, for a combined total of 146 salmon (Appendix A31).

The 2009 early season Seldovia subsistence harvest of 14 Chinook salmon was well below the average catch of 77 fish since the fishery was established (Appendix A31). Uncharacteristically, no other salmon species were reported caught during the early season. The low Chinook salmon and absent early season sockeye salmon catches in 2009 are likely due in part to the low number of participants who actually fished (one), the lowest number documented during the early season since establishment of the fishery. The record catch for both species in the Seldovia subsistence fishery occurred in 2000 when 189 Chinook and 249 sockeye salmon were harvested (Appendix A31). Figures in 2009 showed a shift in both permits issued and fished from the early to the late season. Correspondence with fishermen in Seldovia indicated that most waited for the late season due to a perception of poor salmon runs during the early season.

The harvest outlook for the 2010 Seldovia early season subsistence fishery is difficult to predict given the low participation in the previous four fisheries. If the number of actively fishing permit holders increases next year to pre-2005 levels, then harvests could increase commensurately.

2009 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 2009 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 6). 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 12; 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.

2009 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).

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 2009 Season Summary

Although aerial survey coverage to assess the Kamishak Bay herring stock in 2009 was excellent, overall observation conditions were only considered fair due to periodic high turbidity. A total of 14 surveys were completed in the Kamishak Bay District between April 16 and June 9, with several three- to six-day "gaps" in coverage, or periods during which no surveys were flown due to poor weather. Based on historical observations, the arrival of herring on the grounds in 2009 was considerably later than normal in the district for the fifth consecutive season. Fish were first documented during a survey on May 5 when a cumulative total of 685 st was estimated throughout the district. The highest daily biomass estimation during the seasonal surveying period was made on May 16, with a cumulative estimate of 2,273 st. However, during post season analysis, department staff elected to exclude 1,850 st from that date's estimate because: 1) the observed 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. Notwithstanding this particular day's estimate, the highest daily biomass figure came on May 11, with a cumulative estimate of 944 st observed primarily in Bruin Bay, Kamishak Bay, and Iniskin Bay Subdistricts. Additional but smaller contributions that day were estimated at Douglas Reef, Chenik, and Ursus Cove Subdistricts.

Twenty sightings of spawning activity occurred during surveillance flights in 2009. Department staff observed spawning activity on May 11 (three sightings totaling 1.5 miles of spawn), May 16 (six sightings for 0.3 mi), May 18 (four sightings for 0.4 mi), May 21 (two sightings for 0.5 mi), and May 29 (five sightings for 0.5 mi), resulting in a grand total of 3.2 miles of observed spawn, the highest level since 1999. Though encouraging, correlation between documented spawning and herring abundance in Kamishak Bay has traditionally not been attempted, due to the often sporadic schedule of surveillance flights and survey conditions.

Coverage in 2009 resulted in a cumulative total of 7,061 st of herring observed by department surveyors in the Kamishak Bay District. However, for the previously mentioned reasons, 1,850 st were removed from this total. Additionally, 3,050 st were considered repeat sightings and were also subsequently eliminated from the total. Consequently, the 2009 aerial survey biomass estimate of 2,837 st (Table 10) continued a lengthy trend of sub-threshold totals documented by aerial assessment.

One hypothesis for the lack of herring recruitment in Kamishak Bay originates from 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. Finally, up to 55% 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* in 2009 was considerably less (< 3%), 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.

Reasonably good weather contributed to successful coverage by the department's two spring vessel charters to collect age composition samples during the periods May 6-12 and May 20-25. The early sampling period 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 run in 2009. During the 13 days spent in the district, the contracted vessel collected over 2,300 fish for age, weight, and length (AWL) analysis. Unfortunately, though numbers were slight increases over previous years, information and samples collected from the two charters corroborated the overall low abundance of the population observed by department aerial surveyors, while additionally confirming the low recruitment of new fish.

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 nine years. The ASA model estimated the total 2009 run at just over 2,800 st (Table 10; Figure 12; Appendix B4), the highest figure since 2002 but far lower than the 1989–2008 average of 7,400 st. Recruitment into the spawning population did occur in 2009, but the magnitude of this recruitment was still relatively low. Postseason data analysis of test fishing samples indicate that the overall run this season was dominated by fish ages 3 through 6 at 13.1%, 20.0%, 28.2% and 12.9% of the biomass by weight, respectively (Table 10; Figure 13).

Southern District 2009 Season Summary

A total of nine aerial assessment surveys for herring in the Southern District were flown between April 27 and May 29 in 2009, all conducted under fair to good conditions. The number of surveys conducted this season was higher than the annual average of six flights made during the past five seasons. The 2009 run biomass, estimated as the sum of all daily biomass estimates, totaled 1,242 st, which was below the recent 5-year average of 1,331 st but above the previous year's sum of only 927 st. Nonetheless, the observed total in 2009 continued to follow an overall

pattern of low herring abundances in the Southern District during the past three decades. The peak 2009 individual biomass figure occurred on the sixth survey of the season, May 18, when 728 st were estimated. Peak survey totals in areas where herring historically have been observed were as follows: Mallard Bay, 323 st on May 4; Glacier Spit/Halibut Cove, 172 st on May 21; west side Homer Spit, no herring observed; and east side of the Homer Spit and in Mud Bay, 167 st on May 7. 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 2009 season.

Outer/Eastern Districts 2009 Season Summary

As in previous recent seasons, no herring assessment occurred in the Outer and Eastern Districts during 2009. 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.

2010 HERRING SEASON OUTLOOK

Kamishak Bay District

The forecasted herring biomass generated by the ASA model for 2010 in the Kamishak Bay District is 2,963 st (Table 10; Figure 12; Otis *In prep* b). This total falls below the KBDHMP regulatory threshold of 6,000 st for which a commercial harvest can be considered. Additionally, nearly one-half of the predicted run by weight in 2010 should be comprised of fish age 5 and younger (Table 10; Figure 13). 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 Kamishak Bay District will remain closed for the 2010 season. The resource, and hence the commercial fishery, is best served by protecting the remaining spawning population in order to rebuild it to a harvestable level.

Without a commercial fishery in 2010, the department's ability to collect age composition information will be greatly reduced. The department expects to once again obtain samples using a chartered commercial seine vessel throughout the duration of the 2010 run, with sufficient funding expected for both an early and a late season charter. The department also intends to conduct comprehensive aerial surveys throughout the spawning season, from mid-April to early June, as conditions permit.

Other Districts

Based on the persistent trend of low herring abundance in the Southern District and a historical preponderance of juvenile herring in the Outer and Eastern Districts, 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 2010. Monitoring of the Southern District herring stock will occur as in the past through the use of aerial surveys, possibly in conjunction with test fish sampling conducted on an opportunistic basis.

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. 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 (Otis and Heintz 2003) 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 to 2009. 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, a high degree of temporal stability was not observed in

fatty acid composition 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).

ALASKA BOARD OF FISHERIES PETITION

REGULATORY ACTIONS

The winter of 2008/2009 was not within the BOF's normal 3-year cycle for considering changes to LCI fisheries. CIAA, however, submitted a petition to the BOF to repeal all provisions of **5** AAC 21.375 *Bear Lake Management Plan*, and in its place adopt a new management plan for CIAA's Trail Lakes Hatchery. The BOF accepted the petition for consideration and subsequently transformed it into a formal proposal, which was debated at their March 2009 meeting in Anchorage.

The intent of the CIAA petition was to preclude common property fishing within any LCI SHA involving Trail Lakes Hatchery sockeye salmon until the facility's corporate revenue goal was achieved or its achievement could be projected. Testimony presented by CIAA to the BOF painted a bleak financial picture for the organization, and failure to attain their entire revenue goal during each of the next two seasons threatened the continuation of its longtime enhancement activities. After careful deliberation, the BOF ultimately chose to approve the measures spelled out in CIAA's proposal, eliminating the Bear Lake Management Plan and in its place adopting 5 AAC 21.373 *Trail Lakes Hatchery Sockeye Salmon Management Plan.* A number of provisions from this plan were lifted directly from the former Bear Lake plan for inclusion in the new plan. The most significant additional provisions of the newly adopted plan directed the department to primarily manage SHA's in LCI to achieve the CIAA revenue and broodstock goals for Trail Lakes Hatchery, and to keep these areas closed to common property commercial fishing until the revenue and broodstock goals were attained or their attainment could be projected. One other new provision explicitly stated that no restrictions could be imposed on non-commercial fisheries in pursuit of the management plan's objectives.

Although implementation of the plan began with the 2009 fishing season, the BOF intentionally chose to place a "sunset clause" of May 2011 on the new Trail Lakes Hatchery management plan. In effect, this ensured that all provisions of the plan would be eliminated from regulation before the 2011 fishing season, unless the plan was reconsidered and subsequently adopted prior to the termination date. Those interested in either keeping this plan in regulation, or modifying the provisions of the plan, must submit a formal proposal to the BOF for consideration at their regularly scheduled meeting in November 2010. The Trail Lakes Hatchery sockeye salmon management plan will remain in effect with its current provisions for the upcoming 2010 commercial fishing season.

ACKNOWLEDGEMENTS

2009 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 2009 season. Appreciation is extended to all personnel for a successful program during 2009.

Permanent Employees during the 2009 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
Don Johenning	Fish & Wildlife Technician II
Josh Keller	Boat Officer I
Ken Walters	Vessel Technician II
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, 2009.

District Harvest Type Gear Type	Chinook	Sockeye	Coho	Pink	Chum	Total
Southern						
Commercial						
Set gillnet	83	38,220	968	2,136	2,274	43,681
Purse seine	0	0	0	0	0	0
Hatchery						
Purse seine	0	20,081	1	876	0	20,958
Total	***83***	***58,301***	***969***	***3,012***	***2,274***	***64,639***
Outer						
Commercial						
Purse seine	***1***	***8***	***9***	***853,037***	***35,126***	***888,181***
Eastern						
Commercial:						
Purse seine	0	0	0	0	0	0
Hatchery:						
Purse seine	0	104,775	0	0	0	104,775
Weir	0	32,694	138	0	0	32,832
Derby[a]						
Hook & Line			1,570			1,570
Total	***0***	***137,469***	***1,708***	***0***	***0***	***139,177***
Kamishak Bay						
Commercial						
Purse seine	0	65,763	0	132,414	36,574	234,751
Hatchery						
Purse seine	0	18,771	0	884	0	19,655
Total	***0***	***84,534***	***0***	***133,298***	***36,574***	***254,406***
LCI Total	**84**	**280,312**	**2,686**	**989,347**	**73,974**	**1,346,403**
Percent	0.01%	20.82%	0.20%	73.48%	5.49%	100.00%
1989–2008 Avg.	1,311	284,007	11,951	1,305,629	45,417	1,648,315

Note: Figures for 2009 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, 2009.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove (set gillnet)	9		9
Tutka/Kasitsna Bays (set gillnet)	48		48
Barabara Creek (set gillnet)	4		4
Seldovia Bay (set gillnet)	22		22
SOUTHERN DISTRICT TOTAL	***83***		***83***
OUTER DISTRICT			
Windy Bay (seine)	1		1
OUTER DISTRICT TOTAL	***1***		***1***
EASTERN DISTRICT TOTAL	***0***		***0***
KAMISHAK BAY DISTRICT TOTAL	***0***		***0***
TOTAL LOWER COOK INLET	***84***		***84***

[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, 2009.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		2	2
Halibut Cove (set gillnet)	1,418		1,418
China Poot Bay /China Poot Cr.		223[b]	223
Neptune Bay			
Hatchery Cost Recovery (seine)	205		
Hazel Lake Creek		80	
Oxbow Creek		300	
Upstream Creek		20	
Waterfall Creek		300	
Total			905
Tutka/Kasitsna Bays			
Common Property (set gillnet)	9,185		
Hatchery Cost Recovery (seine)	11,584		
Tutka Creek		53	
Hatchery Broodstock		3,067[c]	
Total			23,889
Barabara Creek (set gillnet)	3,853		3,853
Seldovia Bay (set gillnet) / Seldovia R.	14,216	2	14,218
Port Graham Section			
Common Property (set gillnet)	9,057		
Hatchery Cost Recovery (seine)	8,292		
Port Graham River		6	
Total			17,355
English Bay Section			
Common Property (set gillnet)	491		
English Bay Lakes Escapement		18,191[d]	
Hatchery Broodstock		256[e]	
Total			18,667
SOUTHERN DISTRICT TOTAL	***58,301***	***22,229***	***80,530***
OUTER DISTRICT			
Port Chatham / Port Chatham Creeks		2	2
Windy Bay (seine)/Windy Left Creek	2	6	8
Rocky Bay (seine)	3		3

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Table 3.–Page 2 of 3.

Subdistrict/System	Catch	Escapement[a]	Total Run
OUTER DISTRICT (cont'd)			
Port Dick – South Section (seine)	3		
Port Dick (head end) Creek		3	
Island Creek		3	
Total			9
East Nuka Bay			
Delight Lake		12,700	
Desire Lake		16,000	
Delusion Lake		1,300	
Total			30,000
OUTER DISTRICT TOTAL	***8***	***30,014***	***30,022***
EASTERN DISTRICT			
Aialik Bay / Aialik Lake		3,100	3,100
Resurrection Bay North			
Hatchery (seine)	104,775		
Hatchery (weir–sold)	31,912		
Hatchery (weir–donated)	782		
Bear Lake Escapement		9,977[f]	
Hatchery Broodstock		3,341[g]	
Total Run			150,787
EASTERN DISTRICT TOTAL	***137,469***	***16,418***	***153,887***
KAMISHAK BAY DISTRICT			
Iniskin Bay / North Head Creek		10	10
Kirschner Lake			
Hatchery Cost Recovery (seine)	18,771		
Unharvested Fish		350[b]	
Total Run			19,121
Bruin Bay (seine) / Bruin Bay River	36	10	46
Chenik Lake (seine)	65,727		
Amakdedori Creek		2,160	
Chenik Creek/Lake		15,264[h]	
Total			83,151
McNeil Cove / Mikfik Lake & Creek		15,130	15,130
Kamishak Bay / Little Kamishak River		3	3

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Table 3.–Page 3 of 3.

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT (cont'd)			
Douglas River / Silver Beach			
Douglas Reef Creek		20	
Douglas Clearwater Tributary		80	
Total			100
KAMISHAK BAY DISTRICT TOTAL	***84,534***	***33,027***	***117,561***
TOTAL LOWER COOK INLET	***280,312***	***101,688***	***382,000***

Note: Figures for 2009 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] Although all fish failed to survive due to a mechanical pump failure, a total of 136 were successfully utilized for egg collection and fertilization.
[d] Weir counts for English Bay Lakes sockeye include 18,447 sockeye actually counted, minus the broodstock harvest of 256 sockeye (taken from lake escapement).
[e] English Bay Lakes sockeye broodstock total includes 16 fish collected for broodstock but not utilized.
[f] Weir counts for Bear Lake sockeye include 13,318 sockeye actually counted, minus the broodstock harvest of 3,341 sockeye (taken from lake escapement).
[g] Bear Lake sockeye broodstock total includes 387 fish collected for broodstock but not utilized.
[h] Escapement estimate derived from video counts.

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, 2009.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Northshore Subdistrict			
Clearwater Slough		1,400	
Clay Creek		20	
Total			1,420
Halibut Cove (set gillnet)	53		53
Neptune Bay (hatchery seine)	1		1
Tutka/Kasitsna Bays (set gillnet)	662		662
Barabara Creek (set gillnet)	103		103
Seldovia Bay (set gillnet)	150		150
SOUTHERN DISTRICT TOTAL	***969***	***1,420***	***2,389***
OUTER DISTRICT			
Windy Bay (seine)	6		6
Port Dick (seine)			
North Section	1		
South Section	2		
Total			3
East Nuka Bay / Delight Lake		1,800	1,800
OUTER DISTRICT TOTAL	***9***	***1,800***	***1,809***
EASTERN DISTRICT			
Resurrection Bay North			
Hatchery (weir–donated)	138		
Sport Derby[b]	1,570		
Bear Lake Escapement (weir)		357	
Hatchery Broodstock		570[c]	
Total			2,635
EASTERN DISTRICT TOTAL	***1,708***	***927***	***2,635***
KAMISHAK BAY DISTRICT TOTAL	***0***		***0***
TOTAL LOWER COOK INLET	***2,686***	***4,147***	***6,833***

Note: Figures for 2009 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 broodstock total includes 226 fish utilized by ADF&G, 240 fish utilized by CIAA, and 104 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, 2009.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		5,207	5,207
China Poot Bay / China Poot Cr.		1,120	1,120
Neptune Bay (hatchery seine)	10		10
Tutka/Kasitsna Bays			
Common Property (set gillnet)	2,136		
Tutka Lagoon Creek		3,770	
Total			5,906
Barabara Creek		2,583	2,583
Seldovia Bay / River		14,619	14,619
Port Graham Section			
Hatchery (seine)	866		
Port Graham River		13,996	
Port Graham Left Hand Creek		880	
Total			15,742
SOUTHERN DISTRICT TOTAL	***3,012***	***42,175***	***45,187***
OUTER DISTRICT			
Dogfish Bay		9,226	9,226
Port Chatham (seine) / Port Chatham Cr.	21,681	25,291	46,972
Windy Bay (seine)	201,403		
Windy Right Creek		15,012	
Windy Left Creek		57,263	
Total			273,678
Rocky Bay (seine)	111,407		
Rocky River		173,583	
Scurvy Creek		3,600	
Total			288,590
Port Dick			
South Section (seine)	283,120		
North Section (seine)	221,623		
Taylor Bay Section (seine)	13,803		
Port Dick (head end) Creek		41,681	
Slide Creek		21,409	
Middle Creek		8,831	
Island Creek		44,527	
Taylor Bay Creeks		19,875	
Total			654,869
Nuka Island /			
Tonsina Creek		555	
S. Nuka Island Creek		19,934	
Petrof River		7,543	
Total			28,032

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Table 5.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
OUTER DISTRICT (cont'd)			
E. Arm Nuka Bay (McCarty Fiord)			
Delight Lake		2,874	
Desire Lake		73,926	
Delusion Lake		2,300	
Total			79,100
OUTER DISTRICT TOTAL	***853,037***	***527,430***	***1,380,467***
EASTERN DISTRICT TOTAL	***0***	[c]	***0***
KAMISHAK BAY DISTRICT			
Iniskin Bay			
Sugarloaf Creek		1,643	
North Head Creek		7,432	
Total			9,075
Cottonwood Bay / Creek		3,500	3,500
Ursus Cove			
Brown's Peak Creek		63,605	
Ursus Lagoon Creek		1,400	
Ursus Lagoon Righthand Creek		1,500	
Total			66,505
Rocky Cove (seine) / Sunday Creek	118,562	106,296	224,858
Kirschner Lake Section – Hatchery (seine)	884		884
Bruin Bay (seine) / Bruin Bay River	12,281	1,067,351	1,079,632
Chenik Lake (seine) / Amakdedori Cr.	1,571	9,217	10,788
Kamishak River			
Big Kamishak River		10,362	
Little Kamishak River		770	
Strike Creek		220	
Total			11,352
Douglas River / Douglas Clearwater Tr.		1,100	1,100
KAMISHAK BAY DISTRICT TOTAL	***133,298***	***1,274,396***	***1,407,694***
TOTAL LOWER COOK INLET	***989,347***	***1,844,001***	***2,833,348***

Note: Figures for 2009 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] Duncan Slough pink escapement estimated by single late-season ADF&G aerial survey.

[c] No escapement surveys conducted in Eastern District in 2009.

Table 6.–Commercial chum salmon catches and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2009.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		1,457	1,457
Halibut Cove (set gillnet)	2		2
Tutka/Kasitsna Bays			
Common Property (set gillnet)	591		
Tutka Creek		3	
Total			594
Barabara Creek (set gillnet)	222		222
Seldovia Bay (set gillnet) / River	1,455	2,061	3,516
Port Graham (set gillnet)/Port Graham R.	3	1,029	1,032
English Bay (set gillnet)	1		1
SOUTHERN DISTRICT TOTAL	***2,274***	***4,550***	***6,824***
OUTER DISTRICT			
Dogfish Bay		4,380	4,380
Port Chatham	4	279	283
Windy Bay (seine)	33		
Windy Right Creek		375	
Windy Left Creek		271	
Total			679
Rocky Bay / River	1,624	2,500	4,124
Port Dick			
South Section (seine)	27,455		
North Section (seine)	5,988		
Taylor Bay Section (seine)	22		
Port Dick (head end) Creek		5,592	
Slide Creek		3,492	
Middle Creek		900	
Island Creek		9,295	
Total			52,744
Nuka Island / Petrof River		1,382	1,382
OUTER DISTRICT TOTAL	***35,126***	***28,466***	***63,592***
EASTERN DISTRICT TOTAL	***0***	[b]	***0***
KAMISHAK BAY DISTRICT			
Iniskin Bay			
Iniskin River		30,821	
Sugarloaf Creek		3,755	
North Head Creek		1,898	
Total			36,474
Cottonwood Bay / Creek	1,540	19,405	20,945

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Table 6.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT (cont'd)			
Ursus Cove			
Brown's Peak Creek		1,417	
Ursus Lagoon Righthand Creek		10,210	
Ursus Lagoon Creek		2,736	
Total			14,363
Rocky Cove (seine) / Sunday Creek	23,177	834	24,011
Bruin Bay / River	11,857	10,071	21,928
McNeil River		25,024	25,024
Kamishak River / Reef			
Big Kamishak River		15,026	
Little Kamishak River		4,213	
Strike Creek		1,520	
Total			20,759
Douglas River / Silver Beach			
Douglas Reef Main Left Creek		586	
Douglas Beach Creek		999	
Douglas Clearwater Tributary		1,498	
Total			3,083
KAMISHAK BAY DISTRICT TOTAL	***36,574***	***130,013***	***166,587***
TOTAL LOWER COOK INLET	***73,974***	***163,029***	***237,003***

Note: Figures for 2009 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 2009.

Table 7.–Exvessel value of the commercial salmon catch in numbers of dollars by species, gear type, and harvest type, Lower Cook Inlet, 2009.

	Chinook	Sockeye	Coho	Pink	Chum	Total
COMMON PROPERTY–PURSE SEINE						
No. of Fish	1	65,771	9	985,451	71,700	1,122,932
Pounds	34	289,335	79	3,015,633	582,262	3,897,343
Price/lb.	$1.00	$1.20	$0.52	$0.22	$0.54	
Value	$34	$347,199	$41	$670,951	$313,590	$1,331,815
COMMON PROPERTY–SET GILLNET[a]						
No. of Fish	83	38,220	968	2,136	2,274	43,681
Pounds	1,546	222,822	6,191	5,963	16,862	253,384
Price/lb.	$3.50	$1.49	$0.80	$0.18	$0.25	
Value	$5,417	$331,760	$4,956	$1,073	$4,255	$347,461
HATCHERY–PURSE SEINE & WEIR						
No. of Fish		176,321	139	1,760		178,220
Pounds		985,023	970	5,675		991,668
Price/lb.		$1.67[b]	$0.50[b]	$0.20		
Value		$1,638,123[b]	$2[b]	$1,161		$1,639,286
SPORT FISHING DERBY[c]**–HOOK & LINE**						
No. of Fish			1,570			1,570
Pounds			12,557			12,557
Price/lb.			$0.85			
Value			$10,673			$10,673
TOTAL ALL GEARS						
No. of Fish	84	280,312	2,686	989,347	73,974	1,346,403
Pounds	1,580	1,497,180	19,797	3,037,271	599,124	5,154,952
Price/lb.	$3.45	$1.55[b]	$0.83[b]	$0.22	$0.53	
Value	$5,451	$2,317,082[b]	$15,672[b]	$673,185	$317,845	$3,329,235

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] 2009 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, 2009.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-001-09 May 21	Designates and establishes a Special Harvest Area (SHA) for Cook Inlet Aquaculture Association (CIAA) in the Resurrection Bay North Subdistrict in the Eastern District of the Lower Cook Inlet (LCI) management area. The Bear Lake SHA includes those marine waters of Resurrection Bay north of the latitude of Caines Head, as well as those fresh waters of Bear Creek, Salmon Creek, and Resurrection River downstream of, and including, the Bear Creek weir. This emergency order opens the fresh waters of the Bear Lake SHA to the harvest and sale of salmon seven days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, May 25, 2009, 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 25, 2009, 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-002-09 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, 2009. 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. This emergency order also 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. Monday, June 1, 2009. In addition, this emergency order closes the Port Graham Subdistrict, including both the Port Graham and English Bay Sections, in the Southern District to commercial salmon set gillnet fishing until further notice. The weekly fishing period 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-003-09 May 28	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 6:00 a.m. Saturday until 6:00 a.m. Monday, effective at 6:00 a.m. Monday, June 1, 2009, until further notice.
2-F-H-004-09 June 5	Liberalizes the weekly fishing period for hatchery seining in marine waters of the Bear Lake Special Harvest Area (SHA) in Resurrection Bay of the Eastern District to seven days per week, effective at 10:00 p.m. Friday, June 5, 2009, all until further notice.
2-F-H-005-09 June 10	Changes the days and hours of the previously established 48-hour weekly subsistence salmon fishing period in all waters of Port Graham Subdistrict (see ***Lower Cook Inlet Emergency Order #2-F-H-003-09***). Effective at 9:00 p.m. Friday, June 12, 2009, subsistence salmon fishing in waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, is allowed for one 48-hour fishing period per week, from 9:00 p.m. Friday until 9:00 p.m. Sunday, until further notice.

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Table 8.–Page 2 of 4.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-006-09 June 19	Designates and establishes Special Harvest Areas (SHA's) for Cook Inlet Aquaculture Association (CIAA) in China Poot, Tutka, and Bruin Bay Subdistricts of the Lower Cook Inlet (LCI) management area. This emergency order closes the Kirschner Lake SHA to the common property salmon seine fishery, while concurrently 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 22, 2009, until further notice. This emergency order also repeals the regulatory closed waters markers near the HEA power lines in China Poot Bay, and establishes temporary closed waters at the head of China Poot Bay to provide a Dungeness crab sanctuary.
2-F-H-007-09 June 24	Closes waters of McNeil River and Paint River Subdistricts in the Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Friday, June 26, 2009, until further notice.
2-F-H-008-09 June 29	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 6:00 a.m. Tuesday, June 30, 2009, until further notice.
2-F-H-009-09 June 30	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 2, 2009, 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-010-09 July 3	Opens waters of Chenik Subdistrict in the Kamishak Bay District south of 59° 16′ N. latitude to commercial salmon seining five days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Monday, July 6, 2009, until further notice. Waters north of 59° 16′ N. latitude in Chenik Subdistrict will remain closed to fishing. Regulatory markers near the mouth of Chenik Creek remain in effect for this opening, and fishing is therefore prohibited in waters of Chenik Lagoon.
2-F-H-011-09 July 6	Designates and establishes a Special Harvest Area (SHA) for the Port Graham Hatchery Corporation (PGHC) in the Port Graham Subdistrict within the Southern District of Lower Cook Inlet. The Port Graham SHA consists of all marine waters of the Port Graham Subdistrict east of 151° 53.08' W. longitude, and south and west of a line extending from the southernmost tip of Passage Island to the Coast Guard navigational buoy at approximately 59° 21.45' N. latitude, 151° 50.05' W. longitude, then southeast to a point on the mainland at approximately 59° 20.83' N. latitude, 151° 48.53' W. longitude. This area is located along the south shore of Port Graham from Passage Island to (and including) Duncan Slough. This emergency order also opens those waters of the Port Graham SHA east of the longitude of the U.S. Coast Guard navigational buoy at approximately 151° 50.05' W. longitude to the harvest of salmon seven days per week by authorized agents of Port Graham Hatchery Corporation (PGHC), effective at 6:00 a.m.

-continued-

Table 8.–Page 3 of 4.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-011-09 July 6 (continued)	Tuesday, July 7, 2009, until further notice. Sockeye salmon harvested during this opening may be utilized for both hatchery broodstock and hatchery cost recovery. Revenue obtained from the sale of these fish will be used for recovery of operational expenses associated with the Port Graham Hatchery sockeye salmon enhancement program in Lower Cook Inlet.
2-F-H-012-09 July 8	Closes hatchery seining in marine waters of the Bear Lake Special Harvest Area (SHA) in Resurrection Bay of the Eastern District, effective at 6:00 p.m. Friday, July 10, 2009, for the remainder of the season.
2-F-H-013-09 July 17	Closes all waters of Chenik Subdistrict in Kamishak Bay District of Lower Cook Inlet to commercial salmon seine fishing, effective at 6:00 a.m. Saturday, July 18, 2009, 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 20, 2009, 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. Additionally, waters of the North Section of Port Dick Subdistrict, or statistical reporting area 232-09, will remain closed to fishing.
2-F-H-014-09 July 31	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 2008-2009 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 2009 Southern District personal use fishery.
2-F-H-015-09 July 31	Opens waters of Rocky River Subdistrict 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, August 3, 2009, until further notice. All normal regulatory markers and closed waters In Rocky River Subdistrict remain in effect for this opening.
2-F-H-016-09 August 7	Closes all waters of Port Dick Subdistrict in the Outer District of Lower Cook Inlet to commercial salmon fishing, effective at 10:00 p.m. Friday, August 7, 2009, until further notice. In addition, this emergency order rescinds the commercial salmon fishing regulatory markers protecting the stream mouths at the following locations in the Kamishak Bay District of Lower Cook Inlet: Bruin Bay River in Bruin Bay Subdistrict; Sunday Creek in Rocky Cove Subdistrict; Brown's Peak Creek in Ursus Cove Subdistrict; and

-continued-

Table 8.–Page 4 of 4.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-016-09 August 7 (continued)	Iniskin River in Iniskin Subdistrict, effective at 6:00 a.m. Sunday, August 9, 2009, until further notice. Beginning at that time, commercial salmon seining is allowed up to freshwater at each of the aforementioned streams during open fishing periods.
2-F-H-017-09 August 10	Opens waters of Windy Bay Subdistrict in the Outer District of Lower Cook Inlet to commercial salmon seining on a schedule of five days per week, from 6:00 a.m. Monday until 10:00 p.m. Friday, effective at 6:00 p.m. Tuesday, August 11, 2009, until further notice. All normal regulatory markers and closed waters in Windy Bay Subdistrict remain in effect for this opening. In addition, this emergency order expands the weekly commercial salmon seine fishing period in waters of Rocky River Subdistrict of the Outer District to seven days per week, effective at 6:00 p.m. Tuesday, August 11, 2009, until further notice. Finally, this emergency order rescinds the commercial salmon fishing regulatory markers protecting the stream mouth at Rocky River in Rocky River Subdistrict and allows commercial salmon seining up to freshwater at that location, effective at 6:00 p.m. Tuesday, August 11, 2009, until further notice.
2-F-H-018-09 August 13	Expands the weekly commercial salmon seine fishing period in waters of Windy Bay Subdistrict in the Outer District of Lower Cook Inlet to seven days per week, effective at 10:00 p.m. Friday, August 14, 2009, until further notice. All normal regulatory markers and closed waters in Windy Bay Subdistrict continue to remain in effect for this opening. In addition, this emergency order opens waters of Port Chatham Subdistrict in the Outer District to commercial salmon seining on a schedule of seven days per week, effective at 6:00 a.m. Saturday, August 15, 2009, until further notice. Finally, this emergency order rescinds the commercial salmon fishing regulatory markers protecting the mouths of the small unnamed streams in Port Chatham Subdistrict and allows commercial salmon seining up to freshwater in that subdistrict, effective at 6:00 a.m. Saturday, August 15, 2009, until further notice.
2-F-H-019-09 August 17	Opens waters of the Outer and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06 and 232-08, as well as those waters *east* of 151° 17′ W. longitude in the South and North Sections of Port Dick Subdistrict, or statistical reporting areas 232-07 and 232-09, all in the Outer District, to commercial salmon seining seven days per week, effective at 6:00 a.m. Wednesday, August 19, 2009, until further notice. In addition, this emergency order rescinds the regulatory closed waters markers in Taylor Bay and allows commercial salmon seining up to freshwater at the small unnamed streams in Taylor Bay seven days per week, also effective at 6:00 a.m. Wednesday, August 19, 2009, until further notice. Regulatory markers and closed waters at Middle Creek, at Island Creek, and in Tacoma Cove will be in effect for this opening, therefore fishing is prohibited in these waters. Fishing is also prohibited in waters of Port Dick Subdistrict *west* of 151° 17′ W. longitude based on provisions of this emergency order.
2-F-H-020-09 September 11	Closes the Southern District (Kachemak Bay) personal use set gillnet fishery for coho salmon, effective at 7:00 p.m. Tuesday, September 15, for the remainder of the 2009 season.

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, 2009.

DISTRICT	# of Permits Fished	# of Land-ings	Chinook		Sockeye		Coho		Pink		Chum	
			Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Eastern (231)	2	273	0	0	137,469	823,915	1,708	13,523	0	0	0	0
Outer (232)	11	150	1	34	8	48	9	79	853,037	2,598,372	35,126	275,814
Southern (241)	21	181	83	1,546	58,301	302,830	969	6,195	3,012	8,990	2,274	16,862
Kamishak Bay (249)	10	88	0	0	84,534	370,387	0	0	133,298	429,909	36,574	306,448
LCI Grand Total	**35**	**692**	**84**	**1,580**	**280,312**	**1,497,180**	**2,686**	**19,797**	**989,347**	**3,037,271**	**73,974**	**599,124**
Avg. Wt.				22.51		4.71		7.28		3.56		8.19
Avg. Price				$3.45		$1.55[a]		$0.83[a]		$0.22		$0.53

Note: Figures for 2009 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, 2009, and 2010 forecast.

Age	2009 Est. Spawning Biomass	Percent by Weight	2009 Commercial Harvest[a]	Percent by Weight	2009 Total Biomass	Percent by Weight	2010 Forecast Biomass	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**

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

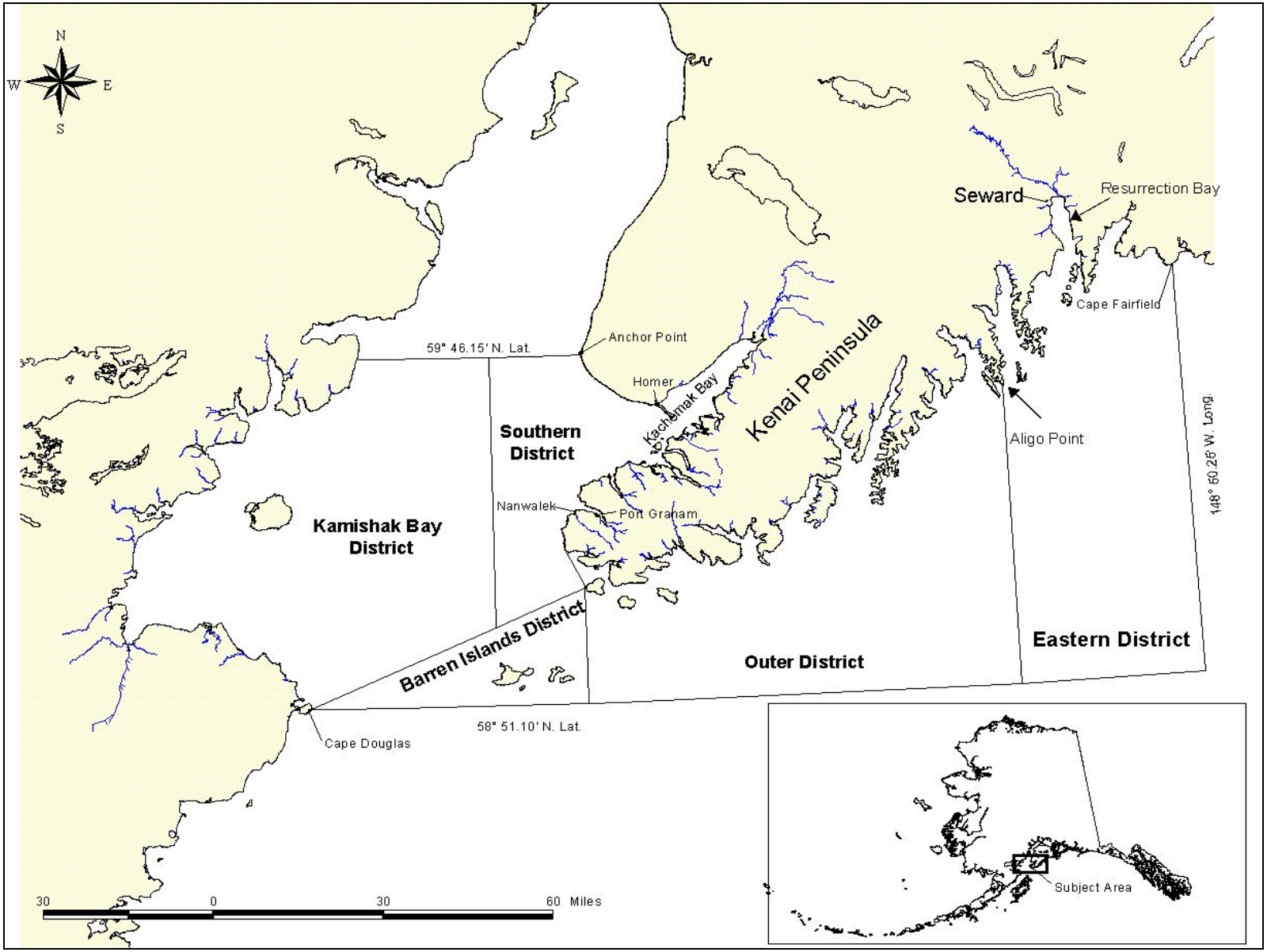

Figure 1.–Lower Cook Inlet management area for commercial salmon and herring fisheries.

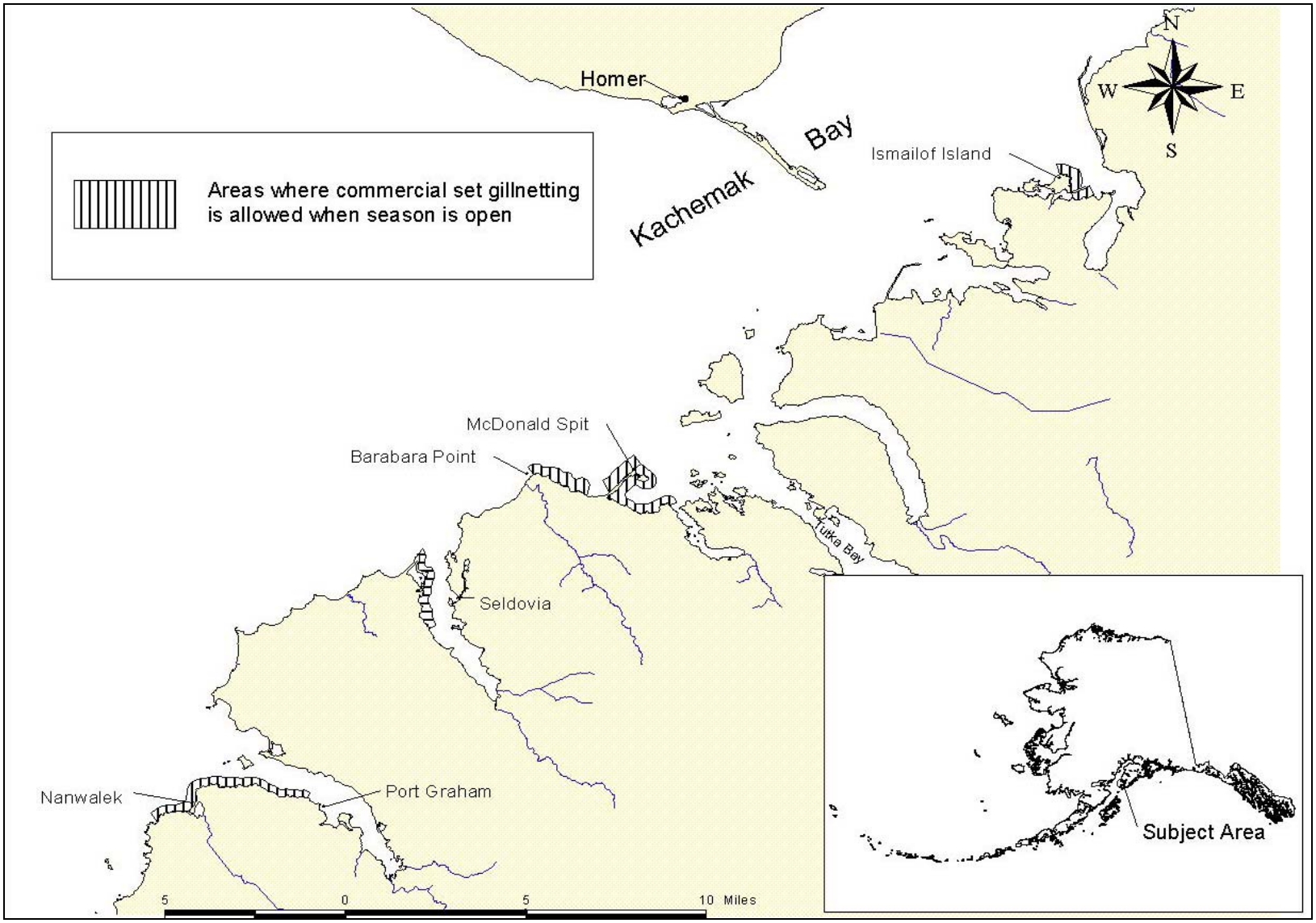

Figure 2.–Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

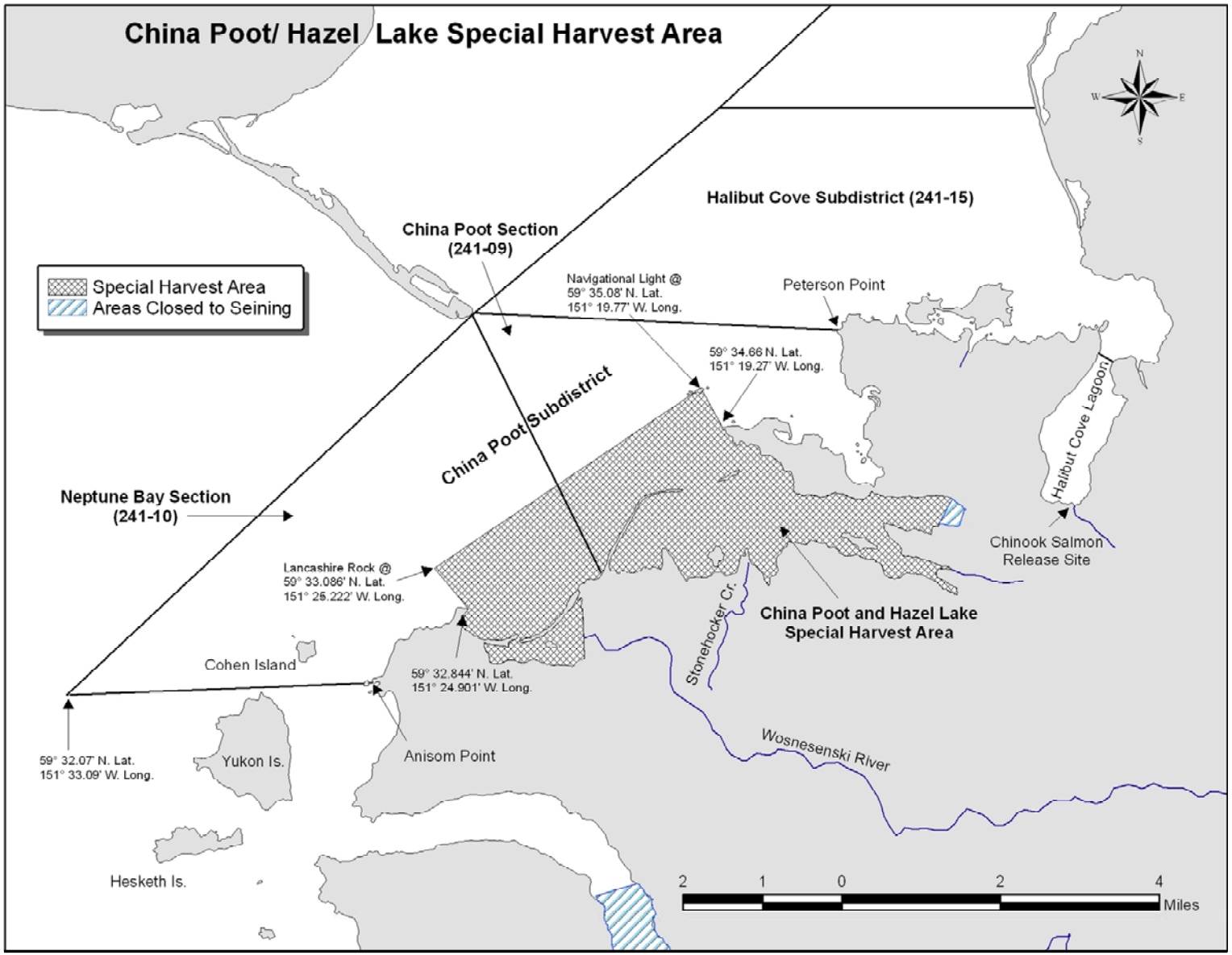

Figure 3.–China Poot / Hazel Lake Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

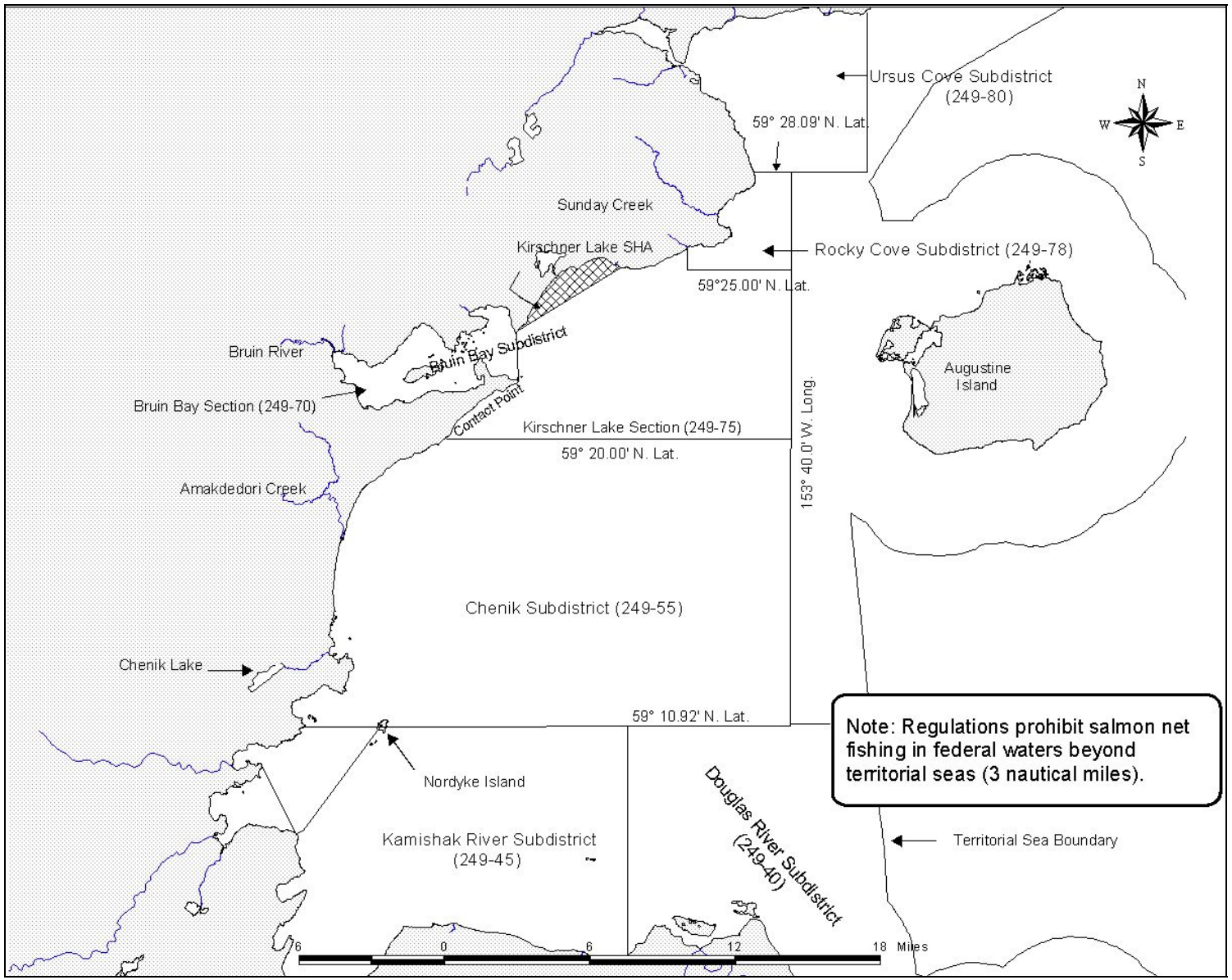

Figure 4.–Kirschner Lake Special Harvest Area for salmon hatchery cost recovery in Kamishak Bay District of Lower Cook Inlet.

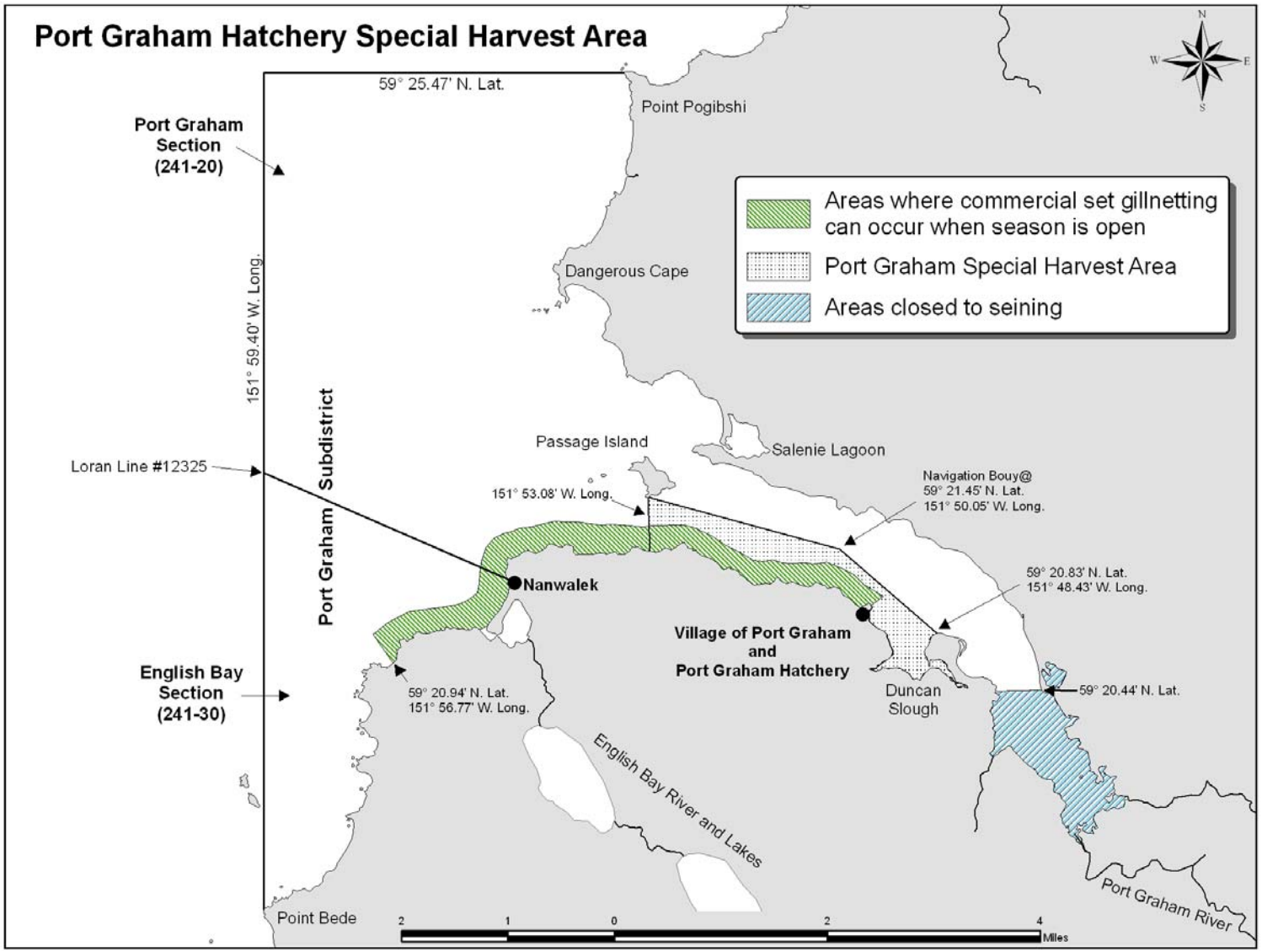

Figure 5.–Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

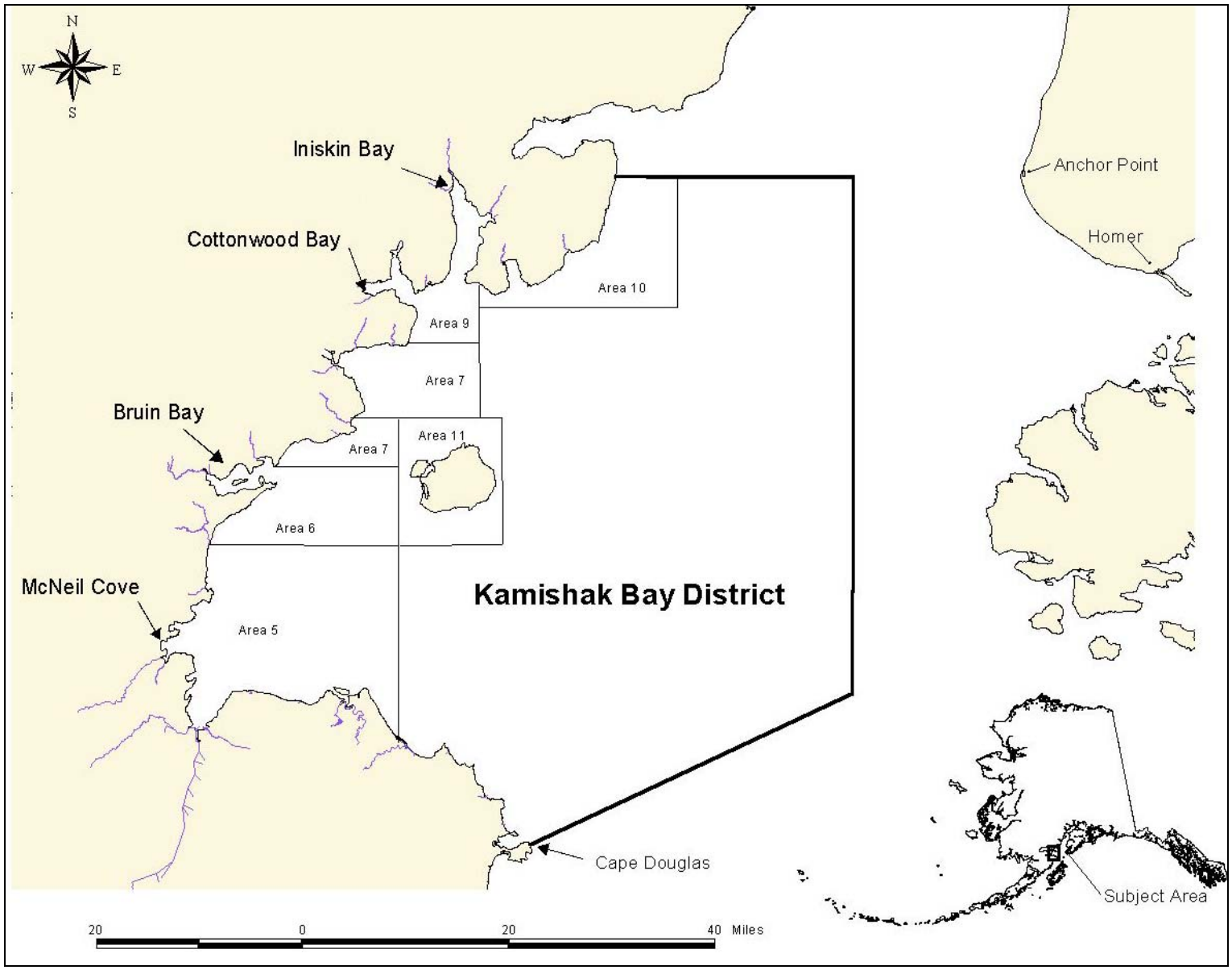

Figure 6.–Commercial fishing areas for herring management purposes in Kamishak Bay District of Lower Cook Inlet.

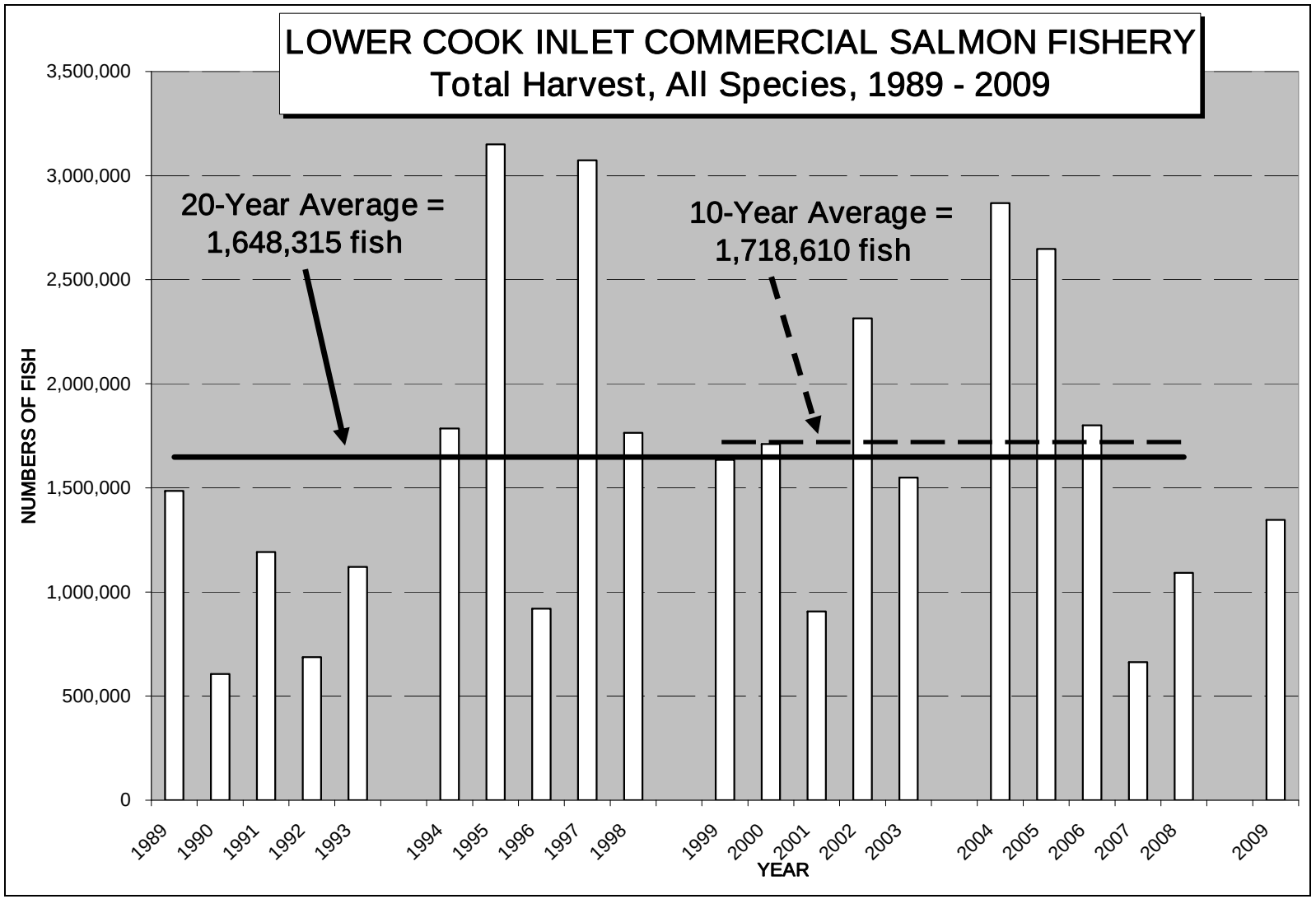

Figure 7.–Total commercial salmon catch, Lower Cook Inlet, 1989–2009.

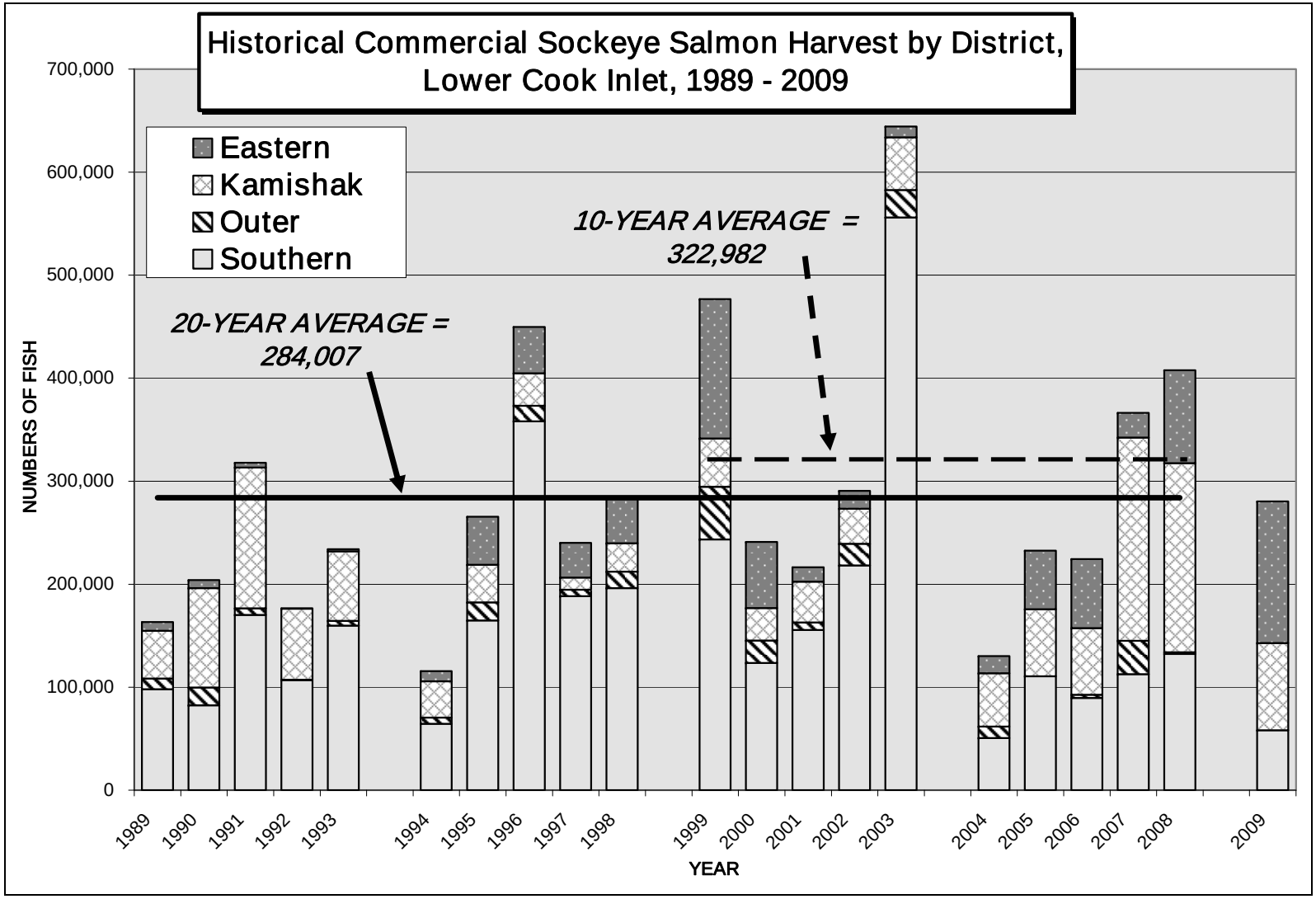

Figure 8.–Commercial sockeye salmon catch by district, Lower Cook Inlet, 1989–2009.

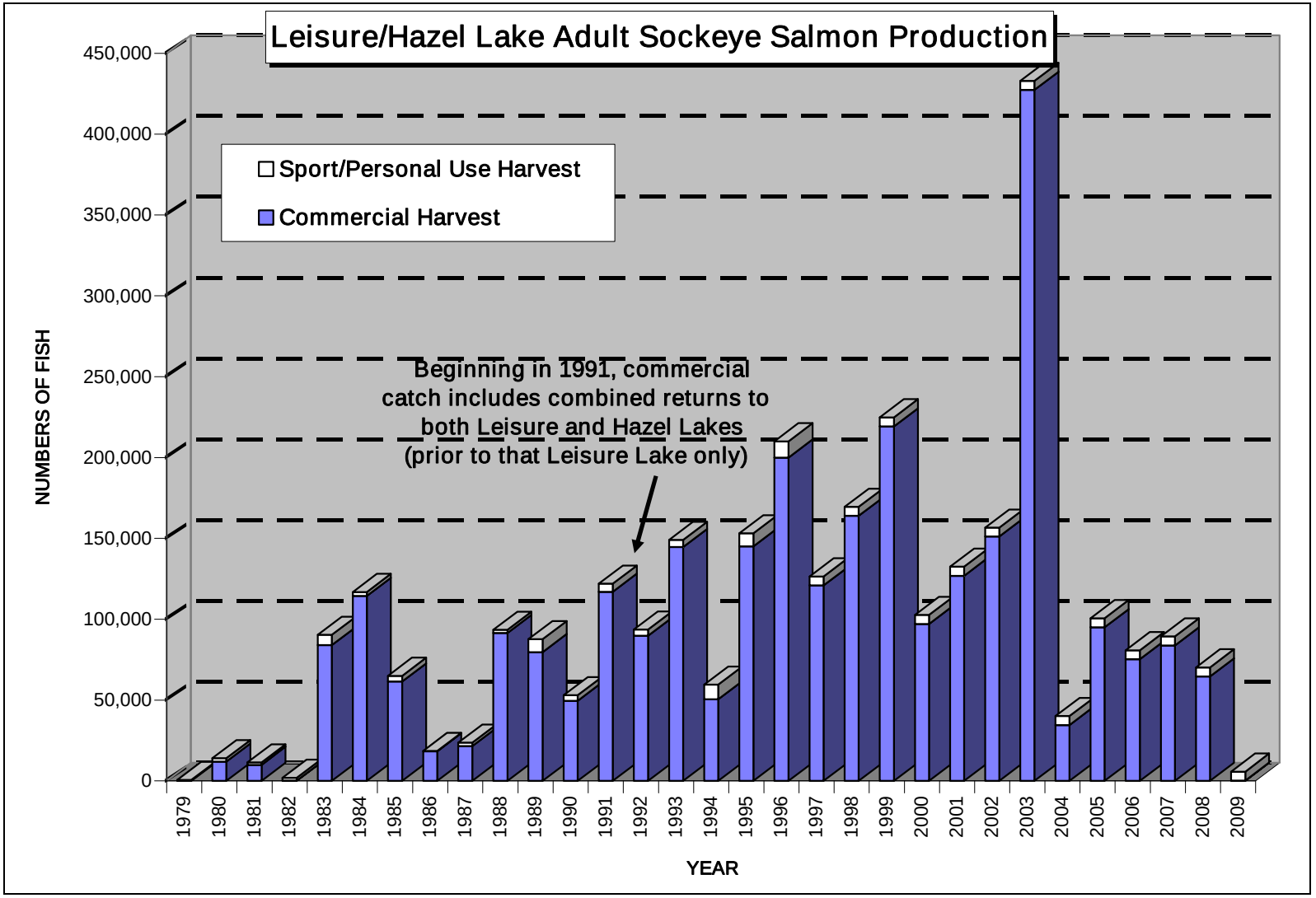

Figure 9.–Sockeye salmon runs to Leisure and Hazel Lakes in the Southern District of Lower Cook Inlet, 1979–2009.

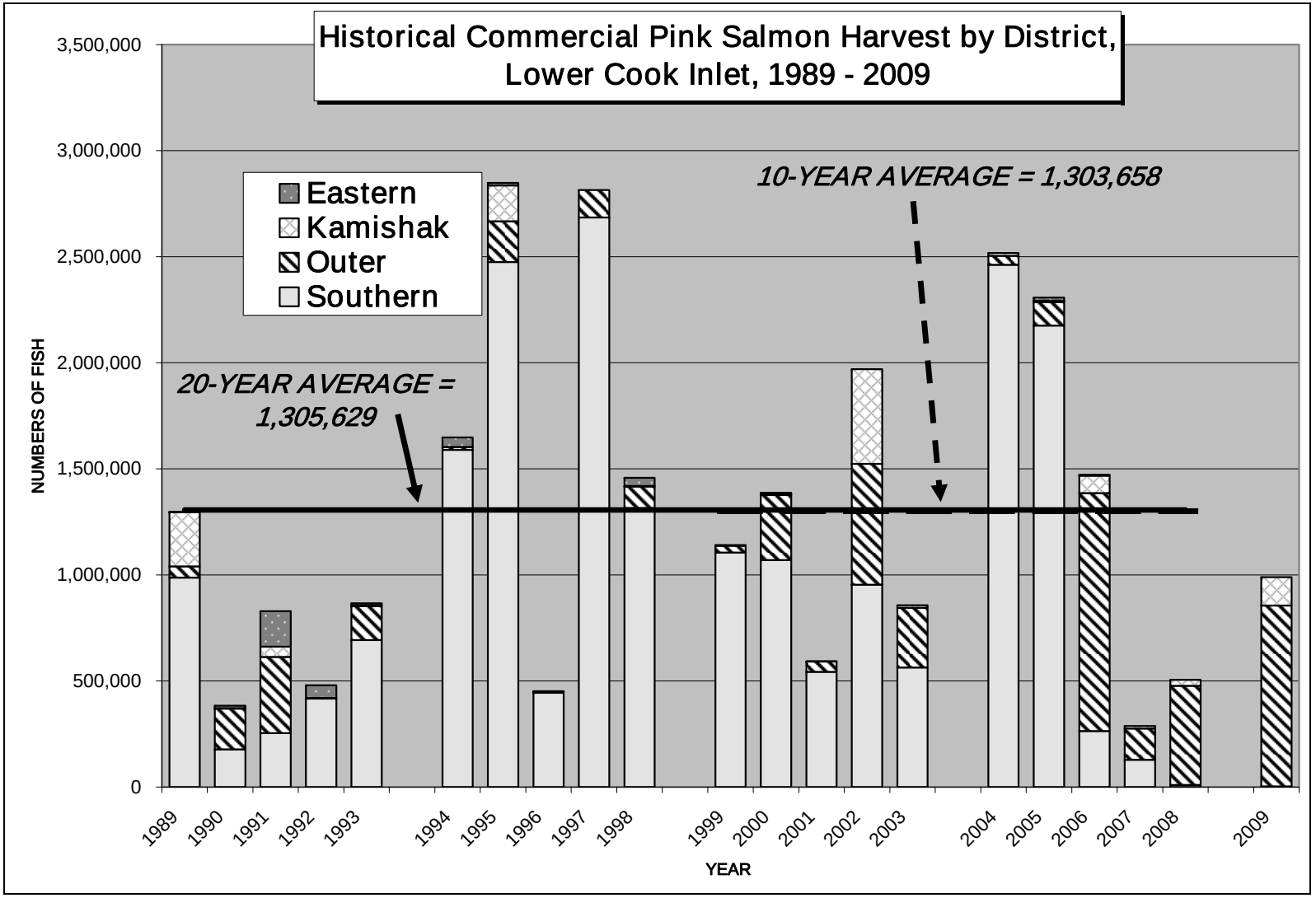

Figure 10.–Commercial pink salmon catch by district, Lower Cook Inlet, 1989–2009.

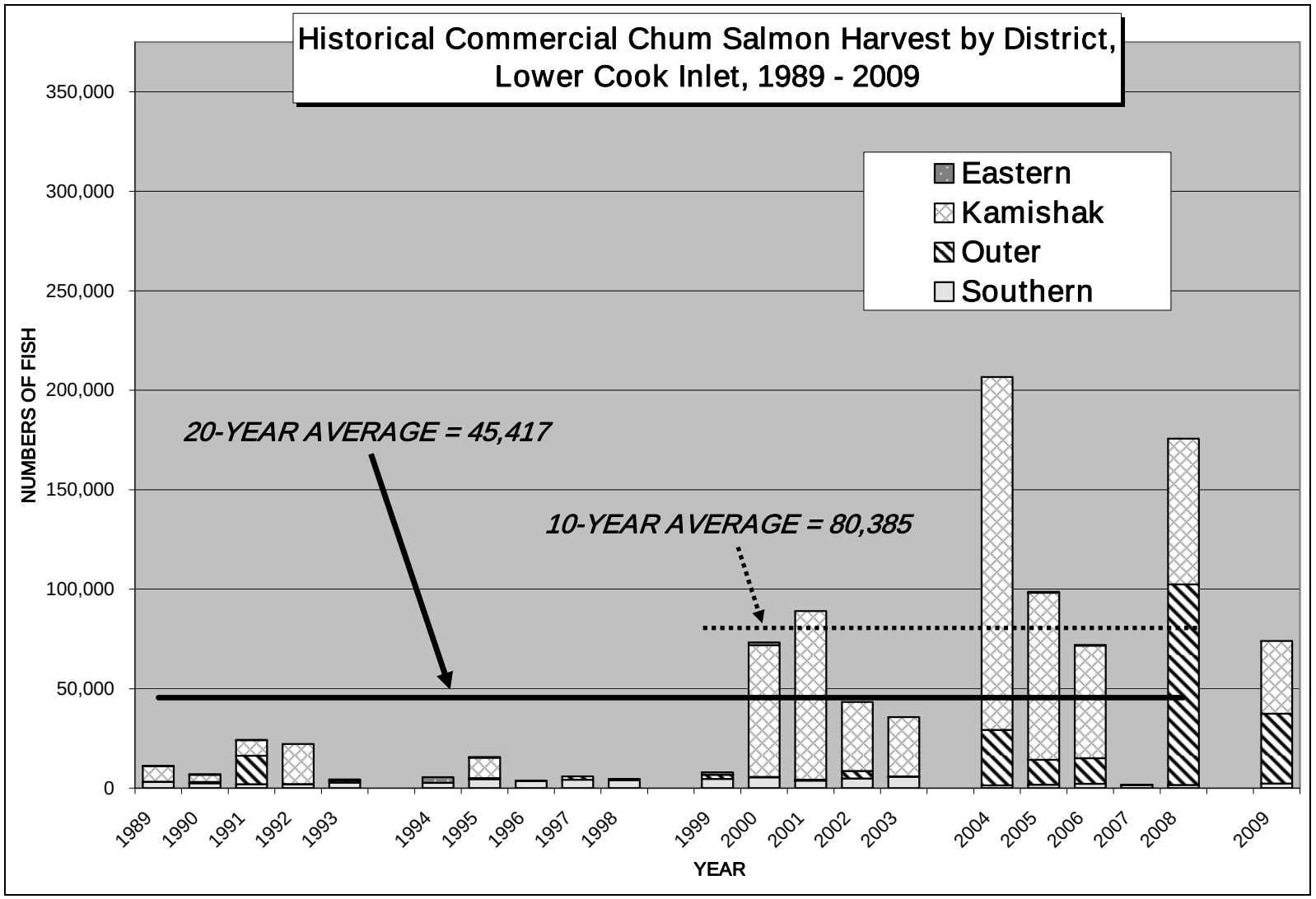

Figure 11.–Commercial chum salmon catch by district, Lower Cook Inlet, 1989–2009.

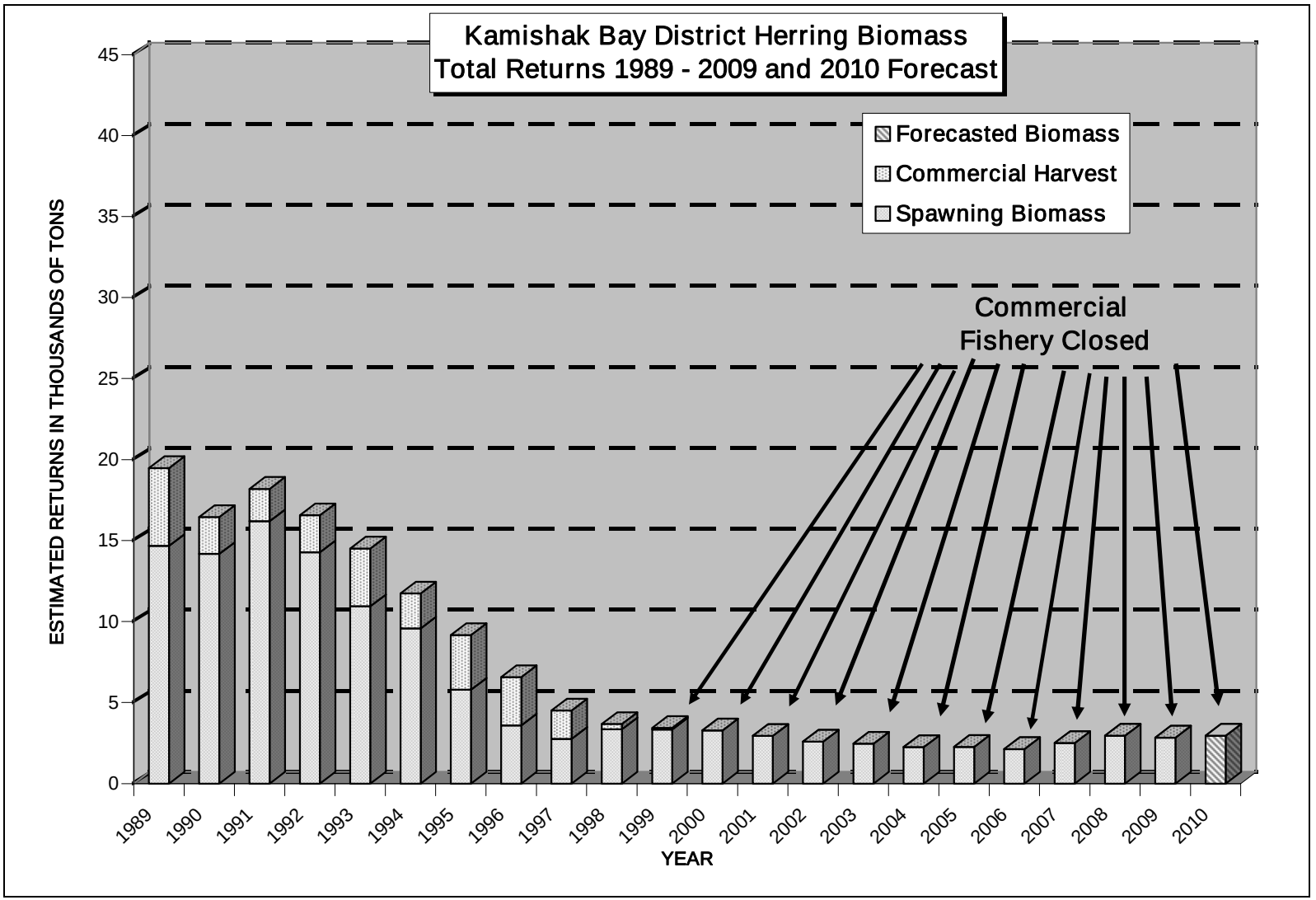

Figure 12.–Biomass estimates and commercial harvests of Pacific herring *Clupea pallasi* in the sac roe seine fishery, Kamishak Bay District, Lower Cook Inlet, 1989–2009, and 2010 projection.

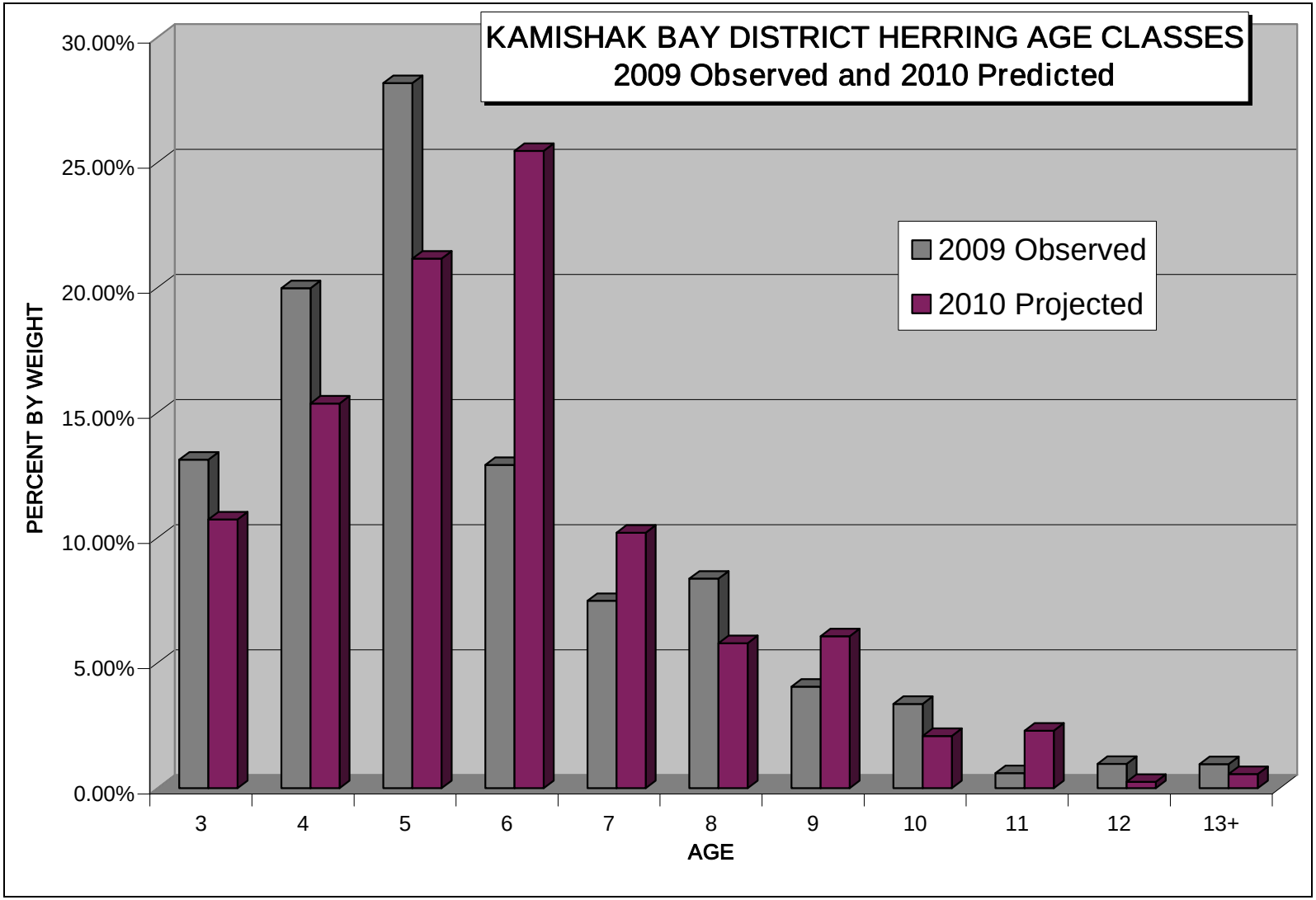

Figure 13.–Herring age composition from samples collected in Kamishak Bay District, Lower Cook Inlet, 2009, and 2010 forecast.

APPENDIX A:
HISTORICAL SALMON TABLES

Appendix A1.–Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1989–2009.

Year	Seines				Set Net Permits Fished
	Permanent Permits	Interim Permits	Total Issued	Actively Fished	
1989	83	0	83	64	23
1990	82	1	83	71	20
1991	82	1	83	68	20
1992	82	1	83	63	21
1993	82	1	83	51	17
1994	82	1	83	32	16
1995	83	1	84	49	23
1996	84	1	85	34	24
1997	84	1	85	23	25
1998	84	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
1989–2008 Avg.	84	1	85	39	21
1999–2008 Avg.	84	2	86	28	20

Source: ADF&G fish ticket database *Unpublished*. Commercial Fisheries Entry Commission License Statistics, 1974-2009, Juneau.

Appendix A2.–Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	33	1,213	59	1,660	39	3,004
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
20 Year Avg.	26	1,271	39	529	118	1,982
1989–1998 Avg.	27	1,185	45	683	24	1,964
1999–2008 Avg.	25	1,358	32	375	212	2,001
2009 % of Total	0.15%	69.56%	0.48%	20.26%	9.55%	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, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum
1989	1.25	1.60	0.70	0.40	0.40
1990	1.35	1.55	0.60	0.30	0.50
1991	1.12	0.83	0.29	0.13	0.27
1992	1.29	1.47	0.43	0.14	0.27
1993	1.02	0.80	0.51	0.12	0.28
1994	0.95	1.06	0.62	0.15	0.25
1995	1.17	1.11	0.47	0.15	0.24
1996	1.33	0.91	0.40	0.08	0.18
1997	1.29	0.93[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
20-Year Avg.	1.57	1.00	0.49	0.14	0.28
1989–1998 Avg.	1.22	1.12	0.49	0.18	0.29
1999–2008 Avg.	1.91	0.89	0.50	0.11	0.27

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, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum
1989	14.1	4.6	7.0	3.1	8.6
1990	13.8	4.1	7.1	2.8	8.9
1991	12.3	4.2	6.6	2.6	7.5
1992	12.3	4.4	7.7	3.2	8.8
1993	12.0	4.4	6.0	2.7	6.2
1994	15.0	4.1	10.2	3.0	6.4
1995	17.8	4.7	7.4	2.9	6.4
1996	16.9	5.2	7.6	2.9	8.0
1997	13.9	4.9	7.8	3.1	7.6
1998	13.1	4.6	8.5	3.1	7.4
1999	14.8	4.7	6.6	2.5	7.9
2000	14.7	5.3	8.2	2.5	9.3
2001	13.6	4.9	7.5	3.1	9.4
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
20-Year Avg.	14.5	4.7	7.6	3.1	7.9
1989–1998 Avg.	14.1	4.5	7.6	2.9	7.6
1999–2008 Avg.	14.9	4.8	7.2	3.2	8.2

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, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	1,893	163,271	12,089	1,296,926	11,305	1,485,484
1990	1,560	203,895	9,297	383,670	6,951	605,373
1991	1,419	317,947	19,047	828,709	24,232	1,191,354
1992	1,891	176,644	5,902	479,768	22,203	686,408
1993	2,168	233,834	13,477	866,774	4,367	1,120,620
1994	1,231	115,418	14,673	1,647,929	5,469	1,784,720
1995	2,303	265,423	17,709	2,848,464	15,636	3,149,535
1996	1,181	449,685	13,572	451,506	3,764	919,708
1997	1,261	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
20-Year Avg.	1,311	284,007	11,951	1,305,629	45,417	1,648,315
1989–1998 Avg.	1,598	245,032	13,342	1,307,600	10,448	1,578,020
1999–2008 Avg.	1,025	322,982	10,560	1,303,658	80,385	1,718,610
2009 % of Total	0.01%	20.82%	0.20%	73.48%	5.49%	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 A6.–Commercial salmon catch for all gear and harvest types in numbers of fish by species in the Southern District, Lower Cook Inlet, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	1,889	98,052	6,667	987,488	3,141	1,097,237
1990	1,546	82,412	1,552	178,087	2,433	266,030
1991	1,399	170,224	9,415	253,962	1,962	436,962
1992	1,852	106,793	1,277	417,021	1,885	528,828
1993	2,162	159,747	4,431	692,794	2,788	861,922
1994	1,230	64,531	1,373	1,589,709	2,631	1,659,474
1995	2,289	164,798	5,161	2,475,312	4,530	2,652,090
1996	1,180	358,163	9,543	444,236	3,511	816,633
1997	1,261	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
20-Year Avg.	1,305	169,098	3,726	1,015,716	3,193	1,193,038
1989–1998 Avg.	1,588	158,938	4,726	1,103,942	3,110	1,272,303
1999–2008 Avg.	1,023	179,258	2,727	927,490	3,275	1,113,773
2009 % of Total	0.13%	90.19%	1.50%	4.66%	3.52%	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 A7.–Commercial set gillnet catch of salmon in numbers of fish by species in the Southern District, Lower Cook Inlet, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	1,281	13,970	4,792	16,210	1,877	38,130
1990	1,361	15,863	1,046	12,646	1,938	32,854
1991	842	20,525	5,011	3,954	1,577	31,909
1992	1,288	17,002	848	15,958	1,687	36,783
1993	1,089	14,791	3,088	12,008	2,591	33,567
1994	1,103	14,004	1,073	23,621	2,419	42,220
1995	2,078	19,406	3,564	41,654	3,958	70,660
1996	1,054	69,338	5,779	14,813	2,792	93,776
1997	1,135	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
20-Year Avg.	1,052	29,164	2,347	14,971	2,844	50,378
1989–1998 Avg.	1,218	27,043	3,073	22,943	2,676	56,954
1999–2008 Avg.	886	31,285	1,620	7,000	3,013	43,803
2009 % of Total	0.19%	87.50%	2.22%	4.89%	5.21%	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 A8.–Commercial salmon catch for all gear and harvest types in numbers of fish by species in the Outer District, Lower Cook Inlet, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	1	10,286	72	52,677	43	63,079
1990	2	17,404	74	191,320	614	209,414
1991	2	6,408	12	359,664	14,337	380,423
1992	0	572	1	146	181	900
1993	2	4,613	119	159,159	970	164,863
1994	0	5,930	993	13,200	32	20,155
1995	12	17,642	1,272	192,098	474	211,498
1996	0	14,999	96	7,199	3	22,297
1997	0	6,255	63	128,373	1,575	136,266
1998	0	15,991	45	102,172	611	118,819
1999	3	51,117	1,482	32,484	2,062	87,148
2000	2	21,623	20	306,555	302	328,502
2001	0	7,339	5	48,559	408	56,311
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
20-Year Avg.	2	13,820	280	216,747	8,987	239,836
1989–1998 Avg.	2	10,010	275	120,601	1,884	132,771
1999–2008 Avg.	1	17,629	285	312,894	16,091	346,900
2009 % of Total	0.00%	0.00%	0.01%	96.04%	3.95%	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, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	0	8,538	5,346	92	312	14,288
1990	0	7,682	7,645	11,815	307	27,449
1991	1	4,703	7,283	167,250	80	179,317
1992	0	432	3,136	60,007	86	63,661
1993	0	1,824	8,924	10,616	9	21,373
1994	1	9,661	10,410	44,987	2,792	67,851
1995	0	46,556	5,192	12,000	330	64,078
1996	0	44,919	3,932	36	223	49,110
1997	0	33,783	5,344	1	66	39,194
1998	1	44,274	14,365	38,829	51	97,520
1999	1	135,305	3,794	1,930	1,232	142,262
2000	1	64,099	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
20-Year Avg.	0	34,896	5,861	18,450	390	59,597
1989–1998 Avg.	0	20,237	7,158	34,563	426	62,384
1999–2008 Avg.	0	49,555	4,565	2,336	355	56,811
2009 % of Total	0.00%	98.77%	1.23%	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, 1989–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1989	3	46,395	4	256,669	7,809	310,880
1990	12	96,397	26	2,448	3,597	102,480
1991	17	136,612	2,337	47,833	7,853	194,652
1992	39	68,847	1,488	2,594	20,051	93,019
1993	4	67,650	3	4,205	600	72,462
1994	0	35,296	1,897	33	14	37,240
1995	2	36,427	6,084	169,054	10,302	221,869
1996	1	31,604	1	35	27	31,668
1997	0	11,733	0	293	7	12,033
1998	0	27,502	0	1,776	29	29,307
1999	0	46,913	0	807	23	47,743
2000	1	31,636	7	6,214	66,072	103,930
2001	2	39,712	9	1,397	84,766	125,886
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
20-Year Avg.	4	66,193	2,083	54,716	32,847	155,844
1989–1998 Avg.	8	55,846	1,184	48,494	5,029	110,561
1999–2008 Avg.	1	76,540	2,983	60,939	60,665	201,126
2009 % of Total	0.00%	33.23%	0.00%	52.40%	14.38%	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, 1989–2009.

Year	Southern	Outer	Kamishak	Eastern	Total
1989	1,097,237	63,079	310,880	14,288	1,485,484
1990	266,030	209,414	102,480	27,449	605,373
1991	436,962	380,423	194,652	179,317	1,191,354
1992	528,828	900	93,019	63,661	686,408
1993	861,922	164,863	72,462	21,373	1,120,620
1994	1,659,474	20,155	37,240	67,851	1,784,720
1995	2,652,090	211,498	221,869	64,078	3,149,535
1996	816,633	22,297	31,668	49,110	919,708
1997	2,885,284	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
20-Year Avg.	1,193,038	239,836	155,844	59,597	1,648,315
1989–1998 Avg.	1,272,303	132,771	110,561	62,384	1,578,020
1999–2008 Avg.	1,113,773	346,900	201,126	56,811	1,718,610
2009 % of Total	4.80%	65.97%	18.90%	10.34%	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 A12.–Commercial Chinook salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1989–2009.

Year	Southern	Outer	Kamishak	Eastern	Total
1989	1,889	1	3	0	1,893
1990	1,546	2	12	0	1,560
1991	1,399	2	17	1	1,419
1992	1,852	0	39	0	1,891
1993	2,162	2	4	0	2,168
1994	1,230	0	0	1	1,231
1995	2,289	12	2	0	2,303
1996	1,180	0	1	0	1,181
1997	1,261	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
20-Year Avg.	1,305	2	4	0	1,311
1989–1998 Avg.	1,588	2	8	0	1,598
1999–2008 Avg.	1,023	1	1	0	1,025
2009 % of Total	96.81%	1.19%	0.00%	0.00%	100.00%

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

[a] 2004–2007 and 2009 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, 1989-2009.

Year	Southern	Outer	Kamishak	Eastern	Total
1989	98,052	10,286	46,395	8,538	163,271
1990	82,412	17,404	96,397	7,682	203,895
1991	170,224	6,408	136,612	4,703	317,947
1992	106,793	572	68,847	432	176,644
1993	159,747	4,613	67,650	1,824	233,834
1994	64,531	5,930	35,296	9,661	115,418
1995	164,798	17,642	36,427	46,556	265,423
1996	358,163	14,999	31,604	44,919	449,685
1997	188,402	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
20-Year Avg.	169,098	13,820	66,193	34,896	284,007
1989–1998 Avg.	158,938	10,010	55,846	20,237	245,032
1999–2008 Avg.	179,258	17,629	76,540	49,555	322,982
2009 % of Total	32.45%	0.42%	45.02%	22.10%	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 A14.–Commercial sockeye salmon catch for all gear and harvest types in thousands of fish by subdistrict, Lower Cook Inlet, 1959–2009.

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
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
Aialik Bay	8.6	0.1	T	0	1.2	0	0	0.3	4.6	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
Port Dick	0	0	T	T	0	0	T	T	0.1	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
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
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
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
Port Graham Bay	17.9	0.7	2.1	0	35.3	68.5	2.6	0	0	4.3	31.7	17.8
Kamishak/Douglas	0	0	T	0.5	1.4	0.8	2.1	2.9	1.0	0.2	0.7	0
McNeil (Mikfik)	0	7.2	0	0.3	0	0	0	0	1.3	0	0	0
Paint River	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
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
Miscellaneous	0.7	0	T	0	0	0	T	0.1	T	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

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, 1989–2009.

Year	Sport Harvest	Personal Use Harvest	Commercial Harvest	Unharvested Fish	Total Run
1989	1,000	7,000	79,714	0	87,714
1990	500	3,000	49,587	0	53,087
1991	1,000	4,000	117,000[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
1989–2008 Average	675	5,243	126,826	264	133,008

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 1997–2009 represent the estimated previous 10-year average.

[c] The final "Personal Use Harvest" figures for 1997–2009 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, 1989–2009.

Year	Commercial Harvest	Escapement[a]	Total Run
1989	38,905	12,000	50,905
1990	70,347	17,000	87,347
1991	60,397	10,189	70,586
1992	13,793	9,269	23,062
1993	24,567	4,000	28,567
1994	0[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
1989-2008 Avg.	31,643	8,141	39,785

[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, 1991–2009.

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
All Years Average	10	16,992	19,842	35,834	9,714	41,776

[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, 1989–2009.

Year	Southern	Outer	Kamishak	Eastern	Total
1989	6,667	72	4	5,346	12,089
1990	1,552	74	26	7,645	9,297
1991	9,415	12	2,337	7,283	19,047
1992	1,277	1	1,488	3,136	5,902
1993	4,431	119	3	8,924	13,477
1994	1,373	993	1,897	10,410	14,673
1995	5,161	1,272	6,084	5,192	17,709
1996	9,543	96	1	3,932	13,572
1997	5,597	63	0	5,344	11,004
1998	2,243	45	0	14,365	16,653
1999	2,757	1,482	0	3,794	8,033
2000	768	20	7	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
20-Year Avg.	3,726	280	2,083	5,861	11,951
1989–1998 Avg.	4,726	275	1,184	7,158	13,342
1999–2008 Avg.	2,727	285	2,983	4,565	10,560
2009 % of Total	36.08%	0.34%	0.00%	63.59%	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 A19.–Commercial pink salmon catch for all gear and harvest types in numbers of fish by district, Lower Cook Inlet, 1989–2009.

Year	Southern	Outer	Kamishak	Eastern	Total
1989	987,488	52,677	256,669	92	1,296,926
1990	178,087	191,320	2,448	11,815	383,670
1991	253,962	359,664	47,833	167,250	828,709
1992	417,021	146	2,594	60,007	479,768
1993	692,794	159,159	4,205	10,616	866,774
1994	1,589,709	13,200	33	44,987	1,647,929
1995	2,475,312	192,098	169,054	12,000	2,848,464
1996	444,236	7,199	36	35	451,506
1997	2,685,764	128,373	293	1	2,814,431
1998	1,315,042	102,172	1,776	38,829	1,457,819
1999	1,105,267	32,484	807	1,930	1,140,488
2000	1,070,065	306,555	6,214	4,473	1,387,307
2001	542,975	48,559	1,397	0	592,931
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
20-Year Avg.	1,015,716	216,747	54,716	18,450	1,305,629
1989–1998 Avg.	1,103,942	120,601	48,494	34,563	1,307,600
1999–2008 Avg.	927,490	312,894	60,939	2,336	1,303,658
2009 % of Total	0.23%	65.43%	10.22%	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, 1960–2008.

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

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, 1989–2009.

Year	Southern	Outer	Kamishak	Eastern	Total
1989	3,141	43	7,809	312	11,305
1990	2,433	614	3,597	307	6,951
1991	1,962	14,337	7,853	80	24,232
1992	1,885	181	20,051	86	22,203
1993	2,788	970	600	9	4,367
1994	2,631	32	14	2,792	5,469
1995	4,530	474	10,302	330	15,636
1996	3,511	3	27	223	3,764
1997	4,260	1,575	7	66	5,908
1998	3,956	611	29	51	4,647
1999	4,624	2,062	23	1,232	7,941
2000	5,340	302	66,072	1,540	73,254
2001	3,789	408	84,766	6	88,969
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
20-Year Avg.	3,193	8,987	32,847	390	45,417
1989–1998 Avg.	3,110	1,884	5,029	426	10,448
1999–2008 Avg.	3,275	16,091	60,665	355	80,385
2009 % of Total	0.90%	57.37%	41.71%	0.02%	100.00%

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

[a] 2004-2006 and 2008-2009 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, 1959–2009.

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

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

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, 1989–2009.

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
1989	4.2	7.7	9.0	2.0	0.1	6.5	11.5	12.0[b]	1.2	0.5	54.7
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[b]	5.6	10.5	1.3	8.6	7.3	9.5	0.8[b]	0.8	[d]	57.1
1995	20.7[b]	15.8	15.8	1.5	8.3	2.6	10.1	1.1[b]	2.4	[d]	78.3
1996	11.1[b]	7.7	9.4	0.7	8.0	3.5	10.5	3.0[b]	2.9	1.8	54.6
1997	14.4[b]	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[b]	9.2[b]	7.9	1.1	6.5	4.9	12.6	1.9	4.1	[d]	62.3
1999	14.6[b]	17.0[e]	14.6	1.1	6.1	3.8	15.7	2.9	8.8	2.2	86.9
2000	11.2[b]	12.3	4.0	2.1	8.2	4.3	10.9	4.8	3.3	1.5	62.7
2001	10.5[b]	10.1	5.5	2.8	8.6	5.1	5.4	0.3	2.7	2.5	53.6
2002	15.3[b]	19.6[b]	16.0	3.6	8.4	6.1	16.7	4.7	3.2	3.3	96.9
2003	19.4[b]	7.5[e]	8.4	2.0	9.5	5.4	12.8	13.8	11.8	2.6	93.2
2004	15.4[b]	7.3[e]	10.7	1.0	8.2	10.1	14.0	17.0	7.2	0.8	91.7
2005	8.2[b]	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[b]	10.9[e]	18.6	1.0	8.3	4.8	17.7	13.9[e]	0.3	[d]	91.0
2007	16.1[b]	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[b]	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[b]	12.7	16.0	1.3	10.0	3.1	15.1	15.3[e]	2.2	T	93.8
20-year Average	11.9	13.1	10.6	1.5	6.6	5.3	10.4	8.2	3.3	2.0	72.8
1989–1998 Average	10.0	9.5	10.8	1.1	4.7	5.1	9.1	6.2	2.1	2.0	60.6
1999–2008 Average	13.8	16.8	10.3	1.9	8.5	5.4	11.6	10.1	4.6	1.9	85.0
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 1998, 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, 1960–2009.

	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	---	---	[d]
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

-continued-

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						1960–2008 Average	Sustainable Escapement Goal[e]
	2004	2005	2006	2007	2008	2009		
Humpy Creek	28.9	93.8	48.4	54.0	90.9	5.2	48.3	21.65–85.55
China Poot Creek	3.3	9.2	7.2	6.2	5.1	1.1	6.3	2.9–8.2
Tutka Lagoon Creek	17.8	133.6	25.8	5.7	14.1	3.8	18.0	11.6–18.9
Barabara Creek	5.4	14.4	3.6	25.2	16.6	2.6	5.6	1.9–9.0
Seldovia River	56.8	98.6	70.0	69.4	53.5	14.6	36.5	19.05–38.95
Port Graham River	44.0	69.1	31.2	25.6	24.7	14.0	17.9	7.0–19.85
Dogfish Lagoon	3.2	22.3	8.0	4.1	8.0	9.2	4.8	---
Port Chatham Creeks	26.4	44.4	24.2	14.5	16.4	25.3	14.4	7.8–21.0
Windy Right Creek	12.0	22.2	17.1	18.3	12.5	15.0	8.6	3.35–10.95
Windy Left Creek	23.3	72.0	65.2	37.3	64.1	57.3	21.7	3.65–29.95
Rocky River	53.8	198.7	67.8	190.0	90.9	173.6	51.7	9.35–54.25
Port Dick Creek[a]	13.3	122.2	51.5	44.2	34.2	41.7	45.1	18.55–58.3
Island Creek	33.6	26.4	107.7	87.2	49.7	44.5	24.7	7.2–28.3
South Nuka Island Creek	6.4	11.2	5.1	6.6	12.3	19.9	10.8	2.7–14.25
Desire Lake Creek	24.3	46.0	74.8	11.8	9.5	73.9	19.1	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	21.3	---
Little Kamishak River	3.0	---	77.0	5.1	34.3	0.8	13.7	---
Amakdedori Creek	---	---	---	---	---	9.2	7.7	---
Bruin Bay River	66.5	98.3	515.1	350.4	150.7	1,067.4	155.3	18.65–155.75
Sunday Creek	31.5	116.2	70.0	394.8	20.4	106.3	41.8	4.85–28.85
Brown's Peak Creek	18.1	61.0	35.7	249.4	17.4	63.6	29.9	2.45–18.8
Totals	481.6	1,328.1	1,328.1	1,599.8	725.3	1,759.3	567.4	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, 1989–2009.

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
1989	1.3	1.8	1.2	3.3	4.8	30.0	12.0	34.0	8.0	6.3	8.0	5.9	116.6
1990	2.6	1.0	0.8	1.1	2.3	2.5	7.9	8.0	4.0	3.8	4.3	8.4	46.7
1991	1.1	3.1	---	7.4	17.3	8.7	8.4	10.0	6.0	1.3	7.7	8.3	79.3
1992	1.4	0.8	1.7	5.4	6.7	4.5	7.1	19.2	8.5	1.7	6.1	3.4	66.5
1993	2.5	5.4	0.1	2.5	3.6	9.1	6.3	17.4	6.0	7.7	12.0	8.0	78.8
1994	5.2	11.3	1.9	3.5	8.8	---	9.0	15.0	6.1	6.2	10.2	18.9	96.1
1995	3.8	4.2	5.1	3.3	7.7	[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	10.6	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	25.0	10.1	12.9	19.4	30.8	140.3
20-Year Avg.	3.5	7.4	4.1	4.5	9.5	21.2	16.9	17.5	10.6	13.8	16.3	15.2	140.6
1989–1998 Avg.	3.1	5.7	1.6	3.3	6.7	10.4	8.1	18.5	7.8	5.7	8.8	11.7	91.3
1999–2008 Avg.	4.0	9.1	6.4	5.7	12.4	28.8	23.9	16.5	13.3	21.9	23.9	18.7	184.6
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, 1969–2009.

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
69–08 Avg.	263	246	93.6	173	73	46	59	2,700	626	38	21	3,490
99–08 Avg.	131	124	94.4	94	30	59	62	1,500	306	13	0	1,939

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 fishermen in the Southern District of Lower Cook Inlet (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery) by area of residence, 1989–2009.

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.	%	
1989	348	74.7	36	7.7	5	1.1	51	10.9	8	1.7	0	0.0	6	1.3	12	2.6	466
1990	441	76.3	36	6.2	5	0.9	65	11.2	12	2.1	0	0.0	6	1.0	13	2.2	578
1991	384	81.4	27	5.7	8	1.7	41	8.7	6	1.3	0	0.0	4	0.8	2	0.4	472
1992	302	82.7	21	5.8	5	1.4	32	8.8	3	0.8	0	0.0	1	0.3	1	0.3	365
1993	242	74.2	25	7.7	5	1.5	44	13.5	3	0.9	0	0.0	5	1.5	2	0.6	326
1994	235	82.2	20	7.0	4	1.4	21	7.3	1	0.3	0	0.0	1	0.3	4	1.4	286
1995	191	81.3	15	6.4	7	3.0	20	8.5	1	0.4	0	0.0	0	0.0	1	0.4	235
1996	241	80.6	16	5.4	7	2.3	26	8.7	3	1.0	1	0.3	2	0.7	3	1.0	299
1997	232	84.1	13	4.7	3	1.1	20	7.2	4	1.4	0	0.0	1	0.4	3	1.1	276
1998	175	77.1	18	7.9	2	0.9	24	10.6	5	2.2	0	0.0	2	0.9	1	0.4	227
1999	96	65.8	18	12.3	1	0.7	23	15.8	3	2.1	0	0.0	4	2.7	1	0.7	146
2000	168	78.9	15	7.0	2	0.9	21	9.9	4	1.9	0	0.0	1	0.5	2	0.9	213
2001	109	70.8	10	6.5	3	1.9	20	13.0	5	3.2	0	0.0	4	2.6	3	1.9	154
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
20-Year Avg.	189	78.1	16	6.8	4	1.5	24	9.7	4	1.5	0	0.0	3	1.2	3	1.2	242
1989–1998 Avg.	279	79.1	23	6.4	5	1.4	34	9.7	5	1.3	0	0.0	3	0.8	4	1.2	353
1999–2008 Avg.	99	75.7	10	7.6	2	1.6	13	9.8	3	2.1	0	0.0	3	2.1	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, 1989–2009.

Year	Salmon Harvest						Dolly Varden	Households Reporting
	Chinook	Sockeye	Coho	Pink	Chum	Total		
1989	51	94	460	640	58	1,303	159	20
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	360	427	150	214	1,534	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
1989–2008 Average	219	425	232	480	169	1,616	236	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, 1989–2009.

Year	Salmon Harvest						Dolly Varden	Households Reporting
	Chinook	Sockeye	Coho	Pink	Chum	Total		
1989	0	63	695	855	16	1,629	523	24
1990	54	638	614	1,947	49	3,302	2,833	28
1991	8	630	1,512	3,093	36	5,279	848	30
1992	71	437	675	676	58	1,917	1,331	35
1993	24	994	567	1666	122	3,373	577	25
1994	27	570	511	1113	43	2,264	473	28
1995	99	1,416	169	487	0	2,171	465	38
1996	55	1,060	598	437	25	2,175	221	27
1997	0	1	0	14	1	16	0	1
1998	5	18	0	0	0	23	31	3
1999	102	2,755	1,320	1,873	890	6,940	631	32
2000	18	3,880	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
1989–2008 Average	51	1,976	814	1,319	169	4,329	597	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, 1996–2009.

	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
Average	18	16	9	7	77	81	0	1	9	168
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
Average	2	3	2	1	0	19	8	31	6	65

[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, 1989–2009 (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			Kirschner Lake	Bruin Lake	Ursus Lake	Bear Lake	Grouse Lake	Resur-rection Bay	Total Sockeye
							Upper	Lower	Elusivak							
1989	2.000	1.000	---	---	---	3.500	1.000	0.500	0.500	0.250	---	---	2.200	---	---	10.950
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
'89–08 Average	1.630	0.943	0.246	0.314	0.106	1.687	0.537	0.250	0.500	0.234	0.250	0.200	1.777	0.762	1.600	6.593
'99–08 Average	1.585	0.901	0.246	0.335	0.106		0.500			0.214			2.281		1.600	5.677

-continued-

YEAR	Juvenile Pink Salmon					Juvenile Chinook Salmon						Juvenile Coho Salmon					
	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		
1989	30.100	6.000	0.332	---	36.432	0.108	0.115	0.104	---	0.307	0.634	0.182	0.080	---	0.143	0.339	0.744
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	0.054	0.060	0.227	---	0.142	0.483	---	0.088	0.125	0.095	0.735	1.043
2009	---	---	---	0	0	0.044	0.035	0.164	---	0	0.243	---	0	0.113	0.043	0.523	0.679
'89–08 Average	62.026	6.000	0.310	11.539	67.127	0.094	0.093	0.194	0.114	0.291	0.718	0.151	0.080	0.135	0.129	0.770	1.021
'99–08 Average	73.420			21.692	76.757	0.086	0.093	0.206	0.059	0.223	0.614		0.100	0.135	0.131	0.834	1.102

[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, 1989–2009.

	Southern		Kamishak		Eastern		Outer		Total	
Year	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits
1989	170	6	4,801	75	0	0	0	0	4,971	75
1990	---	---	2,264	75	---	---	---	---	2,264	75
1991	---	---	1,992	58	0	0	0	0	1,992	58
1992	---	---	2,282	56	0	0	0	0	2,282	56
1993	---	---	3,570	60	---	---	---	---	3,570	60
1994	---	---	2,167	61	---	---	---	---	2,167	61
1995	---	---	3,378	60	---	---	---	---	3,378	60
1996	---	---	2,984	62	---	---	---	---	2,984	62
1997	---	---	1,746[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	---	---	---	---	---	---	---	---	---	---
20-Year Average	170	6	2,239	52	0	0	0	0	2,344	52
1989–1998 Average	170	6	2,552	57	0	0	0	0	2,569	53
1999–2008 Average	---	---	100[b]	1[b]	---	---	---	---	100[b]	1[b]

Source: ADF&G fish ticket database *Unpublished*. Commercial Fisheries Entry Commission License Statistics, 1974-2009, 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, 1989–2009.

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]				
1989	37,785	5,000	4,801	9.5	74	3.50[c]
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 -	---	---	---
1989-2008 Average	15,124	2,676	2,552	10.0	57	2.22

[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, 1969–2009.

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]	---
1999–2009	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.

[e] ADF&G test fish harvest in 1999.

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, 1989–2009.

Year	Aerial Survey Total Biomass Estimate (st)[a]	ASA Model Total Biomass Estimate (st)[b,c]	Actual Commercial Harvest (st)	Estimated Exploitation Rate (%)[b]
1989	35,701	19,480	4,801	24.6
1990	19,664	16,448	2,264	13.8
1991	18,163[d]	18,195	1,992	10.9
1992	24,077	16,561	2,282	13.8
1993	32,439	14,511	3,570	24.6
1994	25,344[d]	11,740	2,167	18.5
1995	25,115	9,171	3,378	36.8
1996	27,640	6,575	2,984	45.4
1997	---	4,510	1,746	38.7
1998	---	3,678	331	9.0
1999	---	3,439	- CLOSED[e] -	---
2000	---	3,282	- CLOSED -	---
2001	---	2,941	- CLOSED -	---
2002	---	2,594	- CLOSED -	---
2003	---	2,467	- CLOSED -	---
2004	---	2,250	- CLOSED -	---
2005	---	2,267	- CLOSED -	---
2006	---	2,130	- CLOSED -	---
2007	---	2,500	- CLOSED -	---
2008	---	2,957	- CLOSED -	---
2009	---	2,837	- CLOSED -	---
1989–2008 Average	26,018	7,385	2,552	20.6

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.

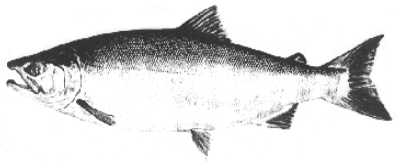
[e] ADF&G test fishing harvested 100 st.

APPENDIX C:
2009 LOWER COOK INLET SALMON OUTLOOK AND MANAGEMENT STRATEGY

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

Denby S. Lloyd, Commissioner

John Hilsinger, Director



Contact:
Lee Hammarstrom, Area Finfish Management Biologist
Ethan Ford, Fishery Biologist I
Phone: (907) 235-8191
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Homer Area Office
3298 Douglas Place
Homer, AK 99603
Date Issued: 5/13/09
Time: 9:00 a.m.

2009 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 2009 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 various hatchery Special Harvest Areas (SHA's) have now been finalized, and management schemes to attain them will be 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 this season is a new hatchery management plan now in regulation for Trail Lakes Hatchery.

The overall 2009 LCI commercial all-species salmon harvest, originally predicted to total about 1.36 million fish, was revised in late winter to a new total of nearly 1.39 million fish. The revised figure, based on an increase in the forecast of the enhanced sockeye salmon component, is approximately 30% greater than the all-species actual harvest taken during 2008. However, it should be noted that this 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 72% of the revised area-wide commercial sockeye salmon harvests this season, while no hatchery pink production is projected to contribute to LCI harvests. Hatchery cost recovery is anticipated to 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	91,800[b]	212,800[c, d]	304,600[c, d]
COHO	[a]	[a]	13,500[a]
PINK	997,800	0	997,800
CHUM	45,400[b]	0	45,400
Total	1,135,000	212,800[c, d]	1,362,500[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: 236,150 (enhanced) and 327,950 (total); revised all-species total is 1,385,850 – see footnote "a" in table below.

The preceding numbers include the following natural and enhanced components:

ENHANCED RUNS

SOCKEYE SALMON		PINK SALMON	
Kirschner Lake	2,000[a]		
Leisure Lake	20,600[a]		
Hazel Lake	5,300[a]		
Tutka Lagoon	11,100		
Bear Lake	173,800[a]		
English Bay Lakes	0[b]		
TOTAL	212,800[a]		
Port Graham Hatchery	*23,350*[c]		

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NATURAL RUNS

SOCKEYE SALMON[d]		PINK SALMON	
Southern District[e]	41,000	Southern District	80,100
Outer District	20,500	Outer District	495,700
Eastern District	6,400	Eastern District	0
Kamishak Bay District	23,900	Kamishak Bay District	421,900
TOTAL	91,800	TOTAL	997,800

[a] CIAA expects to harvest all sockeye salmon returning to their enhancement sites this season for hatchery cost recovery in order to achieve the Trail Lakes Hatchery revenue goal of $1.5 million.

[b] Low level returns are not expected to produce any commercial harvest.

[c] The figure for Port Graham Hatchery sockeye salmon was generated AFTER release of the original preseason forecast; as a result, the revised LCI enhanced-only sockeye TOTAL is 236,150; PGHC expects to harvest all fish returning to the PGH facility for cost recovery and/or broodstock.

[d] Numbers for natural sockeye harvests are not forecasts but simply represent 1980-2008 average commercial catches.

[e]Incidental harvest of fish not originating from the Southern District.

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SUMMARY BY SPECIES

Sockeye Salmon

The original forecasted 2009 LCI sockeye salmon harvest of 304,600 fish is only about 75% of the 2008 catch of 407,600 but is nearly equal to the most recent 10-year average catch of 310,600. However, it should be noted that PGHC released their sockeye salmon forecast estimate after the original LCI forecast was published, resulting in a new projected harvest estimate of nearly 328,000 sockeye salmon for the LCI area. The combined harvests of adult runs to Cook Inlet Aquaculture Association (CIAA) enhancement projects at Leisure and Hazel Lakes in the Southern District are expected to total less than 26,000 sockeye salmon, which is far less than the recent 10-year average harvest of 147,500 sockeye. At Tutka Bay Lagoon, site of another CIAA sockeye enhancement project, the harvestable surplus is forecasted to total approximately 11,000 sockeye salmon, after accounting for potential broodstock requirements. *CIAA expects that all fish returning to their Southern District sockeye salmon enhancement sites in 2009 will be harvested for hatchery cost recovery and/or broodstock purposes, and no surplus is expected for targeted harvest by the common property fishery*. At English Bay Lakes, where returns have contributed to Southern District commercial harvests in some recent years, no commercial sockeye harvest is expected due to another weak return. However, returns to this system have been stronger than anticipated during the last three seasons and have been sufficient to support limited commercial and subsistence harvest opportunities despite weak preseason predictions. Port Graham Hatchery, also in the Southern District, is expecting a return totaling up to 24,000 sockeye salmon, *which will all be utilized to meet hatchery requirements*. At Bear Lake in Resurrection Bay of the Eastern District, CIAA has forecasted a harvest of about 174,000 sockeye salmon, but as is the case in the Southern District, *all sockeye salmon returning to the Bear Lake enhancement site are targeted for escapement and hatchery harvest, and no surplus is expected for the common property fishery*. Kirschner Lake on the west side of Cook Inlet in the Kamishak Bay District, another CIAA-enhanced sockeye system, is expected to produce an adult return totaling only 2,000 fish, and once again *CIAA expects to require the entire return for hatchery purposes*. After six successive seasons of relatively strong runs, as well as targeted commercial harvests during the past five years, the sockeye run to Chenik Lake in the Kamishak Bay District is questionable but could once again produce harvest opportunities in 2009. 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 2009 are anticipated to total just under 1.0 million fish, and for the second consecutive year the entire catch should be a result of only natural production. Natural pink salmon spawning escapement levels into most major systems were good to excellent in 2007, 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 496,000 pink salmon, returning primarily to Port Dick and Rocky Bay, while Windy Bay holds potential for a lesser amount. Bruin Bay, Ursus Cove, and Rocky Cove in the Kamishak Bay District are also predicted to contribute reasonable harvest opportunities, with a cumulative projected total of about 422,000 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 2009.

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Chum Salmon

Based only on average catches since 1989, the total LCI commercial chum salmon harvest could be expected to total as much as 45,000 fish during 2009. However, chum salmon returns to LCI in eight out of the past nine 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 harvest could be greater than the forecast in 2009. This season's chum 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. Since CIAA has indicated that all forecasted sockeye salmon returning to Bear Lake will be required to meet hatchery and escapement objectives in 2009, no surplus is expected and no common property openings to target these fish in Resurrection Bay are planned. As a result, 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 25, 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 2009 has been established at $1.5 million. 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. The forecasted harvestable surplus for Bear Lake in 2009 is approximately 174,000 sockeye salmon. Accurate and timely catch reporting and escapement counts will be critical in order to achieve the intent of the regulations. Closed waters during the hatchery fishing periods will be the same as during the past ten 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 2009 if the Trail Lakes Hatchery revenue goal is achieved or its 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 Monday, 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 (only) by authorized agents of CIAA beginning on June 22. This SHA will likely remain closed to commercial seining for the entire season since CIAA has indicated that all returning sockeye salmon (2,000 forecasted) will be required for cost recovery purposes. However, if the Trail Lakes Hatchery revenue goal of $1.5 million is achieved or its attainment can be projected, the Kirschner Lake SHA will be closed to CIAA and opened to common property seining. At Kirschner Lake, 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 2009 Trail Lakes Hatchery Annual Management Plan (AMP), which should be available prior to the fishing season.

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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 seven 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. The formerly separate SHA's for the Leisure and Hazel Lakes sockeye returns have been combined into a single China Poot and Hazel Lake SHA, which also now includes those waters formerly closed to all seining. Waters of this SHA will open to hatchery cost recovery fishing seven days per week beginning June 22. Because CIAA has indicated that all sockeye salmon returning to all three Southern District enhancement sites will be required to achieve the Trail Lakes Hatchery revenue goal of $1.5 million, no surplus is expected at any location. As a result, *waters traditionally opened to common property seining outside of the Southern District SHA's in past years WILL NOT OPEN to seining this season*. A common property opening to target sockeye salmon returning to any of these CIAA enhancement sites 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 2009 Trail Lakes Hatchery Annual Management Plan (AMP), which should be available prior to the fishing season.

   Because operations at Tutka Bay Hatchery were suspended in 2004, no hatchery-produced pink salmon returns will occur at that location in 2009. As a result, the Department will be managing for achievement of the sustainable escapement goal (SEG) of 6,500 to 17,000 pink salmon (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 22. 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 harvestable surplus of sockeye salmon returning to Tutka Lagoon in 2009 (11,000 forecast) will be required for cost recovery and broodstock purposes, and therefore no common property seine openings targeting these fish are 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 SEG range is 6,000 to 13,500 sockeye, 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.

   Assuming that the commercial set gillnet fishery in Port Graham Subdistrict remains closed for the duration of the sockeye salmon return to English Bay Lakes, and with no return of pink salmon to the Port Graham Hatchery, the commercial set gillnet fishery in Port Graham Subdistrict could remain closed for an undetermined time after the sockeye run is over in order to protect pink salmon returning to Port Graham River until that return can be assessed. Therefore, the potential for a common property set gillnet or seine fishery targeting pink salmon in waters of Port Graham Subdistrict is minimal.

   Port Graham Hatchery is also expecting up to 23,000 sockeye salmon to return to the facility in 2009 as a result of past smolt releases. The Port Graham Hatchery sockeye salmon revenue goal for the Port Graham SHA this season is $200,500, while the broodstock goal is up to 1,500 fish. At expected prices and average weights, it is anticipated that all returning sockeye salmon will be utilized for broodstock and/or cost recovery harvest, and a common property opening to target these fish appears unlikely.

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 20, 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 return to Port Dick is relatively strong this season, with a harvest forecast totaling about 281,000 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 primarily 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. MONDAY, JUNE 1*** 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/gcireg09.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 2009. 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 seventh consecutive season, announcements will be published in real time at the following web site:
http://csfish.adfg.state.ak.us/newsrelease/select.php?year=2009&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 fifth 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 2009.

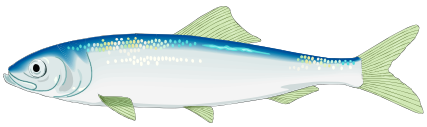
APPENDIX D:
2009 LOWER COOK INLET HERRING FISHERY INFORMATION

Appendix D1.–2009 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



Contact: Lee Hammarstrom, Area Finfish Mgt. Biologist
Ted Otis, Finfish Research Project Leader
Ethan Ford, Fishery Biologist I
Lower Cook Inlet

Phone: (907) 235-8191
Fax: (907) 235-2448

Homer Area Office
3298 Douglas Place
Homer, AK 99603

2009 LCI Herring Announcement #1
Date Issued: 1/26/09
Time: 9:00 a.m.

2009 Lower Cook Inlet Herring Fishery Information

This notice provides information to fishermen and processors on the 2009 Kamishak Bay District herring season. The commercial sac-roe herring fishery in Kamishak Bay will not open in 2009 because all information collected during 2008 suggests that the biomass 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. This news is being released for the benefit of those interested in Kamishak Bay herring stock status, and also to report Kamishak Bay herring stock status to individuals interested in the Kodiak Management Area food/bait fishery. Because Kodiak and Kamishak herring stocks mix, regulations require that Kodiak food/bait harvest guidelines take into account 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. For over ten years, an age-structured analysis (ASA) model has been used to forecast Kamishak herring abundance and set harvest guidelines for the upcoming season. 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. Unfortunately, for the first time since 1984, no herring age, sex, or size composition data were collected by the Department in Kamishak Bay during 2008 because no bids were received to conduct the vessel-based surveys required to collect these data. Normally two spring vessel charters are conducted in order to help assess the herring abundance and collect age composition samples. The early sampling period coincides with the arrival of the first fish on the grounds, while the second charter is used to collected age composition samples during the latter portion of the return. Without information traditionally provided by these charters, the ability of the ASA model used to generate the annual Kamishak herring forecast is seriously compromised. As a result, the Department was forced to rely solely on aerial surveys to determine relative stock abundance in 2008.

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Aerial survey coverage and observation conditions to assess the Kamishak Bay herring stock in 2008 were considered fair, with several 5- to 7-day "gaps" in coverage, or periods during which no surveys were flown due to poor weather. This coverage resulted in a cumulative total of 2,098 st of herring observed by Department surveyors in the Kamishak Bay District this season, the sixth lowest volume in the past 19 years. The last eight consecutive years of disappointingly low aerial survey abundance indices indicate the lack of a significant recruitment event in Kamishak Bay during any recent season. One hypothesis for the lack of recruitment in Kamishak Bay originates from the relatively poor condition of the fish observed in recent years, characterized by low average weights-at-age, which can lead to higher than normal mortality. Another contributing factor may be disease. In 2007, an ongoing ADF&G-conducted disease assessment program documented *Ichthyophonus* infection rates ranging from 20-32% in herring sampled from three locations in Kamishak Bay. *Ichthyophonus* is a protozoan pathogen that has been linked to population declines of Atlantic herring. While it is uncertain what role this pathogen played, or continues to play, in the recent trend of poor recruitment and survival, its prevalence in the Kamishak stock is concomitant with the loss of older age classes (> age-8) from the population.

The aerial survey information collected during the 2008 season served to confirm the continuing long-term trend of low herring abundance in Kamishak Bay District, and that a continued closure of the commercial fishery is prudent in order to allow the herring stocks opportunity to rebuild.

Kamishak Bay Herring Test Fishing Charters

The Alaska Department of Fish and Game is once again soliciting bids from herring purse seine fishermen interested in test fishing in Kamishak Bay during two 7-10 day periods between May 1 and June 15, 2009. This project will assist the department in collecting representative herring samples for age composition analysis to assess population abundance and to forecast future returns. No herring will be harvested for sale during this season's test fishing charters. Interested parties are asked to submit bids for either or both survey(s) on forms that can be obtained from the ADF&G 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 ten (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 year's surveys will be tentatively scheduled for approximately May 5 – May 15 and May 25 – June 3. 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 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 the 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 herring from Kamishak Bay waters for onboard pathology sample preparation and for later laboratory analysis to determine age/weight/sex information. Secondarily, hydroacoustic observations of herring, climatic and water parameters, and other information as determined by the onboard ADF&G observer, will also be recorded throughout the duration of each survey. Because Kamishak Bay, located approximately 75 nautical miles from Homer on the west side of Lower Cook Inlet, is considered remote, the vessel involved in each charter is expected to remain on the grounds for the duration of the charter and will not be returning to a formal harbor to overnight. Prospective bidders should note that little commercial fishing effort occurs in Kamishak Bay during this time of year, equating to very limited nearby support from other fishing vessels.

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CONDITIONS OF THE BID ARE AS FOLLOWS: 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 vessel charter will originate from and return to the Homer small boat harbor.
2. A full crew consisting of a captain and minimum of three (3) deckhands (including a "skiff man" with at least one season's experience). Consideration will also be given to those applicants who can demonstrate that they routinely and competently fish in Alaska's commercial herring fisheries with only two (2) deckhands due to specialized equipment. The successful bidder(s) must be able to demonstrate at least ten (10) years' participation in Alaska commercial herring sac roe fisheries, including at least five (5) years in the Kamishak herring sac roe fishery.
3. All fishing equipment, including: purse seine vessel, seine skiff, herring seine net, all necessary fishing gear and equipment.
4. Onboard accommodations (including individual bunk space) for one ADF&G 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 ADF&G observer, for a charter lasting ten (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 an ADF&G chartered aircraft with an onboard ADF&G 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 ADF&G 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.

EVALUATION OF BIDS: **Bids for the two charters will be evaluated separately, and separate contracts will be issued for each charter. The Department of Fish and Game will evaluate all bids on the basis of their dollar amount using the following criteria: maximum ten (10) day charter consisting of eight (8) days of functional fishing activity to be paid at the daily bid rate plus two (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 ADF&G 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 ADF&G office by the close of business (5:00 p.m.) on Tuesday, April 14, 2009. The winning bidder will be notified on April 15.