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Fishery Manuscript No. 07-06

Review of Salmon Escapement Goals in Upper Cook Inlet, Alaska, 2007

by

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November 2007

Alaska Department of Fish and Game

Divisions of Sport Fish 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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by

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The Division of Sport Fish Fishery Manuscript series was established in 1987 for the publication of technically-oriented results of several years' work undertaken on a project to address common objectives, provide an overview of work undertaken through multiple projects to address specific research or management goal(s), or new and/or highly technical methods. Since 2004, the Division of Commercial Fisheries has also used the Fishery Manuscripts series. Fishery Manuscripts are intended for fishery and other technical professionals. Fishery Manuscripts 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 editorial and peer review.

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ABSTRACT

In January 2007, a salmon escapement goal review committee, composed of Alaska Department of Fish and Game staff from the Division of Commercial Fisheries and Division of Sport Fish, was formed to review Pacific salmon *Oncorhynchus* spp. escapement goals for the major river systems in Upper Cook Inlet, Alaska. Escapement goals were evaluated for 22 Chinook salmon, 1 chum salmon, 3 coho salmon, and 8 sockeye salmon stocks. The committee did not recommend a change to any existing goals, however, the committee recommended re-instating the sustainable escapement goals (SEG) of 50–700 for Campbell Creek Chinook salmon and 15,000–30,000 for Packers Creek sockeye salmon. In addition, the committee recommended removing the SEG for South Fork Eagle River Chinook salmon and Campbell Creek coho salmon.

Key words: Upper Cook Inlet, escapement goal, biological escapement goal, BEG, sustainable escapement goal, SEG, sockeye salmon, *Oncorhynchus nerka,* Chinook salmon, *O. tshawytscha*, coho salmon, *O. kisutch*, chum salmon, *O. keta*, Alaska Board of Fisheries.

INTRODUCTION

Upper Cook Inlet (UCI), Alaska, supports all five species of Pacific salmon *Oncorhynchus*. The Alaska Department of Fish and Game (ADF&G; department) reviews the escapement goals for UCI salmon stocks on a schedule that corresponds to the Alaska Board of Fisheries (BOF) 3-year cycle for considering area regulatory proposals. This report describes the UCI salmon escapement goals that were reviewed in 2007 and presents information from the subsequent 3 years in the context of these goals. UCI escapement goals were thoroughly reviewed during the previous 2004–2005 BOF cycle (Clark et al. 2007; Hasbrouck and Edmundson 2007). Due to the thoroughness of the previous analyses, this review re-analyzed only those goals with recent (2004–2006) data that substantially changed findings from the 2004 review.

Escapement goals were reviewed based on the Policy for the Management of Sustainable Salmon Fisheries (SSFP; 5 AAC 39.222) and the Policy for Statewide Salmon Escapement Goals (EGP; 5 AAC 39.223). The Alaska Board of Fisheries adopted these policies into regulation during winter 2000–2001 to ensure that the state's salmon stocks are conserved, managed, and developed using the sustained yield principle. Two important terms defined in the SSFP were:

"Biological Escapement Goal" or "(BEG)" means the escapement that provides the greatest potential for maximum sustained yield; BEG will be the primary management objective for the escapement unless an optimal escapement or inriver run goal has been adopted; BEG will be developed from the best available biological information, and should be scientifically defensible on the basis of available biological information; BEG will be determined by the department and will be expressed as a range based on factors such as salmon stock productivity and data uncertainty; the department will seek to maintain evenly distributed salmon escapements within the bounds of a BEG;" and

"Sustainable Escapement Goal" or "(SEG)" means a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated due to the absence of a stock specific catch estimate; the SEG is the primary management objective for the escapement, unless an optimal escapement or inriver run goal has been adopted by the board, and will be developed from the best available biological information; the SEG will be determined by the department and will be stated as a range that takes into account data uncertainty; the department will seek to maintain escapements within the bounds of the SEG.

During the 2007 review process, escapement goals for the following stocks were evaluated:

- Sockeye salmon *O. nerka*: Fish and Packers creeks, and Crescent, Kasilof, Kenai, Russian (early and late run), and Yentna rivers;
- Chinook salmon *O. tshawytscha*: Alexander, Campbell, Clear, Crooked, Goose, Lake, Little Willow, Montana, Peters, Prairie, Sheep, and Willow creeks, and Chuitna, Chulitna, Deshka, Eagle River South Fork, Kenai (early and late run), Lewis, Little Susitna, Talachulitna, and Theodore rivers;
- Chum salmon *O. keta*: Clearwater Creek;
- Coho salmon *O. kisutch*: Campbell and Jim creeks, and Little Susitna River.

During the winter of 2006–2007, the department established an escapement goal review committee (hereafter referred to as the committee). The committee consisted of 4 Division of Commercial Fisheries and 7 Division of Sport Fish personnel (Table 1). The committee was formed to recommend the appropriate type of escapement goal (BEG or SEG) and provide an analysis for recommending an escapement goal for each stock.

The committee formally met 16 January, 2007 to review escapement goals and develop recommendations. The committee also communicated by email. All committee recommendations were reviewed by ADF&G regional and headquarters staff prior to being adopted by ADF&G as escapement goals per the SSFP and EGP.

METHODS

Available escapement, catch, and age data for each stock were compiled from research reports, management reports, and unpublished historical databases. Escapement refers to the annual estimated size of the spawning salmon stock. Escapement is affected by a variety of factors including exploitation, predation, diseases, and physical and biological changes in the environment. The committee evaluated the type, quality, and quantity of data for each stock. This evaluation was used to determine the appropriate type of escapement goal as defined in regulation. Generally speaking, an escapement goal for a stock should provide escapement that produces sustainable yields. Escapement goals for salmon have typically been based on spawner-recruit relations (e.g., Beverton and Holt 1957; Ricker 1954), which represent the productivity of the stock and estimated carrying capacity. However, specific methods to determine escapement goals vary in their technical complexity. Thus, escapement goals should be evaluated and revised over time as improved methods of assessment and goal setting are developed, and when new and better information become available. An escapement goal for a stock was defined as a BEG if a sufficiently long time series of escapement, catch, and age estimates were available; the estimates were sufficiently accurate and precise; and the data were considered sufficient to provide a scientifically defensible estimate of MSY (as per rules and methods in Hilborn and Walters 1992; CTC 1999; Quinn and Deriso 1999). A BEG is used when the reference points can be estimated and there is sufficient fishing power and inseason management capability to harvest annual runs to achieve the BEG. An escapement goal for a stock was defined as an SEG if a sufficiently long time series of escapement estimates were available, but there was concern about the spawner-return data (lack of age composition estimates and/or concern with stock-specific catch allocation) or there was a lack of information on stock productivity.

STUDY AREA

The UCI management unit consists of that portion of Cook Inlet north of Anchor Point and is divided into the Central and Northern districts (Figure 1). The Central District is approximately 120 km (75 miles) long, averages 50 km (32 miles) in width, and is further subdivided into 6 subdistricts. The Northern District is 80 km (50 miles) long, averages 32 km (20 miles) in width, and is divided into 2 subdistricts. Commercial salmon fisheries target mainly sockeye salmon with secondary catches of Chinook, coho, chum and pink salmon. Sport fish management is divided into the Northern Kenai Peninsula, Northern Cook Inlet, and the Anchorage management areas. These areas offer diverse personal use and recreational fishing opportunities for all 5 species of Pacific salmon.

ESCAPEMENT AND HARVEST DATA COLLECTION

Estimates or indices of salmon escapement are obtained with a variety of methods such as foot and aerial surveys, capture-recapture experiments, weir counts, and hydroacoustics (sonar). Differences in methods among years can affect the comparability and reliability of data. In the practical arena of salmon management, fishery biologists try to determine the amount of harvestable surplus and the number of spawners necessary to perpetuate the stock or run, known as the escapement goal.

Escapements of most Chinook salmon stocks in UCI have been monitored by single foot and aerial surveys. Such surveys provide only an index of escapement because we lack supporting data (i.e., accurate estimates of stream life and observer variability) to estimate number of fish in the escapement. The indices are a measurement on a numeric scale that provides information only about the relative level of the escapement. These measurements provide a ranking of escapement magnitude across years, but alone these measurements provide no information on the total number of fish in the escapement or of their age composition.

Hydroacoustics (sonar) have been used to assess early- and late-run Chinook salmon inriver runs to the Kenai River (Miller et al. 2005). An associated gillnetting program has been used to sample Chinook salmon to estimate age, sex, and size composition (Reimer 2004). Since 1995, the Deshka River Chinook salmon escapement has been counted and sampled at a weir, but in prior years escapement was indexed annually by single aerial surveys (Yanusz *In prep*). Chinook salmon escapement into the Deshka River prior to 1995 was estimated by expanding the aerial surveys in those years using the relationship between weir counts and survey indices observed since 1995. A weir project has also been in place to count and sample Chinook salmon in Crooked Creek (Gamblin et al. 2004). Sonar and weir data provides a count or an estimate of the total number of fish in the escapement.

For coho salmon stocks, escapements have been monitored with a combination of single foot surveys and weir counts (Bue and Hasbrouck *Unpublished*). Peak aerial surveys have been used to index escapement of chum salmon in Clearwater Creek, the only chum salmon stock in UCI that is monitored by ADF&G (Tobias and Willette 2007).

Sonar has been deployed to count or estimate sockeye salmon passing specific locations in the Crescent, Kasilof, Kenai, and Yentna rivers. Fish wheel catches were used to apportion sonar counts to species in these systems and to sample fish for age, sex, and size information

(Westerman and Willette 2006). Weirs have been installed to count and sample adult sockeye salmon escapements in the Russian River (Gamblin et al. 2004), Fish Creek (Sweet et al. 2004), and Packers Creek (Fandrei 1996).

Commercial catch statistics were compiled from ADF&G fish ticket information. The majority of sockeye salmon returning to UCI are caught in mixed stock fisheries (Shields 2007). A weighted age-composition apportionment method has been used to estimate stock-specific harvests of sockeye salmon in commercial gillnet fisheries in UCI (Tobias and Willette 2007). This method is based upon the assumption that age-specific exploitation rates were equal among stocks in the gillnet fishery (Bernard 1983) and is dependent upon accurate and precise escapement measures for all contributing stocks to the fishery. The age-composition catch apportionment method utilizes four data sources: (1) commercial harvests, (2) escapements into major UCI drainages, (3) age composition of harvests, and (4) age composition of escapements. Harvest allocation for each stock was estimated by harvest location and age composition. Estimates of sport harvest were derived from the postal survey (Statewide Harvest Survey) conducted annually by the Division of Sport Fish (Jennings et al. 2007).

ESCAPEMENT GOAL RECOMMENDATION

Escapement goals were evaluated for UCI stocks using the following methods: (1) Spawner-Return data; (2) Yield Analysis; (3) Smolt/Fry Information; and (4) Percentile Approach. Spawner-Return data was used to estimate escapement goals when the committee determined it had "good" estimates of total return (escapement and stock-specific harvest) for a stock. When "good" spawner-return data was available, escapement goals were estimated based on: (1) escapements producing average yields that were 90–100% of MSY (S_{MSY}) from a stock-recruitment model, and (2) the Yield Analysis, explained below, which also estimates MSY with corresponding 90–100% yield range. Smolt and/or fry information, when available, was used to aid in the estimation of escapement goals for stocks by examining the stability of freshwater productivity (average weight through time) and to better understand the effects of process error in marine versus freshwater environments. If marine survival is assumed to be largely density independent, a smolt stock-recruit production model provides improved estimates of yield related to spawners by eliminating marine environmental influences on survival.

Spawner-Return Data

Salmon spawner-return data were analyzed for all available brood years. Annual runs, the sum of escapements and harvests, were estimated as described in Bernard (1983). Where quantifiable, sport and subsistence harvests were included in total return estimates.

Spawner-return data were analyzed using a Ricker (1954) stock-recruitment model to estimate MSY and the escapement goal range. Results were not used if the model fit the data poorly ($p \geq 0.20$) or model assumptions were violated. Hilborn and Walters (1992), Quinn and Deriso (1999), and the CTC (1999) provide good descriptions of the Ricker model and diagnostics to assess model fit. All stock-recruitment models were tested and corrected for serial correlation of residuals when necessary. Additionally, the Ricker alpha parameter was corrected for the logarithm transformation bias induced into the model as described in Hilborn and Walters (1992) from fitting a regression line to ln(recruits/spawners) versus spawners.

Additional spawner-return analyses were conducted to examine stock productivity and the escapement goal for Kenai River sockeye salmon. Details about the various methods are provided in Clark et al. (2007). These analyses included:

(1) examination of a hierarchy of mathematical models that related number of spawners and adult recruitment of sockeye salmon;

(2) simulations using brood-interaction model parameters (Carlson et al. 1999) using the 1969–1999 spawner-recruit data and for the recent brood years 1979–1999 because the latter data set was obtained using more consistent methods for stock composition; and

(3) simulations testing the effects of alternating spawner abundances on yields in the brood-interaction model.

Yield Analysis

For the Kenai River sockeye salmon stock, Clark et al. (2007) conducted a Markov yield analysis (Hilborn and Walters 1992) to further evaluate the escapement goal range using three data sets: (1) the original spawner-recruit data set used in 1999, (2) an updated data set, and (3) a reduced data set. As in the original 1999 analysis, the yield table was constructed by partitioning the data into overlapping intervals of 200,000 spawners. The mean number of spawners, mean return, mean return per spawner, mean yield, and the range of yields was calculated for each interval of spawner abundance.

Percentile Approach

Most salmon stocks in UCI with an escapement goal have an SEG. In 2001, the SEG of these stocks was developed using percentiles of observed escapements, whether estimates or indices, that incorporated contrast in the escapement data and exploitation of the stock (Bue and Hasbrouck *Unpublished*). Percentile ranking is the percent of all escapement values that fall below a particular value. To calculate percentiles, escapement data are ranked from smallest to the largest value, with the smallest value the 0^{th} percentile (i.e., none of the escapement values are less than the smallest). The percentile of all remaining escapement values is a cumulative, or summation, of 1/(n-1), where n is the number of escapement values. Contrast in the escapement data is simply the maximum value divided by the minimum value. As contrast increased, the percentiles used to estimate the SEG were narrowed, primarily from the upper range, to allow the SEG to include a wide range of escapements. For exploited stocks with high contrast, the lower end of the SEG range was increased to the 25^{th} percentile as a precautionary measure for stock protection. The percentiles used at different levels of contrast were as follows (Bue and Hasbrouck *Unpublished*):

Escapement Contrast and Exploitation	SEG Range
Low Contrast (<4)	15^{th} Percentile to maximum observation
Medium Contrast (4 to 8)	15^{th} to 85^{th} Percentile
High Contrast (>8); Low Exploitation	15^{th} to 75^{th} Percentile
High Contrast (>8); Exploited Population	25^{th} to 75^{th} Percentile

For this review, the SEG ranges of all stocks were reevaluated using the percentile approach with updated or revised escapement data. If the estimated SEG range was consistent with the current goal (i.e., a high degree of overlap), the committee recommended no change to the goal.

RESULTS

There were 34 escapement goals evaluated for 32 stocks in UCI (Table 2). There were 32 existing escapement goals and 2 new goals for stocks that previously had goals. The recommendation for each escapement goal follows by species and river. The detailed information for each escapement goal can be found in the previous review reports (Clark et al. 2007; Hasbrouck and Edmundson 2007).

CHINOOK SALMON

Eagle River South Fork

The committee recommended that the Eagle River South Fork escapement goal for Chinook salmon be dropped. The sport harvest on this stock is very small (averaging less than 100 fish per year) and 5 of the past 6 surveys were poor quality, providing little information about escapements.

Campbell Creek

The committee recommended that the Campbell Creek Chinook salmon goal be re-instated to its previous level of 50 to 700 fish. During the 2004 review the goal was dropped because no fishery on this stock existed. In January of 2005 however, the BOF created a small youth-only fishery, which now warrants an escapement goal for this stock. The annual harvest for this fishery is approximately 100 fish (D. Bosch, Fishery Biologist, ADF&G, Division of Sport Fish, Region II; personal communication).

CHUM SALMON

The committee did not recommend any changes to the Clearwater Creek goal, the only chum salmon goal in UCI.

COHO SALMON

Campbell Creek

The committee recommended that the Campbell Creek escapement goal for coho salmon be dropped. Coho salmon runs to Campbell Creek are predominantly hatchery-stocked fish, with brood stock from Ship Creek.

SOCKEYE SALMON

Packers Creek

The committee recommended that the Packers Creek sockeye salmon goal be re-instated to its previous level of 15,000 to 30,000 before the 2004 review when it was dropped. In 2004, the committee dropped this goal because the weir had not operated since 2001. In 2005 however, a video counting system was installed for an annual assessment of escapement.

Fish Creek

The SEG for Fish Creek sockeye salmon is 20,000 to 70,000 fish after broodstock needs have been met (Appendix C2; CIAA 2007). Escapements during 2004–2006 were below the goal once (2005) and within the goal twice (Appendix C2).

The committee recommended no change to the SEG for Fish Creek sockeye salmon. Since 2002 this goal has been based on the percentile approach (Bue and Hasbrouck *Unpublished*; Hasbrouck and Edmundson 2007) applied to observed escapements from a time period prior to hatchery supplementation (1938–1978) so that the effects of supplementation did not influence yields and subsequent escapement of this stock. It was thought that a range of escapements from 20,000 to 70,000 fish would utilize available spawning areas, produce adequate numbers of juvenile salmon that would not tax the productive capacity of the lake, and sustain yields into the future.

Currently, this goal is evaluated using escapements of hatchery and naturally-produced fish because we can't manage fisheries to target hatchery fish. Hatchery supplementation of this stock began in 1979 and continues to the present (Dodson 2007). Prior to 1999 the hatchery did not mark fry released into the lake so there was no method to differentiate hatchery-produced from naturally-produced adults at the weir. Returning adults of hatchery origin have been differentiated from naturally produced fish at the weir from 2002 to the present. Although insufficient to assess the current goal, this information will prove useful in future evaluations of the escapement goal.

Fish used as broodstock in the hatchery program have not been (Bue and Hasbrouck *Unpublished*; Hasbrouck and Edmundson 2007) and should not be included in the evaluation of the escapement goal. These fish are used as a source of eggs and milt to produce fry that are stocked into Big Lake in the Fish Creek drainage and are also used to support hatchery programs in other waters (Dodson 2007). Broodstock do not contribute to the spawning escapement of the Fish Creek stock at the time of the evaluation of the escapement goal. Moreover, broodstock fish are not involved in the competition for spawning sites that may be a significant factor in the productive capacity of Fish Creek. Conversely, if rearing capacity is limiting production in the Fish Creek drainage, juveniles produced from broodstock and stocked back into Fish Creek would compete with naturally produced juvenile sockeye salmon. Competition from these hatchery-produced juveniles would likely be disproportionately greater than the naturally produced juveniles from an equivalent number of adult salmon taken during brood collection and evaluation of the escapement goal.

DISCUSSION

The committee recommended that most escapement goals for UCI salmon stocks remain status quo (Table 2). However, the Campbell Creek Chinook salmon and Packers Creek sockeye salmon goals that were dropped in the last review from 2004 were re-instated. Also, the Eagle River South Fork Chinook salmon and Campbell Creek coho salmon goals were dropped.

Historical escapement through 2006 and, when possible, harvest or total return data, of each stock appear in Appendices A–D. Through their respective time frames, data in the appendices were used in the review of escapement goals and development of SEGs of UCI salmon stocks in 2001 (Bue and Hasbrouck *Unpublished*), 2004 (Clark et al. 2007; Hasbrouck and Edmundson

2007), and in this review. Escapement values of some Chinook and coho salmon stocks were corrected because errors were discovered in the data.

It was recommended that the majority of current escapement goals for sockeye salmon in UCI remain unchanged. In this review, the committee did not have evidence to warrant a change in sockeye salmon escapement goals. However, some of the stocks underlying spawner-recruit data may be changed in the relatively near future using new information to allocate harvests.

The department has recently developed new, less expensive genetic techniques that are being used to estimate the stock composition of commercial sockeye salmon harvests in UCI for 2005 to 2007. It is anticipated that the results from these analyses will provide somewhat different estimates of harvest by stock for the major sockeye salmon producing stocks in UCI, and will thereby change the estimates of total run for these stocks. ADF&G has received General Fund monies to allow for the analysis of genetics samples each year. As time and funding allow, it is anticipated that select historical harvests will be genetically tested for stock composition and in conjunction with run strength, age composition, and run timing, modeled to re-estimate historical harvest composition by stock.

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TABLES AND FIGURES

Table 1.–List of members on the Alaska Department of Fish and Game (ADF&G) Upper Cook Inlet salmon escapement goal committee. Also provided is a list of other participants who assisted with the escapement goal review.

Name	Affiliation
Escapement Goal Committee:	
Lowell Fair	ADF&G, Division of Commercial Fisheries
Tracy Lingnau	ADF&G, Division of Commercial Fisheries
Scott Raborn	ADF&G, Division of Commercial Fisheries
Mark Willette	ADF&G, Division of Commercial Fisheries
Robert Begich	ADF&G, Division of Sport Fish
Bob Clark	ADF&G, Division of Sport Fish
James Hasbrouck	ADF&G, Division of Sport Fish
Tim McKinley	ADF&G, Division of Sport Fish
Dave Rutz	ADF&G, Division of Sport Fish
Tom Vania	ADF&G, Division of Sport Fish
Rich Yanusz	ADF&G, Division of Sport Fish
Other Participants:	
Doug Eggers	ADF&G, Division of Commercial Fisheries
Jeff Regnart	ADF&G, Division of Commercial Fisheries
Jim Seeb	ADF&G, Division of Commercial Fisheries
Matt Miller	ADF&G, Division of Sport Fish
George Pappas	ADF&G, Division of Sport Fish

Table 2.–Current escapement goals, escapements observed from 2004 through 2007, and escapement goal recommendations in 2007 for Chinook, chum, coho, and sockeye salmon stocks of Upper Cook Inlet, Alaska.

		Escapement Goal		Escapements [b]			
System	Escapement Data [a]	Type (BEG, SEG)	Range	2004	2005	2006	Recommendation [c]
Chinook Salmon							
Alexander Creek	SAS	SEG	2,100–6,000	2,215	2,140	885	NC
Campbell Creek	SFS	SEG	50–700	964	1,097	1,052	Re-instated previous SEG
Chuitna River	SAS	SEG	1,200–2,900	2,938	1,307	1,911	NC
Chulitna River	SAS	SEG	1,800–5,100	2,162	2,838	2,862	NC
Clear (Chunilna) Creek	SAS	SEG	950–3,400	3,417	1,924	1,520	NC
Crooked Creek [d]	Weir	SEG	650–1,700	2,196	1,903	1,516	NC
Deshka River	Weir	BEG	13,000–28,000	57,934 [e]	37,725	31,150	NC
Eagle River-S. Fork	SFS	SEG	50–350	47	32 [f]	13 [f]	Drop goal
Goose Creek	SAS	SEG	250–650	417	468	306	NC
Kenai River - Early Run	Sonar	BEG	4,000–9,000	11,855	16,387	18,560 [g]	NC
Kenai River - Late Run	Sonar	BEG	17,800–35,700	40,198	26,046	24,843 [g]	NC
Lake Creek	SAS	SEG	2,500–7,100	7,598	6,345	5,300	NC
Lewis River	SAS	SEG	250–800	1,000	441	341	NC
Little Susitna River	SAS	SEG	900–1,800	1,694	2,095	1,855	NC
Little Willow Creek	SAS	SEG	450–1,800	2,227	1,784	816	NC
Montana Creek	SAS	SEG	1,100–3,100	2,117	2,600	1,850	NC
Peters Creek	SAS	SEG	1,000–2,600	3,757	1,508	1,114	NC
Prairie Creek	SAS	SEG	3,100–9,200	5,570	3,862	3,570	NC
Sheep Creek	SAS	SEG	600–1,200	285	760	580	NC
Talachulitna River	SAS	SEG	2,200–5,000	8,352	4,406	6,152	NC
Theodore River	SAS	SEG	500–1,700	491	478	958	NC
Willow Creek [d]	SAS	SEG	1,600–2,800	2,840	2,411	2,193	NC
Chum Salmon							
Clearwater Creek	PAS	SEG	3,800–8,400	3,900	530	500	NC

-continued-

Table 2.–Page 2 of 2.

System	Escapement Data [a]	Escapement Goal: Type (BEG, SEG)	Escapement Goal: Range	Escapements [b]: 2004	Escapements [b]: 2005	Escapements [b]: 2006	Recommendation [c]
Coho Salmon							
Campbell Creek	SFS	SEG	100–500	713	1,130	542	Drop goal
Jim Creek [h]	SFS	SEG	450–700	4,652	1,464	2,389	NC
Little Susitna River	Weir	SEG	10,100–17,700	40,199	16,839	8,786 [i]	NC
Pink Salmon							
No stocks with an escapement goal							
Sockeye Salmon							
Crescent River	Sonar	BEG	30,000–70,000	103,000	125,000	92,000	NC
Fish Creek (Knik) [j]	Weir	SEG	20,000–70,000	20,465	12,051	26,712	NC
Kasilof River	Sonar	BEG	150,000–250,000	575,000	346,000	366,000	NC
Kenai River	Sonar	SEG	500,000–800,000	1,120,000	1,113,000	1,270,000 [k]	NC
Packers Creek	Weir	SEG	15,000–30,000	NS	25,516	NS	Re-instated previous SEG
Russian River - Early Run	Weir	SEG	14,000–37,000	56,582	52,903	80,524	NC
Russian River - Late Run	Weir	SEG	30,000–110,000	110,244	54,808	84,432	NC
Yentna River	Sonar	SEG	90,000–160,000	71,281	36,921	92,045	NC

[a] SAS = Single Aerial Survey, PAS = Peak Aerial Survey, SFS = Single Foot Survey.

[b] NS = No Survey. Fish required to meet broodstock needs, in addition to meeting escapement goal, include 250 Chinook salmon at Crooked Creek and Deception Creek; 500 Chinook salmon at Ship Creek; 150 coho salmon at Jim Creek; 1,000 coho salmon at Ship Creek; 10,000 sockeye salmon at the Kasilof River; and 5,000 sockeye salmon at Fish Creek.

[c] NC = No Change.

[d] Escapement of naturally produced fish only.

[e] Weir count. Historic harvest upstream of weir = 1,005 Chinook salmon during 2000–2003.

[f] Poor survey count due to timing, weather, or poor visibility.

[g] Actual estimates of escapement not available until fall 2008 pending results from the Statewide Harvest Survey.

[h] Foot survey of McRoberts Creek only, upon which the SEG is based.

[i] Incomplete weir count due to flooding.

[j] The goal represents total spawner abundance minus sockeye salmon taken for broodstock.

[k] Used preliminary estimate of sport harvest upstream of sonar.

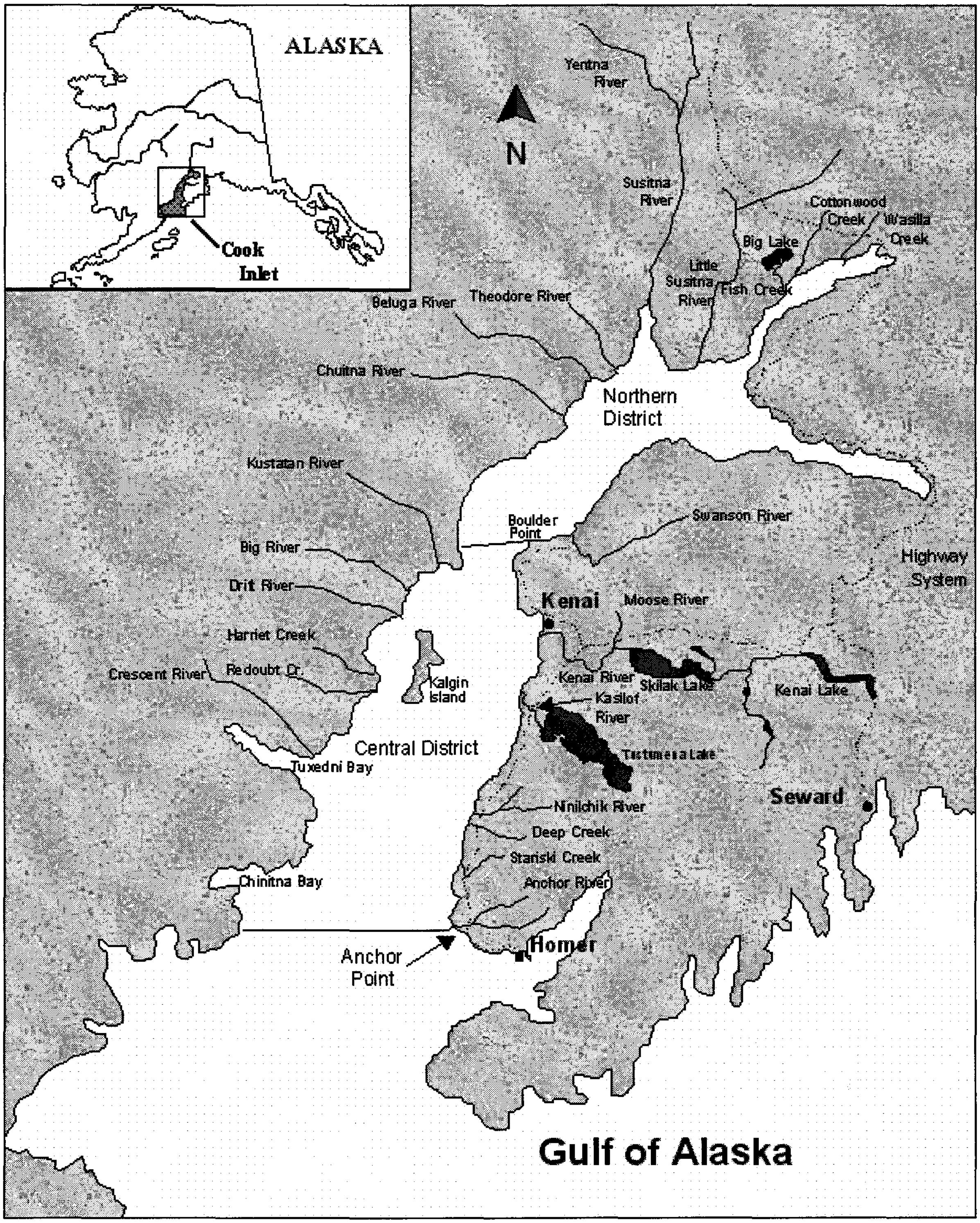

Figure 1.–Map of Upper Cook Inlet showing locations of the Northern and Central Districts and the primary salmon spawning drainages.

APPENDIX A.
SUPPORTING INFORMATION FOR ESCAPEMENT GOALS FOR CHINOOK SALMON OF UPPER COOK INLET

Appendix A1.–Data available for analysis of escapement goals, Alexander Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1974	2,193	
1975	1,878	
1976	5,412	
1977	9,246	
1978	5,854	
1979	6,215	712
1980		1,438
1981		1,121
1982	2,546	2,506
1983	3,755	1,711
1984	4,620	2,107
1985	6,241	2,761
1986	5,225	2,937
1987	2,152	2,224
1988	6,273	4,687
1989	3,497	4,882
1990	2,596	5,119
1991	2,727	6,548
1992	3,710	4,124
1993	2,763	5,154
1994	1,514	3,070
1995	2,090	1,217
1996	2,319	1,005
1997	5,598	1,470
1998	2,807	1,275
1999	3,974	2,241
2000	2,331	2,721
2001	2,282	2,313
2002	1,936	1,992
2003	2,012	2,293
2004	2,215	1,294
2005	2,140	1,052
2006	885	1,396

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007). Years with no harvest estimate occur because the escapement time series precedes the survey (begun in 1977) or harvest could not be estimated from survey data.

Appendix A2.–Data available for analysis of escapement goals, Campbell Creek Chinook salmon.

Year	Escapement [a]
1961	70
1962	40
1963	187
1964	116
1965	119
1966	15
1967	300
1968	125
1969	
1970	63
1971	102
1972	37
1973	201
1974	79
1975	
1976	210
1977	349
1978	
1979	
1980	
1981	
1982	68
1983	
1984	423
1985	
1986	733
1987	571
1988	
1989	218
1990	458
1991	590
1992	931
1993	937
1994	1,076
1995	734
1996	369
1997	1,119
1998	761
1999	1,035
2000	591
2001	717
2002	744
2003	747
2004	964
2005	1,097
2006	1,052

[a] Escapement not surveyed or monitored during years with no escapement value.

Appendix A3.–Data available for analysis of escapement goals, Chuitna River Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1977		227
1978		408
1979	1,246	78
1980		17
1981	1,362	115
1982	3,438	105
1983	4,043	1,185
1984	2,845	723
1985	1,600	734
1986	3,946	960
1987		146
1988	3,024	312
1989	990	581
1990	480	1,064
1991	537	377
1992	1,337	516
1993	2,085	893
1994	1,012	530
1995	1,162	201
1996	1,343	844
1997	2,232	728
1998	1,869	551
1999	3,721	561
2000	1,456	513
2001	1,501	457
2002	1,394	629
2003	2,339	592
2004	2,938	333
2005	1,307	294
2006	1,911	445

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A4.–Data available for analysis of escapement goals, Chulitna River Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1982	863	
1983	4,058	
1984	4,191	
1985	783	
1986		
1987	5,252	
1988		
1989		
1990	2,681	
1991	4,410	
1992	2,527	
1993	2,070	
1994	1,806	
1995	3,460	
1996	4,172	43
1997	5,618	0
1998	2,586	41
1999	5,455	76
2000	4,218	10
2001	2,353	38
2002	9,002	0
2003		0
2004	2,162	0
2005	2,838	12
2006	2,862	0

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey for North Fork Chulitna River only (Jennings et al. 2007). Years with no harvest estimate occur because harvest could not be estimated from survey data.

Appendix A5.–Data available for analysis of escapement goals, Clear Creek Chinook salmon.

Year	Escapement [a]
1979	864
1980	
1981	
1982	982
1983	938
1984	1,520
1985	2,430
1986	
1987	
1988	4,850
1989	
1990	2,380
1991	1,974
1992	1,530
1993	886
1994	1,204
1995	1,928
1996	2,091
1997	5,100
1998	3,894
1999	2,216
2000	2,142
2001	2,096
2002	3,496
2003	
2004	3,417
2005	1,924
2006	1,520

[a] Escapement not surveyed or monitored during years with no escapement value.

Appendix A6.–Data available for analysis of escapement goals, Crooked Creek Chinook salmon.

Brood	Count at the Weir [a]			Actual Escapement [b]			Sport Harvest [c]	
							Early Run	
Year	Wild	Hatchery	Total	Total	Wild	Year	(thru 6/30)	Total
1976	1,682 [d]		1,682	1,537	1,537			
1977	3,069 [d]		3,069	2,390	2,390			
1978	4,535	180	4,715	4,388	4,220	1978		251
1979	2,774	770	3,544	3,177	2,487	1979		283
1980	1,764	518	2,282	2,115	1,635	1980		310
1981	1,871	1,033	2,904	2,919	1,881	1981		1,242
1982	1,449	2,054	3,503	4,107	1,699	1982		2,316
1983	1,543	2,762	4,305	3,842	1,377	1983		2,853
1984	1,372	2,278	3,650	3,409	1,281	1984		3,964
1985	1,175	1,637	2,812	2,491	1,041	1985		2,986
1986	1,539	2,335	3,874	4,055	1,611	1986		7,071
1987	1,444	2,280	3,724	3,344	1,297	1987		4,461
1988	1,174	2,622	3,796	700	216	1988		4,953
1989	1,081	1,930	3,011	750	269	1989		3,767
1990	1,066	1,581	2,647	1,663	670	1990		2,852
1991			2,281	893		1991		5,055
1992			3,533	843		1992		6,049
1993			2,291	657		1993		8,695
1994			1,790	640		1994		7,217
1995			2,206	750		1995		6,681
1996			2,224	764		1996	5,295	6,128
1997						1997	5,627	6,728
1998						1998	4,201	4,839
1999	602	1,189	1,791	1,503	505	1999	7,597	8,255
2000	662	752	1,414	1,100	515	2000	8,815	9,901
2001	2,122	462	2,584	3,023	1,381	2001	7,488	8,866
2002	2,506	797	3,303	3,254	958	2002	4,791	5,242
2003	2,923	1,204	4,127	4,780	2,554	2003	3,078	4,222
2004	2,641	2,232	4,873	4,674	2,196	2004	3,295	4,333
2005	2,107	1,055	3,162	2,923	1,903	2005	3,468	4,520
2006	1,589	1,056	2,645	2,568	1,516	2006	2,421	3,304

[a] Excludes age 0.1 fish. No weir count in 1997 and 1998.

[b] Number of fish estimated to have actually spawned. Includes fish counted during foot surveys below the weir. During all years fish were removed at the weir for brood stock and from 1988–1996 fish were also sacrificed for disease concerns.

[c] From Statewide Harvest Survey (Jennings et al. 2007) (large fish >20" only) for the Kasilof River sport fishery. Includes both wild and hatchery fish and an unknown number of late-run fish prior to 1996.

[d] Assumed wild.

Appendix A7.–Data available for analysis of escapement goals, Deshka River Chinook salmon.

Brood Year	Aerial Survey [a]	Spawning Escapement [b]	Weir Escapement	Total Return [a]	Yield	Return/ Spawner	Year	Sport Harvest [c]
1974	5,279	15,915		61,420	45,505	3.86	1974	
1975	4,737	14,840		33,603	18,764	2.26	1975	
1976	21,693	48,481		38,000	-10,480	0.78	1976	
1977	39,642	84,091		38,513	-45,579	0.46	1977	
1978	24,639	54,325		44,748	-9,577	0.82	1978	
1979	27,385	59,773		52,325	-7,448	0.88	1979	2,811
1980		35,132 [d]		44,840	9,708	1.28	1980	3,685
1981		23,605 [d]		44,783	21,178	1.90	1981	2,769
1982	16,000	37,186		75,172	37,986	2.02	1982	4,307
1983	19,237	43,608		36,457	-7,151	0.84	1983	4,889
1984	16,892	38,955		35,455	-3,501	0.91	1984	5,699
1985	18,151	41,453		47,362	5,909	1.14	1985	6,407
1986	21,080	47,264		31,066	-16,198	0.66	1986	6,490
1987	15,028	35,257		22,244	-13,013	0.63	1987	5,632
1988	19,200	43,534		21,472	-22,062	0.49	1988	5,474
1989		23,686 [d]		16,208	-7,478	0.68	1989	8,062
1990	18,166	41,483		6,988	-34,494	0.17	1990	6,161
1991	8,112	21,536		15,921	-5,614	0.74	1991	9,306
1992	7,736	20,790		43,081	22,291	2.07	1992	7,256
1993	5,769	16,887		31,748	14,860	1.88	1993	5,682
1994	2,665	10,729		30,309	19,580	2.83	1994	624
1995	5,150		10,048	52,974	42,926	5.27	1995	0
1996	6,343		14,349	25,488	11,139	1.78	1996	11
1997	19,047		35,587	33,599	-1,988	0.94	1997	42
1998	15,556	36,305		42,087	42,087	1.16	1998	3,384
1999	12,904		29,088	66,785	37,697	2.30	1999	3,496
2000 [e]			33,965				2000	7,075
2001 [e]			27,966				2001	5,007
2002 [e]	8,749		28,535				2002	4,508
2003 [e]			39,257				2003	6,605
2004 [e]	28,778		56,659				2004	9,050
2005 [e]	11,495		36,433				2005	7,332
2006 [e]	6,499		29,922				2006	7,753

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] Data used for spawner-recruit analysis. Aerial surveys were expanded, based on the relationship of aerial surveys to weir counts observed for 1995–2004, to obtain estimates of spawning escapement (Yanusz *In prep*).

[c] From Statewide Harvest Survey (Jennings et al. 2007). Years with no harvest estimate occur because the escapement time series precedes the survey (begun in 1977) or harvest could not be estimated from survey data.

[d] Based on average survey indices from nearby years for 1980 and an expectation-maximization (E-M) algorithm for 1981 and 1989 (Yanusz *In prep*), and regression expansion noted in footnote b.

[e] Complete return data not yet available.

Appendix A8.–Data available for analysis of escapement goals, Goose Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1981	262	
1982	140	
1983	477	
1984	258	
1985	401	
1986	630	145
1987	416	334
1988	1,076	218
1989	835	385
1990	552	504
1991	968	288
1992	369	1,033
1993	347	633
1994	375	361
1995	374	226
1996	305	437
1997	308	298
1998	415	348
1999	268	371
2000	348	258
2001		160
2002	565	403
2003	175	350
2004	417	335
2005	468	150
2006	306	27

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007). Years with no harvest estimate occur because harvest could not be estimated from survey data.

Appendix A9.–Data available for analysis of escapement goals, Kenai River early-run Chinook salmon.

Year	Escapement	Total Return	Yield [a]	Return/ Spawner
1986	18,682	9,863	-8,819	0.53
1987	11,780	17,438	5,659	1.48
1988	5,331	20,736	15,404	3.89
1989	9,449	20,326	10,876	2.15
1990	8,494	19,716	11,222	2.32
1991	8,834	17,162	8,328	1.94
1992	7,610	11,008	3,398	1.45
1993	10,293	13,926	3,633	1.35
1994	9,947	21,814	11,867	2.19
1995	11,310	16,782	5,472	1.48
1996	16,595	8,857	-7,738	0.53
1997	8,185	12,516	4,331	1.53
1998	7,760	11,783	4,023	1.52
1999	17,276	21,101	3,825	1.22
2000 [b]	10,476			
2001 [b]	14,982			
2002 [b]	6,185			
2003 [b]	10,097			
2004 [b]	11,855			
2005 [b]	16,387			
2006 [b]	18,560			

[a] Yield is total return minus escapement.

[b] Complete return data not yet available.

Appendix A10.–Data available for analysis of escapement goals, Kenai River late-run Chinook salmon.

Year		Escapement	Total Return	Yield [a]	Return/ Spawner
1986		47,375	47,475	99	1.00
1987		34,900	65,177	30,278	1.87
1988		32,137	71,743	39,605	2.23
1989		19,256	44,111	24,855	2.29
1990		26,508	49,078	22,570	1.85
1991		26,695	69,694	42,998	2.61
1992		22,524	48,784	26,260	2.17
1993		33,738	47,132	13,394	1.40
1994		35,065	53,482	18,417	1.53
1995		31,255	53,697	22,442	1.72
1996		30,907	39,270	8,363	1.27
1997		26,297	43,586	17,289	1.66
1998		26,768	67,840	41,072	2.53
1999		34,962	99,135	64,173	2.84
2000	[b]	29,627			
2001	[b]	17,947			
2002	[b]	30,464			
2003	[b]	23,736			
2004	[b]	40,198			
2005	[b]	26,046			
2006	[b]	24,843			

[a] Yield is total return minus escapement.

[b] Complete return data not yet available.

Appendix A11.–Data available for analysis of escapement goals, Lake Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1979	4,196	1,796
1980		775
1981		795
1982	3,577	1,645
1983	7,075	2,423
1984		2,881
1985	5,803	2,575
1986		2,134
1987	4,898	3,282
1988	6,633	2,784
1989		3,554
1990	2,075	3,423
1991	3,011	2,712
1992	2,322	3,668
1993	2,869	6,425
1994	1,898	3,548
1995	3,017	2,838
1996	3,514	2,587
1997	3,841	3,777
1998	5,056	2,511
1999	2,877	3,037
2000	4,035	4,611
2001	4,661	4,067
2002	4,852	2,878
2003	8,153	4,467
2004	7,598	3,657
2005	6,345	4,508
2006	5,300	4,070

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A12.–Data available for analysis of escapement goals, Lewis River Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1977		9
1978		12
1979	546	
1980		
1981	560	
1982	606	
1983		
1984	947	
1985	861	100
1986	722	
1987	875	185
1988	616	246
1989	452	190
1990	207	285
1991	303	16
1992	445	
1993	531	27
1994	164	
1995	146	
1996	257	
1997	777	
1998	626	
1999	675	
2000	480	
2001	502	
2002	439	0
2003	878	0
2004	1,000	0
2005	441	0
2006	341	0

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007). Years with no harvest estimate occur because harvest could not be estimated from survey data.

Appendix A13.–Data available for analysis of escapement goals, Little Susitna River Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1977		191
1978		93
1979		800
1980		646
1981		1,418
1982		1,467
1983	929	1,187
1984	558	1,883
1985	1,005	1,845
1986		1,457
1987	1,386	2,282
1988	3,197	2,822
1989	2,184	4,204
1990	922	1,965
1991	892	2,102
1992	1,441	3,920
1993		3,441
1994	1,221	4,204
1995	1,714	1,698
1996	1,079	1,484
1997		2,938
1998	1,091	2,031
1999		2,713
2000	1,094	2,803
2001	1,238	2,243
2002	1,660	3,144
2003	1,114	2,138
2004	1,694	2,362
2005	2,095	2,724
2006	1,855	3,303

[a] Escapement not surveyed or monitored during years with no escapement value. No aerial survey conducted in 1989; however, in 1988, 1989, 1994, and 1995 a weir was operated on the Little Susitna River. Based on the relationship of weir counts to aerial surveys in 1988, 1994, and 1995, 50% of the 1989 weir count of 4,367 Chinook salmon was used for an index of escapement.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A14.–Data available for analysis of escapement goals, Little Willow Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1979	327	0
1980		32
1981	459	0
1982	316	0
1983	1,042	0
1984		37
1985	1,305	25
1986	2,133	872
1987	1,320	711
1988	1,515	937
1989	1,325	507
1990	1,115	387
1991	498	684
1992	673	1,023
1993	705	1,200
1994	712	745
1995	1,210	436
1996	1,077	896
1997	2,390	699
1998	1,782	546
1999	1,837	1,344
2000	1,121	577
2001	2,084	941
2002	1,680	580
2003	879	510
2004	2,227	445
2005	1,784	621
2006	816	449

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A15.–Data available for analysis of escapement goals, Montana Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1981	814	661
1982		241
1983		504
1984		1,522
1985		979
1986		2,796
1987	1,320	1,726
1988	2,016	1,070
1989		1,708
1990	1,269	478
1991	1,215	575
1992	1,560	3,078
1993	1,281	4,054
1994	1,143	3,111
1995	2,110	1,004
1996	1,841	1,612
1997	3,073	2,181
1998	2,936	1,471
1999	2,088	3,279
2000	1,271	1,728
2001	1,930	2,646
2002	2,357	2,026
2003	2,576	1,242
2004	2,117	1,071
2005	2,600	1,328
2006	1,850	1,672

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A16.–Data available for analysis of escapement goals, Peters Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1983	2,272	
1984	324	112
1985	2,901	
1986	1,915	
1987	1,302	
1988	3,927	549
1989	959	339
1990	2,027	385
1991	2,458	495
1992	996	655
1993	1,668	283
1994	573	202
1995	1,041	252
1996	749	74
1997	2,637	34
1998	4,367	74
1999	3,298	197
2000	1,648	236
2001	4,226	88
2002	2,959	52
2003	3,998	122
2004	3,757	85
2005	1,508	0
2006	1,114	33

[a] In 1983 only a tributary was surveyed, not the mainstem of Peters Creek.

[b] From Statewide Harvest Survey (Jennings et al. 2007). Years with no harvest estimate occur because harvest could not be estimated from survey data.

Appendix A17.–Data available for analysis of escapement goals, Prairie Creek Chinook salmon.

Year	Escapement
1981	1,875
1982	3,844
1983	3,200
1984	9,000
1985	6,500
1986	8,500
1987	9,138
1988	9,280
1989	9,463
1990	9,113
1991	6,770
1992	4,453
1993	3,023
1994	2,254
1995	3,884
1996	5,037
1997	7,710
1998	4,465
1999	5,871
2000	3,790
2001	5,191
2002	7,914
2003	4,095
2004	5,570
2005	3,862
2006	3,570

Appendix A18.–Data available for analysis of escapement goals, Sheep Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1979	778	10
1980		45
1981	1,013	0
1982	527	0
1983	975	0
1984	1,028	0
1985	1,634	0
1986	1,285	1,778
1987	895	1,610
1988	1,215	1,847
1989	610	1,116
1990	634	1,537
1991	154	1,519
1992		2,663
1993		2,300
1994	542	1,349
1995	1,049	746
1996	1,028	1,397
1997		550
1998	1,160	700
1999		2,558
2000	1,162	852
2001		1,420
2002	854	928
2003		1,284
2004	285	914
2005	760	878
2006	580	707

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A19.–Data available for analysis of escapement goals, Talachulitna River Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1979	1,648	293
1980		121
1981	2,025	57
1982	3,101	0
1983	10,014	336
1984	6,138	424
1985	5,145	224
1986	3,686	201
1987		116
1988	4,112	909
1989		403
1990	2,694	709
1991	2,457	848
1992	3,648	445
1993	3,269	875
1994	1,575	927
1995	2,521	509
1996	2,748	697
1997	4,494	778
1998	2,759	563
1999	4,890	977
2000	2,414	694
2001	3,309	409
2002	7,824	508
2003	9,573	587
2004	8,352	344
2005	4,406	800
2006	6,152	452

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A20.–Data available for analysis of escapement goals, Theodore River Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1977		237
1978		58
1979	512	20
1980		17
1981	535	77
1982	1,368	42
1983	1,519	0
1984	1,251	1,110
1985	1,458	1,195
1986	1,281	1,418
1987	1,548	1,146
1988	1,906	1,137
1989	1,026	1,317
1990	642	748
1991	508	369
1992	1,053	522
1993	1,110	527
1994	577	581
1995	694	360
1996	368	183
1997	1,607	0
1998	1,807	0
1999	2,221	0
2000	1,271	0
2001	1,237	21
2002	934	0
2003	1,059	13
2004	491	0
2005	478	0
2006	958	0

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007).

Appendix A21.–Data available for analysis of escapement goals, Willow Creek Chinook salmon.

Year	Escapement [a]	Sport Harvest [b]
1979	848	459
1980		289
1981	991	585
1982	592	629
1983	777	534
1984	2,789	774
1985	1,856	1,063
1986	2,059	1,017
1987	2,768	1,987
1988	2,496	2,349
1989	5,060	2,846
1990	2,365	3,237
1991	2,006	3,208
1992	1,660	8,884
1993	2,227	8,626
1994	1,479	5,980
1995	3,792	2,742
1996	1,776	2,690
1997	4,841	3,135
1998	3,500	2,793
1999	2,081	4,988
2000	2,601	3,782
2001	3,132	4,573
2002	2,553	3,591
2003	3,855	3,922
2004	2,840	2,818
2005	2,411	2,466
2006	2,193	2,141

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007) which includes harvest for the entire drainage, including wild and hatchery produced fish of Deception Creek origin.

APPENDIX B.
SUPPORTING INFORMATION FOR ESCAPEMENT GOALS FOR COHO SALMON OF UPPER COOK INLET

Appendix B1.–Data available for analysis of escapement goals, Jim Creek coho salmon.

Year	Escapement [a]	Sport Harvest [b]
1981		1,801
1982		2,306
1983		774
1984		3,429
1985	662	2,523
1986	439	2,948
1987	667	3,676
1988	1,911	11,078
1989	597	4,220
1990	599	6,184
1991	484	2,920
1992	11	3,409
1993	503	2,878
1994	506	3,946
1995	702	3,549
1996	72	3,911
1997	701	1,786
1998	922	4,197
1999	12	2,612
2000	657	5,653
2001	1,019	8,374
2002	2,473	14,707
2003	1,421	6,415
2004	4,652	11,766
2005	1,464	10,114
2006	2,389	19,256

[a] Escapement for McRoberts Creek only, a tributary to Jim Creek. Escapement not surveyed or monitored during years with no escapement value.

[b] From Statewide Harvest Survey (Jennings et al. 2007) for Knik River and tributaries including Jim Creek.

Appendix B2.–Data available for analysis of escapement goals, Little Susitna River coho salmon.

Year	Total Escapement [a]	% Hatchery Contribution to Escapement [b]	Escapement Hatchery	Escapement Wild	Sport Harvest [c]
1977					3,415
1978					4,865
1979					3,382
1980					6,302
1981					5,940
1982					7,116
1983					2,835
1984					14,253
1985					7,764
1986	6,999			6,999	6,039
1987					13,003
1988	20,491	22	4,428	16,063	19,009
1989	15,232	45	6,862	8,370	14,129
1990	14,310	24	3,370	10,940	7,497
1991	37,601	22	8,322	29,279	16,450
1992	20,393	11	2,324	18,069	20,033
1993	33,378	29	9,615	23,763	27,610
1994	27,820	18	5,124	22,696	17,665
1995	11,817	9	1,069	10,748	14,451
1996	16,699	3	444	16,255	16,753
1997	9,894			9,894	7,756
1998	15,159			15,159	14,469
1999	3,017			3,017	8,864
2000	15,436			15,436	20,357
2001	30,587			30,587	17,071
2002	47,938			47,938	19,278
2003	10,877			10,877	13,672
2004	40,199			40,199	15,307
2005	16,839			16,839	10,203
2006	8,786			8,786	12,399

[a] Escapement not surveyed or monitored during years with no escapement value.

[b] Based on sampling and coded wire tag data collected at the weir in 1988–1996. Hatchery stocking program ended in 1995, thus no hatchery produced fish in the coho salmon run since 1997.

[c] From Statewide Harvest Survey (Jennings et al. 2007).

APPENDIX C.
SUPPORTING INFORMATION FOR ESCAPEMENT GOALS FOR SOCKEYE SALMON OF UPPER COOK INLET

Appendix C1.–Data available for analysis of escapement goals, Crescent River sockeye salmon.

Year	Escapement [a]	Total Return	Yield [a]	Return/ Spawner
1975	41,000	216,000	175,000	5.27
1976	51,000	52,000	1,000	1.02
1977	87,000	99,000	12,000	1.14
1978	74,000	245,000	171,000	3.31
1979	86,654	245,000	158,346	2.83
1980	90,863	275,000	184,137	3.03
1981	41,213	163,000	121,787	3.96
1982	58,957	168,000	109,043	2.85
1983	92,122	182,000	89,878	1.98
1984	118,345	114,000	-4,345	0.96
1985	128,628	54,000	-74,628	0.42
1986 [b]	95,000	90,000	-5,000	0.95
1987	120,219	64,000	-56,219	0.53
1988	57,716	51,000	-6,716	0.88
1989	71,064	80,000	8,936	1.13
1990	52,238	42,000	-10,238	0.80
1991	44,578	55,000	10,422	1.23
1992	58,229	85,000	26,771	1.46
1993	37,556	91,000	53,444	2.42
1994	30,355	88,000	57,645	2.90
1995	52,311	138,000	85,689	2.64
1996	28,729	76,000	47,271	2.65
1997	70,768	100,000	29,232	1.41
1998	62,257	180,000	117,743	2.89
1999	66,519	159,000	92,481	2.39
2000	56,599	178,000	121,401	3.14
2001 [c]	78,081			
2002 [c]	62,833			
2003 [c]	122,457			
2004 [c]	103,201			
2005 [c]	125,623			
2006 [c]	92,533			

[a] Escapement was estimated by sonar beginning in 1975.

[b] In 1986, the sonar operation was terminated earlier than usual on July 16. A total of 20,385 sockeye salmon had been counted through that date. To account for the missing period, total sockeye salmon escapement in 1986 was estimated using the exploitation rate through July 13 and total Western Subdistrict catch.

[c] Complete return data not yet available.

Appendix C2.–Data available for analysis of escapement goals, Fish Creek sockeye salmon.

Year	Escapement [a]	Year	Escapement [a]
1938	182,463	1973	2,705 [e]
1939	116,588	1974	16,225 [f]
1940	306,982	1975	29,882
1941	55,077	1976	14,032
1942		1977	5,183
1943		1978	3,555
1944		1979	68,739 [g]
1945		1980	62,828 [g]
1946	57,000 [b]	1981	50,479 [g]
1947	150,000 [b]	1982	28,164 [g]
1948	150,000 [b]	1983	118,797 [g]
1949	68,240	1984	192,352 [g]
1950	29,659	1985	68,577 [g]
1951	34,704	1986	29,800 [g]
1952	92,724	1987	91,215 [g]
1953	54,343	1988	71,603 [g]
1954	20,904	1989	67,224 [g]
1955	32,724	1990	50,000 [g]
1956	32,663 [c]	1991	50,500 [g]
1957	15,630	1992	71,385 [g]
1958	17,573	1993	117,619 [g]
1959	77,416 [c,d]	1994	95,107 [g]
1960	80,000 [c,d]	1995	115,000 [g]
1961	40,000 [c,d]	1996	63,160 [g]
1962	60,000 [c,d]	1997	54,656 [g]
1963	119,024 [c,d]	1998	22,853 [g]
1964	65,000 [c,d]	1999	26,746 [g]
1965	16,544 [c,d]	2000	19,533 [g]
1966	41,312 [c,d]	2001	43,469 [g]
1967	22,624 [c,d]	2002	90,483 [g]
1968	19,616 [c,d]	2003	92,298 [g]
1969	12,456	2004	22,157 [g]
1970	25,000	2005	14,215 [g]
1971	31,900	2006	32,562 [g]
1972	6,981		

[a] Data for 1979–2000 were excluded from analyses because hatchery stocks were present.

[b] Escapement enumerated by ground surveys.

[c] Escapement enumerated using a counting screen.

[d] Includes 3,500 sockeye salmon behind weir when it washed out on 8/8/70.

[e] Includes 500 sockeye salmon behind weir when it was removed on 8/7/71.

[f] Counting occurred downstream of Knik Road prior to 1983, at South Big Lake Road. From 1983–1991, and at Lewis Road from 1992–present.

[g] Partial counts due to termination of counting before the end of the run.

Appendix C3.–Data available for analysis of escapement goals, Kasilof River sockeye salmon.

Year	Escapement [a]	Total Return	Yield [a]	Return/ Spawner	Hatchery Release (millions) [b]
1975	44,000	365,000	321,000	8.30	1.14
1976	133,000	757,000	624,000	5.69	0.00
1977	153,000	696,000	543,000	4.55	0.40
1978	109,000	811,000	702,000	7.44	7.76
1979	149,000	869,000	720,000	5.83	5.21
1980	178,000	1,207,000	1,029,000	6.78	8.78
1981	246,000	2,059,000	1,813,000	8.37	15.95
1982	168,000	1,457,000	1,289,000	8.67	16.94
1983	199,000	1,040,000	841,000	5.23	17.05
1984	219,000	830,000	611,000	3.79	16.39
1985	493,000	421,000	-72,000	0.85	13.56
1986	263,000	789,000	526,000	3.00	15.53
1987	235,000	1,076,000	841,000	4.58	6.27
1988	141,000	755,000	614,000	5.35	6.01
1989	149,000	581,000	432,000	3.90	6.01
1990	137,000	564,000	427,000	4.12	6.00
1991	228,000	1,062,000	834,000	4.66	6.06
1992	176,000	925,000	749,000	5.26	6.00
1993	140,000	585,000	445,000	4.18	0.00
1994	190,000	858,000	668,000	4.52	6.00
1995	191,000	580,000	389,000	3.04	6.14
1996	237,000	803,000	566,000	3.39	5.98
1997	256,000	746,000	490,000	2.91	4.56
1998	262,000	889,000	627,000	3.39	5.95
1999	301,000	1,321,000	1,020,000	4.39	5.43
2000	245,000	1,495,000	1,250,000	6.10	0.00
2001 [c]	297,000				6.07
2002 [c]	216,000				6.02
2003 [c]	347,000				6.01
2004 [c]	575,000				6.00
2005 [c]	346,000				0.00
2006 [c]	366,000				0.00

[a] The hatchery component of the escapement was removed.
[b] Hatchery release arranged by brood year.
[c] Complete return data not yet available.

Appendix C4.–Data available for analysis of escapement goals, Kenai River sockeye salmon (excludes late-run Russian River escapement through the weir and Hidden Lake enhanced).

Year	Escapement	Total Return	Yield	Return/ Spawner
1968	82,180	916,445	834,265	11.15
1969	51,850	409,481	357,631	7.90
1970	72,400	519,828	447,428	7.18
1971	289,270	862,669	573,399	2.98
1972	301,950	2,185,543	1,883,593	7.24
1973	358,070	1,995,399	1,637,329	5.57
1974	144,470	665,130	520,660	4.60
1975	128,500	895,207	766,707	6.97
1976	353,161	1,186,922	833,761	3.36
1977	663,627	2,810,690	2,147,063	4.24
1978	349,828	3,450,735	3,100,907	9.86
1979	245,850	1,110,592	864,742	4.52
1980	397,557	2,345,553	1,947,996	5.90
1981	359,344	2,267,624	1,908,280	6.31
1982	566,034	8,929,594	8,363,560	15.78
1983	566,652	8,697,304	8,130,652	15.35
1984	309,514	3,251,505	2,941,991	10.51
1985	396,032	2,245,906	1,849,874	5.67
1986	400,302	1,740,938	1,340,636	4.35
1987	1,333,136	9,530,501	8,197,365	7.15
1988	838,851	2,119,694	1,280,843	2.53
1989	1,333,687	3,898,327	2,564,640	2.92
1990	439,052	1,333,864	894,812	3.04
1991	376,149	3,926,048	3,549,899	10.44
1992	752,239	3,468,728	2,716,489	4.61
1993	669,758	1,287,000	617,242	1.92
1994	894,646	2,549,000	1,654,354	2.85
1995	520,778	1,490,000	969,222	2.86
1996	578,927	1,887,000	1,308,073	3.26
1997	872,041	3,136,000	2,263,959	3.60
1998	551,891	3,654,000	3,102,109	6.62
1999	582,907	5,159,000	4,576,093	8.85
2000	393,154	6,291,000	5,897,846	16.00
2001 [a]	457,760			
2002 [a]	700,549			
2003 [a]	938,398			
2004 [a]	1,120,000			
2005 [a]	1,113,000			
2006 [a]	1,270,000			

[a] Complete return data not yet available.

Appendix C5.–Data available for analysis of escapement goals, Packers Lake sockeye salmon.

Year	Escapement [a]
1974	2,123
1975	4,522
1976	13,292
1977	16,934
1978	23,651
1979	37,755
1980	28,520
1981	12,934
1982	15,687
1983	18,403
1984	30,403
1985	36,864
1986	29,604
1987	35,401
1988	18,607
1989	22,304
1990	31,868
1991	41,275
1992	30,143
1993	40,869
1994	30,776
1995	29,473
1996	16,971
1997	31,439
1998	17,728
1999	25,648
2000	20,151
2001	
2002	
2003	
2004	
2005	22,000
2006	

[a] Only weir data from 1974–1989 were used in calculating the goal.

Appendix C6.–Table of data available for analysis of escapement goals, early-run Russian River sockeye salmon.

Brood Year	Escapement [a]	Total Return	Yield	Return/ Spawner	Year	Harvest [b]
1965	21,510	5,970	-15,540	0.28	1965	10,030
1966	16,660	7,822	-8,838	0.47	1966	14,950
1967	13,710	18,662	4,952	1.36	1967	7,240
1968	9,120	19,800	10,680	2.17	1968	6,920
1969	5,000	13,169	8,169	2.63	1969	5,870
1970	5,450	12,642	7,192	2.32	1970	5,750
1971	2,650	8,728	6,078	3.29	1971	2,810
1972	9,270	98,980	89,710	10.68	1972	5,040
1973	13,120	26,788	13,668	2.04	1973	6,740
1974	13,160	52,849	39,689	4.02	1974	6,440
1975	5,650	14,130	8,480	2.50	1975	1,400
1976	14,735	115,408	100,673	7.83	1976	3,380
1977	16,060	17,515	1,455	1.09	1977	20,400
1978	34,240	17,001	-17,239	0.50	1978	37,720
1979	19,750	94,836	75,086	4.80	1979	8,400
1980	28,620	42,401	13,781	1.48	1980	27,220
1981	21,140	76,040	54,900	3.60	1981	10,720
1982	56,110	278,179	222,069	4.96	1982	34,500
1983	21,270	23,549	2,279	1.11	1983	8,360
1984	28,900	42,857	13,957	1.48	1984	35,880
1985	30,610	43,776	13,166	1.43	1985	12,300
1986	36,340	90,637	54,297	2.49	1986	35,100
1987	61,510	109,215	47,705	1.78	1987	154,200
1988	50,410	87,848	37,438	1.74	1988	54,780
1989	15,340	57,055	41,715	3.72	1989	11,290
1990	26,720	94,893	68,173	3.55	1990	30,215
1991	32,389	126,044	93,655	3.89	1991	65,390
1992	37,117	64,978	27,861	1.75	1992	30,512
1993	39,857	41,584	1,727	1.04	1993	37,261
1994	44,872	114,649	69,777	2.56	1994	48,923
1995	28,603	26,462	-2,141	0.93	1995	23,572
1996	52,905	192,657	139,752	3.64	1996	39,075
1997	36,280	63,876	27,596	1.76	1997	36,788
1998	34,143	57,692	23,549	1.69	1998	42,711
1999	36,607	106,219	69,612	2.90	1999	34,283
2000	32,736	94,932	62,196	2.90	2000	40,732
2001 [c]	78,255	20,468			2001	35,400
2002 [c]	85,943				2002	52,139
2003 [c]	23,650				2003	22,986
2004 [c]	56,582				2004	32,727
2005 [c]	52,903				2005	37,139
2006 [c]	80,524				2006	51,167

[a] Escapements of brood years 1965–1968 from tower counts and of 1969–2000 from weir counts.

[b] Harvest during 1965–1996 from an onsite creel survey and during 1997–2000 from Statewide Harvest Survey (Jennings et al. 2007). Estimates are only of fish harvested near the Russian River itself.

[c] Complete return data not yet available.

Appendix C7.–Data available for analysis of escapement goals, late-run Russian River sockeye salmon.

Year	Harvest [a]	Escapement [b] Above Weir	Escapement [b] Below Weir	Local Return
1963	1,390	51,120	Unknown	52,510
1964	2,450	46,930	Unknown	49,380
1965	2,160	21,820	Unknown	23,980
1966	7,290	34,430	Unknown	41,720
1967	5,720	49,480	Unknown	55,200
1968	5,820	48,880	4,200	58,900
1969	1,150	28,870	1,100	31,120
1970	600	26,200	220	27,020
1971	10,730	54,420	10,000	75,150
1972	16,050	79,115	6,000	101,165
1973	8,930	25,070	6,680	40,680
1974	8,500	24,900	2,210	35,610
1975	8,390	31,960	690	41,040
1976	13,700	31,940	3,470	49,110
1977	27,440	21,360	17,090	65,890
1978	24,530	34,340	18,330	77,200
1979	26,840	87,850	3,920	118,610
1980	33,500	83,980	3,220	120,700
1981	23,720	44,520	4,160	72,400
1982	10,320	30,800	45,000	86,120
1983	16,000	33,730	44,000	93,730
1984	21,970	92,660	3,000	117,630
1985	58,410	136,970	8,650	204,030
1986	30,810	40,280	15,230	86,320
1987	40,580	53,930	76,530	171,040
1988	19,540	42,480	30,360	92,380
1989	55,210	138,380	28,480	222,070
1990	56,180	83,430	11,760	151,370
1991	31,450	78,180	22,270	131,900
1992	26,101	63,478	4,980	94,559
1993	26,772	99,259	12,258	138,289
1994	26,375	122,277	15,211	163,863
1995	11,805	61,982	12,479	86,266
1996	19,136	34,691	31,601	85,428
1997	12,910	65,905	11,337	90,152
1998	25,110	113,477	19,593	158,180
1999	32,335	139,863	19,514	191,712
2000	30,229	56,580	13,930	100,739
2001	18,550	74,964	17,044	110,558
2002	31,999	62,115	6,858	100,972
2003	28,085	157,469	27,474	213,028
2004	22,417	110,244	30,458	163,119
2005	18,503	54,808	29,048	102,359
2006	29,694	84,432	18,452	132,578

[a] Harvest during 1963–1996 from an onsite creel survey and during 1997–2000 from Statewide Harvest Survey (Jennings et al. 2007). Estimates are only of fish harvested near the Russian River itself.

[b] Escapements of brood years 1963–1968 from tower counts and of 1969–2000 from weir counts.

Appendix C8.–Data available for analysis of escapement goals, Yentna River sockeye salmon.

Year	Escapement
1981	139,401
1982	113,847
1983	104,414
1984	149,375
1985	107,124
1986	92,076
1987	66,054
1988	52,330
1989	96,269
1990	140,290
1991	109,632
1992	66,074
1993	141,694
1994	128,032
1995	121,220
1996	90,660
1997	157,822
1998	119,623
1999	99,029
2000	133,094
2001	83,532
2002	78,591
2003	180,813
2004	71,281
2005	36,921
2006	92,045

APPENDIX D.
SUPPORTING INFORMATION FOR ESCAPEMENT GOALS FOR CHUM SALMON OF UPPER COOK INLET

Appendix D1.–Data available for analysis of escapement goals, Clearwater Creek chum salmon.

Year	Escapement [a]
1971	5,000
1972	
1973	8,450
1974	1,800
1975	4,400
1976	12,500
1977	12,700
1978	6,500
1979	1,350
1980	5,000
1981	6,150
1982	15,400
1983	10,900
1984	8,350
1985	3,500
1986	9,100
1987	6,350
1988	
1989	2,000
1990	5,500
1991	7,430
1992	8,000
1993	1,130
1994	3,500
1995	3,950
1996	5,665
1997	8,230
1998	2,710
1999	6,400
2000	31,800
2001	14,570
2002	8,864
2003	7,200
2004	3,900
2005	530
2006	500

[a] Escapement not surveyed or monitored during years with no escapement value.

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Special Publication No. 07-17

Biological and Fishery-Related Aspects of Overescapement in Alaskan Sockeye Salmon *Oncorhynchus nerka*

by

Robert Clark,

Mark Willette,

Steve Fleischman,

and

Doug Eggers

December 2007

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

SPECIAL PUBLICATION NO. 07-17

BIOLOGICAL AND FISHERY-RELATED ASPECTS OF OVERESCAPEMENT IN ALASKAN SOCKEYE SALMON *ONCORHYNCHUS NERKA*

by

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ABSTRACT

Overescapement of salmon is defined by the Alaska Department of Fish and Game as escapements that are above the range of the current escapement goal. Our understanding of how overescapement affects long and short term yields is dependent on knowledge of the production relationship and the amount of fishing power. We analyzed brood and run information from 40 Alaska sockeye salmon *Oncorhynchus nerka* stocks to determine the biological and fishery-related effects of overescapement.

For 37 of the 40 stocks we reviewed, overescapement occurred at least once in a recent 15 year period. We examined the long term effects of overescapement on yields relative to MSY for 29 of the 40 stocks. This subset of stocks was chosen because the observed exploitation rate is less than or equal to the exploitation rate at Maximum Sustained Yield (MSY) allowing examination of yields at levels of escapement that would exceed the escapement that produces MSY. Yields from these stocks decreased below MSY as escapements increased beyond that which produces MSY. Averaged across all of these stocks, long term yields decreased and variability in yields increased when current escapement goals were exceeded. This result is consistent with the generic theory of compensatory production, where spawning efficiency decreases with increasing escapement levels and stocks are limited by the carrying capacity of the habitat. Overescapement, in general, is not sustainable as it causes returns and yields to decrease in the next generation, which also result in lower escapements. Lower escapements then result in higher returns and yields in succeeding generations. We also found evidence of delayed density dependence in five Alaskan sockeye salmon stocks. In three of these stocks, returns per spawner fell below replacement for 2 to 5 years following consecutive overescapements that were greater than twice the upper bound of the escapement goal range.

In the remaining 11 of 40 stocks we were unable to examine long term yields at levels of escapement exceeding that which produces MSY. In these cases, yields from these stocks increased above the average yield as escapements increased beyond the upper bound of the current escapement goal. Averaged across all of these stocks, long term yields increased and variability in yields decreased slightly when current escapement goals were exceeded. This result is also consistent with the generic theory of compensatory production. As escapement increases, but is below the level thought to produce MSY, returns and yields will increase even if overescapement occurs. This is due to the high productivity of salmon across a wide range of intermediate escapements so that the long term change in yield due to overescapement is small when exploitation rate is high.

Short term losses in yield were assessed by evaluating foregone annual harvest as a result of overescapement in the most recent 15 years for all 40 stocks. Although foregone harvest due to overescapement was common, on average these harvests typically represented 5% or less of the annual run. Seven of 40 stocks had losses in harvest exceeding 10% of the annual run on average. However, when we examined losses only during years that overescapement occurred, 18 stocks exhibited foregone harvest greater than 10% of the run, and seven of these stocks exhibited foregone harvest greater than 20% of the run. Foregone harvest due to overescapement was more prevalent for stocks with low fishing power.

Although overescapement as defined is occurring on most of the 40 Alaskan sockeye salmon stocks we reviewed, for some of these stocks more information is needed to understand the effect overescapement may or may not have on production and the fishery. Alternative methods for determination of carrying capacity of sockeye salmon watersheds should be developed and validated, especially for highly exploited stocks. Research focused on estimating carrying capacity in select watersheds should include efforts to better define the threshold juvenile salmon densities that cause delayed density-dependent responses in rearing lake ecosystems. From a fishery standpoint, better forecasts of salmon runs and improved inseason management could reduce the incidence of overescapement in highly exploited stocks.

Key words: sockeye salmon, *Oncorhynchus nerka*, overescapement, carrying capacity, exploitation rate, escapement goals, biological reference points, maximum sustained yield, escapement goal policy, sustainable salmon policy

BACKGROUND

The topic of overescapement in Pacific salmon stocks is controversial and complex, especially in regards to the management of Alaskan sockeye salmon *Oncorhynchus nerka*. The controversy has many facets, but three major issues tend to recur in the debate: 1) the definition of overescapement; 2) the effects of overescapement on the stock; and, 3) the effects of overescapement on the fishery. This report attempts to clarify these major issues from the perspective of the Alaska Department of Fish and Game (ADF&G). Our perspective is one that is mandated by the imperatives of Alaskan law, guided by a very simple but useful theory of wild salmon production, based on experience gained through the development of scientifically defensible escapement goals for sockeye salmon stocks throughout the state, and grounded in the sound fishery management principles we have applied to the harvest of these stocks.

The objectives of this report are to: 1) provide definitions of key terms relevant to the issue of overescapement; 2) describe and clarify the process of escapement goal development that is central to the issue of overescapement; 3) discuss the biological and fishery-related aspects of overescapement; and, 4) provide recommendations to address the issue of overescapement in Alaskan sockeye salmon. To aid in clarifying and discussing overescapement, we provide the results from a set of basic, consistent analyses of 40 Alaskan sockeye salmon stocks from fisheries ranging from southeast Alaska to the Kuskokwim Bay region (Figure 1). We also review hypotheses concerning density dependence and present five case studies of delayed-density dependence in sockeye salmon.

RELEVANT POLICIES

From the ADF&G perspective, any discussion of overescapement in salmon stocks must be grounded in the constitutional mandates to provide for sustained yield of fish. Article VIII, section 4 of the Alaska Constitution states that:

> "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses."

This mandate for sustainable management of Pacific salmon provided the impetus for development of a scientifically defensible escapement goal policy in Alaska. Along with the statutory functions, powers and duties of the Commissioner of ADF&G (Alaska Statutes 16.05.020 and 16.05.050) and relevant management plans for salmon stocks (Title 5 of the Alaska Administrative Code, various chapters), the development of escapement goals is regulated by the policy for the management of sustainable salmon fisheries and the policy for statewide salmon escapement goals (Title 5 of the Alaska Administrative Code, Chapter 39).

These two regulatory policies define four types of escapement goals, two of which are routinely developed by ADF&G and are most important to sustained yield management of salmon stocks. The biological escapement goal (BEG) is defined as: the escapement that provides the greatest potential for maximum sustained yield (MSY). As an alternative to management for MSY, the sustainable escapement goal (SEG) is defined as: the escapement that is known to provide for sustained yield. Both of these escapement goals must be described as ranges that take into account our uncertainty in the data and variation in stock productivity. The two regulatory policies also stipulate that BEGs and SEGs for Pacific salmon be developed from the best available data and be scientifically defensible.

DEFINITIONS

Some of the confusion and controversy surrounding the effects of overescapement is caused by the lack of a common set of definitions from which to discuss the issue. Basic definitions of salmon population biology are offered here, some of which come directly from statute or regulation, others come from basic texts on fisheries science or from our own experience.

Salmon stock. A locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics or an aggregation of two or more interbreeding groups, which occur in the same geographic area and is managed as a unit (from 5 AAC 39.222(f)).

Escapement (or Spawning Abundance or Spawners). The annual estimated size of the spawning salmon stock; quality of escapement may be determined not only by numbers of spawners, but also by factors such as sex ratio, age composition, temporal entry into the system, and spatial distribution within the salmon spawning habitat (from 5 AAC 39.222(f)).

Brood (year). All salmon in a stock spawned in a specific year.

Run. The total number of salmon in a stock surviving to adulthood and returning to the vicinity of the natal stream in any calendar year, composed of both the harvest of adult salmon plus the escapement; the annual run in any calendar year, except for pink salmon is composed of several age classes of mature fish from the stock, derived from the spawning of a number of previous brood years (from 5 AAC 39.222(f)).

Harvest. The number or weight of salmon taken of an annual run from a specific stock.

Harvest rate. The fraction of an annual run from a stock taken in a fishery.

Return (or Total Return or Recruitment or Production). The total number of salmon in a stock from a single brood (spawning) year surviving to adulthood; because the ages of adult salmon (except pink salmon) returning to spawn varies, the total return from a brood year will occur over several calendar years; the total return generally includes those mature salmon from a single brood year that are harvested in fisheries plus those that comprise the salmon stock's spawning escapement; "return" does not include a run, which is the number of mature salmon in a stock during a single calendar year (from 5 AAC 39.222(f)).

Yield. Defined in regulation as the number or weight of salmon harvested in a particular year or season from a stock (from 5 AAC 39.222(f). However, in this report yield is defined as the return minus the escapement for a particular brood year. This quantity is also known as the surplus production or expected yield. Note that yield is defined in terms of a single brood year, while harvest is defined in terms of the annual run that is composed of components from multiple brood years.

Exploitation rate. Fraction of the return by stock taken in a fishery (specific to a brood year).

Carrying Capacity (or S_{EQ}). Biological reference point that is the highest escapement where the return is expected to equal escapement. This is the point where escapements at or larger than this are expected to produce no yields in the future.

Intrinsic Rate of Increase. Expected number of mature salmon produced per spawner when escapement is close to zero.

Density Dependent Survival. A survival rate affected by abundance of young at the start of a time period or by escapement of their parents.

Density Independent Survival. A survival rate unaffected by abundance of young or by escapement of their parents.

Process Error. Deviations in actual return from expected return given a specific escapement.

Compensatory Mortality. A mortality rate that increases as the initial abundance increases. For example, when the return-per-spawner of a stock decreases as the spawner abundance of that stock increases.

Depensatory Mortality. A mortality rate that decreases as the initial abundance increases.

Sustained Yield. The average annual yield that results from a level of escapement that can be maintained on a continuing basis; a wide range of average annual yield levels is sustainable; a wide range of escapement levels can produce sustained yields (from 5 AAC 39.222(f)).

Sustainable Escapement Goal (or SEG). A level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated due to the absence of a stock specific catch estimate; the SEG is the primary management objective for the escapement, unless an optimal escapement goal or inriver run goal has been adopted by the board, and will be developed from the best biological information; the SEG will be determined by the department and will be stated as a range that takes into account data uncertainty; the department will seek to maintain escapements within the bounds of the SEG (from 5 AAC 39.222(f)).

Maximum Sustained Yield (or MSY). The greatest average annual yield from a salmon stock; in practice, MSY is achieved when a level of escapement is maintained within a specific range on an annual basis, regardless of annual run strength; the achievement of MSY requires a high degree of management precision and scientific information regarding the relationship between salmon escapement and subsequent return; the concept of MSY should be interpreted in a broad ecosystem context to take into account species interactions, environmental changes, an array of ecosystem goods and services, and scientific uncertainty (from 5 AAC 39.222(f)).

Biological Escapement Goal (or BEG). The escapement that provides the greatest potential for maximum sustained yield; BEG will be the primary management objective for the escapement unless an optimal escapement goal or inriver run goal has been adopted; BEG will be developed from the best biological information, and should be scientifically defensible on the basis of available biological information; BEG will be determined by the department and will be expressed as a range based on factors such as salmon stock productivity and data uncertainty; the department will seek to maintain evenly distributed salmon escapements within the bounds of the BEG (from 5 AAC 39.222(f)).

S_{MSY}. Biological reference point that is the escapement that produces the greatest expected yields (i.e., MSY). The BEG range should be based on this reference point.

μ_{MSY}. The exploitation rate for a stock that would on average produce MSY.

Overescapement. Escapements that are above the range of the current escapement goal.

Scientifically Defensible. Relative to an escapement goal for a stock of Pacific salmon, when there is evidence confirming the expectation of sustainable yields from that stock for that escapement goal. Evidence can be empirical (an observed history of yields from the stock), model-based (a model validated with data from one or many stocks), or theoretically-based (a theory validated with experiments from one or many stocks).

GENERIC THEORY OF SALMON PRODUCTION

Any generic theory of salmon production must include the two main ecological processes of an intrinsic rate of increase and a carrying capacity. Similar information can be found in basic texts of fisheries science (Ricker 1975, Hilborn and Walters 1992, Quinn and Deriso 1999).

The intrinsic rate of increase describes the density independent survival of a salmon stock, where survival of the stock is unrelated to size of the escapement. In this case, competition between spawning salmon or juveniles is low so that the survival is not related to the density of the spawners or their offspring. This process is thought to occur when the salmon stock is small relative to its carrying capacity and therefore is described from the left side of the population model where escapements are small (Figure 2).

The intrinsic rate of increase is thought to be specific to species and region. Species-specific influences on salmon productivity include fecundity, maturation schedule, longevity, and growth rate. Regionally specific influences include locally similar freshwater and marine climate, predators, and fisheries.

The intrinsic rate of increase causes a salmon stock to grow indefinitely, but there must be a limit to this growth. The carrying capacity describes the density dependent survival of a salmon stock, where the survival of the stock is directly related to the size of the escapement. In this case, competition between spawning salmon or juveniles increases; consequently survival rate decreases as abundance of spawning adults or juveniles increases. This process is also called compensation and increases as the salmon stock approaches and possibly exceeds its carrying capacity on the right hand side of the production model (Figure 2). Empirically, carrying capacity can be defined as the average size of a salmon stock when it is not being fished.

The carrying capacity of a salmon stock is thought to be watershed and stock specific. There are several potential mechanisms for carrying capacity, including a limitation of rearing or limitation of the spawning grounds. For sockeye salmon, rearing limitation or competition among juveniles can occur through trophic production in lakes by affecting the size, age at smoltification, and survival of fry and smolt (Kyle et al. 1988, Schmidt et al. 1993, Koenings and Kyle 1997). Spawning limitation can also occur in sockeye salmon, with increased competitive interactions among spawning adults causing increased aggressive behavior on the spawning grounds, egg retention, and death prior to spawning (Semenchenko 1988).

More specific but fairly simple models of salmon production result from the generic model. In general, differences among models are due to differences in the relationship between density dependent survival and escapement with the asymptotic (Beverton and Holt 1957), exponential (Ricker 1975), and piece-wise (e.g., hockey stick model of Bradford et al. 2000) forms most commonly used. Although we used the Ricker form of the production model in this report, each of these simple models can be used to estimate parameters that correspond to the intrinsic rate of increase and carrying capacity from a data set composed of escapements and subsequent returns. Once these two quantities are estimated, the biological reference points S_{MSY}, S_{EQ}, and μ_{MSY} can be calculated (see example in Figure 3) and provide information important to development of an escapement goal.

One last consideration in a generic theory of salmon production is the concept of process error. As defined, process error is the variation we observe in the return at any fixed level of escapement. Process error is due to annual variation in survival from spawning adults to returning adults from factors that can change from year-to-year. For example, changes in the fraction of female spawners in the escapement or fecundity of individual spawners, size composition, age composition, the occurrence of floods, drought, freezing, and changes in temperature. Furthermore, errors in estimating the true escapement and return, if not accounted for in our stock assessments end up as process error although they are actually measurement error.

Process error is generally thought of as random through time, but can also be serially correlated (e.g., several years of high survival are grouped together followed by several years of low survival) or correlated with another variable that we may have measured (e.g., escapement in prior years, marine survival rate, environmental variables). Process error is also thought to be distributed log-normally (Peterman 1981) as can be seen in the example in Figure 4. In Figure 4, we see a large amount of variation in returns at any particular level of escapement that obscures the underlying production curve. It is also easy to see why we might observe a large return from a particular escapement in one year and a low return from the same magnitude of escapement in another year. Explanation and prediction of process error in the upcoming year is crucial to forecasting salmon abundance, but is of lesser importance to the development of an escapement goal.

The occurrence of process error in salmon production necessitates a statistical approach to developing reference points for the recommendation of escapement goals. Statistical approaches allow us to view the production curve estimated from the escapement and return data as the expected production we might see on average if escapement was fixed at a certain level (Figure 3). However, there are potential pitfalls with the statistical approach that have been discussed by others in the literature and are relevant when exploitation rate is high (>50% per year) or there is measurement error in estimates of escapement (Walters and Ludwig 1981, Kehler et al. 2002). Specific statistical methods used in this report to estimate the parameters and biological reference points are detailed in Appendix A.

Factors in the Estimation of Reference Points

As stated above we use accepted statistical techniques to estimate the production curve and biological reference points. From a practical standpoint, our ability to successfully estimate the production curve and the reference points are linked directly back to the history of the fishery and specifically, the range of historical escapements (Walters and Hilborn 1976, Clark et al. in press). Measurement error is also a factor, where imprecision in estimates of escapement can bias estimates of the reference points (Kehler et al. 2002).

The history of fishing on a salmon stock can determine where the production data we gather on that stock lies on a plot of recruits against escapement (stock-recruit plot). This in turn affects our ability to estimate carrying capacity and/or intrinsic rate of increase needed to estimate reference points. Fisheries with a history of very low harvest rates (<15%) tend to have their production data (recruits plotted against escapement) clumped close to the carrying capacity on the right hand side of the plot. In this case we are likely to have very little knowledge of the intrinsic rate of increase, but good knowledge of what the carrying capacity of the stock might be (Figure 5; Walters and Hilborn 1976).

Conversely, fisheries with a history of high harvest rates (>50% harvested per year) tend to have their production data clumped on the left hand side of the stock-recruit plot. In this case, we have very little knowledge of carrying capacity, but good knowledge of the intrinsic rate of increase

(Figure 5). Fisheries with moderate or variable harvest rates can have production data spread across the stock-recruit plot, resulting in good knowledge of both intrinsic rate of increase and carrying capacity.

Measurement error, especially in estimates of escapement can be a factor in the estimation of reference points. Imprecise estimates of escapement will cause bias in estimates of the reference points (Kehler et al. 2002) and the direction of the bias changes as harvest rate increases. The effect of measurement error is especially troublesome for fisheries with high harvest rates, because the bias tends to result in biological reference points that are too low. Precise estimates of escapement (from towers, weirs, sonars, and mark-recapture experiments) are therefore important for fisheries with a history of high harvest rates.

We also use several alternative methods to estimate reference points for comparison with results from spawner-recruit analyses. A tabular Markov approach is often used to compare yields at various levels of spawner abundance (Hilborn and Walters 1992), but results can be sensitive to how spawner abundances are grouped if data are sparse. When limnological data are available, euphotic volume (Koenings and Burkett 1987) and zooplankton biomass (Koenings and Kyle 1997) models are used to estimate lake carrying capacity. The euphotic volume model is based on lake area and the depth of light penetration sufficient to support net primary production. The zooplankton biomass model utilizes seasonal mean total zooplankton biomass to predict smolt production. Both limnological models are based on the assumption that lake carrying capacity is reached when density-dependent growth causes age-1 smolts to emigrate at a threshold size of 60 mm (2 g). In systems that are thought to be spawning limited, a spawning habitat model has been used (Nelson et al. 2005) to estimate the number of spawners at carrying capacity assuming a mean density of one female per m^2 (Burgner 1991).

FACTORS IN THE DEVELOPMENT OF AN ESCAPEMENT GOAL

Although the estimation of reference points is the centerpiece of scientifically defensible escapement goal analysis, many salmon stocks in Alaska lack sufficient information content on them to estimate reference points or do not have production data. Yet, we would like to recommend an escapement goal in these situations.

The Sustainable Escapement Goal (SEG) is used in these circumstances. SEGs are recommended when we lack estimates of reference points for MSY management, but need a goal that preserves the status quo of sustainable fishing practices observed for many years. Examples of these situations occur below in the section Examples from Alaskan Sockeye Salmon. Methods of determining SEGs are many although the common thread in these methods is that the recommended goal must be based on evidence of producing yields that can be sustained into the future.

Conversely, a Biological Escapement Goal (BEG) is used when the reference points can be estimated and there is sufficient fishing power and inseason management capability to harvest annual runs to achieve the BEG.

A REVIEW OF HYPOTHESES CONCERNING DENSITY DEPENDENCE

Short Term Effects of Overescapement – Single Brood

A general theory of salmon production developed by W.E Ricker and others states that survival (e.g., return-per spawner) decreases with increasing spawner abundance, and stock size is limited by the habitat's carrying capacity. When the escapement goal range brackets S_{MSY}, the biological consequence of overescapement is a higher likelihood of lower future production due to compensatory mortality. Different mechanisms cause compensatory mortality in sockeye salmon populations at various life history stages mostly functioning when the fish reside in freshwater. Much less is known about mechanisms causing mortality in the sea, but once these fish disperse into the open ocean, mortality is likely density independent. Although, Ricker's theory predicts that compensatory mortality is the dominant process regulating salmon production, mortality at various lifestages can also be depensatory. The terms compensatory and depensatory refer to the effect of salmon density on their survival, but in the actual system many different factors interact to cause mortality. Salmon density is only one modifying factor affecting the outcome.

During spawning and embryo development, several mechanisms cause compensatory mortality. High spawner densities cause an increase in egg retention and spawning failure, but together these effects reduce embryo deposition by <3% (West and Mason 1987; Quinn et al. 2007). High spawner densities can also result in redd superimposition leading to an asymptotic relation between spawner density and spawning success (McNeil 1964). Embryos displaced by subsequent waves of spawners often die due to mechanical shock (prior to the eyed stage) and predation mostly by various fishes (Selifonov 1987, Ward and Larkin, 1964, Morton 1982). Once deposited in spawning beds, high embryo densities cause higher mortality due to excessive oxygen demand and increases in fungal or parasite infestations (Hunter 1959, Selifonov 1987).

During juvenile lifestages, several different agents function to cause either depensatory or compensatory mortality. The juvenile period can be divided into six distinct lifestages of various lengths: emergent (1 to 7 days), littoral (1 to 2 months), pelagic feeding (5 to 6 months), overwintering (3 to 4 months), smolt (1 to 2 weeks), and early marine (1 to 2 months). We will next examine the mortality processes functioning within each lifestage.

In the emergent stage, fry mortality is likely size-dependent, depensatory, and buffered by the presence of alternative prey. Many emergent fry migrate through streams to lake rearing habitats suffering intense predation losses mostly to various small fishes (Semko 1954, Foerester 1968, Stober and Hamalainen 1980). Mortality at this lifestage (range 13% to 91%) is likely depensatory, because predator populations consume a relatively fixed number of prey causing a greater proportion of fry to survive when their densities are high (Hunter 1959). However, the presence of other prey fishes (pink and chum salmon fry), in systems where they exist, likely buffers sockeye salmon losses (Semko 1954). Mortality at this lifestage is size-dependent (West and Larkin 1987), but size at this lifestage is mostly determined by egg size (Bilton 1971) because there is little time for growth.

In the littoral zone, fry mortality is likely size-dependent and buffered by the presence of alternative prey. In this lifestage, predation and parasitism are likely important agents of mortality. Starvation seems unlikely since emergent fry can survive up to 4 weeks without food (Bilton and Robins 1973). Potential predators include Dolly Varden charr, rainbow trout, lake trout, juvenile coho salmon, northern pike, Arctic terns and gulls (Hartman and Burgner 1972). Predation on juvenile sockeye salmon fry is likely buffered in these habitats by the presence of other prey fish species such as sticklebacks, cottids, trout fry (Burgner 1991), and large numbers of sockeye salmon smolts which cause predators to aggregate near lake outlets (Ward and Larkin 1964). Parasitism by the cestode *Eubothrium salvelini* likely also causes significant mortality among sockeye fry in littoral habitats, because small fry (<45 mm) are much more susceptible to infection (Boyce 1974, West and Larkin 1987). Infected juveniles exhibit reduced growth and impeded swimming performance making them more susceptible to predation (Boyce 1979, 1982, Boyce and Clarke 1983). Since vulnerability to predators and parasites is size dependent, growth becomes an important factor modifying mortality in this lifestage, because it determines the time individuals spend in the vulnerable size range.

Mortality in the pelagic feeding stage is also likely size-dependent and buffered by the presence of alternative prey, but growth at this time also largely determines survival in the next lifestage. Salmon likely encounter fewer predators in the pelagic zone (Burgner 1991), because most of the fish that feed on them tend to be benthic and inshore feeders (Arctic charr, trout, northern pike). Since alternative prey are sometimes abundant (sticklebacks and whitefish), potential predators often have few salmon in their stomachs (Hartman and Burgner 1972). Although predation rate may be low, predation losses over the entire lifestage may still be substantial, because of its relatively long duration. The various diel and seasonal feeding behaviors and depth preferences exhibited by juvenile sockeye salmon (Burgner 1991) to avoid predation (Eggers 1982) support the notion that predation is an important agent of mortality at this lifestage. Inter- and intra-specific competition for food causes growth to be density dependent during this lifestage, extending the time juveniles spend in vulnerable smaller sizes. Sticklebacks and whitefish are also the primary competitors for food in sockeye salmon rearing lakes in Alaska (Burgner 1991). In Babine Lake, fry mortality was strongly size-dependent (91% <median size; 36% >median size) and greatest during the pelagic feeding period in late summer and autumn (West and Larkin 1987). Overall, salmon mortality during lake residence has ranged from 51-93% during 15 years at Babine Lake (McDonald and Hume 1984).

Whether predation mortality in the littoral and pelagic stages is compensatory or depensatory likely depends upon predator size and abundance and juvenile salmon density and growth. Ward and Larkin (1964) proposed that cyclic dominance in Adams River sockeye salmon resulted from depensatory predation caused by predator satiation. However, even in stocks exhibiting cyclic dominance, mortality must become compensatory, because there exists an upper limit on salmon population size. Modeling studies have revealed that juvenile salmon can achieve high survival rates by forming high density aggregations to satiate predators, but this strategy can only succeed if zooplankton densities are sufficient to support high salmon growth rates in high density aggregations (Willette et al. 2001). When predators were satiated, simulated salmon mortality increased when salmon biomass grew slower than predation rate. Conversely, simulated salmon mortality decreased when salmon biomass grew faster than predation rate. Eventually simulated salmon populations declined below the satiation threshold of predators causing mortality to become compensatory. Thus, predation mortality can be depensatory when predator abundance and size are properly scaled with salmon densities and growth rates, and these conditions likely only exist for a relatively short time. In many rearing lakes, juvenile sockeye salmon growth is density dependent (Goodlad et al. 1974, Rogers et al. 1980, Edmundson and Mazumder 2001), indicating that competition for food limits growth, extending the time individuals spend in the vulnerable smaller size range, causing mortality to be compensatory.

During the overwintering stage, mortality is likely size-dependent and most often caused by predation, but at times is caused by starvation when juveniles are very small. Since growth during winter is negligible (Eggers 1978), mortality is likely compensatory and dependent on growth during the previous lifestage. During winter, juvenile salmon likely remain deep in the water column at low light intensities to avoid piscivore predation, living off stored energy reserves (Eggers 1978). However, resumption of active feeding in late winter when zooplankton densities are still low indicates a response to declining energy reserves (Eggers 1978) that likely increases their predation risk. Edmundson et al. (2001) concluded that lipid reserves of juvenile sockeye salmon rearing in Skilak Lake were very near the minimum required to survive the winter fast. Comparison of salmon length distributions between fall 1993 and the following spring indicated that juveniles <48 mm (0.8 g) did not survive the winter (Edmundson et al. 2001). This size threshold needed to survive over winter is similar to that found in other fish species (Carlson and Kaeding 1991, Paul and Paul 1998). Modeling has demonstrated that the fall distribution of sizes and energy contents of juveniles and the duration of winter likely determine survival (Patrick 2000). The distribution of sizes and energy contents of juvenile sockeye salmon in Skilak Lake indicates that the likelihood of surviving over winter declines for individuals <0.5 g body weight, because more of the juveniles in this smallest size class have energy reserves only slightly above the starvation-mortality threshold (Figure 6). We are continuing research to better estimate the threshold size and energy content needed for sockeye salmon to survive the winter and predict overwinter mortality. However in many rearing lakes, juvenile sockeye salmon grow to mean sizes >1.0 g before winter (Kyle 1992b, Willette et al. 1993, Edmundson et al. 2001), so significant overwinter mortality may be rare among sockeye salmon stocks.

During smolt emigrations and the early marine period, mortality is likely size dependent and depensatory. The primary agent of mortality at this lifestage is most often predation. However, small smolts (<50mm, 1.0g) may not be able to osmoregulate successfully in seawater, and this effect is compounded for individuals that have been parasitized (Boyce and Clarke 1983). Predation at this lifestage is often conspicuous as predators aggregate to feed on smolts at lake outlets and river mouths (Hartman and Burgner 1972, Meacham and Clarke 1979, Ruggerone and Rogers 1984). Estimated depensatory mortality rates due to predation have ranged from 95% at low smolt density to <10% at high smolt density (Ruggerone and Rogers 1984). Individuals successfully transitioning into seawater then encounter a much greater abundance of predators mostly fishes and birds (Willette et al. 2001). Since predation by fishes is often size dependent (Willette 2001), smolt-to-adult survival of Alaskan sockeye salmon increases with smolt size from about 10% at 60 mm to 35% at 90 mm (Figure 7; Koenings and Hasbrouck 1994). Although direct predation losses at this lifestage are depensatory, smolt size is the result of compensatory growth during lake residence, so size-dependent smolt-to-adult survival tends to reinforce compensatory effects.

High spawner (and progeny) abundances tend to force individuals into marginal habitats increasing the level of responses to unfavorable environmental or ecological conditions leading to higher variability in production. Spawners utilize less favorable habitat when densities are high leading to greater embryo mortality due to desiccation and freezing if water levels drop (Selifonov 1987). High juvenile densities may force individuals to migrate out of nearshore or deep overwintering predation refugia leading to increased predation losses (Eggers 1978, Willette 2001). Generally, high spawner abundances create a high production potential, which may or may not be realized depending upon the conditions later encountered by offspring.

Long Term Effects of Overescapement – Delayed Density Dependence

Delayed density dependence has been proposed as one mechanism that could account for the cyclic dominance observed in many sockeye salmon populations (Levy and Wood 1992). However, maintenance of population cycles also requires that age at maturity be somewhat constant (Levy and Wood 1992, Walters and Woodey 1992). The mechanisms causing delayed density dependence could function in populations with variable age at maturity leading to delayed density dependent mortality without persistent population cycles. Population cycles can also be maintained by depensatory fishing independent of depensatory mortality during the freshwater period and delayed-density dependent mortality (Eggers and Rogers 1987). It is often not possible to clearly separate single-brood effects from delayed density dependence, because the two processes are highly confounded, particularly when high spawner abundances occur over consecutive brood years.

Four hypotheses have been proposed to explain the ecological mechanisms causing delayed density dependence in sockeye salmon populations:

(1) The delayed-embryo mortality hypothesis states that high salmon egg densities reduce survival of embryos in subsequent years (Hunter 1959).

(2) The delayed-parasitism hypothesis states that large juvenile salmon populations cause an increase in parasite infestations reducing survival of juveniles in subsequent years (Ricker and Smith 1975).

(3) The delayed-predation hypothesis states that large juvenile salmon populations cause an increase in the abundance of predators reducing survival of juveniles in subsequent years (Ricker 1950).

(4) The delayed-food availability hypothesis states that heavy grazing on zooplankton by juvenile salmon from an abundant year class diminishes the food supply available for successive broods in nursery lakes reducing their survival (Koenings and Kyle 1997).

The delayed-embryo mortality hypothesis was first proposed by Hunter (1959) who investigated instream survival of pink and chum salmon embryos and fry over 10 years. He observed that infertile or dead eggs from large spawning populations persisted in spawning beds for 1-2 years. Two very large spawning populations in 1945 and 1954 apparently reduced egg-to-fry survival of subsequent broods for 2 years (Hunter 1959). He postulated that the high oxygen demand from the residual mass of dead eggs reduced subsequent embryo survival, but residual fungal or parasite infestations are other possible explanations.

Direct evidence supporting the delayed-parasitism hypothesis is weak, but this may be due more to a lack of directed research than lack of functioning mechanisms. Ricker and Smith (1975) documented that infestation by the cestode parasite *Eubothrium salvelini* in Skeena River sockeye salmon smolts reduced mean size 18-35%. They postulated that high juvenile salmon densities may lead to cestode infestations that persist for more than one year. But, a 12-year time series showed no correlation between levels of cestode infestation in smolts and smolt abundance in the current or previous years (Ricker and Smith (1975). However, the authors noted that lack of a correlation at the smolt life stage could result if most infected fry died (Ricker and Smith 1975). Boyce (1974) concluded that shedding of eggs, essential to reproduction of *E. salvelini,* occurred in spring when emergent sockeye salmon fry were most vulnerable to infection, providing a plausible mechanism for transmission from smolts to emergent fry. The copepod *Cyclops*, which is common in Alaskan lakes, was also identified as an intermediate host whereby infections could be transmitted to sockeye salmon fry through feeding (Boyce 1974). West and Larkin (1987) suggested that parasitism by *E. salvelini* was one mechanism that could account for strong size-dependent mortality among emergent sockeye salmon fry in Babine Lake. Further studies are needed to examine whether levels of infestation in emergent fry are related to levels of infestation in smolts and subsequent fry survival.

The delayed-predation hypothesis, first proposed by Ricker (1950), is strongly supported by extensive field and modeling studies conducted by Ward and Larkin (1964) in Shuswap Lake, British Columbia (Ricker 1997). The hypothesis involves depensatory predation on the dominant broodline, and a delayed predator response affecting subsequent broods. Ward and Larkin (1964) postulated that large juvenile sockeye salmon populations increased the reproductive success of predacious fishes (primarily rainbow trout) increasing predation losses of subsequent juvenile salmon populations. They documented that rainbow trout fed primarily on juvenile salmon from egg deposition through smoltification, and that trout stomach fullness and condition was correlated with juvenile salmon abundance. They documented a numerical response of trout populations to the abundance of juvenile salmon prey, i.e. cyclic changes in trout abundance that lagged salmon abundance. Levy and Wood (1992) suggested that depensatory predation must occur on emergent fry populations to account for the variable cyclic dominance patterns observed in the various stocks rearing in Shuswap Lake. Larkin (1971) developed a simulation model incorporating a delayed-predation mechanism that successfully reproduced the observed pattern of cyclic dominance in this stock. Ward and Larkin's (1964) conceptual model had the great merit of accounting for the fact that brood line 2 is usually much more abundant than brood lines 3 or 4 due to the buffering effect of brood line 1 on their predation losses (Ricker 1997). However, more recent estimates of juvenile salmon survival suggest that the overall mortality caused by predators (mostly squawfish) in Shuswap Lake is compensatory not depensatory (Williams et al. 1989). The extent to which this mechanism may function in other sockeye salmon populations is unclear. Although some studies have examined functional responses of fish predators to sockeye salmon abundance (Rogers et al. 1972, Morton 1982, Ruggerone and Rogers 1982), none have provided data sufficient to support a delayed-predation hypothesis.

Whole lake experiments have produced strong evidence supporting the delayed-food availability hypothesis (Koenings and Kyle 1997), but evidence of this mechanism in naturally-producing sockeye salmon populations is limited. In whole-lake experiments, grazing by large juvenile sockeye salmon populations reduced zooplankton biomass up to 90%, created predator-resistant zooplankton communities, and reduced fry-to-smolt survival up to 75% (Koenings and Kyle 1997). Zooplankton communities became resistant to predation as the vulnerable *Daphnia*, *Diaptomus*, and ovigerous *Cyclops* were virtually eliminated, and the more agile nonovigerous *Cyclops* and smaller *Bosmina* became dominant (Koenings and Kyle 1997). The reduction in zooplankton biomass and development of a predator-resistant community increased the second year after initial treatment causing the greatest reduction in fry-to-smolt survival to also be delayed (Koenings and Kyle 1997). Once restructured by excessive grazing, zooplankton communities exhibiting the highest levels of restructuring were slowest to respond to either reduced grazing or nutrient treatment (Koenings and Kyle 1997). These experiments revealed a mechanism causing delayed density-dependent salmon survival when spawner abundances exceed the carrying capacity of rearing lakes for 2 or more consecutive years.

One manifestation of diminished food availability is the tendency for smaller members of a year class to migrate to sea a year later further increasing competition for food in subsequent years. As juvenile densities increased at Leisure Lake, the size of age-1 smolts declined from 97 to 60 mm and the fraction of the population holding over to emigrate at age 2 increased from 3% to 76% (Koenings and Burkett 1987). In the Kvichak watershed, high escapements in the preceding brood year tended to reduce age-1 smolt size and survival in the current year perhaps through exhaustion of the food supply (Burgner 1991). In Becharof Lake, high smolt abundances were correlated with an increase in the proportion of holdover age-2 smolts in the subsequent year class indicating that large juvenile populations reduced the food available for subsequent broods causing them to extend their freshwater residence and increasing competition among broods (Martin and Lloyd 1996).

EXAMPLES FROM ALASKAN SOCKEYE SALMON

The effects of overescapement on Alaskan sockeye salmon were examined by researching existing fisheries and analyzing adult production data from around the state. We searched recent escapement goal analyses for sockeye salmon stocks in Alaska and found published or readily available brood tables for 40 stocks. With some minor exceptions, we attempted to use only published production data (Table 1) so that the fishery descriptions and brood tables need not be reproduced in this report. We coalesced return and escapement data from sockeye salmon stocks from Southeast Alaska and Yakutat (11 stocks), Prince William Sound (3 stocks), upper Cook Inlet (4 stocks), Kodiak (9 stocks), Chignik (2 stocks), the Alaska Peninsula (2 stocks), Bristol Bay (8 stocks) and Kuskokwim Bay (1 stock). Run size for these 40 stocks range from less than 10,000 (Lost) to more than 55 million (Kvichak) fish and represent a wide range of life history characteristics (differing freshwater and ocean ages at return), rearing lakes (stained, glacial, and clear), and drainage area (small to very large drainages). Twenty of the stocks currently have BEGs and 20 stocks have SEGs.

To better compare and describe the effects of overescapement, the same production model was used and the same set of statistical analyses was performed on each stock. Note that the stock-recruit analyses presented herein were only used for comparison purposes in the discussion of overescapement, and may not match the case-specific analyses performed and models used during the cycle of escapement goal reviews (see Table 1 for references to escapement goal reviews by management area). In many cases, the case-specific analyses used a variety of production models, statistical methods, and/or truncated production data sets. Moreover, these case-specific analyses addressed issues such as model selection, changes in data quality over time, and statistical versus practical considerations that could not be replicated in a single analysis of the 40 stocks analyzed in this report.

Simple stock-recruitment analyses were performed on data from each stock to estimate parameters and reference points (see Appendix A for analytical methods). From a long-term biological perspective, we were most interested in estimating: 1) the exploitation rate at MSY or μ_{MSY}, 2) escapement at MSY or S_{MSY}, 3) MSY, and 4) the carrying capacity or S_{EQ}. In our analysis, a Ricker production model was used to estimate these parameters, although other production models have been used to estimate reference points and set escapement goals for some Alaskan sockeye salmon stocks (e.g., a gamma model for Ayakulik River and a brood-interaction model for Kenai River). As an index of sampling error we calculated the non-parametric coefficient of variation (NPCV) for each reference point. From the brood table we also calculated the observed exploitation rate or μ_{OBS}, and average yields when escapements were within and above the current escapement goal. Note that the observed exploitation rate calculated as in Appendix A is not strictly equivalent to the average harvest rate in the fishery. Observed exploitation rate in this context is used to compare with exploitation rate at MSY in determining the range of data available to estimate the biological reference points and should not be misconstrued as a parameter for management of the fishery. We also plotted returns on escapement and return per spawner on escapement for each stock (Appendix B).

In addition, several metrics were developed to evaluate short-term fishery-related effects of overescapement. We used these analyses to determine the percent occurrence of overescapement, the average loss of harvest due to overescapement, and the percentage of the annual run foregone to overescapement in the most recent 15 run years (see Appendix A for analytical methods). We also plotted the annual run divided into harvest and escapement, and the percent difference between the observed escapement and the upper bound of the goal for the most recent 15 run years (Appendix B).

BIOLOGICAL ASPECTS OF OVERESCAPEMENT

The biological aspects of overescapement can be examined in relation to reliable estimates of the reference points. Although other methods are available for calculating reference points, we used a statistical approach to model production of adult sockeye salmon and based our definition of "reliable" on the non-parametric coefficient of variation (NPCV) of the estimate of S_{EQ} or carrying capacity. We used the arbitrary criterion of NPCV less than 0.25 (similar to a CV of 25% or less) as our measure of reliability.

Based on this approach we could reliably estimate S_{EQ} for 27 of the 40 stocks (Appendix C). In general, we were able to reliably estimate S_{EQ} if the observed exploitation rate was less than or equal to the exploitation rate at MSY (Figure 8). Similarly, 29 of the 40 stocks had observed exploitation rates that were less than or equal to exploitation rate at MSY (Figure 8). Twenty seven of these 29 stocks had a reliable estimate of S_{EQ}, but two stocks did not (East Alsek and Ugashik). Based on these results we ultimately chose the criterion of an observed exploitation rate less than or equal to exploitation rate at MSY to differentiate those stocks with exploitation rates near or below MSY (29 stocks) and those with exploitation rates above MSY (11 stocks). All subsequent analyses were done using these two groups of stocks. Note that our Ricker model estimates of the exploitation rate at MSY can differ from those estimated using other spawner-recruit models. For example, the brood-interaction model used to set the escapement goal range for Kenai River sockeye salmon estimated μ_{MSY} at 0.81 (Carlson et al. 1999); whereas, the Ricker model estimate of μ_{MSY} is 0.74.

OVERESCAPEMENT IN RELATION TO CARRYING CAPACITY

Next we examined whether overescapements, when they occur, are approaching or exceeding carrying capacity. For the 29 stocks with an observed exploitation rate less than or equal to exploitation rate at MSY we calculated the percentage of brood years where the escapement was equal to or exceeded the estimate of S_{EQ} (Appendix B1). The percentage of time the observed escapement was above S_{EQ} ranged from 0% to 25% and was a function of the observed exploitation rate on the stock (Figure 9). Many of the stocks with higher rates (>10% of the time) of escapements approaching carrying capacity are those with low fishery exploitation rates such as Situk, Redoubt, Klukshu, Italio, Akwe, and Speel in Southeast Alaska; Buskin and Afognak on Kodiak Island; Crescent in upper Cook Inlet; as well as Middle Fork Goodnews in Kuskokwim Bay (Figure 9).

OVERESCAPEMENT IN RELATION TO PRODUCING MSY OR SUSTAINED YIELDS

For those stocks with an observed exploitation rate less than or equal to exploitation rate at MSY, we can compare yields at differing levels of escapement to see if yields are reduced as escapement increases above that needed to produce MSY. As expected, a composite graph of the 29 stocks indicates that yields tend to be maximized as escapements approach that needed to produce MSY (Figure 10). Conversely, yields tended to be reduced as escapements exceeded that needed to produce MSY. Also, MSY was achieved at least part of the time over a wide range of escapements until they exceeded 200% of escapement that produces MSY. This result is also confirmed by inspection of the stock-recruitment relationships estimated from brood tables for each stock (upper panels in Appendices B3-B40).

Similar results were obtained when we compared average yields when escapements fell within the current escapement goal to average yields when overescapement occurred. Twenty-two of 29 stocks exhibited a decrease in average yield when overescapement occurred. Averaged across all 29 stocks, yields decreased 48% when overescapement occurred relative to when the current escapement goal was met (Table 2). On average, variability in yields increased 278% as overescapement occurred (Table 2).

Although we could not reliably estimate S_{MSY} using a Ricker model for the 11 of 40 stocks where observed exploitation rate is greater than the exploitation rate at MSY, we were able to compare trends in yields as escapements increased above the upper end of the current escapement goal. For these stocks, yields tended to continue to increase above the average as overescapement occurred (Figure 11). Above average yields tended to occur over the entire range of observed escapements indicating that yields are being sustained from these stocks.

A similar result was obtained when we compared average yields for escapements that fell within the current escapement goal to average yields when overescapement occurred. Seven of 11 stocks exhibited an increase in average yield when overescapement occurred. Averaged across all 11 stocks, yields increased 94% when overescapement occurred relative to when the current escapement goal was met (Table 3). On average, variability in yields decreased 11% as overescapement occurred (Table 3).

DELAYED DENSITY DEPENDENCE

Five examples of delayed-food availability responses can be found among sockeye salmon rearing lakes in Alaska. However, single-brood and delayed-density dependent effects are highly confounded when high spawner abundances occur over consecutive brood years.

In Frazer Lake, three consecutive overescapements (>2 times the upper bound of the escapement goal range) in 1980-1982 resulted in a decline in production from subsequent broods in 1981 and 1982 when returns per spawner fell below replacement (Figure 12). Reduced sockeye salmon production was associated with a decline in macrozooplankton density from $3{,}590 m^{-3}$ (1970-1976) when escapements were within the current escapement goal range to $140 m^{-3}$ in 1981-1982 (Kyle et al. 1988). The average length of the smallest macrozooplankter (*Bosmina*) shifted below the observed threshold size (0.40 mm) for juvenile sockeye salmon prey, and *Bosmina* became the dominant macrozooplankton species in the lake (Kyle et al. 1988). These changes in the macrozooplankton community were associated with a decline in smolt length from 90 to 70 mm that persisted for 4 years even after escapement levels declined (Kyle et al. 1988). A single overescapement (3 times the upper bound of the escapement goal range) in 1985 resulted in a return per spawner below replacement, but an escapement within the goal range the following year resulted in record high production (Figure 12). Thus at Frazer Lake, consecutive overescapements produced an apparent delayed-density dependent response, but a single overescapement resulted in a single-brood response.

In Afognak Lake, three consecutive overescapements (>2 times the upper bound of the escapement goal range) in 1995-1997 resulted in a decline in production from subsequent broods in 1996 and 1997 when returns per spawner fell below replacement (Figure 12). As in Frazer Lake, reduced sockeye salmon production was associated with a decline in macrozooplankton biomass from 670 mg m^{-2} for brood year 1995 to 221 mg m^{-2} for brood years 1996-1997 (Baer et al. 2007). During this same time period, the biomass of *Daphnia*, a preferred sockeye salmon prey, declined from 44 mg m^{-2} to 15 mg m^{-2}, and the mean length of *Daphnia* declined from 0.78 to 0.57 mm (Baer et al. 2007). A similar overescapement (>2 times the upper bound of the escapement goal range) in 1982 resulted in a return per spawner below replacement from the 1983 year class, but no limnological data is available from this time period. Several other smaller overescapements (<2 times the upper bound of the escapement goal range) in 1984-1985 and 1989-1994 did not result in returns per spawner falling below replacement. However, the production history of Afognak Lake sockeye salmon is confounded by lake fertilization (1990-2000) and fry stocking programs (1992, 1994, 1996-1998).

In Coghill Lake, several consecutive years of overescapement in 1980-1982, 1985, and 1987 (>2 times the upper bound of the escapement goal range) were associated with a decline in production from subsequent broods in 1985-1989 when returns per spawner fell below replacement (Figure 12). Although, no limnological data were available for the period before the overescapement events, Edmundson et al. (1997) postulated that the decline in production could have been caused by overgrazing by large juvenile sockeye salmon populations as had been previously documented in Frazer Lake. The small average size (1.5 g) of smolt emigrating from Coghill Lake in the early 1990's supported this hypothesis (Edmundson et al. 1997). After 1989, escapements were maintained within the escapement goal range, the lake was fertilized for 4 years (1993-1996), and sockeye salmon production returned to normal levels (Figure 12).

In the Chignik watershed, overescapements have occurred in both early and late sockeye salmon runs from 1998 through 2001, with the combined escapements for both runs nearly double the upper range of the goals in 2001. The early run spawns in Black Lake (and tributaries) and the late run spawns in Chignik Lake, but in recent years the juveniles from both runs have overwintered in Chignik Lake. Limnological studies of Chignik Lake documented a threefold decline in macrozooplankton biomass between 1991 (Kyle 1992a) and 2000-2002 (Bouwens and Finkle 2003). During the later period, the zooplankton community was dominated by *Bosmina* and *Cyclops*, both inefficient grazers on phytoplankton, and *Daphnia*, a preferred sockeye salmon prey, was nearly absent (Bouwens and Finkle 2003). In addition, the mean size of *Bosmina* was below the threshold size for juvenile sockeye salmon prey (Bouwens and Finkle 2003). Further, chlorophyll *a* levels were high but macrozooplankton biomass was low indicating inefficient energy transfer from primary producers to primary consumers, attributable to top-down grazing pressure (Bouwens and Finkle 2003). In 2003, only 6.75 million sockeye salmon smolts emigrated from the system compared with an average of 20 million smolts per year from 1997-2002 (Bouwens and Finkle 2003). The adult return from brood year 2001 was about 1.6 million, about 43% below the recent 20-year average (1978-1997).

In the Kenai watershed, overescapements in 1987 through 1989 (~1.5 times the upper bound of the escapement goal range) were associated with below average returns per spawner from brood years 1988-1990 (Figure 12). About 75% of the juvenile sockeye salmon produced in this system rear in glacially turbid Skilak Lake. Limnological studies of this lake documented a 50% decline in spring (May-June) copepod biomass in 1988 and 1990 following these overescapements (Edmundson et al. 2003). These observations led to the hypothesis that grazing by large fry populations reduced the biomass of copepods available for emergent fry the following spring reducing their survival. This hypothesis was supported by a weak statistical relationship between fall fry abundance and copepod biomass the following spring, and a significant statistical relationship between spawner abundance, spring copepod biomass, and fall fry abundance (Edmundson et al. 2003). Subsequently, a brood-interaction model was found to provide the best fit to the spawner-recruit data for this stock (Carlson et al. 1999), and in 1999 a brood-interaction simulation model was used to establish the current escapement goal range (Fried 1999). Edmundson et al. (2003) also found that euphotic zone depths in Skilak Lake had declined over the past 20 years due to increased glacial melt and attendant silt loading. Since euphotic zone depth directly affects primary production, these changes were associated with a 50% reduction in zooplankton biomass and the size of sockeye salmon fry in the fall (Edmundson et al. 2003).

More recent overescapements (~1.5 times the upper bound of the escapement goal range) in the Kenai watershed in 2004-2006 have raised concerns about future production, because productivity in Skilak Lake is currently about 35% lower than in the late 1980s, and the overescapements have occurred consecutively. The 2004 year class produced the largest fall fry population (DeCino and Willette 2004) and the smallest fall fry ever observed in Skilak Lake (Table 4), raising concerns about overwinter mortality (Edmundson et al. 2003). The 2005 year class produced the smallest fall fry population and the lowest egg-to-fry survival ever observed in Skilak Lake (Table 4). Juvenile production data from the 2006 year class are not yet available. The outcome of these overescapements will not be known until adults from these year classes begin to return in 2009.

OVERESCAPEMENT AND JUVENILE SIZE

One manifestation of overescapement is changes in juvenile sockeye salmon size caused by density-dependent growth. The overall relationship between smolt size and production can be viewed within the context of the Beverton-Holt and Ricker production models (Figure 13). In general, the Beverton-Holt model is appropriate when there is a ceiling of abundance imposed by available food or habitat. Whereas, the Ricker model is appropriate when compensatory mortality results from overseeding of spawning beds, or density-dependent growth extends the time in a vulnerable size range (Ricker 1975). As spawner and juvenile abundances increase, juvenile growth becomes density dependent due to competition for limited food resources. In systems that are rearing limited (Beverton-Holt model), smolt size will reach a constant minimum when juvenile abundance reaches a maximum (Figure 13). However, in systems that are spawning limited (Ricker model), smolt size will increase at spawner densities greater than the escapement that produces the maximum return, because juvenile abundance declines due to compensatory mortality of embryos. When top-down effects reduce food available to juveniles and intraspecific competition increases holdovers, age-1 smolt size will continue to decline as spawner abundance increases even though age-1 smolt abundance declines. These top-down effects may only be observed when spawner abundances are more than two times S_{MSY} over consecutive broods and may not be adequately described by a Ricker model (Koenings and Kyle 1997). At very high spawner and juvenile abundances, juveniles cannot sequester sufficient energy reserves to survive over winter, causing smolt size to reach a constant minimum slightly above the starvation-mortality threshold (Figure 6).

FISHERY-RELATED ASPECTS OF OVERESCAPEMENT

The fishery-related aspects of overescapement can be examined for all 40 sockeye salmon stocks and do not require that we know the production relationship or have a reliable estimate of the biological reference points. When overescapement occurs, harvest is foregone and the additional escapement can affect subsequent production and yield as we have shown in the previous section of this report. In this section, we focus on the immediate loss of harvest due to overescapement relative to the magnitude of the run. Plots of the annual run broken into harvest and escapement by run year (lower left panel) and the percent difference between the upper bound of the escapement goal and the observed escapement by run size (lower right panel) are in Appendices B3-B40.

OVERESCAPEMENT IN RELATION TO FOREGONE HARVEST

The simplest metric of overescapement is the frequency of its occurrence. Only three of the 40 stocks did not experience overescapement in at least one year during the most recent 15 years of published data and based on the current escapement goal range (Appendix B2). The percentage of years where overescapement occurred ranged from 0% (Italio, East Alsek, and Upper Station LR stocks) to 93% of the time or 14 out of the 15 years (Karluk ER, Frazer, and Chignik LR stocks). The frequency of overescapement did not appear related to the observed exploitation rate of each stock, although overescapement occurred more frequently in stocks where the observed exploitation rate is less than the exploitation rate at MSY (Figure 14).

A better metric would be to look at the loss in harvest due to overescapement. By averaging the number of fish forgone in the harvest due to overescapement in the most recent 15 years ($\overline{H}_{LOST}$) we see that some loss of harvest occurred in 37 of 40 stocks indicating that some overescapement is occurring with regularity (Appendix B2). Many of the stocks that regularly overescape have fairly low exploitation rates indicating a lack of fishing power, or unexpectedly large runs, or the presence of management or economic constraints on the fishery.

The magnitude of foregone harvest should also be considered since this potentially affects the total benefits (e.g., ex-vessel value, fishing-related employment, economic impact) of the harvest to the fishery. Overescapements may occur more frequently when the run is large (lower right panel of Appendices B3-B40). Moreover, the effect on benefits accrued to the fishery could be significant if foregone harvest is a large percentage of the run. Eighteen of the 40 stocks had average losses ($\overline{\%H}_{LOST}$) that were 5% or greater of the run (Appendix B2). Of these 18 stocks seven had losses that exceeded 10% of the run on average (Speel, Redoubt, Akwe, Karluk ER, Karluk LR, Saltery, and Afognak stocks). Eighteen of the 40 stocks had average losses during the years that overescapement occurred ($\overline{\%H}_{OVER}$) that were 10% or greater of the run (Appendix B2). Of these 18 stocks, seven had losses that exceeded 20% of the run on average (Speel, Redoubt, Lost, Akwe, Ayakulik, Saltery, and Afognak stocks). Foregone harvest was related to fishing power, with stocks that do not achieve the exploitation rate at MSY showing the greatest losses in harvest (Figure 15).

CONCLUSIONS

In this report, overescapement was defined as escapements that are above the range of the current escapement goal. For most of the 40 Alaskan sockeye salmon stocks we reviewed, overescapement occurred at least once in a recent 15 year period. Although overescapement was easy to detect, the biological and fishery-related effects of overescapement were more difficult to detect and assess. Much of the difficulty is due to the life history characteristics of sockeye salmon, with their variable freshwater and marine residence times, dependence on lakes for rearing, and variable size at smoltification causing highly variable, often time-dependent, density independent changes in survival from spawning adult to returning adult. Moreover, Alaska's fixed escapement goal policy and the precautionary nature of the sustainable salmon fisheries management policy dictates that this high variability in survival is largely borne by the fishery as variable harvests that may sometimes be forgone.

We found evidence of delayed density dependence in five Alaskan sockeye salmon stocks. In three of these stocks, returns per spawner fell below replacement for 2 to 5 years following consecutive overescapements that were greater than twice the upper escapement goal range. These observations were consistent with results from whole lake experiments that have shown that overgrazing by large fry populations for 2 or more consecutive years caused the highest level of restructuring of zooplankton populations and the slowest recovery time (Koenings and Kyle 1997).

However, as seen in the review of salmon stocks in British Columbia (Walters et al. 2004) we did not observe long-term stock collapse of any of the 40 stocks that could be attributed to overescapement. We did observe one stock that failed to produce sustained yields on average (Italio, Appendix B7). The watershed that supports this stock (Italio River) has undergone significant natural changes in habitat, leading to a loss of productive capacity and a closure of the fishery.

We were able to assess the density dependent biological effects of overescapement for 29 of the 40 stocks. These are stocks where observed exploitation rate is less than or equal to exploitation rate at MSY. As expected, yields increased as escapements approached the escapement that produces MSY and then decreased as escapements exceeded this value. Although some stocks exhibited increases in yields, when averaged across these 29 stocks, overescapement resulted in a decrease in yields and an increase in the variability in yields.

This result is consistent with the generic theory of compensatory production, where spawning efficiency decreases with increasing escapement levels and stocks are limited by the carrying capacity of the habitat. Overescapement, in general, is not sustainable as it causes returns and yields to decrease in the next generation, which also result in lower escapements. Lower escapements then result in higher returns and yields in succeeding generations.

For the remaining 11 stocks where observed exploitation rate is greater than exploitation rate at MSY, we found that yields tended to increase as escapements increased, even when overescapement occurred. Although four stocks exhibited decreases in yield (McDonald, Kenai, Ayakulik, and Upper Station ER), when averaged across all 11 stocks, overescapement resulted in an increase in yields and a slight decrease in variability in yields.

This result is also consistent with the generic theory of compensatory production. As escapement increases, but is below the level thought to produce MSY, returns and yields will increase even if overescapement occurs. This is due to the high productivity of salmon across a wide range of intermediate escapements so that the long term change in yield due to overescapement is small when exploitation rate is high.

Foregone harvest due to overescapement occurred in 37 of the 40 stocks we reviewed. In many stocks these annual losses were a small percentage of run size, often less than 5% of the run when averaged across all 15 years in the analysis. Seven of these 40 stocks exhibited average annual losses in harvest due to overescapement that ranged from 10% to 21% of the run. When we examined foregone harvest only during years that overescapement occurred, 18 stocks exhibited losses greater than 10% of the run, and seven of these stocks exhibited losses greater than 20% of the run. Lack of fishing power, especially during large runs appears to cause these larger losses.

RECOMMENDATIONS

Although overescapement as defined is occurring on most of the 40 Alaskan sockeye salmon stocks we reviewed, for some of these stocks more information is needed to understand the effect overescapement may or may not have on production and the fishery. Salmon fisheries are not controlled experiments and thus are not easily adapted to the basic tools of science such as replication or the use of controls. However, there are some recommendations we can make to look further into the effects of overescapement.

Alternative methods for determination of carrying capacity of sockeye salmon watersheds should be developed and validated. Limnological methods of determining maximum smolt capacity already exist (e.g., Koenings and Kyle 1997), but should be validated in systems that have independently derived and reliable estimates of carrying capacity. Coring of lake bottoms and measurement of proxies for marine derived nutrients in the sediments has shown considerable promise in systems that support primarily sockeye salmon and have nearby fishless control lakes (e.g., Schindler et al. 2005). Meta-analyses of existing sockeye salmon data should be conducted to see if there are correlates to carrying capacity similar to those shown for Chinook salmon *Oncorhynchus tshawytscha* and watershed area (Parken et al. 2004). The analyses presented herein could form the basis of such a meta-analysis.

Along these same lines, a modeling effort could be attempted that incorporates all of the previously discussed hypotheses concerning density dependence (e.g., predators, zooplankton, spawner densities) as special cases. This model would be formulated as a hierarchical meta-analysis that would produce an analysis of uncertainty in the model outputs such as changes in yield from differing levels of escapement. Similarly, a statistical or graphical analysis of the factors affecting and significance of delayed density dependence could be attempted.

Research focused on estimating carrying capacity in select watersheds should include efforts to better define the threshold juvenile salmon densities that cause delayed density-dependent responses in rearing lake ecosystems. A fundamental assumption of classical spawner-recruit analyses is that productivity of the system does not change over time, processes causing a non-linear response between spawner abundance and future productivity must be understood to properly set escapement goals.

Further research is needed to better define the levels of spawner and fry abundances that can significantly reduce zooplankton biomass, develop a predator-resistant zooplankton community, and reduce sockeye salmon survival. Lack of consensus among salmon biologists regarding the significance of these processes in sockeye salmon population dynamics has been due in part to our lack of understanding of the threshold population densities needed to evoke an ecological response. This has been further complicated by the fact that these threshold salmon densities likely change over time as bottom-up influences change primary productivity. As a result, lack of a response at population densities thought to be sufficient has been interpreted as evidence refuting the mechanism. A program monitoring limnological parameters, zooplankton biomass and species composition, fry and smolt size and abundance should be implemented in sockeye salmon rearing lakes that are likely to experience high escapement levels. These data are needed to improve the efficacy of escapement goal analyses, since responses that only function above a poorly understood threshold are not amenable to statistical time-series analyses typically used to set salmon escapement goals.

From a fishery standpoint, better forecasts of salmon runs and improved inseason management could reduce the incidence of overescapement in highly exploited stocks. Assessments would improve with more accurate catch apportionments in mixed-stock fisheries through the use of genetic stock identification techniques. Our understanding of the factors that affect density independent survival could greatly improve forecasting ability and the management of fisheries to attain escapement goals. Assessments of marine survival of smolts and enumeration of smolt produced from varying levels of escapement would aid in an understanding of the effects of process error in marine versus freshwater environments. In addition to foregone harvests, better economic data from sockeye salmon fisheries statewide could help to determine the effect of overescapement on benefits accrued to these fisheries.

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TABLES AND FIGURES

Table 1.–Sockeye salmon stocks, assessment methods, brood years available, goal type, escapement goals, and source citations used in this report.

Area	Stock	Assessment	Brood yrs	Goal Type	Lower	Upper	Citation[a]
Southeast	Chilkat	Weir/M-R	19	SEG	80,000	200,000	1
	Chilkoot	Weir/M-R	19	SEG	50,000	90,000	1
	Speel	Weir	14	BEG	4,000	13,000	1
	McDonald	Foot survey	17	SEG	70,000	100,000	3
Yakutat	Italio	Peak aerial	26	BEG	5,000	14,000	1
	Situk	Weir	22	BEG	30,000	70,000	1
	Redoubt	Weir	15	BEG	10,000	25,000	1
	East Alsek-Doame	Peak aerial	26	BEG	26,000	57,000	1
	Klukshu	Weir	21	BEG	7,500	15,000	1
	Lost	Peak foot	14	BEG	1,538	3,538	2
	Akwe	Peak aerial	13	BEG	6,000	15,000	2
PWS	Eshamy	Weir	27	BEG	20,000	40,000	4
	Coghill	Weir	37	SEG	20,000	40,000	4
	Copper	Sonar	39	SEG	410,000	760,000	4
Upper Cook Inlet	Kenai	Sonar	32	SEG	500,000	800,000	5
	Kasilof	Sonar	31	BEG	150,000	250,000	5
	Crescent	Sonar	31	BEG	30,000	70,000	5
	Russian ER	Weir	33	SEG	14,000	37,000	5
Kodiak	Karluk ER	Weir	16	BEG	100,000	210,000	6
	Karluk LR	Weir	16	BEG	170,000	380,000	6
	Ayakulik	Weir	33	SEG	200,000	500,000	6
	Upper Station ER	Weir	29	SEG	30,000	65,000	6
	Upper Station LR	Weir	29	BEG	120,000	265,000	6
	Frazer	Weir	30	BEG	70,000	150,000	6
	Saltery	Weir	21	BEG	15,000	30,000	6
	Buskin	Weir	8	SEG	8,000	13,000	6
	Afognak	Weir	16	BEG	20,000	50,000	6
Chignik	Chignik ER	Weir	46	SEG	350,000	400,000	7
	Chignik LR	Weir	46	SEG	200,000	250,000	7

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Table 1. Page 2 of 2.

Area	Stock	Assessment	Brood yrs	Goal Type	Lower	Upper	Citation[a]
AK Peninsula	Nelson	Weir	23	BEG	97,000	219,000	8
	Bear LR	Weir	16	SEG	117,000	195,000	8
Bristol Bay	Kvichak	Tower	44	SEG	2,000,000	10,000,000	9
	Naknek	Tower	44	SEG	800,000	1,400,000	9
	Egegik	Tower	42	SEG	800,000	1,400,000	9
	Ugashik	Tower	42	SEG	500,000	1,200,000	9
	Wood	Tower	44	SEG	700,000	1,500,000	9
	Igushik	Tower	44	SEG	150,000	300,000	9
	Nushagak	Sonar	21	SEG	340,000	760,000	9
	Togiak	Tower	43	BEG	120,000	270,000	9
Kuskokwim Bay	Middle Fork Goodnews	Weir	18	BEG	18,000	40,000	10

[a] Citations:

1. Geiger et al. 2004.
2. Clark et al. 1995.
3. Johnson et al. 2005.
4. Evenson et al. unpublished.
5. Hasbrouck and Edmundson 2007.
6. Nelson et al. 2005.
7. Witteveen et al. 2005.
8. Nelson et al. 2006/
9. Baker et al. 2006.
10. Molyneaux and Brannian 2006.

Table 2.–Average yields and coefficient of variation within and above current escapement goals for 29 sockeye salmon stocks with observed exploitation rate less than or equal to exploitation rate at MSY. μMSY is calculated from a Ricker model.

					Within goal range			Above goal range			Percent difference	
Stock	Goal Type	μ_{OBS}	μ_{MSY}	Harvest rate	Yield	n	CV	Yield	n	CV	Yield	CV
Chilkat	SEG	0.64	0.69	0.47	131,072	9	64%	209,148	1	0%	60%	-64%
Speel	BEG	0.29	0.86	0.31	6,424	5	104%	-8,390	6	189%	-231%	85%
Italio	BEG	-0.04	0.38	0.06	3,960	11	271%	-6,167	10	171%	-256%	-101%
Situk	BEG	0.33	0.56	0.43	45,648	9	63%	37,053	13	223%	-19%	159%
Redoubt	BEG	0.32	0.75	0.07	27,605	5	141%	-4,680	6	535%	-117%	394%
East Alsek	BEG	0.56	0.58	0.42	68,823	19	120%	83,738	3	30%	22%	-90%
Klukshu	BEG	0.27	0.56	0.35	8,446	8	88%	3,905	12	319%	-54%	231%
Lost	BEG	0.42	0.69	0.43	4,507	6	58%	1,936	8	220%	-57%	162%
Akwe	BEG	0.36	0.58	0.39	15,868	6	95%	-1,337	5	541%	-108%	447%
Eshamy	BEG	0.65	0.77	0.58	33,336	8	84%	60,244	4	187%	81%	103%
Coghill	SEG	0.69	0.78	0.65	179,845	14	172%	87,880	16	190%	-51%	18%
Copper	SEG	0.67	0.70	0.71	1,090,198	23	64%	871,862	3	22%	-20%	-42%
Kasilof	BEG	0.77	0.77	0.70	847,581	12	46%	518,264	5	75%	-39%	30%
Crescent	BEG	0.46	0.62	0.38	64,821	15	85%	46,573	11	195%	-28%	109%
Karluk ER	BEG	0.46	0.69	0.33	270,682	2	4%	197,829	13	85%	-27%	81%
Karluk LR	BEG	0.48	0.74	0.37	305,736	3	22%	356,683	10	143%	17%	121%

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Table 2. Page 2 of 2.

Stock	Goal type	μ_{OBS}	μ_{MSY}	Harvest rate	Within goal range			Above goal range			Percent difference	
					Yield	n	CV%	Yield	n	CV%	Yield	CV
Frazer	BEG	0.62	0.75	0.36	521,394	6	154%	255,947	13	167%	-51%	12%
Saltery	BEG	0.33	0.64	0.27	51,636	7	70%	3,920	14	1002%	-92%	933%
Buskin	SEG	0.52	0.72	0.41	14,462	6	64%	4,574	2	10%	-68%	-54%
Afognak	BEG	0.22	0.69	0.20	48,490	4	134%	13,504	12	556%	-72%	422%
Chignik LR	SEG	0.71	0.73	0.67	805,354	11	69%	652,871	28	63%	-19%	-6%
Nelson	BEG	0.57	0.71	0.55	367,614	11	38%	224,330	12	89%	-39%	51%
Bear LR	SEG	0.75	0.81	0.73	417,079	4	71%	490,698	7	63%	18%	-8%
Ugashik	SEG	0.69	0.72	0.56	2,089,595	14	105%	2,988,014	10	69%	43%	-36%
Wood	SEG	0.61	0.62	0.57	1,969,359	26	71%	1,989,900	9	117%	1%	46%
Igushik	SEG	0.63	0.73	0.62	866,312	14	120%	482,366	21	178%	-44%	58%
Nushagak	SEG	0.57	0.62	0.65	1,019,529	16	57%	-36,604	3	4727%	-104%	4670%
Togiak	BEG	0.68	0.68	0.63	477,061	23	80%	207,866	6	140%	-56%	60%
MF Goodnews	BEG	0.25	0.53	0.23	15,808	10	153%	5,106	7	424%	-68%	271%
Average		0.50	0.68	0.45	405,801		92%	335,760		370%	-48%	278%

Table 3.–Average yields and coefficients of variation within and above current escapement goals for 11 sockeye salmon stocks with observed exploitation rate greater than exploitation rate at MSY. μMSY is calculated from a Ricker model.

					Within goal range			Above goal range			Percent difference	
Stock	Goal type	μ_{OBS}	μ_{MSY}	Harvest rate	Yield	n	CV%	Yield	n	CV%	Yield	CV
Chilkoot	SEG	0.61	0.58	0.50	85,747	10	156%	171,484	7	61%	100%	-95%
McDonald	SEG	0.50	0.37	0.66	113,250	4	40%	109,000	7	127%	-4%	87%
Kenai	SEG	0.82	0.74	0.74	3,548,945	9	82%	3,192,232	5	89%	-10%	7%
Russian ER	SEG	0.60	0.49	0.44	32,374	16	120%	77,897	7	99%	141%	-21%
Ayakulik	SEG	0.54	0.44	0.39	415,407	20	120%	181,388	2	153%	-56%	33%
U. Station ER	SEG	0.50	0.47	0.39	55,919	14	128%	41,776	7	111%	-25%	-17%
U. Station LR	BEG	0.65	0.62	0.55	274,104	15	81%	948,755	3	39%	246%	-43%
Chignik ER	SEG	0.66	0.52	0.52	860,534	11	72%	991,126	17	79%	15%	7%
Kvichak	SEG	0.52	0.38	0.45	5,002,435	23	178%	16,038,000	8	100%	221%	-78%
Naknek	SEG	0.65	0.59	0.59	2,561,298	23	72%	2,824,304	12	112%	10%	40%
Egegik	SEG	0.83	0.71	0.74	5,546,839	21	104%	8,081,093	9	63%	46%	-41%
Average		0.63	0.54	0.54	1,681,532		105%	2,968,823		94%	62%	-11%

Table 4.–Summary of limnological and juvenile production data for Kenai River late-run sockeye salmon, brood years 1985-2006. Mean annual euphotic zone depth (EZD) in Skilak Lake is provided as an index of interannual changes in primary production. Fry abundance was estimated from acoustic surveys, and fry weight was estimated from trawl samples collected in Skilak Lake in September each year. All abundance estimates are in thousands.

Brood Year	Mainstem Spawners	Potential Egg Deposition	EZD (m)	Fall Fry Wt. (g)	Fall Fry Abundance		Egg-to-Fry Survival
					Skilak	Total	
1985	234.28	486,196	9.0	1.7	17,877	22,217	0.046
1986	352.66	733,239	8.3	-	9,029	10,182	0.014
1987	1,268.33	3,430,362	12.4	0.9	30,883	37,071	0.011
1988	785.14	1,846,695	11.8	1.2	12,660	13,988	0.008
1989	1,187.54	2,451,806	5.7	1.3	21,850	24,601	0.010
1990	340.81	588,241	6.7	1.5	6,347	7,127	0.012
1991	295.12	553,800	9.6	1.8	8,427	9,541	0.017
1992	675.93	1,739,544	7.7	1.2	31,347	35,687	0.021
1993	565.63	1,260,616	5.9	1.4	8,354	11,159	0.009
1994	769.69	1,682,828	8.3	1.7	7,378	8,813	0.005
1995	452.82	899,797	3.4	1.6	4,830	5,582	0.006
1996	537.88	1,131,986	5.8	0.9	23,000	25,316	0.022
1997	795.73	1,642,865	5.1	0.7	15,332	21,194	0.013
1998	430.10	801,995	7.6	1.3	5,908	8,331	0.010
1999	426.28	857,051	6.9	1.2	18,663	19,950	0.023
2000	318.38	617,640	9.2	1.0	20,416	22,510	0.036
2001	364.36	781,874	8.7	1.0	6,802	8,749	0.011
2002	610.53	1,240,680	4.3	1.3	10,521	12,750	0.010
2003	775.61	1,727,567	6.0	0.6	20,390	22,908	0.013
2004	1,120.00	2,372,232	5.8	0.5	39,500	41,936	0.018
2005	1,113.00	2,357,405	7.3	0.7	4,238	4,478	0.002
2006	1,270.00	2,689,941	-	-	-	-	-
Mean	667.72	1,449,744	7.4	1.2	15,417	17,814	0.015

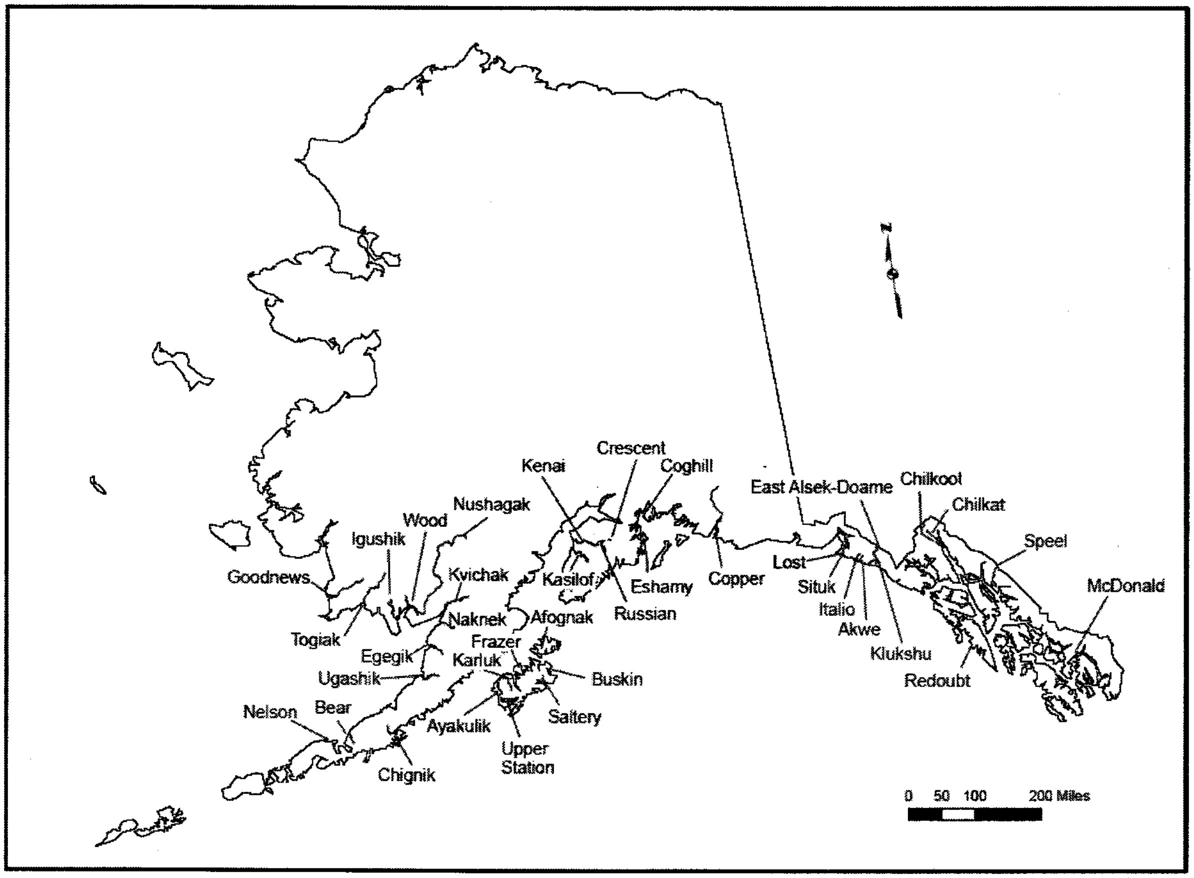

Figure 1.–Map of Alaska with location of the 40 sockeye salmon stocks in this review.

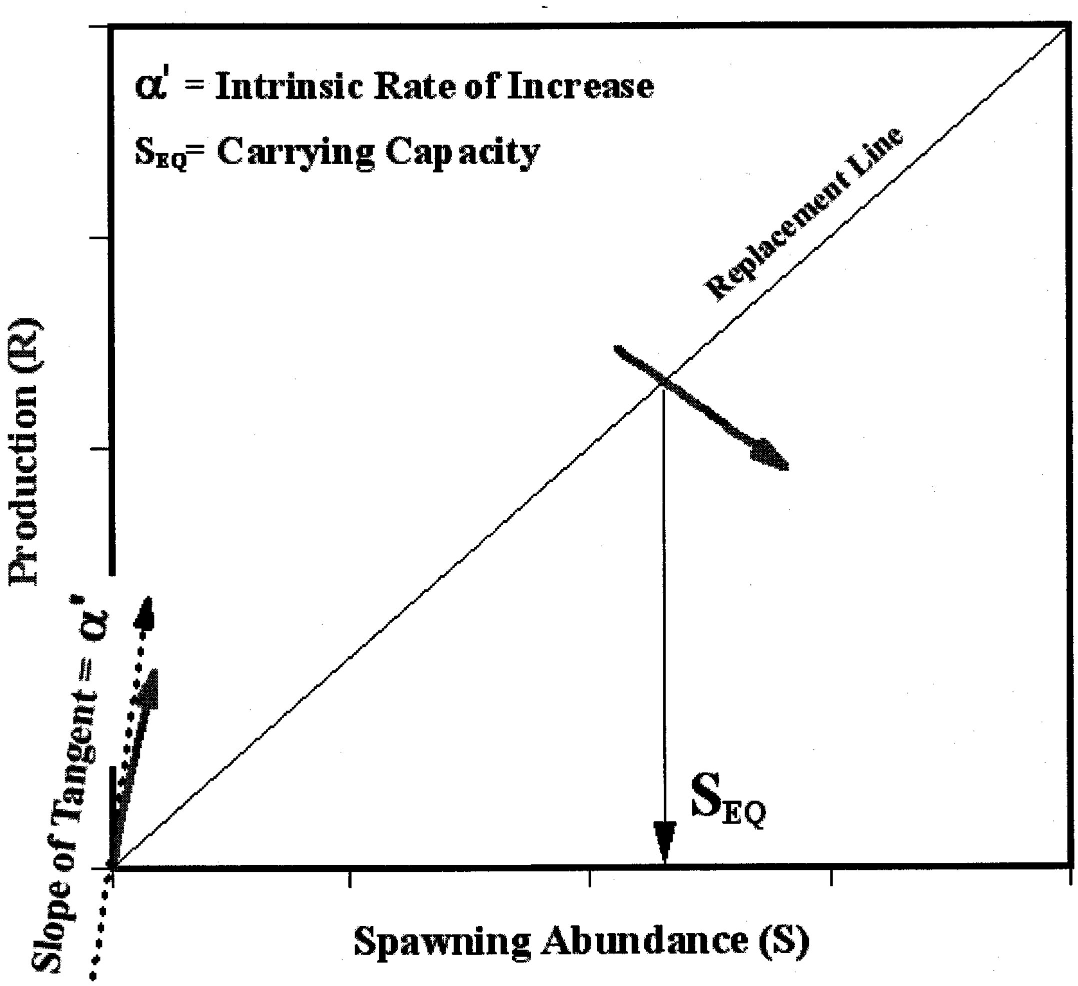

Figure 2.–Schematic representation of a generic production model for salmon.

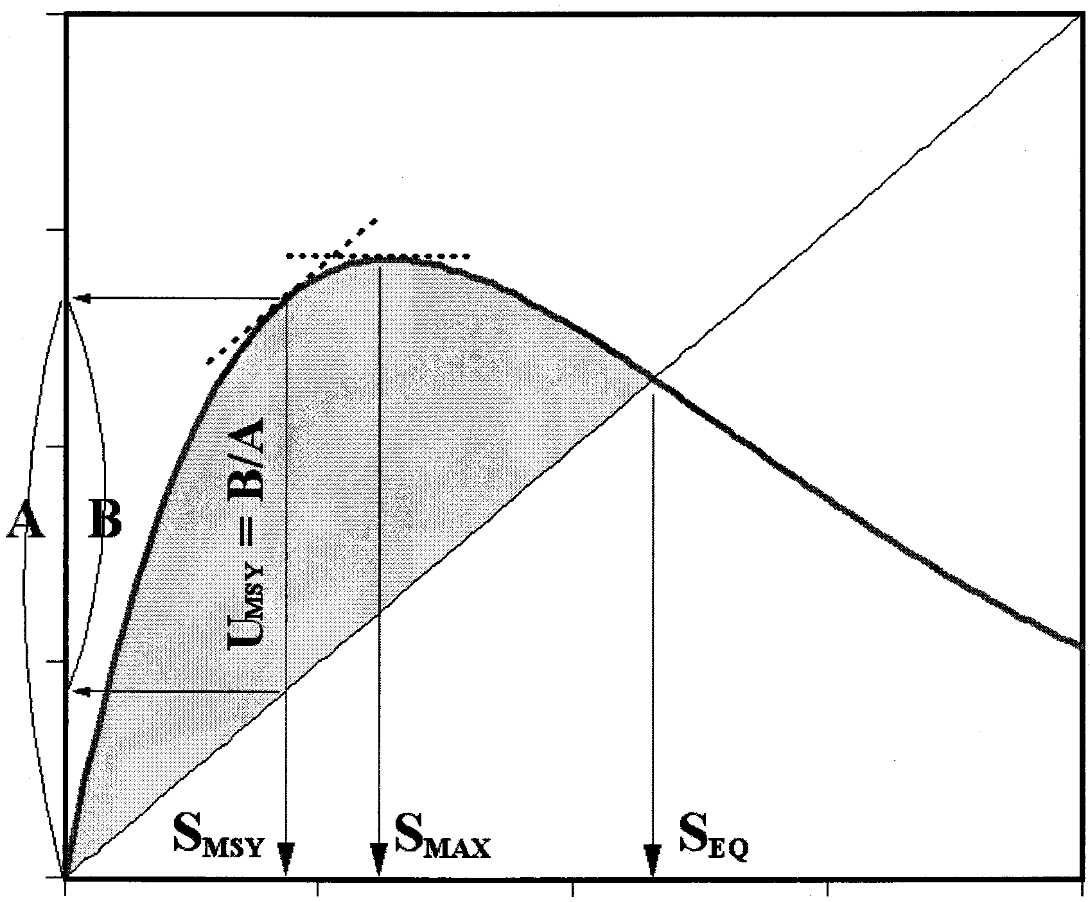

Figure 3.–Schematic representation of a Ricker stock-recruitment curve and relevant biological reference points.

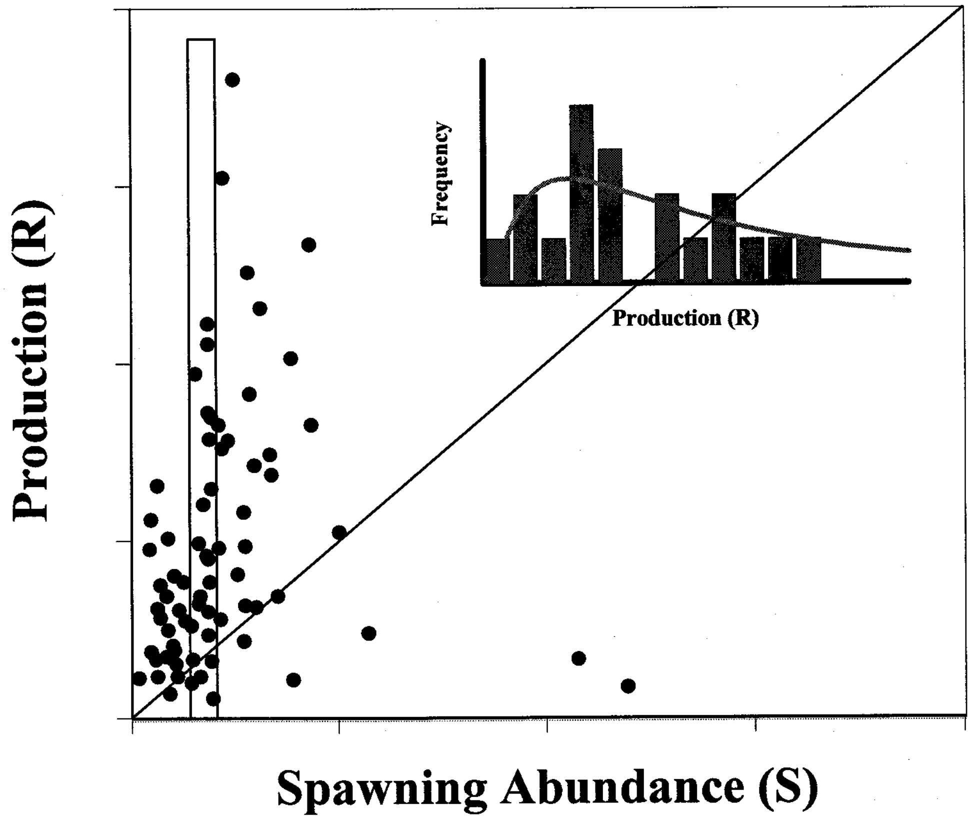

Figure 4.–Schematic representation of log-normal process error of stock-recruitment data.

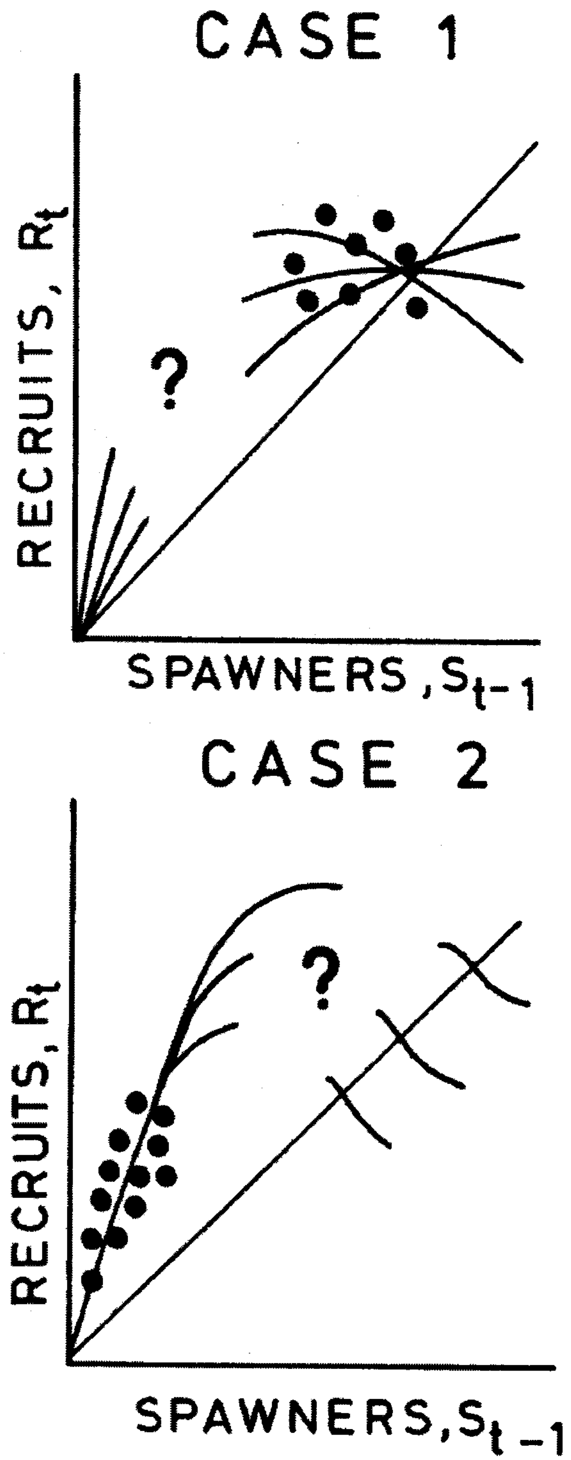

Figure 5.–Schematic of production data expected from fisheries with very low harvest rates (case 1) and from fisheries with high harvest rates (case 2).

Source: From Walters and Hilborn (1976).

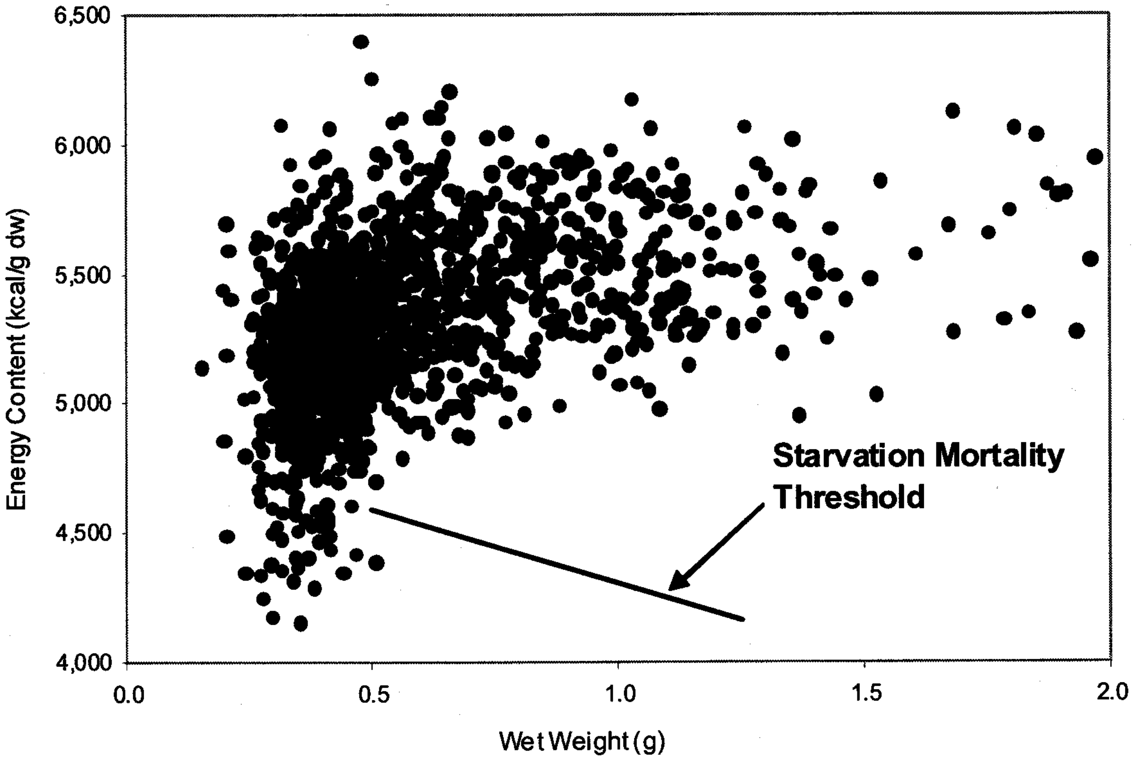

Figure 6.–Distribution of whole-body energy content in relation to wet weight for juvenile sockeye salmon collected in Skilak Lake in the fall, 2000-2005. Bomb calorimetry was used to measure energy content. The solid line indicates the mean (n=64) energy content of juvenile sockeye salmon that died from starvation in the laboratory.

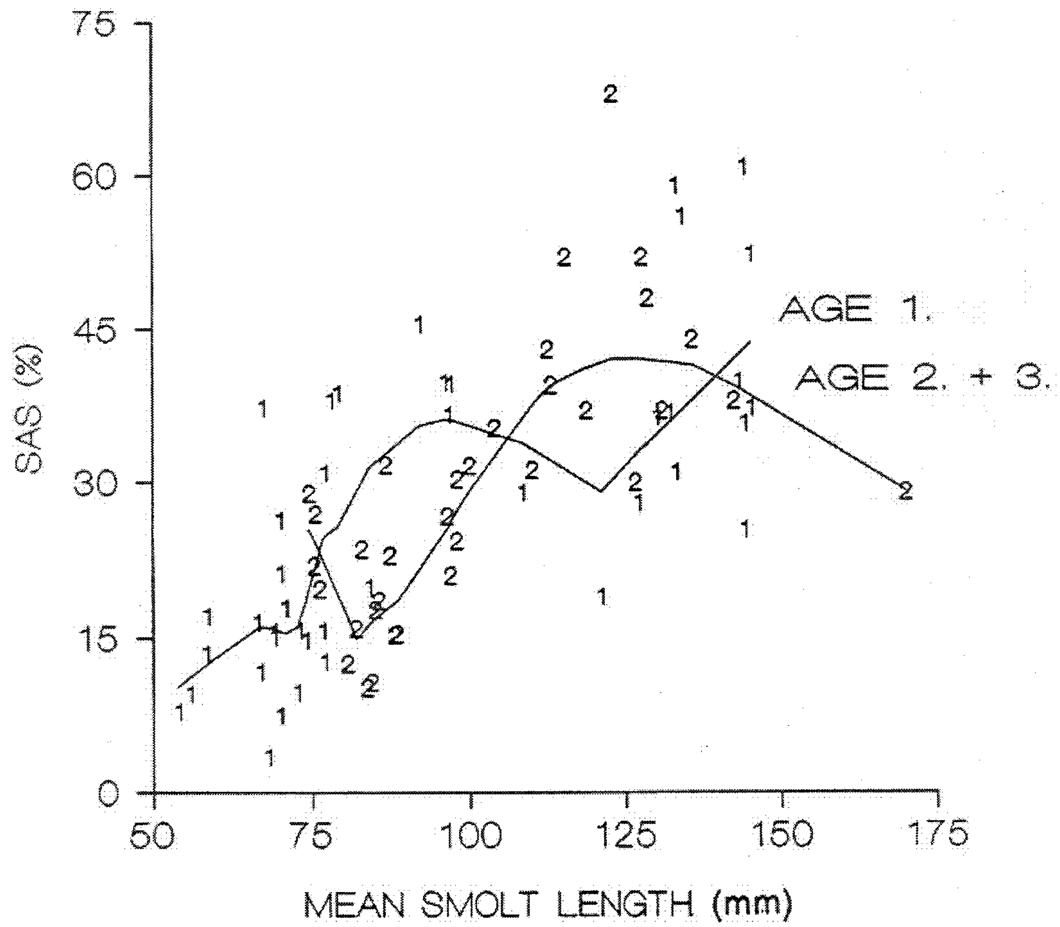

Figure 7.–Loess (F=0.4) models relating smolt-to-adult survival of age 1 and age 2 & 3 smolts to mean lengths of sockeye salmon from 12 nursery systems located in Alaska.

Source: From (Koenings et al. 1993).

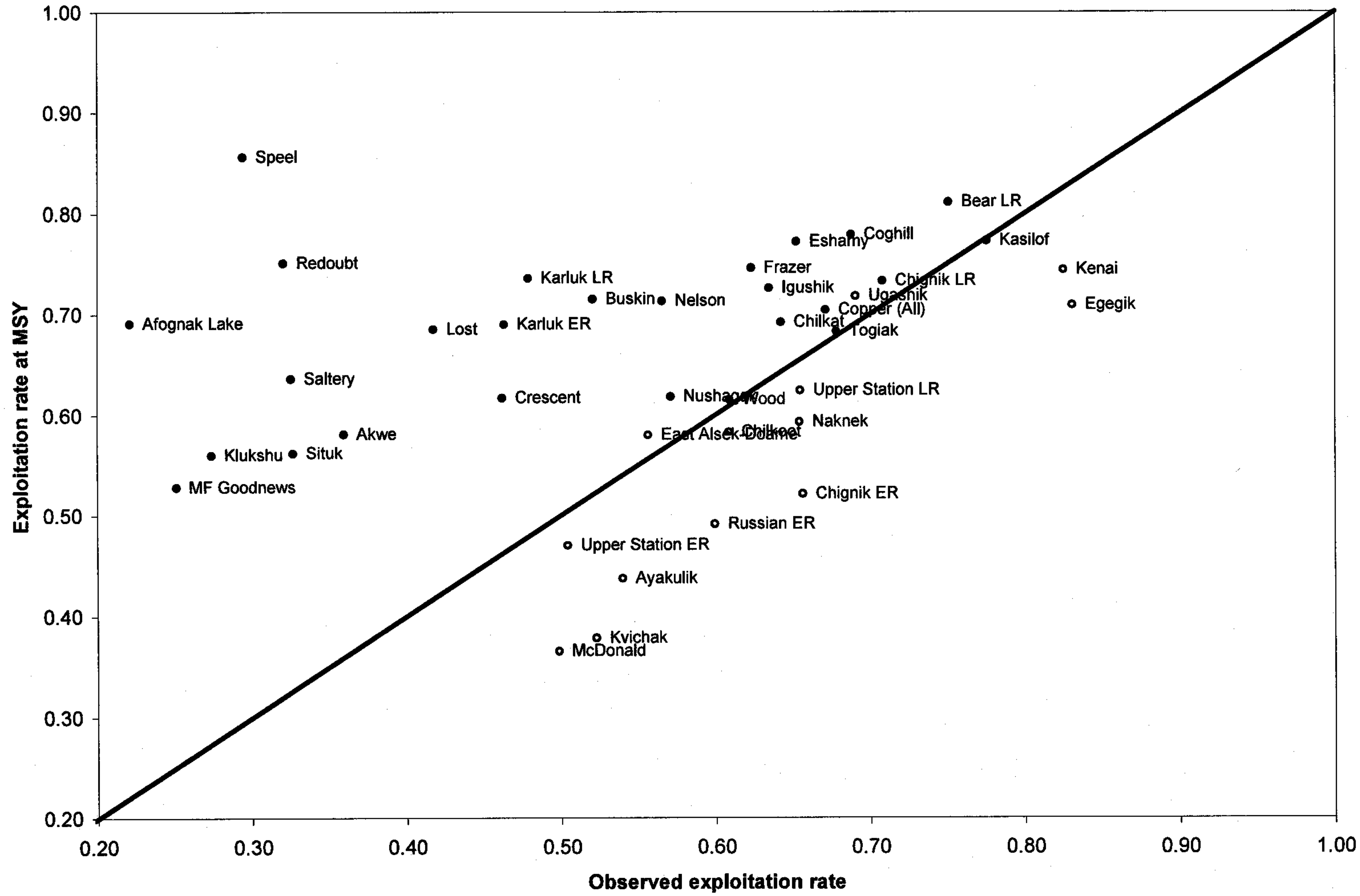

Figure 8.–Estimated exploitation rate at MSY determined from lnα' plotted against the observed exploitation rate for 40 Alaskan sockeye stocks (Italio stock not visible in this plot). Open circles designate stocks that do not have a reliable estimate of carrying capacity (NPCV of $S_{EQ} > 0.250$) and closed circles designate stocks that do have a reliable estimate of carrying capacity (NPCV of $S_{EQ} \leq 0.250$).

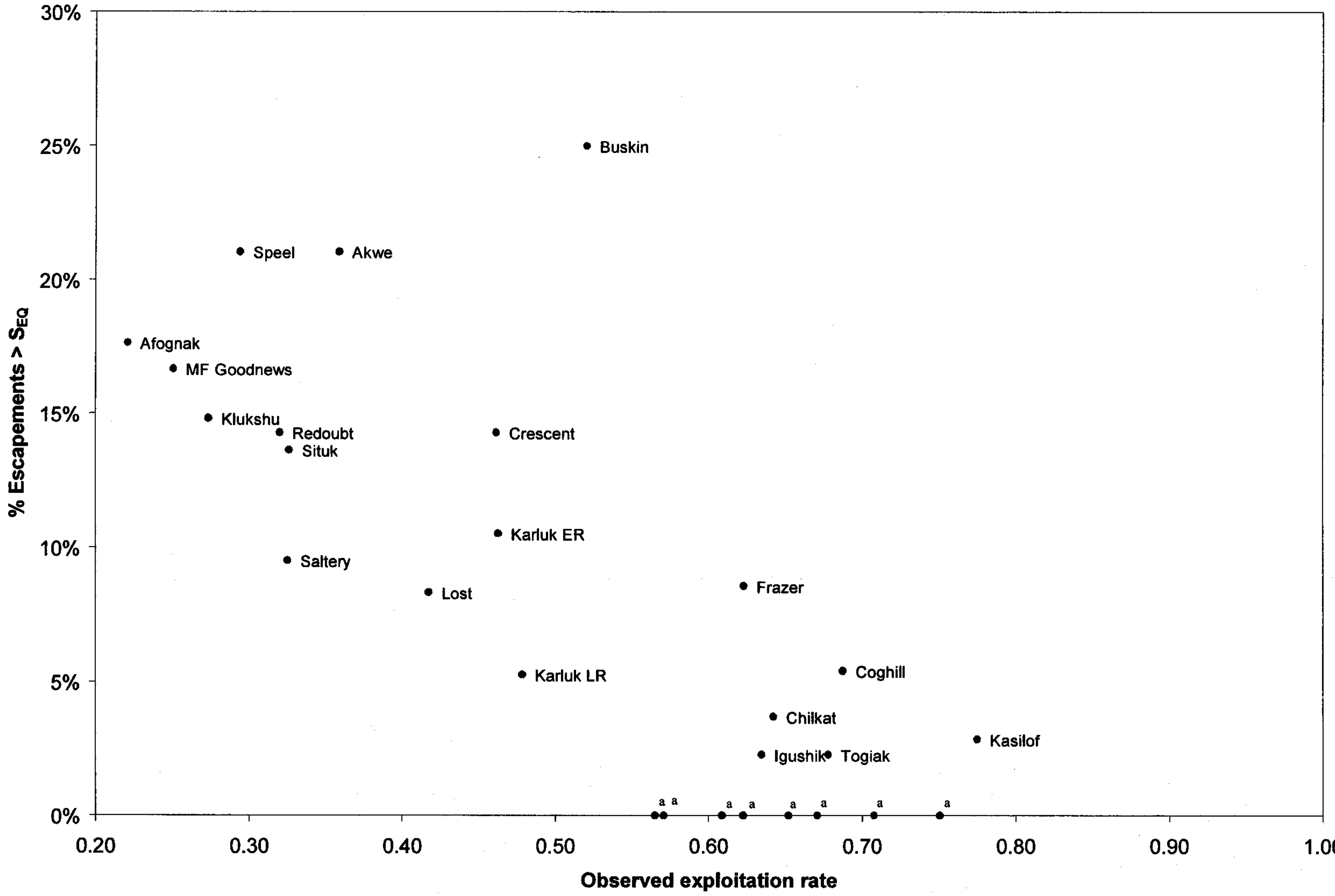

Figure 9.–Percentage of escapements greater than carrying capacity (S_{EQ}) plotted against the observed exploitation rate for 29 sockeye salmon stocks with a reliable estimate of S_{EQ} (Italio stock not shown).

[a] Stocks with no escapements greater than carrying capacity plotted on the x-axis are: East Alsek, Nelson, Bear LR, Chignik LR, Wood, Nushagak, Ugashik, Eshamy and Copper.

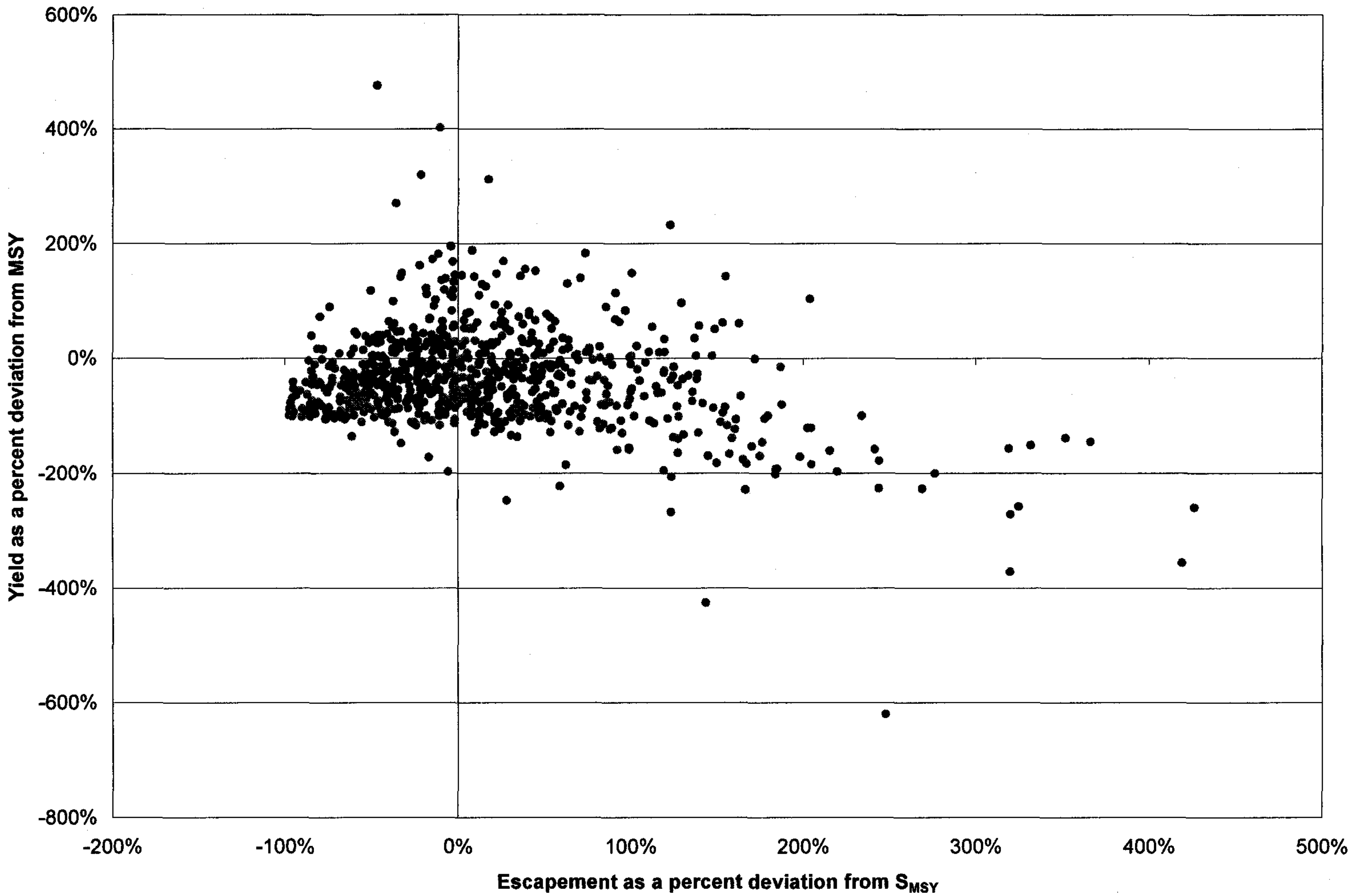

Figure 10.–Composite scatterplot of yields as a percent deviation from MSY on escapement as a percent deviation from S_{MSY} for 29 sockeye salmon stocks with observed exploitation rate less than or equal to exploitation rate at MSY.

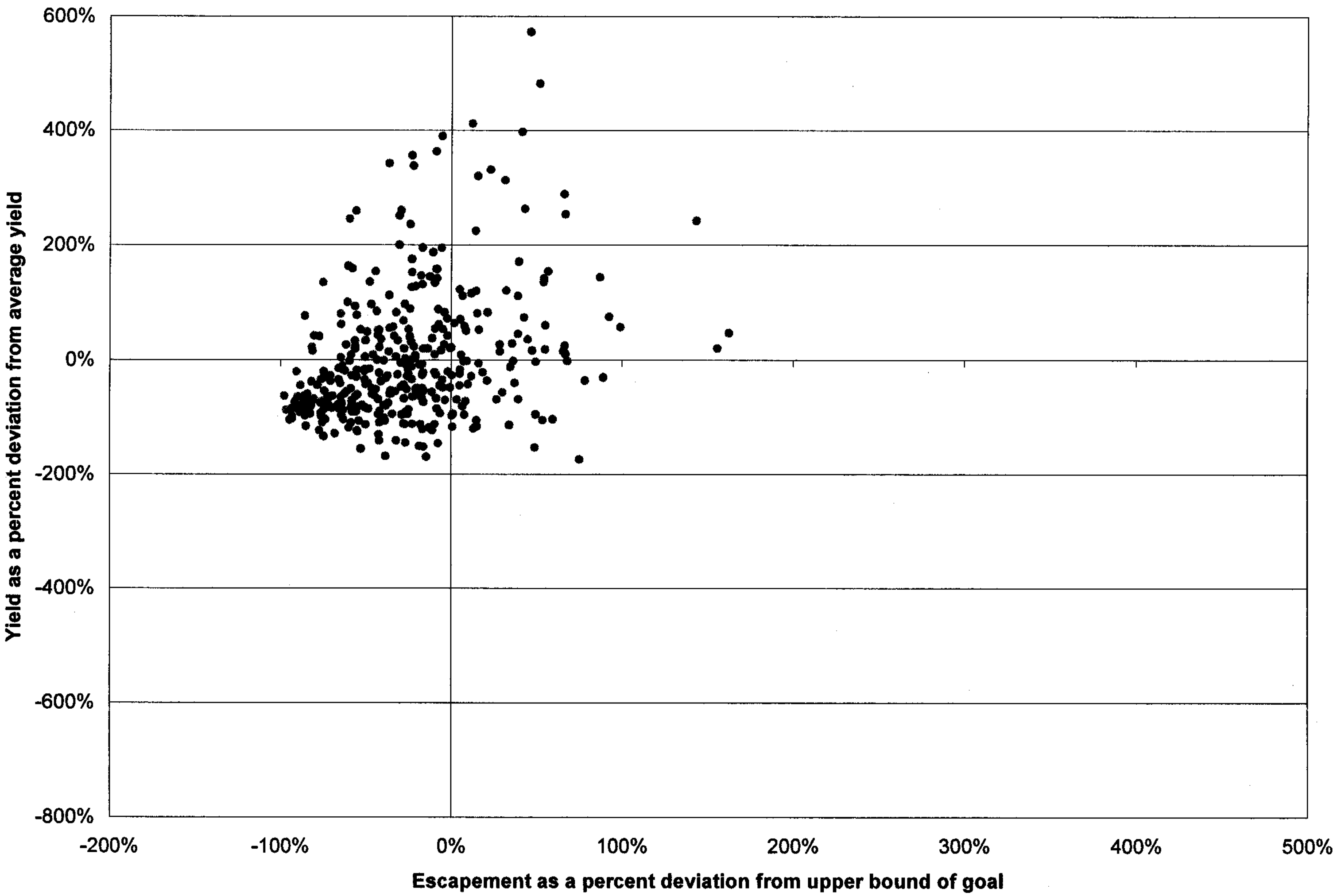

Figure 11.–Composite scatterplot of yields as a percent deviation from average yield on escapement as a percent deviation from the upper bound of the escapement goal for 11 sockeye salmon stocks with observed exploitation rate greater than exploitation rate at MSY.

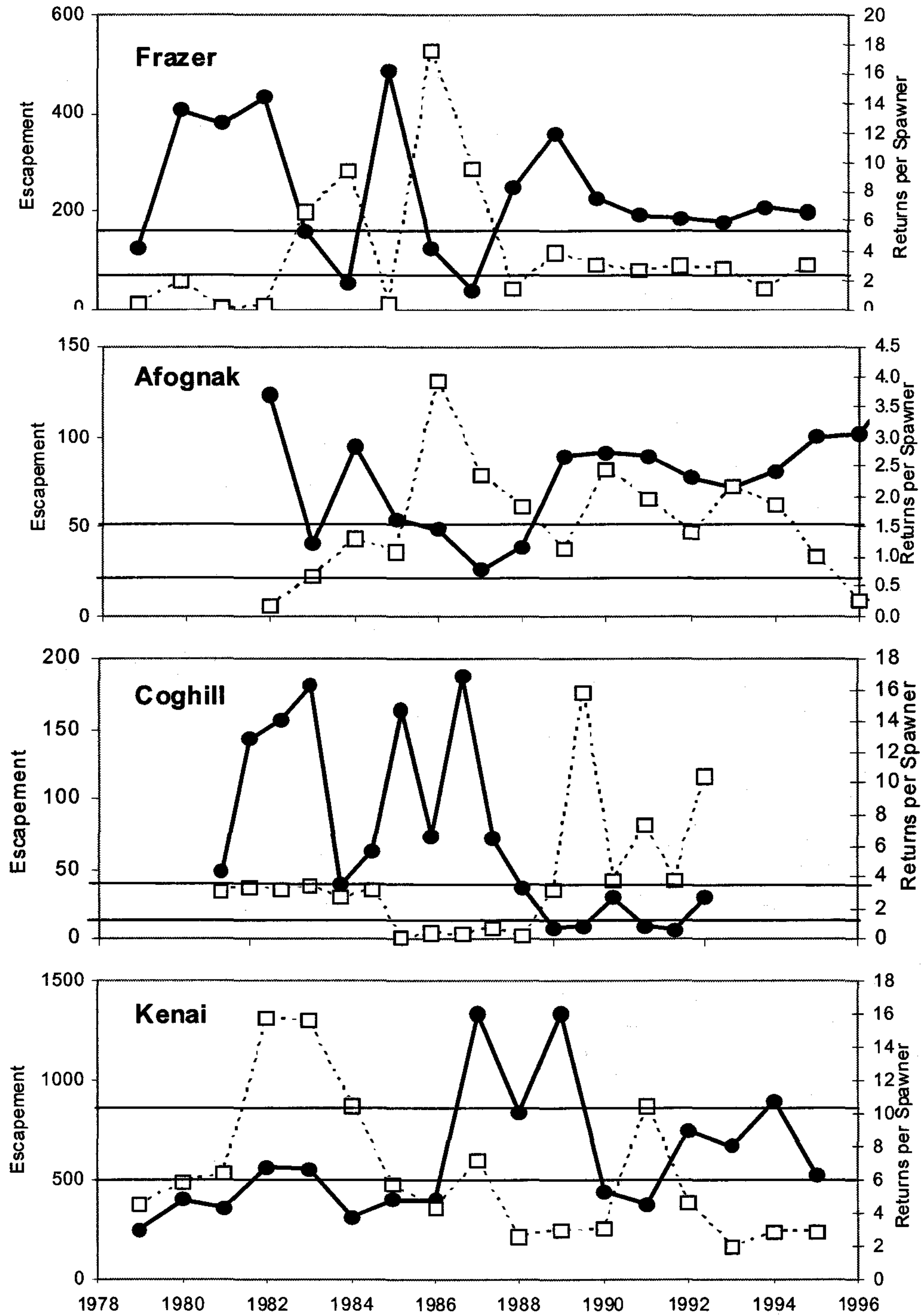

Figure 12.–Escapements (solid circles; in thousands) and returns per spawner (open squares) for Frazer, Afognak, Coghill, and Kenai river sockeye salmon stocks, 1978-1996. Solid horizontal lines indicate escapement goal ranges for each stock.

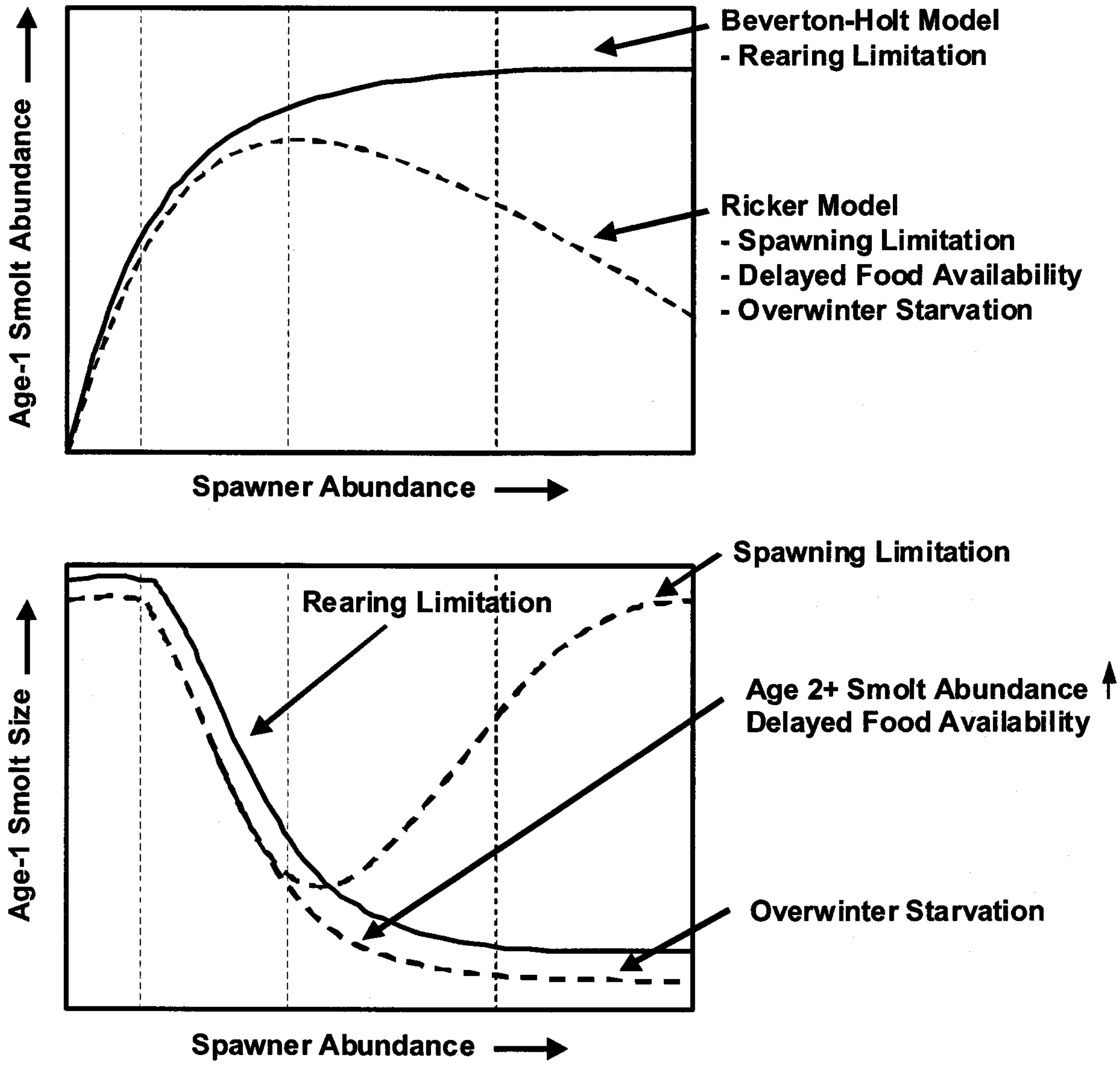

Figure 13.–Theoretical relationships between sockeye salmon spawner abundance, and juvenile abundance and size viewed within the context of the Beverton-Holt (solid line) and Ricker (dashed line) production models.

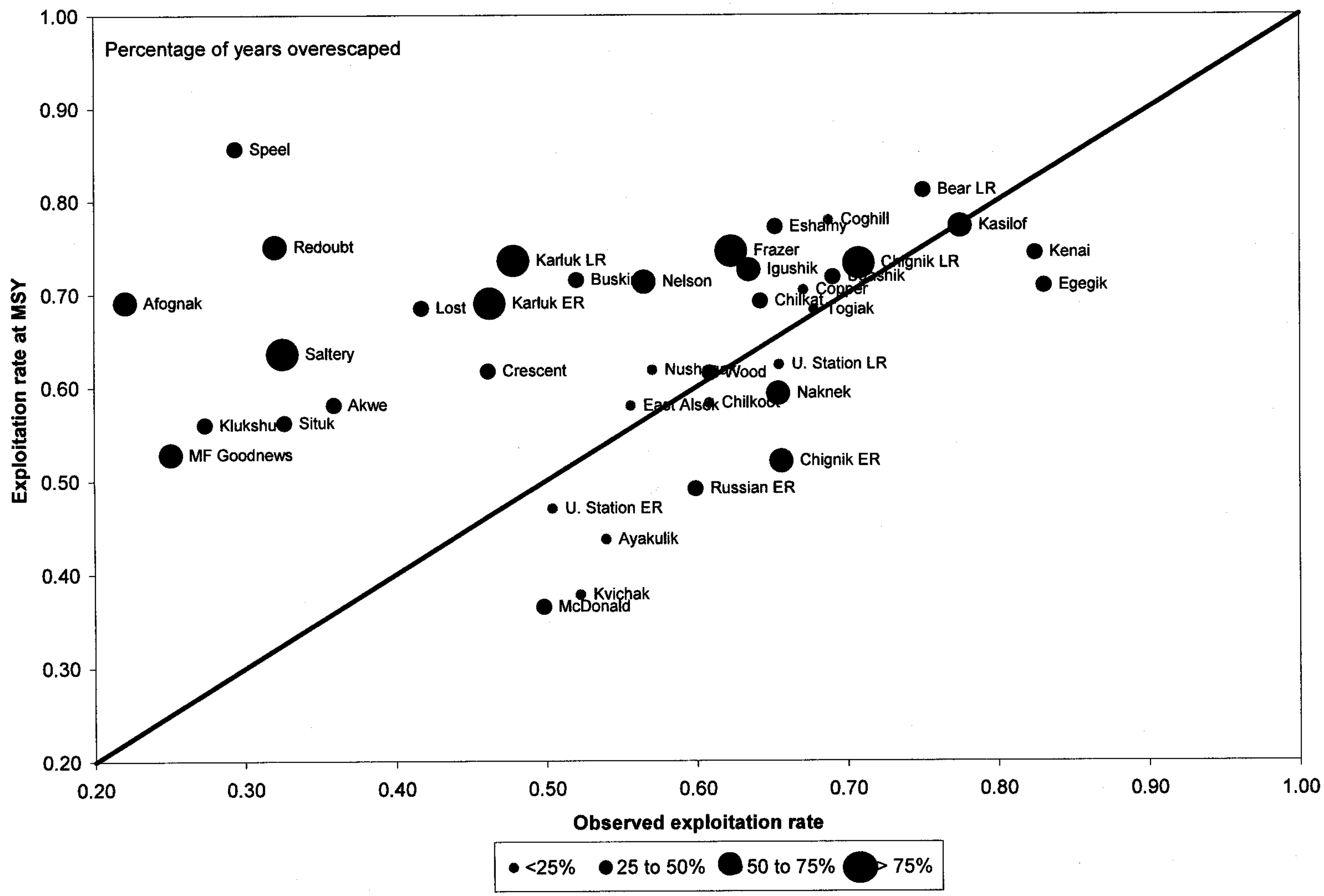

Figure 14.–Exploitation rate at MSY plotted against observed exploitation rate for 40 sockeye salmon stocks. Size of each point represents the percentage of years when overescapement occurred during the most recent 15 years.

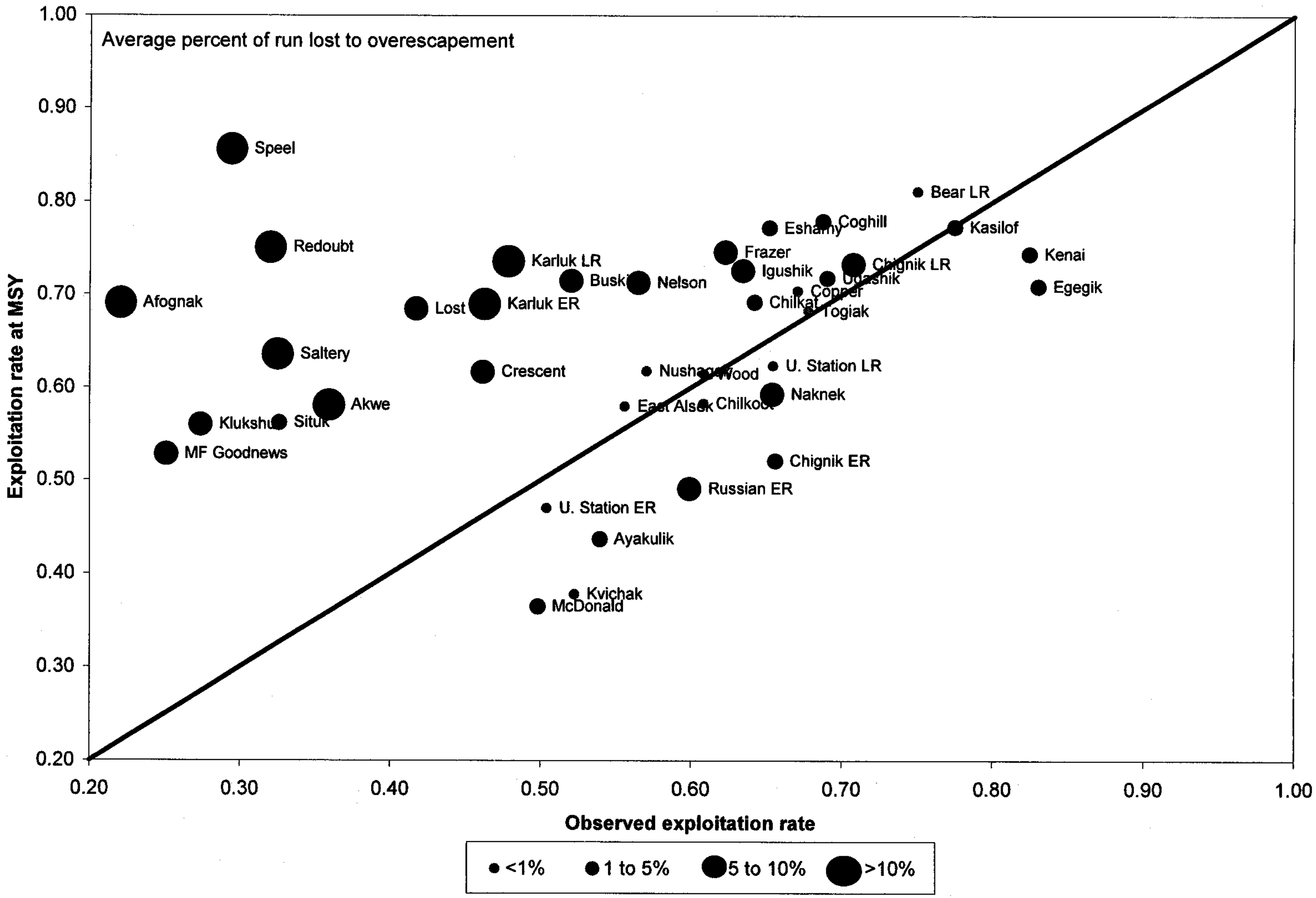

Figure 15.–Exploitation rate at MSY plotted against observed exploitation rate for 40 sockeye salmon stocks. Size of each point represents the average percentage of the run lost to overescapement during the most recent 15 years.

APPENDIX A
Stock-Recruitment Methodology and Overescapement Metrics

Appendix A1.–Stock-recruit analysis methodology and overescapement metrics.

Simple stock-recruitment analyses were performed on each brood table using the linearized form of the Ricker relationship with multiplicative process error (Hilborn and Walters 1992) to estimate parameters (Equation 1) and reference points (Equations 2 through 4). Beginning with the familiar non-linear form of the stochastic Ricker equation,

$$R = \alpha S \exp(-\beta S)\exp(\varepsilon), \tag{1a}$$

where S is the escapement and R is the resultant return. We then divide by S and take natural logs to form the simple linear regression recipe (SLR)

$$\ln\left(\frac{R}{S}\right) = \ln\alpha - \beta S + \varepsilon;\ \varepsilon \sim N\left(0, \sigma_\varepsilon^2\right). \tag{1b}$$

A linear regression of ln(R/S) on S will estimate the parameters lnα (y-intercept), β (slope), and σ_ε^2 (mean squared residual error). We then adjust $\widehat{\ln\alpha}$ for asymmetrical log-normal process error (Hilborn 1985),

$$\widehat{\ln\alpha'} = \widehat{\ln\alpha} + \hat{\sigma}_\varepsilon^2/2 \tag{1c}$$

and estimate the relevant reference points for salmon management from the regression parameters:

$$\hat{S}_{EQ} = \frac{\widehat{\ln\alpha'}}{\hat{\beta}}, \tag{2}$$

$$\hat{S}_{MSY} \approx \hat{S}_{EQ}\left(0.5 - 0.07\widehat{\ln\alpha'}\right), \text{ and} \tag{3}$$

$$\hat{\mu}_{MSY} \approx \widehat{\ln\alpha'}\left(0.5 - 0.07\widehat{\ln\alpha'}\right). \tag{4}$$

In this formulation, the estimate of S_{EQ} is the carrying capacity and the estimate of α′ is the intrinsic rate of increase. The estimate of σ_ε^2 is the process error. The estimate of S_{MSY} is the escapement that produces MSY and μ_{MSY} is the exploitation rate at MSY.

Statistical uncertainty about the parameters and reference points was assessed with a bootstrap technique (Efron and Tibshirani 1993); resampling the residuals of the linear regression with replacement, calculating all parameter estimates and reference points for each bootstrap replicate, omitting replicates with negative values of $\ln\alpha$ or β[1], and using percentiles of the bootstrap values to obtain interval estimates. Here, for comparison among stocks we also calculated a nonparametric analog of the coefficient of variation (NPCV) for each parameter and reference point (Prager and Mohr 1999):

$$NPCV = \frac{\left(69.15^{th}\ percentile - 30.85^{th}\ percentile\right)}{median}; \qquad (5)$$

where an NPCV of 0.250 (25%) or less was considered precise.

In addition, serial correlation in process error with a lag of one year was examined for each of the stocks with a time series regression of the simple model in equation (1). In this model, process errors are not independent, but serially dependent on the process error from the previous brood year (Noakes et al. 1987). The linear form of the model is then (AR1):

$$\ln\left(\frac{R}{S}\right) = \ln\alpha - \beta S + \varepsilon_{by};\ \varepsilon_{by} = \phi_1 \varepsilon_{by-1} + a_{by} \text{ or,} \qquad (6a)$$

$$\ln\left(\frac{R_{by}}{S_{by}}\right) = (1-\phi_1)\ln\alpha + \phi_1 \ln\left(\frac{R_{by-1}}{S_{by-1}}\right) + \phi_1\beta S_{by-1} - \beta S_{by} + a_{by},\ a_{by} \sim Norm\left(0, \sigma_a^2\right) \qquad (6b)$$

The time series regression includes an additional parameter (ϕ_1) that controls the strength of the correlation between the process error in two adjacent brood years (*by* and *by-1*) and can range from -1 to 1. The adjustment to $\hat{\ln\alpha}$ for asymmetric log-normal process error is then:

$$\hat{\ln\alpha}' = \hat{\ln\alpha} + \hat{\sigma}_a^2 \Big/ 2\left(1 - \hat{\phi}_1^2\right) \qquad (6c)$$

The remaining reference points are then calculated as in equations 2 through 4. Statistical uncertainty was handled with a model-based resampling bootstrap technique (Davison and Hinckley 1997) and estimation of NPCV's as above. Three stocks that were missing production data from consecutive brood years (Lost, Akwe, Eshamy) were not included in the time series analysis.

Several metrics were calculated to describe the difference in observed yield from expected yields and the difference in observed escapements from the reference points where we could reliably estimate S_{MSY} and S_{EQ} (NPCV $\leq$ 0.250). First, simple averages of annual escapement and yield were calculated for each brood table. One metric of overescapement is the percentage of brood years when the observed escapement was equal to or greater than the carrying capacity (S_{EQ}):

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[1] Negative values of $\ln\alpha$ correspond to stocks with the intrinsic rate of increase less than one, and negative values of β correspond to R/S increasing with increasing S. Since neither of these situations have biological analogs (they cannot occur in nature), these replicates must be omitted before calculating interval estimates.

$$\% \geq \hat{S}_{EQ} = \frac{number\ of\ brood\ years\ S \geq \hat{S}_{EQ}}{number\ of\ brood\ years} \times 100\% \qquad (7)$$

We also compared $\hat{\mu}_{MSY}$ to observed exploitation rate in the brood table:

$$\mu_{OBS} = \frac{average\ yield}{average\ return}, \text{ where} \qquad (8a)$$

$$average\ yield = \frac{\sum_{by=1}^{n}(return_{by} - escapement_{by})}{n}, \text{ and} \qquad (8b)$$

$$average\ return = \frac{\sum_{by=1}^{n} return_{by}}{n} \qquad (8c)$$

as a method of determining if the range of data in the brood table was sufficient to reliably estimate the biological reference points. The more familiar average annual harvest rate was also calculated for each stock from the annual harvest as a proportion of the annual run (i):

$$Harvest\ rate = \frac{\sum_{i=1}^{n}\left(harvest_i / run_i \right)}{n} \qquad (9)$$

Several metrics were calculated to describe the short-term loss of harvest when overescapement occurs. Because escapement goals can change over time, only the most recent 15 years of run, harvest, and escapement data for each stock were used and only the currently published escapement goal was evaluated. Note that these calculations are for data from calendar year runs and not the brood table of returns. One simple metric of overescapement is the percentage of years (out of the 15 most recent years) that overescapement occurred:

$$\%Overescapement = \frac{number\ of\ run\ years\ that\ overescapement\ occurred}{15\ years} \times 100\%. \qquad (10)$$

However, overescapement can be very small in some years (i.e., a few fish over the escapement goal) or very large. To account for this, the average harvest foregone was calculated for the most recent 15 years:

$$\overline{H}_{LOST} = \frac{\sum_{i=1}^{15} \begin{cases} Escapement_i - Upper\ bound\ of\ goal & if\ Escapement_i > Upper\ bound\ of\ goal \\ 0 & if\ Escapement_i \leq Upper\ bound\ of\ goal \end{cases}}{15}, \qquad (11)$$

so that zeros indicate that overescapement did not occur on average and positive values indicate that overescapement occurred on average. Overescapement is more likely to occur during large runs than small runs. To measure the effect of run size on overescapement, the average percentage of the run foregone to overescapement was also calculated for the most recent 15 years:

$$\overline{\%H}_{LOST} = \sum_{i=1}^{15} \frac{\begin{cases} Escapement_i - Upper\ bound\ of\ goal & if\ Escapement_i > Upper\ bound\ of\ goal \\ 0 & if\ Escapement_i \le Upper\ bound\ of\ goal \end{cases}}{Run_i} \times 100\% \Bigg/ 15, \qquad (12)$$

so that percentages of zero indicate that overescapement did not occur on average and positive percentages indicate that overescapement did occur on average.

An alternative method of examining foregone harvest due to overescapement was to average the harvest foregone only in those years when overescapement occurred:

$$\overline{H}_{OVER} = \frac{\sum_{i=1}^{15} Escapement_i - Upper\ bound\ of\ goal, if\ Escapement_i > Upper\ bound\ of\ goal}{number\ of\ years\ overescapement\ occurred} \qquad (13)$$

Similar to equation 12, the average percentage of the run foregone to overescapement was calculated, but only for those years when overescapement occurred:

$$\overline{\%H}_{OVER} = \frac{\sum_{i=1}^{15} \frac{Escapement_i - Upper\ bound\ of\ goal, if\ Escapement_i > Upper\ bound\ of\ goal}{Run_i} \times 100\%}{number\ of\ years\ overescapement\ occurred}. \qquad (14)$$

APPENDIX B
Summary of Reference Points, Overescapement Metrics and Data Plots

Appendix B1.–Goal type, escapement goal, biological reference points and biological performance metrics for 40 sockeye salmon stocks.

Stock	Goal	Lower	Upper	Model Used	S_{EQ}	$\% \geq S_{EQ}$	S_{MSY}	MSY	μ_{MSY}	μ_{OBS}
Chilkat	SEG	80,000	200,000	SLR	239,156	4%	88,147	200,439	0.69	0.64
Chilkoot	SEG	50,000	90,000	AR1	NE[a]	NE	NE	NE	0.58	0.61
Speel	BEG	4,000	13,000	SLR	25,616	21%	7,707	48,625	0.86	0.29
McDonald	SEG	70,000	100,000	SLR	NE	NE	NE	NE	0.37	0.50
Italio	BEG	5,000	14,000	SLR	18,329	19%	8,055	5,028	0.38	-0.04
Situk	BEG	30,000	70,000	SLR	128,231	14%	51,578	67,320	0.56	0.33
Redoubt	BEG	10,000	25,000	SLR	49,969	14%	17,466	53,198	0.75	0.32
East Alsek	BEG	26,000	57,000	SLR	148,811	0%	59,223	83,125	0.58	0.56
Klukshu	BEG	7,500	15,000	SLR	22,462	15%	9,044	11,717	0.56	0.27
Lost	BEG	1,538	3,538	SLR	6,619	8%	2,454	5,392	0.69	0.42
Akwe	BEG	6,000	15,000	SLR	29,454	21%	11,716	16,504	0.58	0.36
Eshamy	BEG	20,000	40,000	SLR	58,111	0%	19,863	68,055	0.77	0.65
Coghill	SEG	20,000	40,000	SLR	175,143	5%	59,413	211,660	0.78	0.69
Copper	SEG	410,000	760,000	AR1	1,275,428	0%	465,612	1,118,266	0.70	0.67
Kenai	SEG	500,000	800,000	SLR	NE	NE	NE	NE	0.74	0.82
Kasilof	BEG	150,000	250,000	AR1	572,807	3%	195,667	672,519	0.77	0.77
Crescent	BEG	30,000	70,000	SLR	116,461	14%	45,313	74,039	0.62	0.46
Russian ER	SEG	14,000	37,000	SLR	NE	NE	NE	NE	0.49	0.60
Karluk ER	BEG	100,000	210,000	SLR	401,757	11%	148,289	334,193	0.69	0.46
Karluk LR	BEG	170,000	380,000	SLR	770,164	5%	273,255	768,279	0.74	0.48
Ayakulik	SEG	200,000	500,000	SLR	NE	NE	NE	NE	0.44	0.50
Station ER	SEG	30,000	65,000	SLR	NE	NE	NE	NE	0.47	0.50
Station LR	BEG	120,000	265,000	SLR	NE	NE	NE	NE	0.62	0.65
Frazer	BEG	70,000	150,000	SLR	402,117	9%	141,325	418,283	0.75	0.62
Saltery	BEG	15,000	30,000	SLR	60,181	10%	23,121	40,897	0.64	0.33
Buskin	SEG	8,000	13,000	SLR	18,219	25%	6,585	16,714	0.72	0.52
Afognak	BEG	20,000	50,000	SLR	97,101	18%	35,811	81,057	0.69	0.22
Chignik ER	SEG	350,000	400,000	SLR	NE	NE	NE	NE	0.52	0.66
Chignik LR	SEG	200,000	250,000	AR1	737,660	0%	262,357	728,271	0.73	0.71

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Appendix B1.–Page 2 of 2.

Stock	Goal	Lower	Upper	Model Used	S_{EQ}	% ≥ S_{EQ}	S_{MSY}	MSY	μ_{MSY}	μ_{OBS}
Nelson	BEG	97,000	219,000	SLR	422,374	0%	152,992	383,704	0.71	0.57
Bear LR	SEG	117,000	195,000	SLR	410,506	0%	133,669	583,423	0.81	0.75
Kvichak	SEG	2,000,000	10,000,000	AR1	NE	NE	NE	NE	0.38	0.52
Naknek	SEG	800,000	1,400,000	SLR	NE	NE	NE	NE	0.59	0.65
Egegik	SEG	800,000	1,400,000	AR1	NE	NE	NE	NE	0.71	0.83
Ugashik	SEG	500,000	1,200,000	AR1	4,613,891	0%	1,663,994	4,279,316	0.72	0.69
Wood	SEG	700,000	1,500,000	AR1	3,113,860	0%	1,212,565	1,969,471	0.62	0.61
Igushik	SEG	150,000	300,000	SLR	1,055,001	2%	377,765	1,011,125	0.73	0.63
Nushagak	SEG	340,000	760,000	SLR	2,009,201	0%	780,914	1,282,898	0.62	0.57
Togiak	BEG	120,000	270,000	SLR	525,452	2%	194,973	426,047	0.68	0.68
Goodnews	BEG	18,000	40,000	SLR	53,358	17%	21,870	24,862	0.53	0.25

[a] NE = no estimate due to NPCV > 0.250 and $\mu_{OBS} > \mu_{MSY}$.

Appendix B2.–Fishery performance metrics in the most recent 15 years for 40 sockeye salmon stocks.

Stock	Goal	Lower	Upper	Harvest rate	%Overescape	H_{LOST}	$\%H_{LOST}$	H_{OVER}	$\%H_{OVER}$
Chilkat	SEG	80,000	200,000	0.42	33%	10,592	3%	31,775	9%
Chilkoot	SEG	50,000	90,000	0.48	7%	43	<1%	638	<1%
Speel	BEG	4,000	13,000	0.31	47%	5,979	16%	12,811	35%
McDonald	SEG	70,000	100,000	0.68	20%	5,600	2%	28,000	8%
Italio	BEG	5,000	14,000	0.02	0%	0	0%	0	0%
Situk	BEG	30,000	70,000	0.56	27%	1,906	1%	7,829	5%
Redoubt	BEG	10,000	25,000	0.09	67%	10,899	19%	16,348	29%
East Alsek	BEG	26,000	57,000	0.38	0%	0	0%	0	0%
Klukshu	BEG	7,500	15,000	0.32	40%	2,371	8%	5,927	20%
Lost	BEG	1,538	3,538	0.38	40%	892	9%	2,229	22%
Akwe	BEG	6,000	15,000	0.40	47%	5,507	13%	11,800	28%
Eshamy	BEG	20,000	40,000	0.42	40%	2,659	5%	6,647	12%
Coghill	SEG	20,000	40,000	0.61	13%	3,649	2%	27,369	17%
Copper	SEG	410,000	760,000	0.71	20%	17,731	<1%	88,654	2%
Kenai	SEG	500,000	800,000	0.75	40%	96,128	3%	240,319	7%
Kasilof	BEG	150,000	250,000	0.70	53%	50,281	4%	94,276	7%
Crescent	BEG	30,000	70,000	0.32	40%	11,491	7%	28,728	18%
Russian ER	SEG	14,000	37,000	0.48	40%	7,797	7%	19,492	17%
Karluk ER	BEG	100,000	210,000	0.37	93%	87,785	16%	94,055	17%
Karluk LR	BEG	170,000	380,000	0.40	87%	151,682	15%	175,017	17%
Ayakulik	SEG	200,000	500,000	0.46	7%	17,873	2%	268,101	35%
Station ER	SEG	30,000	65,000	0.54	13%	865	1%	6,485	6%
Station LR	BEG	120,000	265,000	0.55	0%	0	0%	0	0%
Frazer	BEG	70,000	150,000	0.61	93%	54,160	9%	58,029	9%
Saltery	BEG	15,000	30,000	0.30	80%	14,184	17%	17,731	22%
Buskin	SEG	8,000	13,000	0.41	50%	3,046	9%	6,092	19%
Afognak	BEG	20,000	50,000	0.22	73%	27,247	21%	40,685	32%
Chignik ER	SEG	350,000	400,000	0.62	53%	85,311	5%	159,958	9%
Chignik LR	SEG	200,000	250,000	0.71	93%	95,584	8%	102,412	8%

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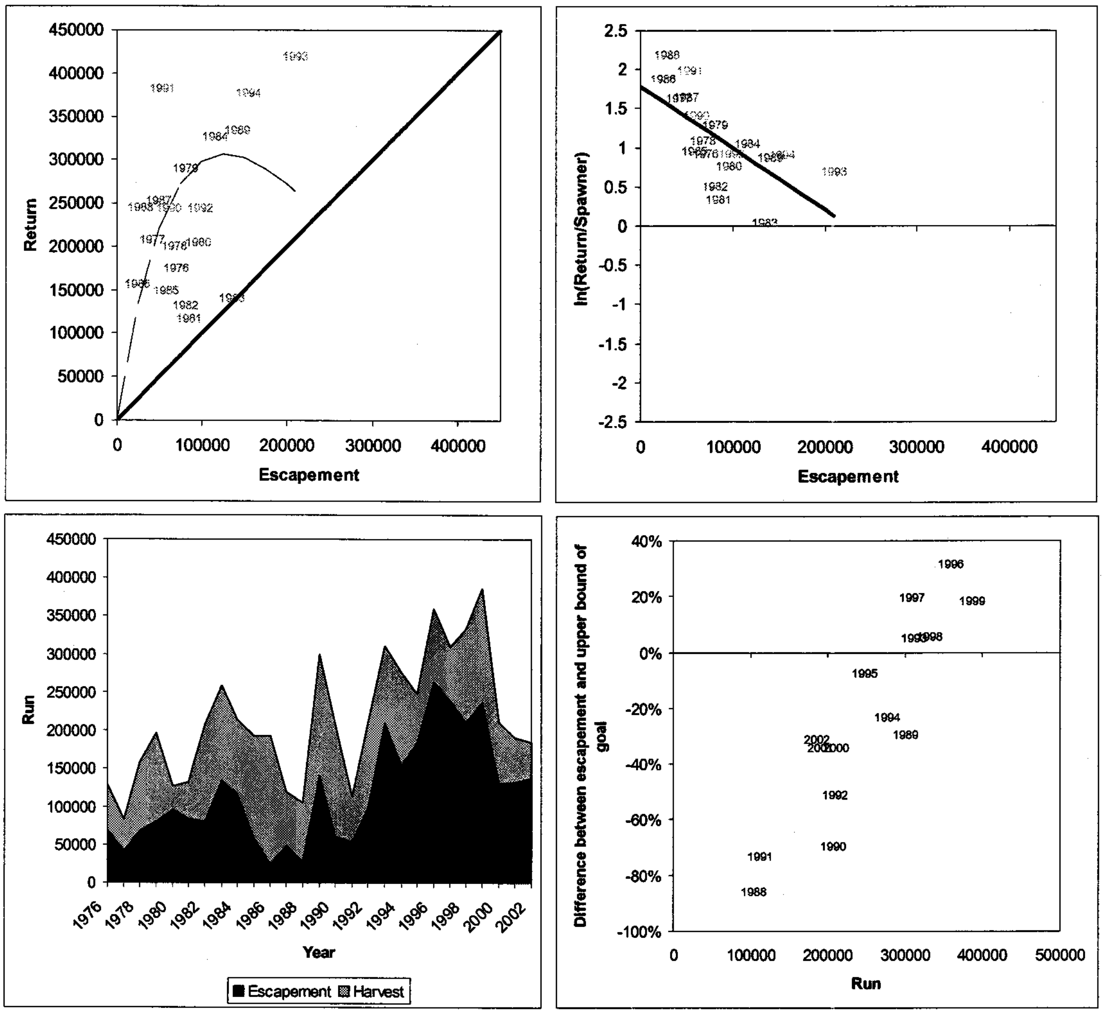
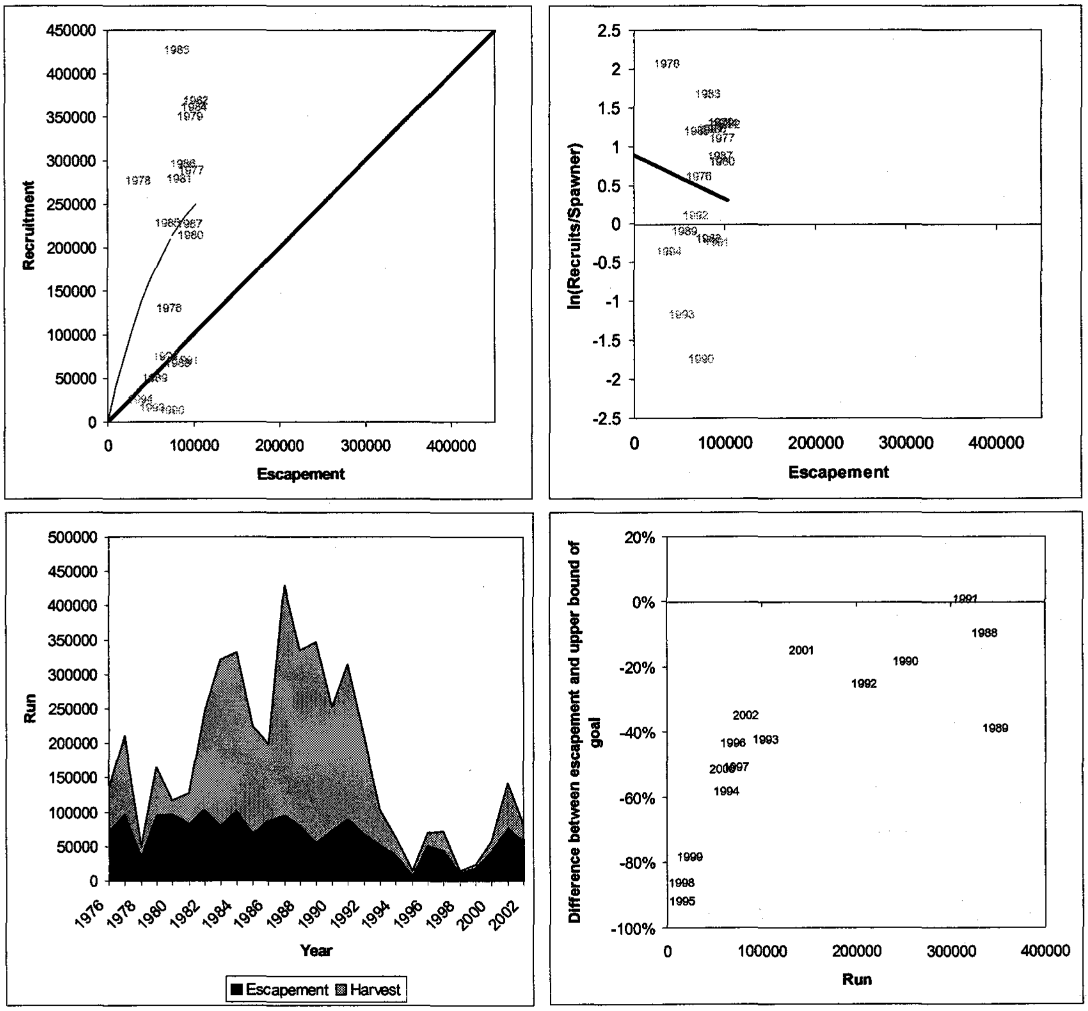
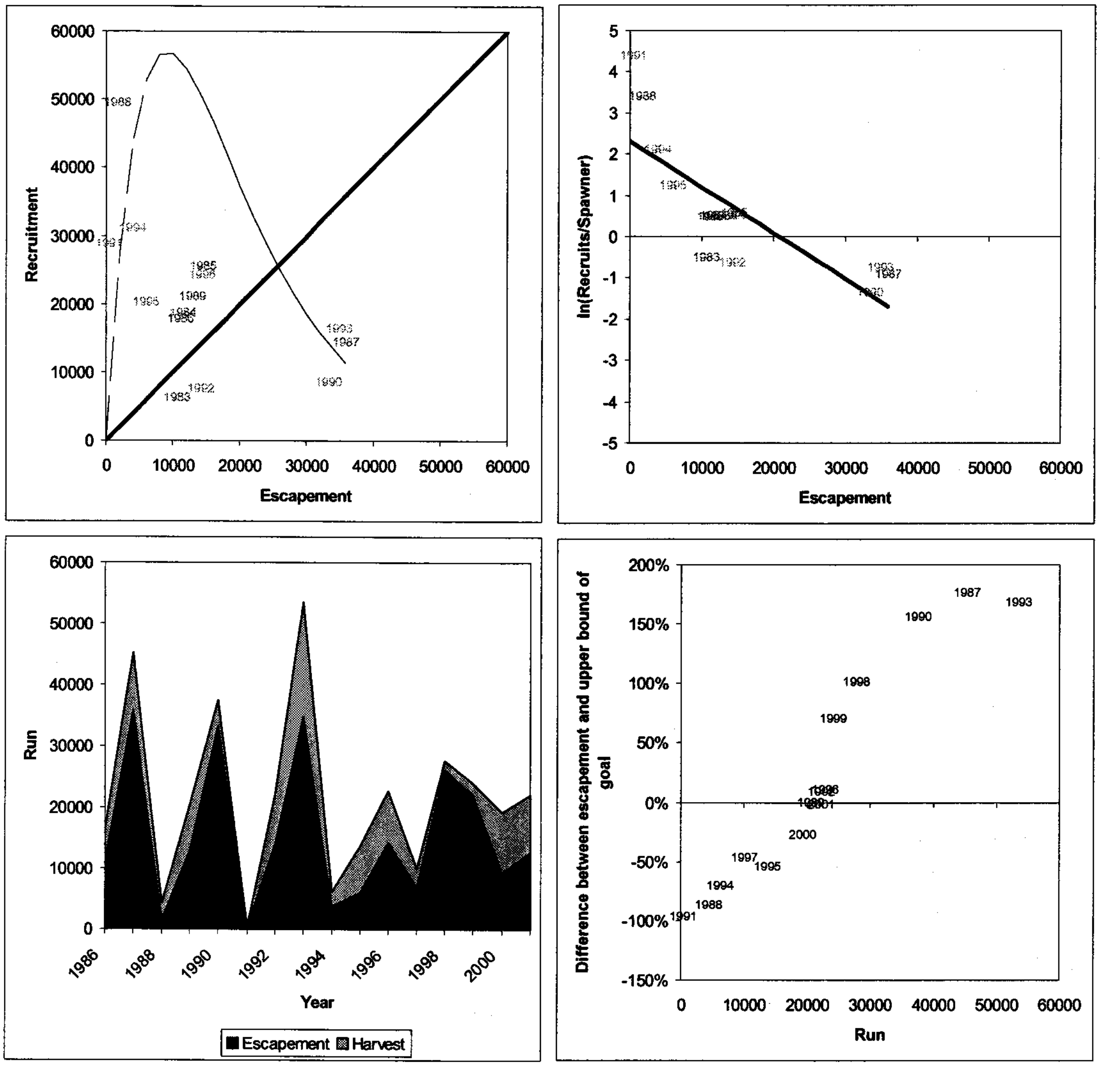
Stock	Goal	Lower	Upper	Harvest rate	%Overescape	H_{LOST}	$\%H_{LOST}$	H_{OVER}	$\%H_{OVER}$
Nelson	BEG	97,000	219,000	0.55	53%	42,100	6%	78,938	12%
Bear LR	SEG	117,000	195,000	0.75	33%	6,067	1%	18,202	2%
Kvichak	SEG	2,000,000	10,000,000	0.39	7%	2,600	<1%	39,000	<1%
Naknek	SEG	800,000	1,400,000	0.63	53%	366,133	5%	686,500	10%
Egegik	SEG	800,000	1,400,000	0.84	40%	206,533	2%	516,333	4%
Ugashik	SEG	500,000	1,200,000	0.68	33%	204,867	4%	614,600	11%
Wood	SEG	700,000	1,500,000	0.66	33%	31,533	1%	94,600	2%
Igushik	SEG	150,000	300,000	0.70	67%	94,800	5%	142,200	8%
Nushagak	SEG	340,000	760,000	0.67	13%	25,800	1%	193,500	6%
Togiak	BEG	120,000	270,000	0.67	13%	7,667	1%	57,500	5%
Goodnews	BEG	18,000	40,000	0.24	53%	5,339	8%	10,010	15%



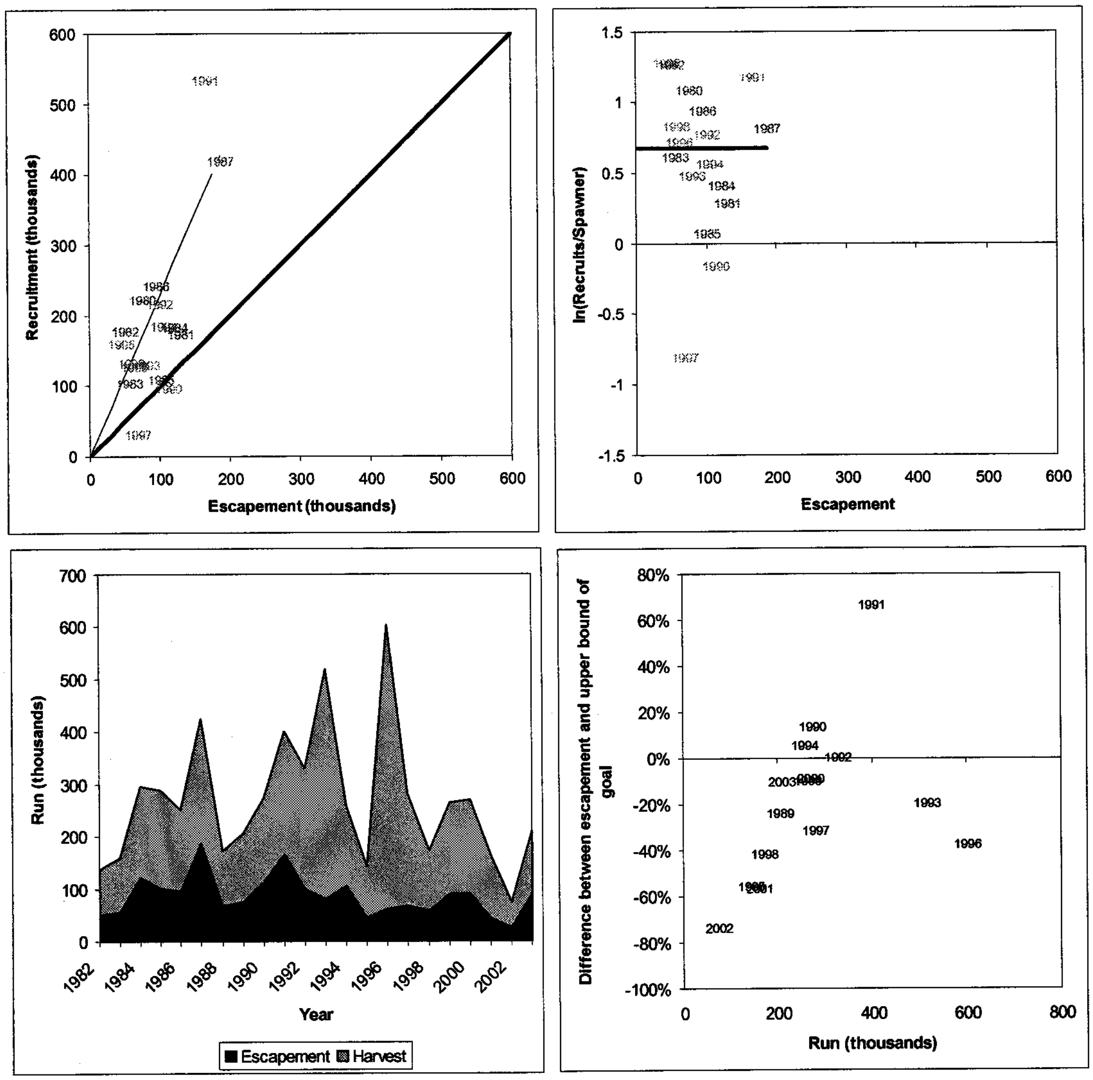
Appendix B3.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1976-1994 brood years and 1976-2002 run years for the Chilkat stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



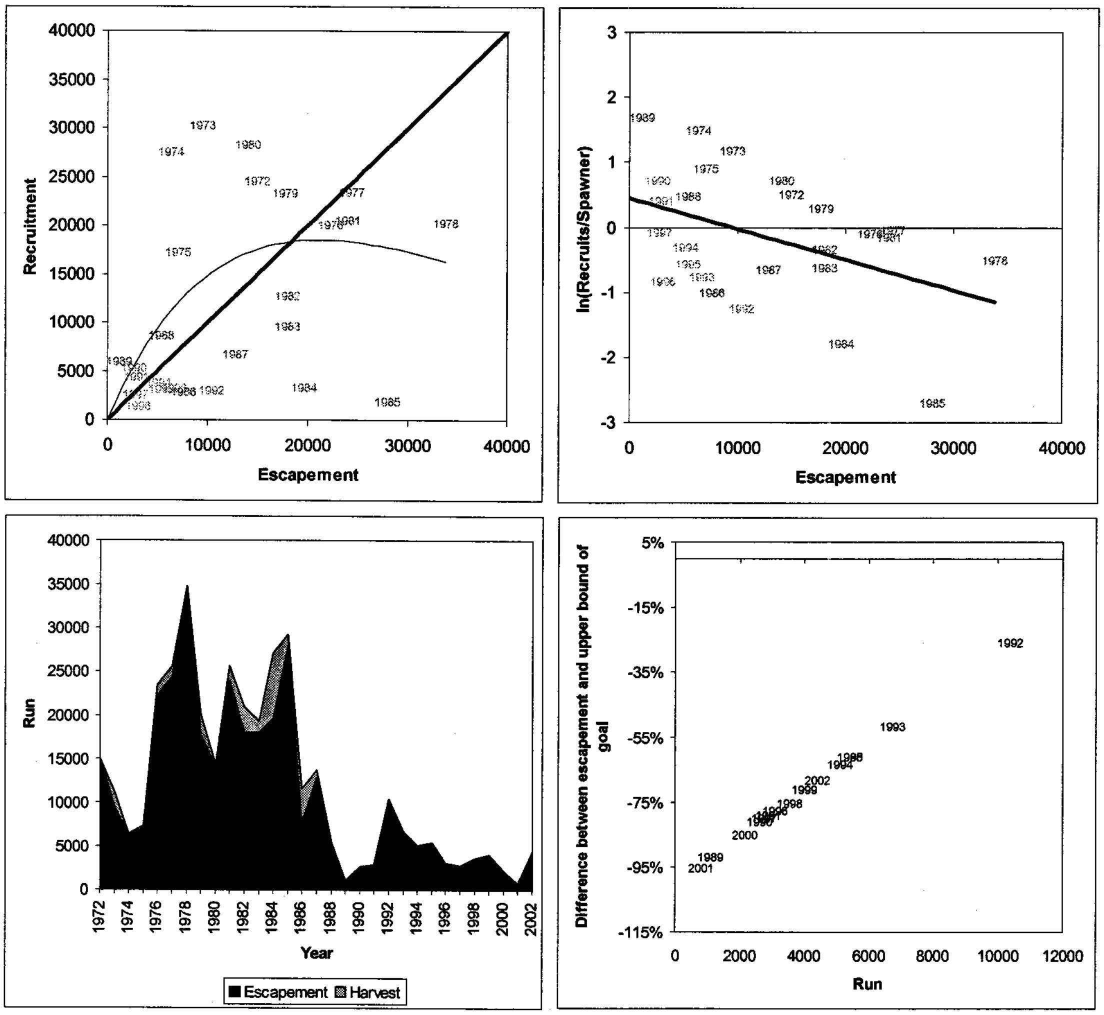
Appendix B4.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1976-1994 brood years and 1976-2002 run years for the Chilkoot stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



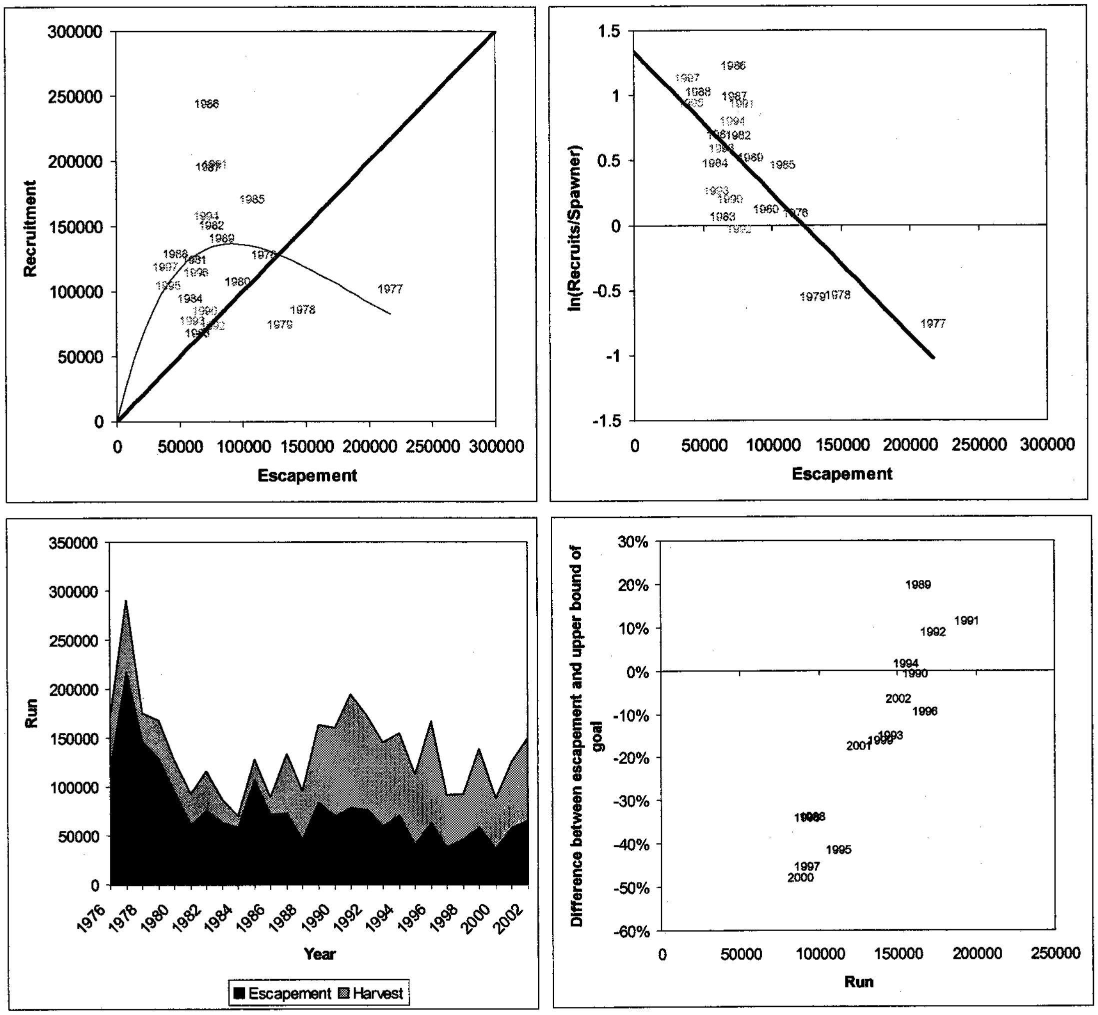
Appendix B5.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1983-1996 brood years and 1983-2001 run years for the Speel stock. Bottom right panel depicts run data from the most recent 15 years (1987-2001).



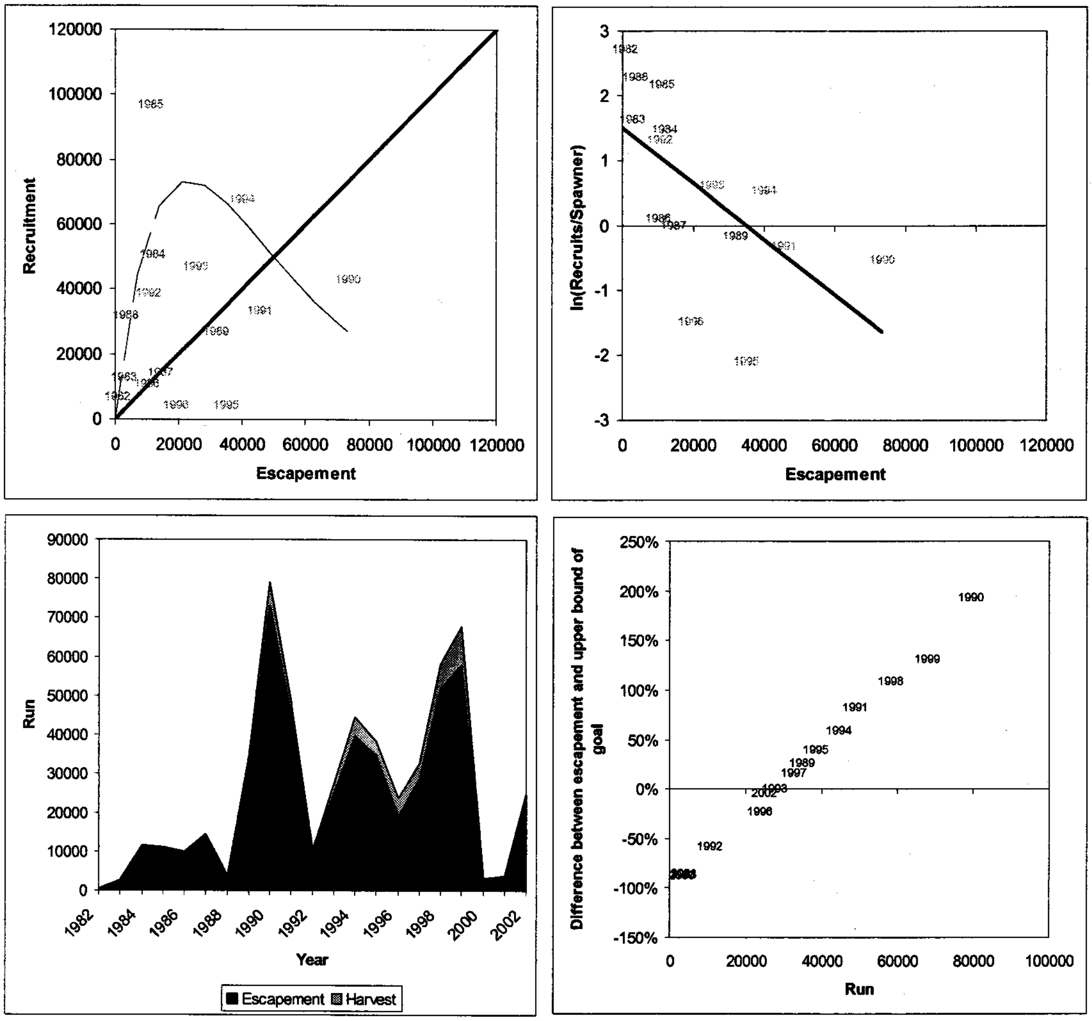
Appendix B6.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1980-1987 and 1990-1998 brood years and 1982-2003 run years for the McDonald stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



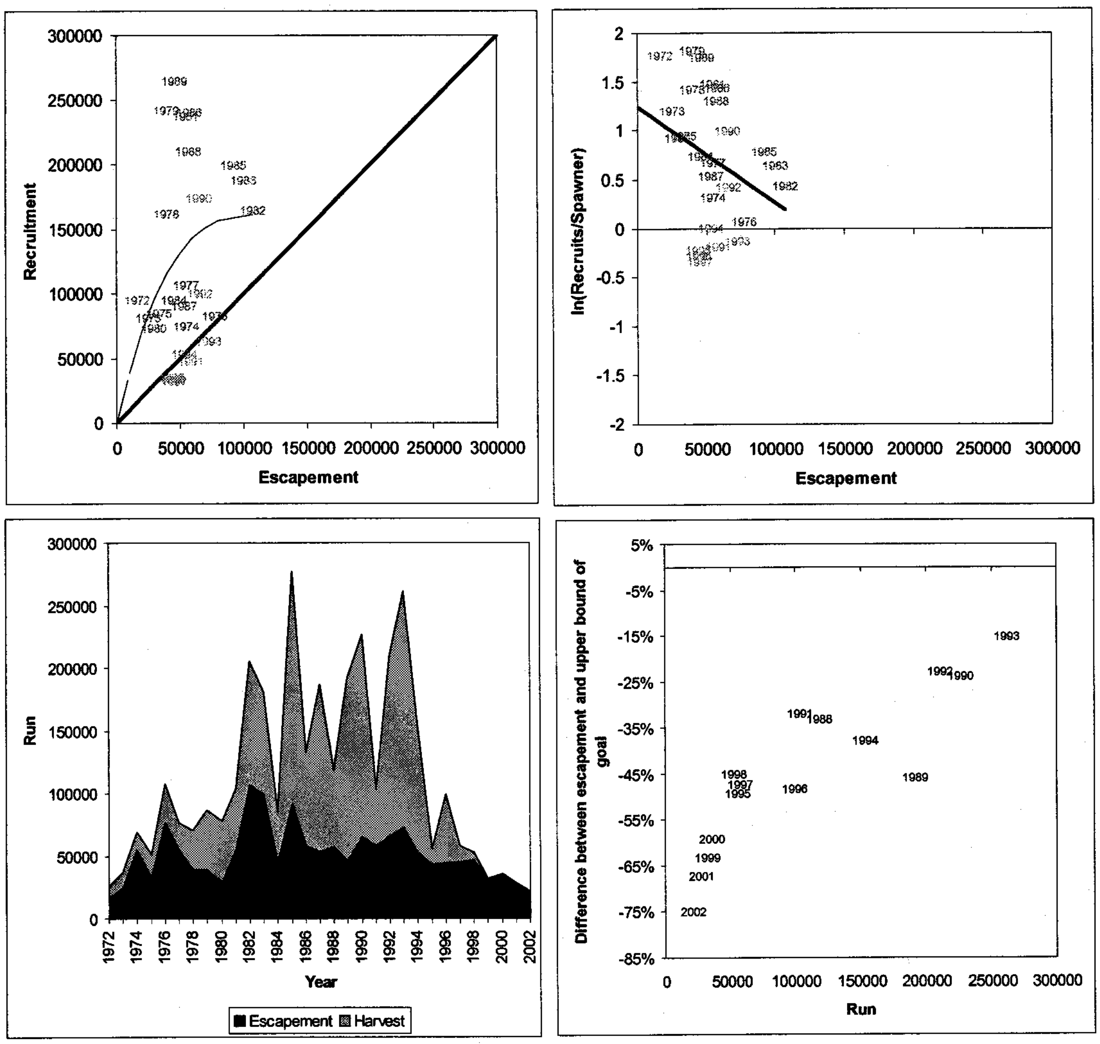
Appendix B7.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1972-1997 brood years and 1972-2002 run years for the Italio stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



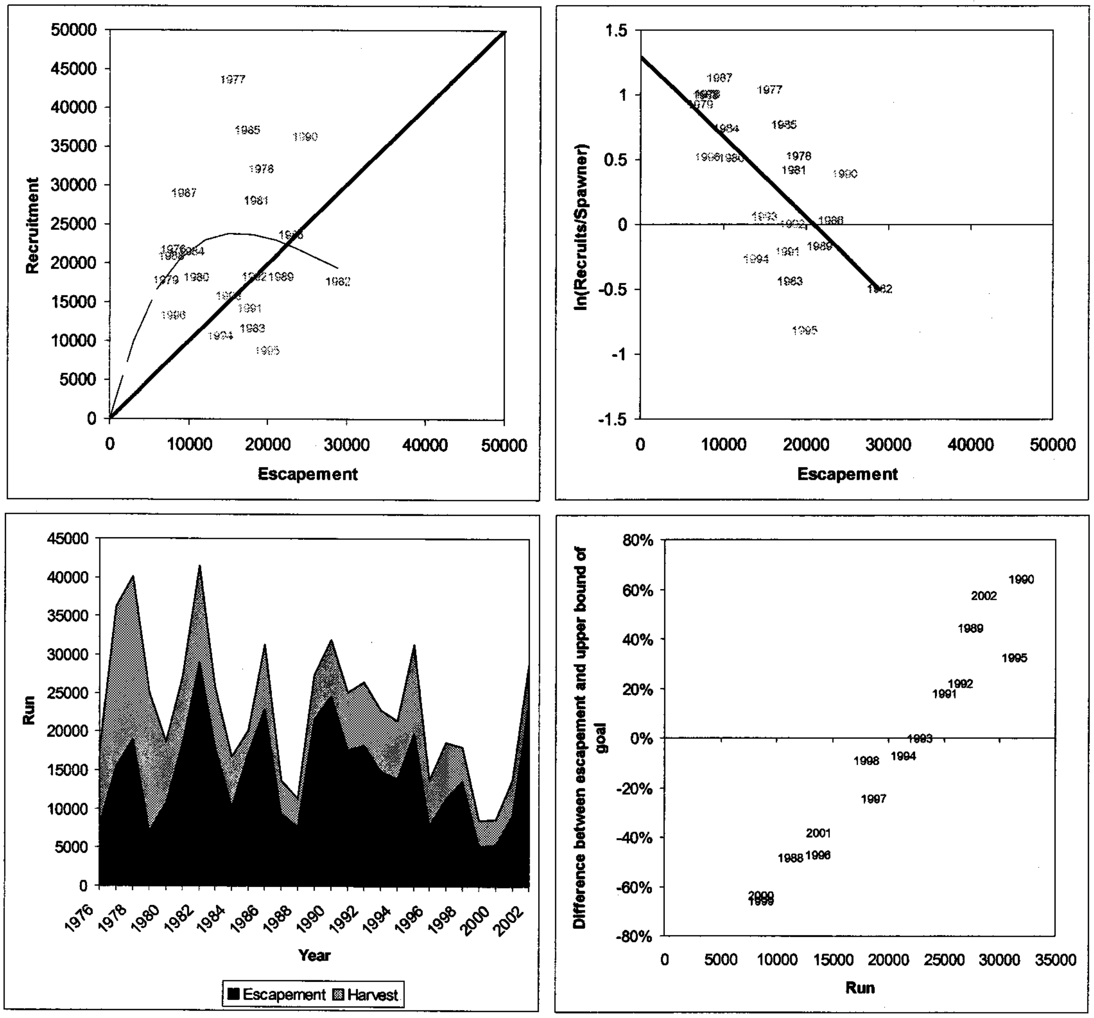
Appendix B8.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1976-1997 brood years and 1976-2002 run years for the Situk stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



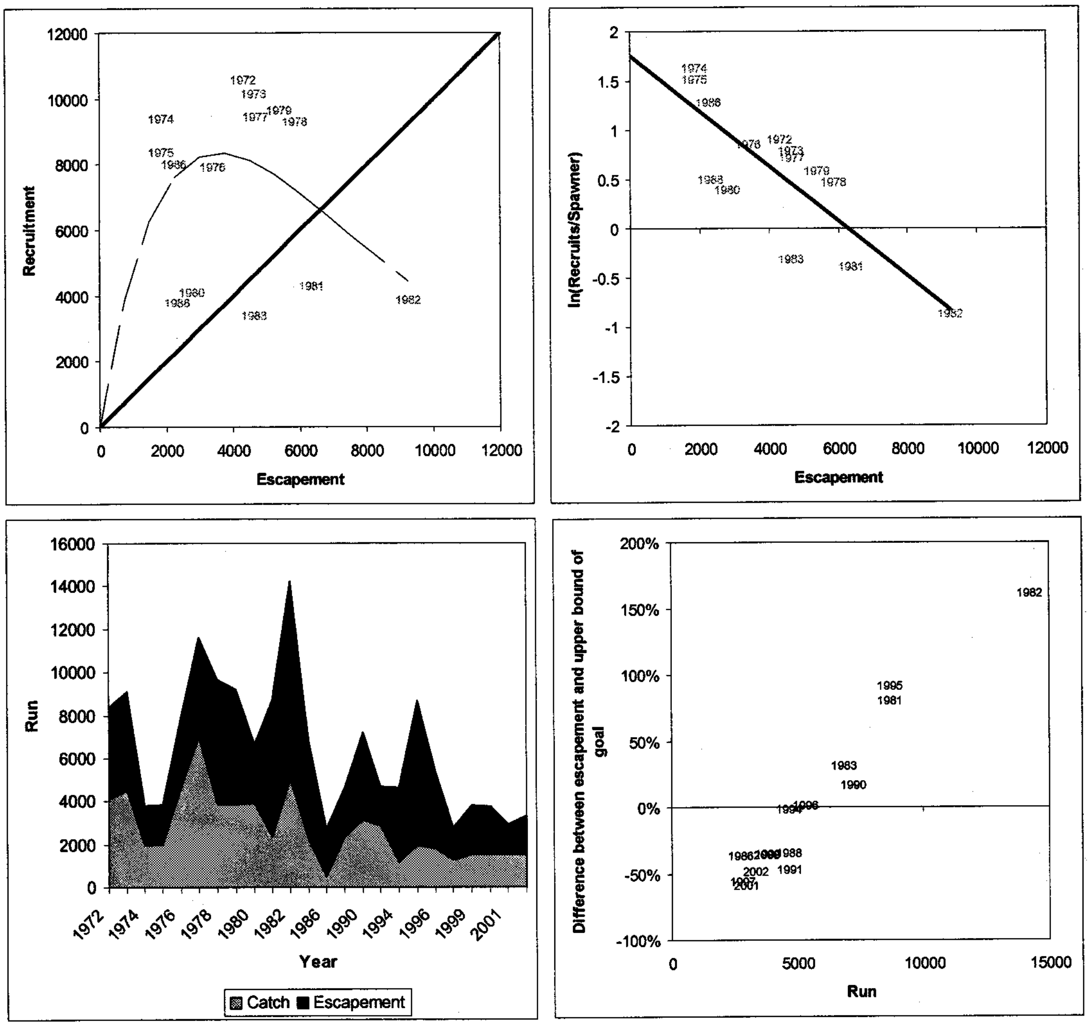
Appendix B9.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1982-1996 brood years and 1982-2002 run years for the Redoubt stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



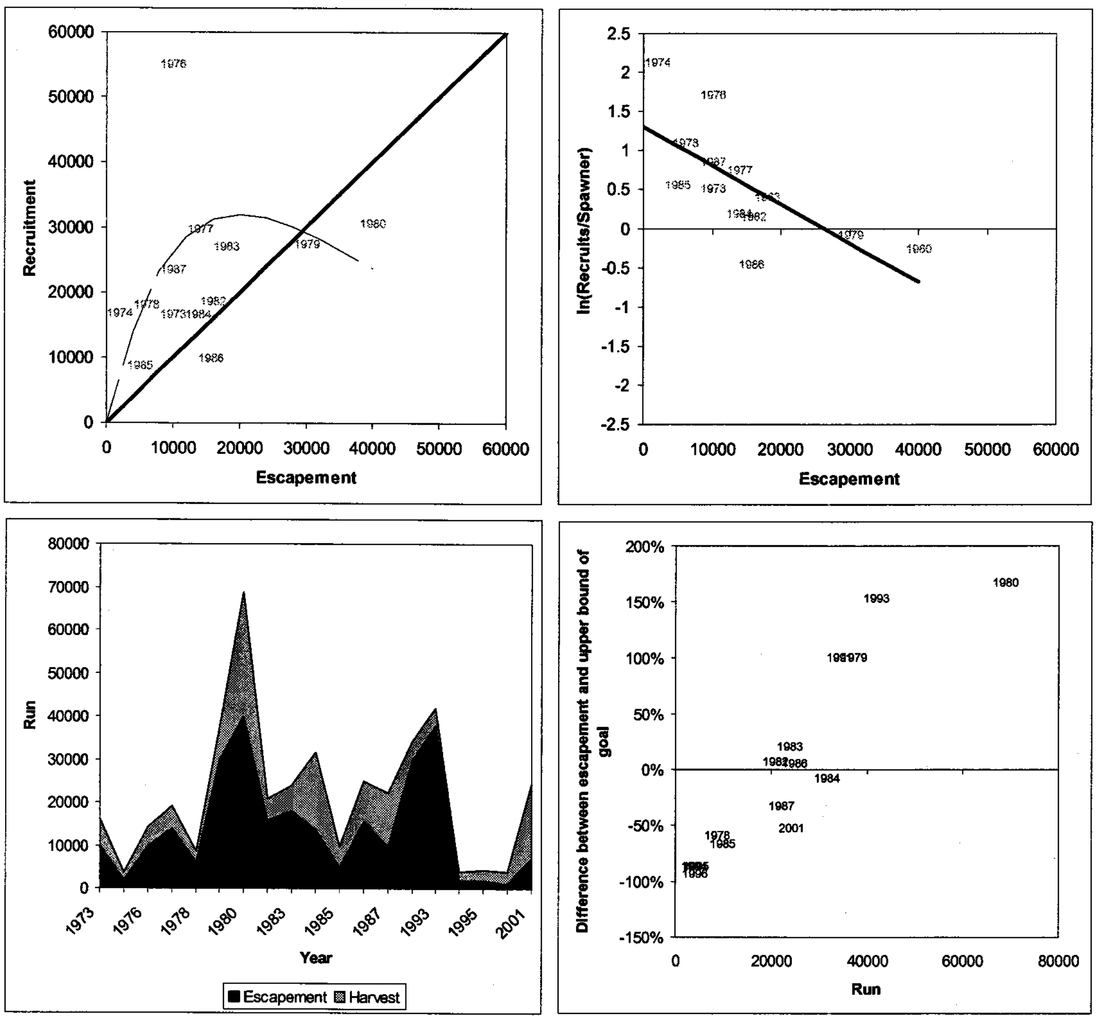
Appendix B10.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1972-1997 brood years and 1972-2002 run years for the East Alsek-Doame stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



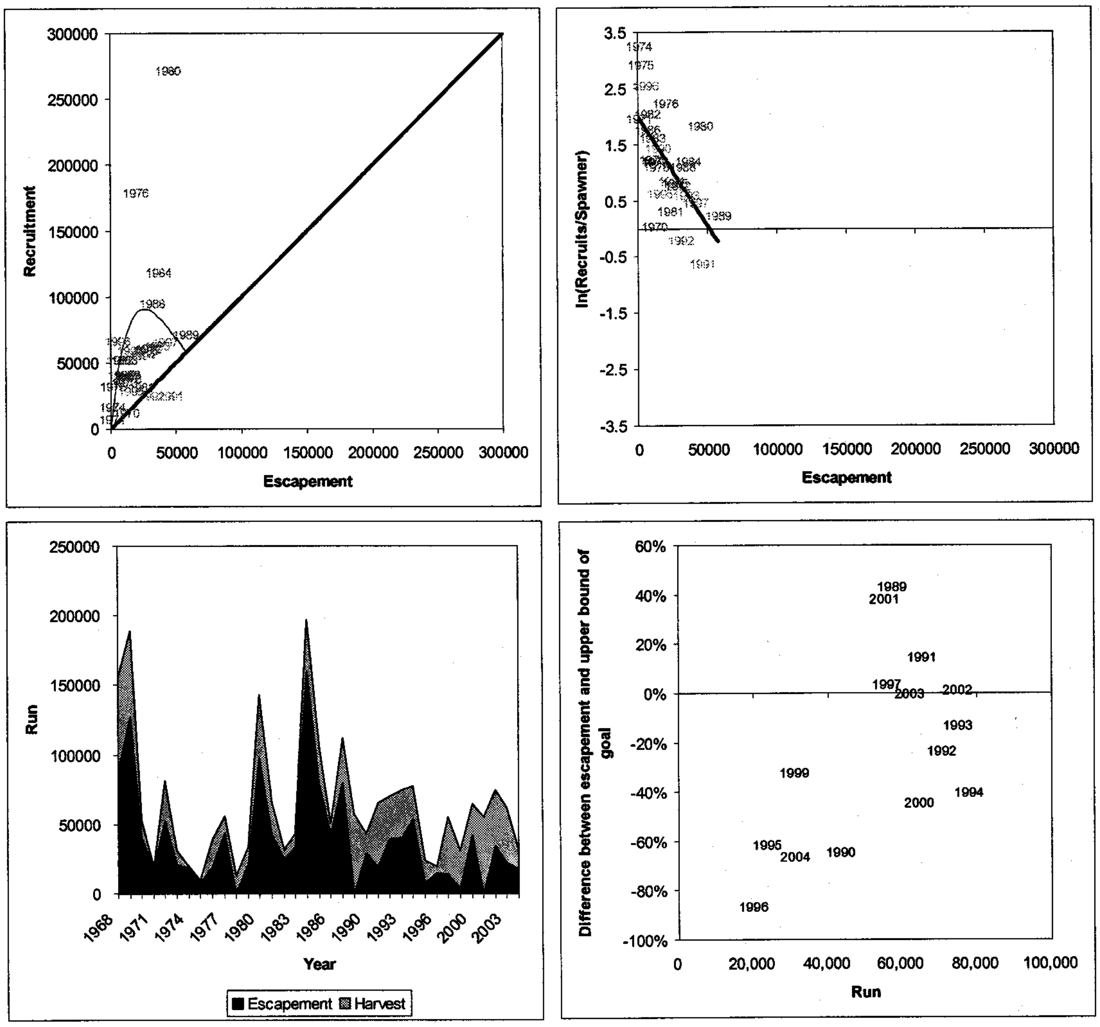
Appendix B11.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1976-1996 brood years and 1976-2002 run years for the Klukshu (Alsek) stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



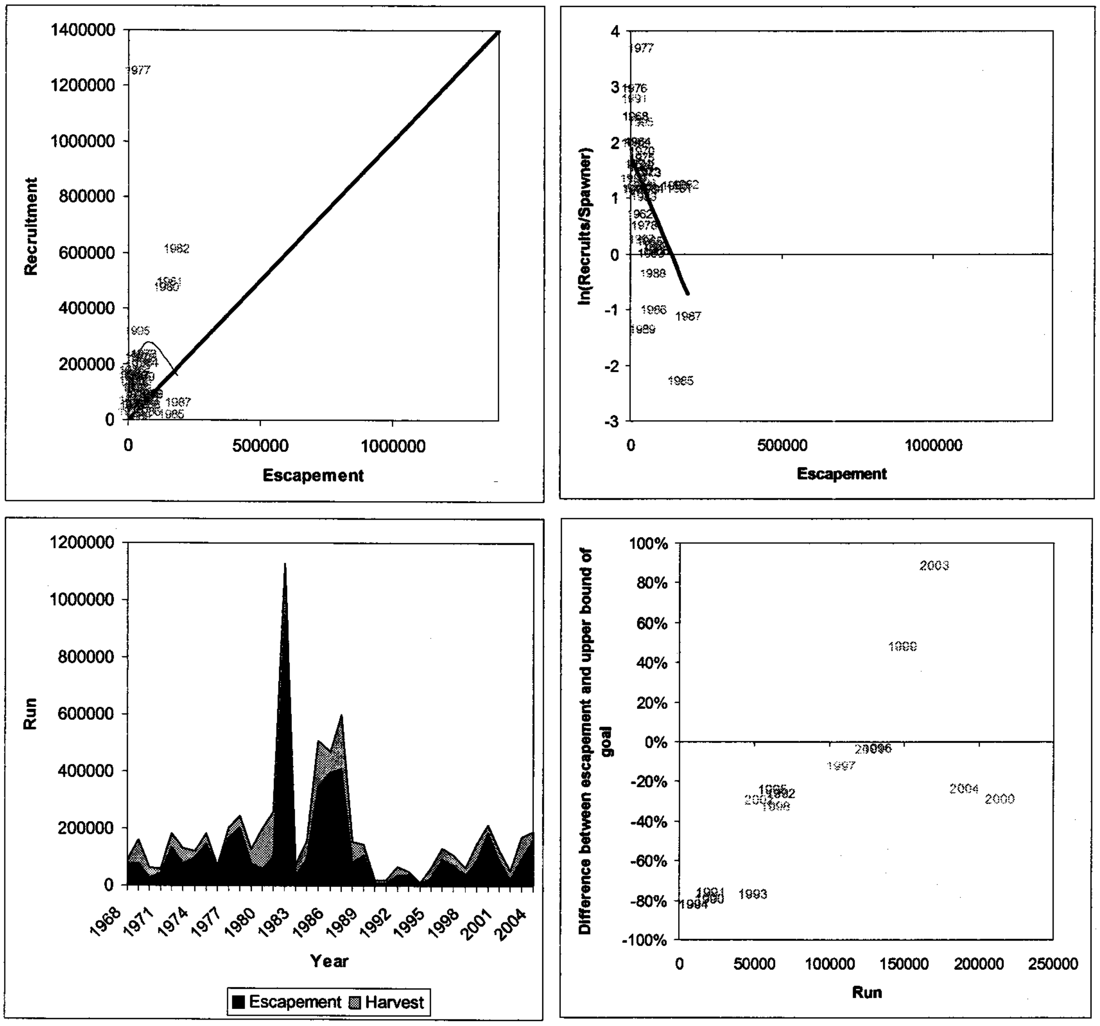
Appendix B12.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1972-1983, 1986, and 1988 brood years and 1972-1983, 1986, 1988, 1990-1991, 1994-1997 and 1999-2002 run years for the Lost stock. Bottom right panel depicts run data from the most recent 15 years (1981-1983, 1986, 1988, 1990-1991, 1994-1997, and 1999-2002).



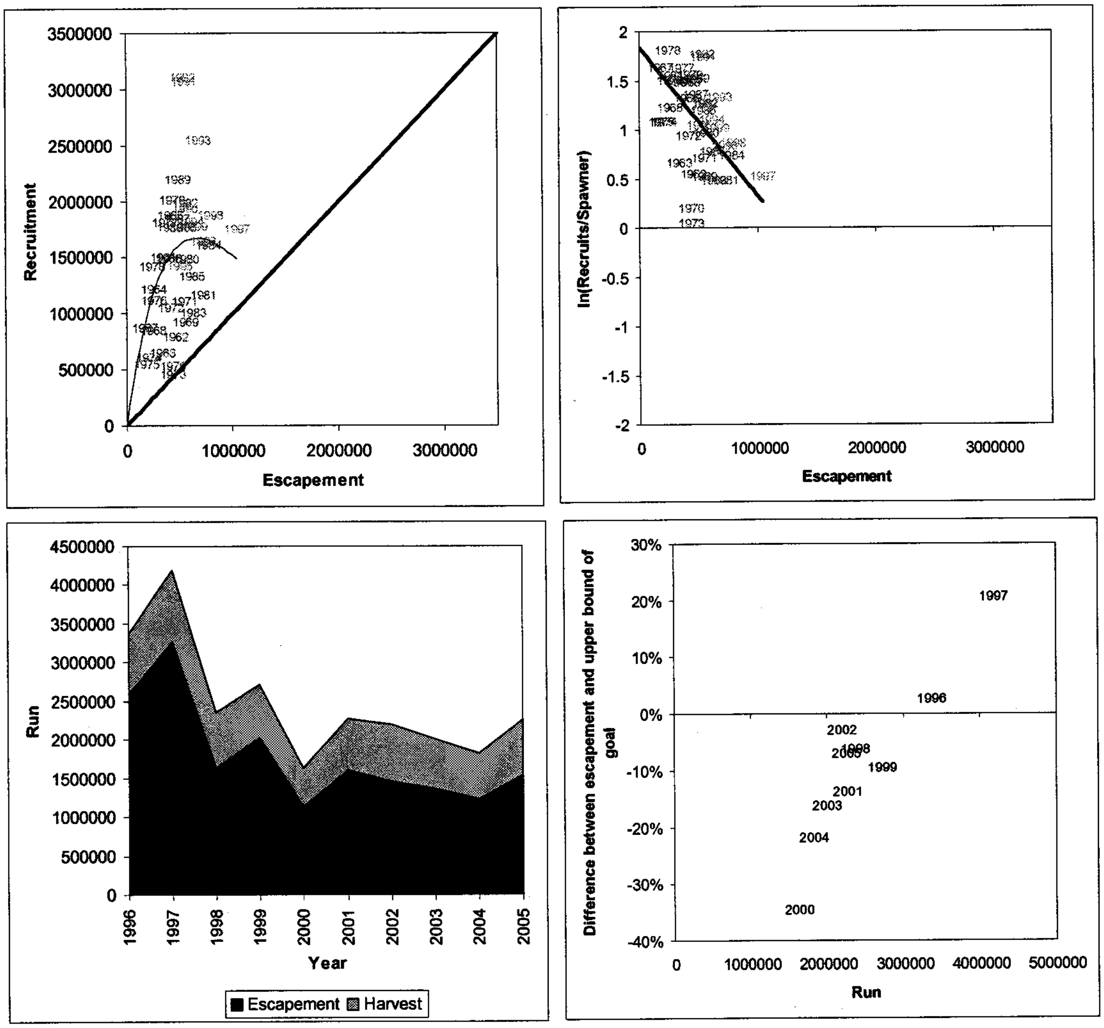
Appendix B13.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1973, 1974, 1976-1980 and 1982-1987 brood years and 1972, 1973, 1976-1980, 1982-1987, 1991, 1993-1996 and 2001 run years for the Akwe stock. Bottom right panel depicts run data from the most recent 15 years (1978-1980, 1982-1987, 1991, 1993-1996 and 2001).



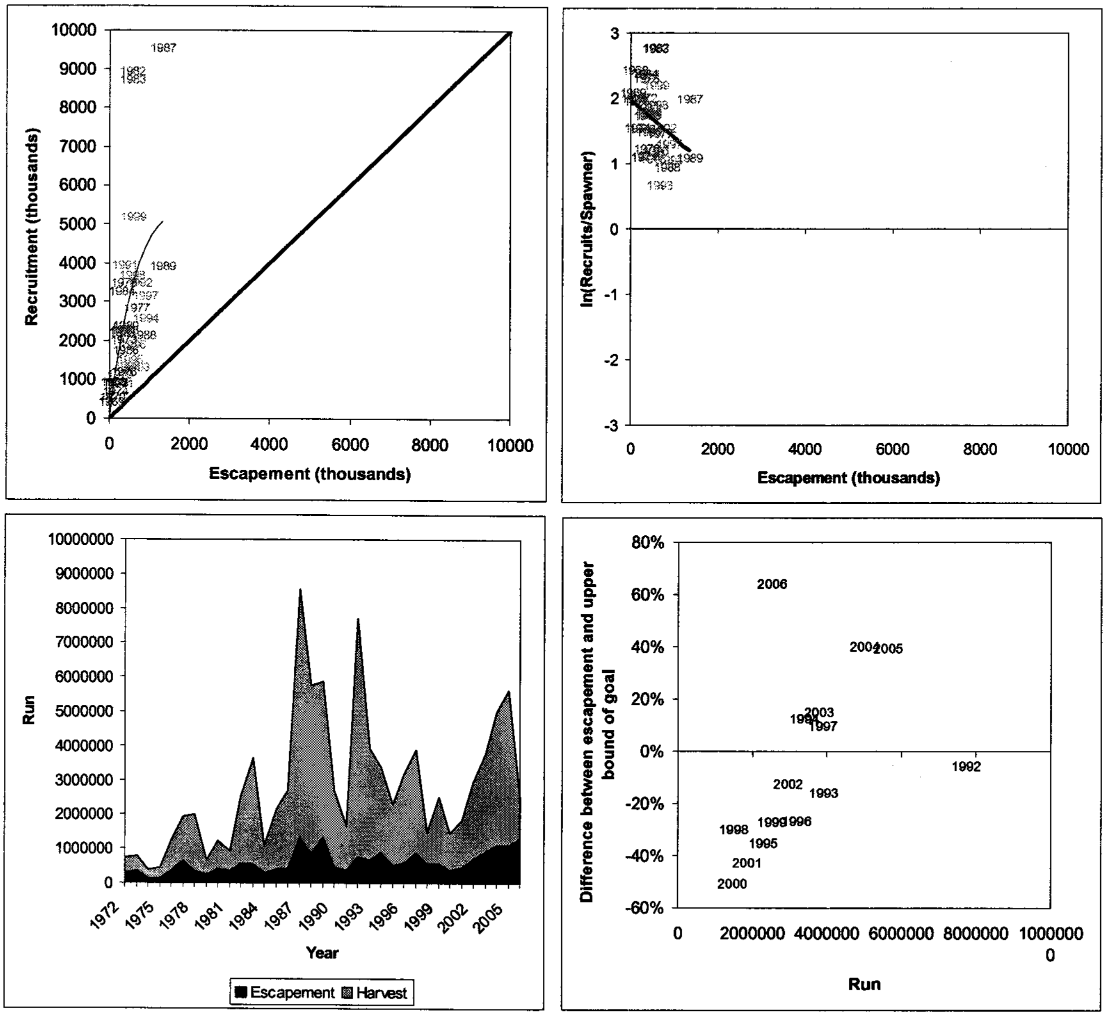
Appendix B14.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1970-1986 and 1988-1997 brood years and 1968-1986, 1988-1997, and 1999-2004 run years for the Eshamy stock. Bottom right panel depicts run data from the most recent 15 years (1989-1997 and 1999-2004).



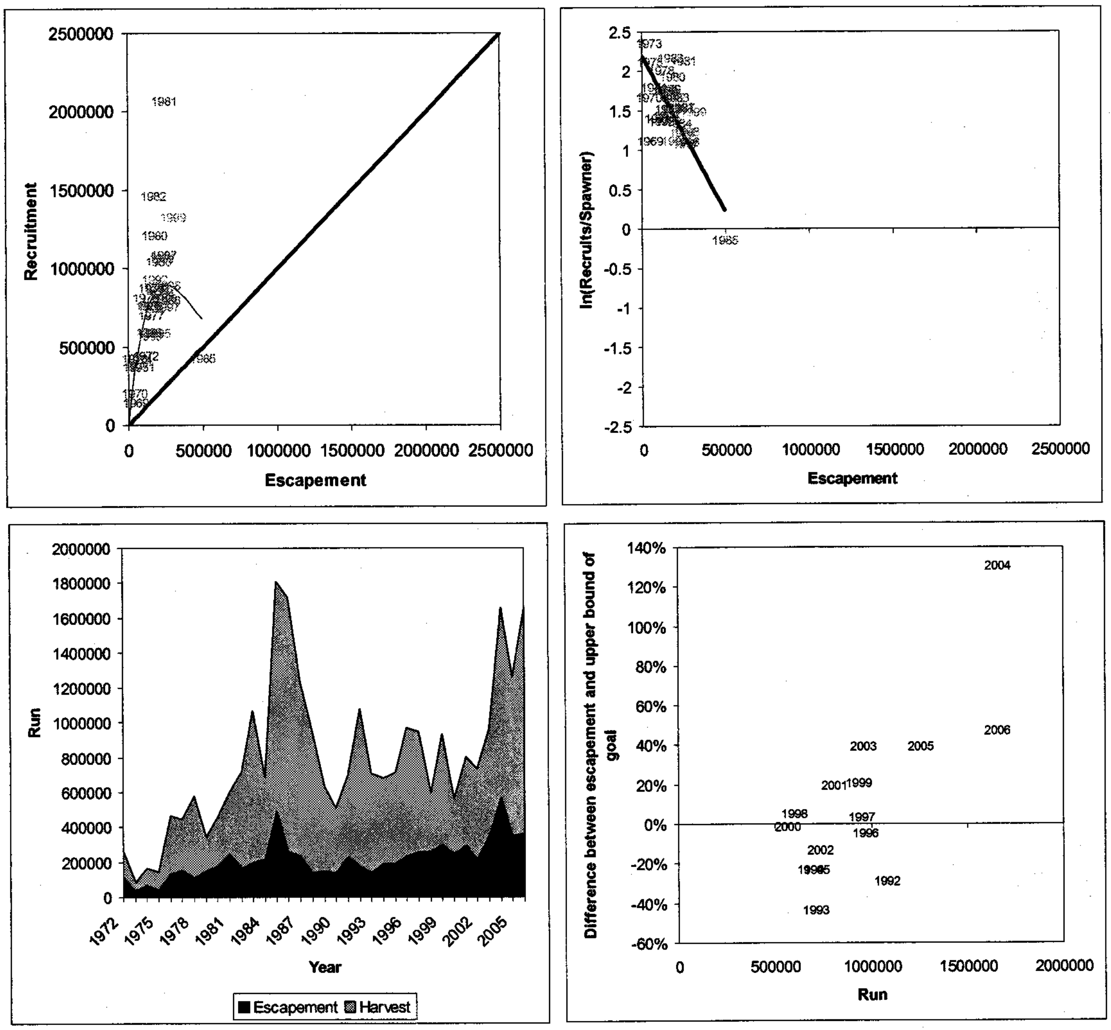
Appendix B15.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1962-1998 brood years and 1968-2004 run years for the Coghill stock. Bottom right panel depicts run data from the most recent 15 years (1990-2004).



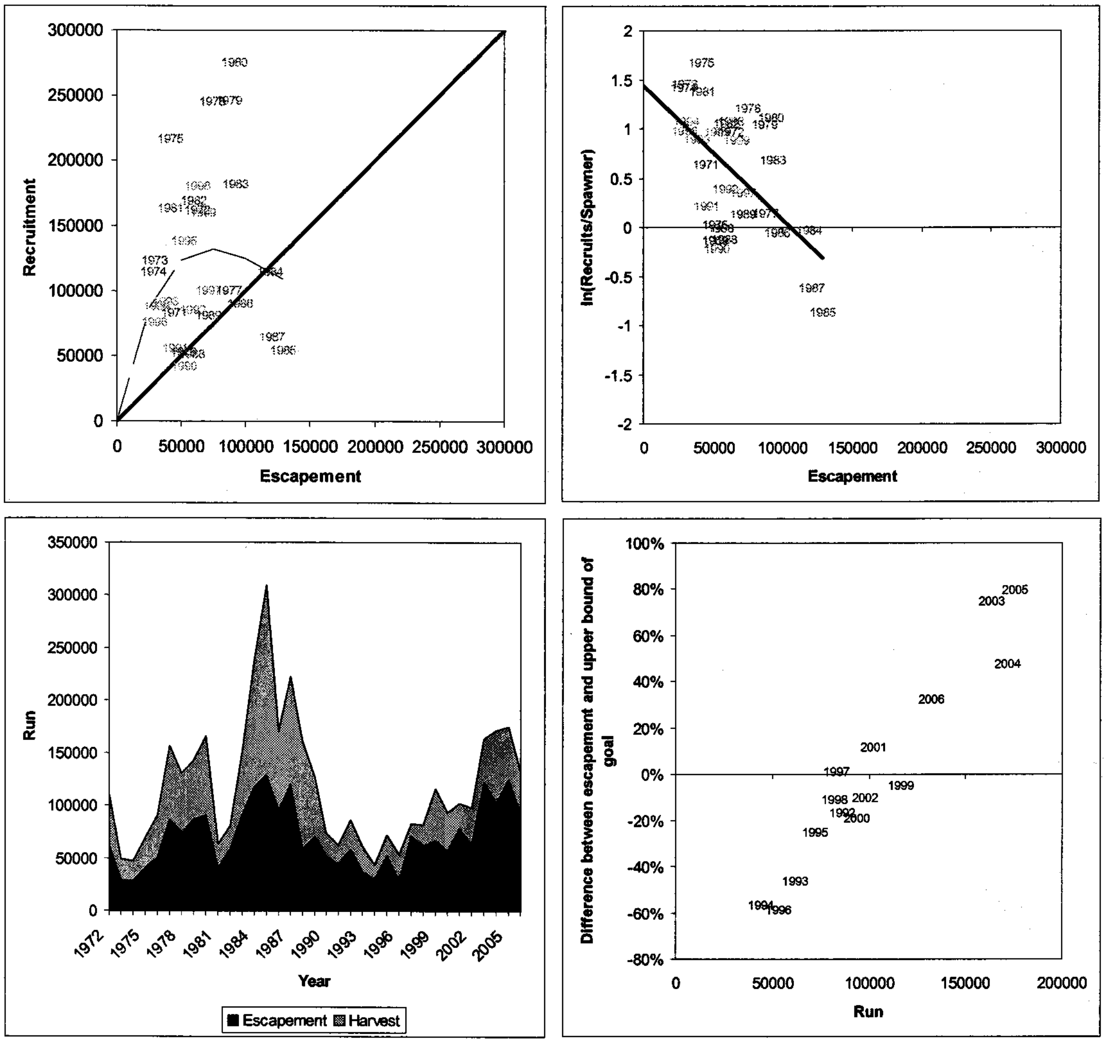
Appendix B16.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1961-1999 brood years and 1996-2005 run years for the Copper stock. Bottom right panel depicts run data from the most recent 10 years (1996-2005).



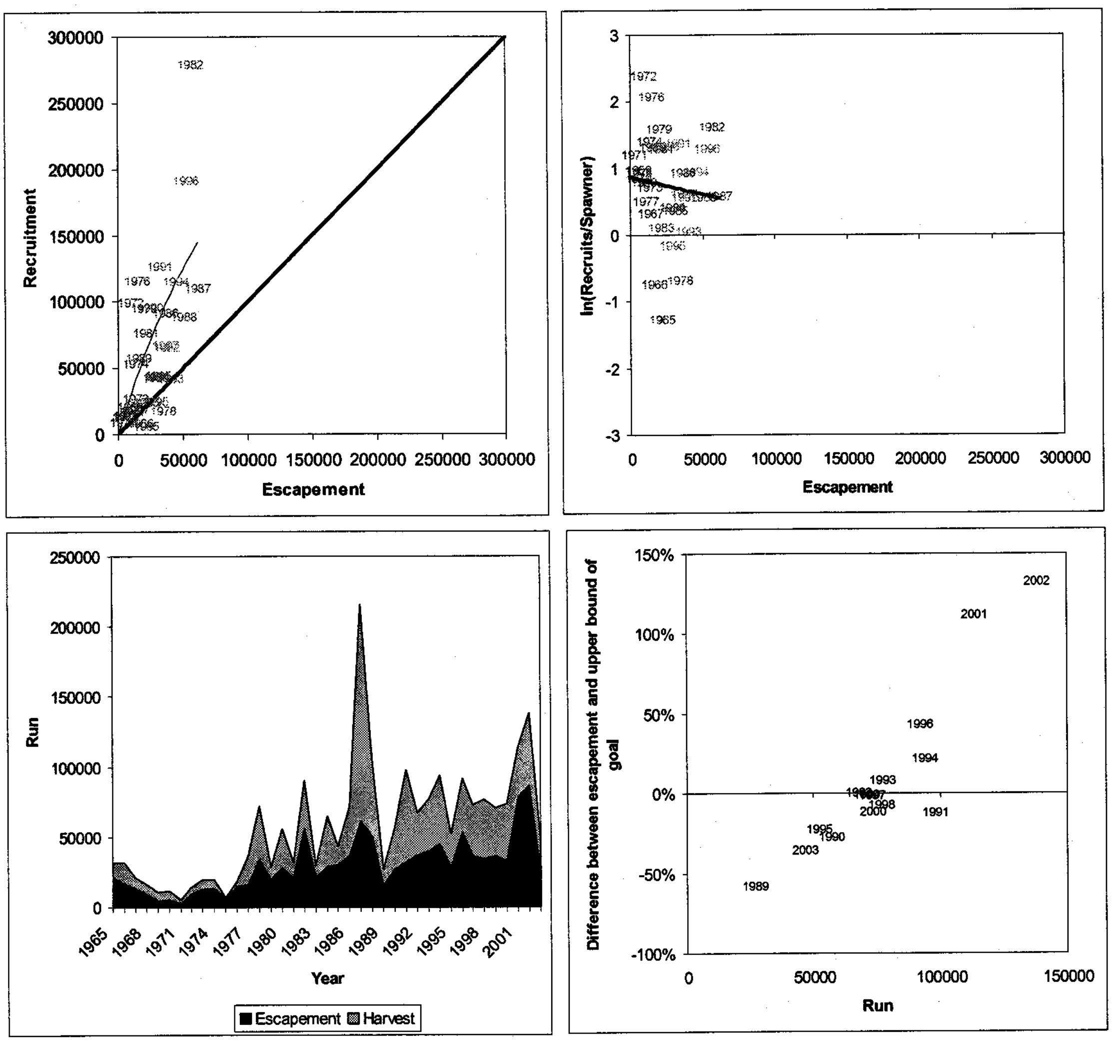
Appendix B17.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1968-1999 brood years and 1968-2006 run years for the Kenai stock. Bottom right panel depicts run data from the most recent 15 years (1992-2006).



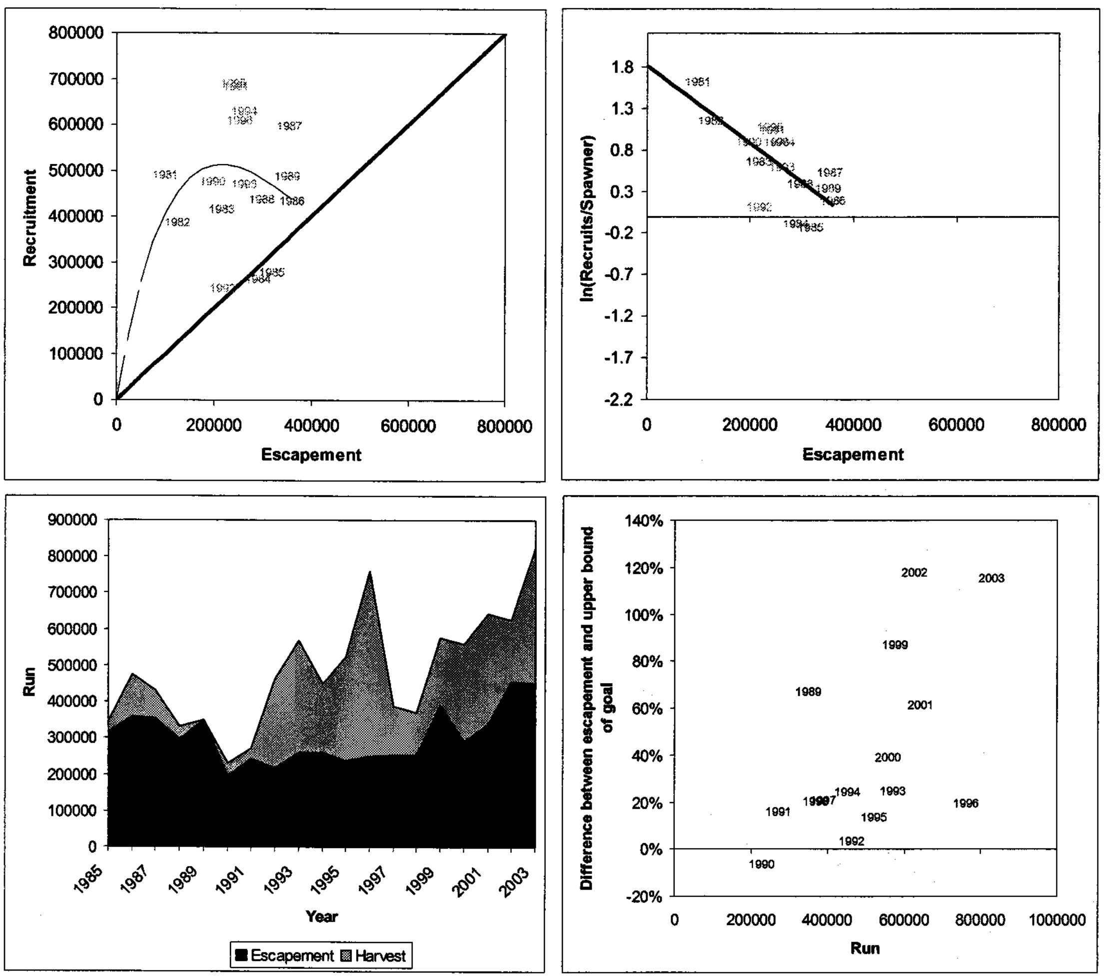
Appendix B18.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1969-1999 brood years and 1969-2006 run years for the Kasilof stock. Bottom right panel depicts run data from the most recent 15 years (1992-2006).



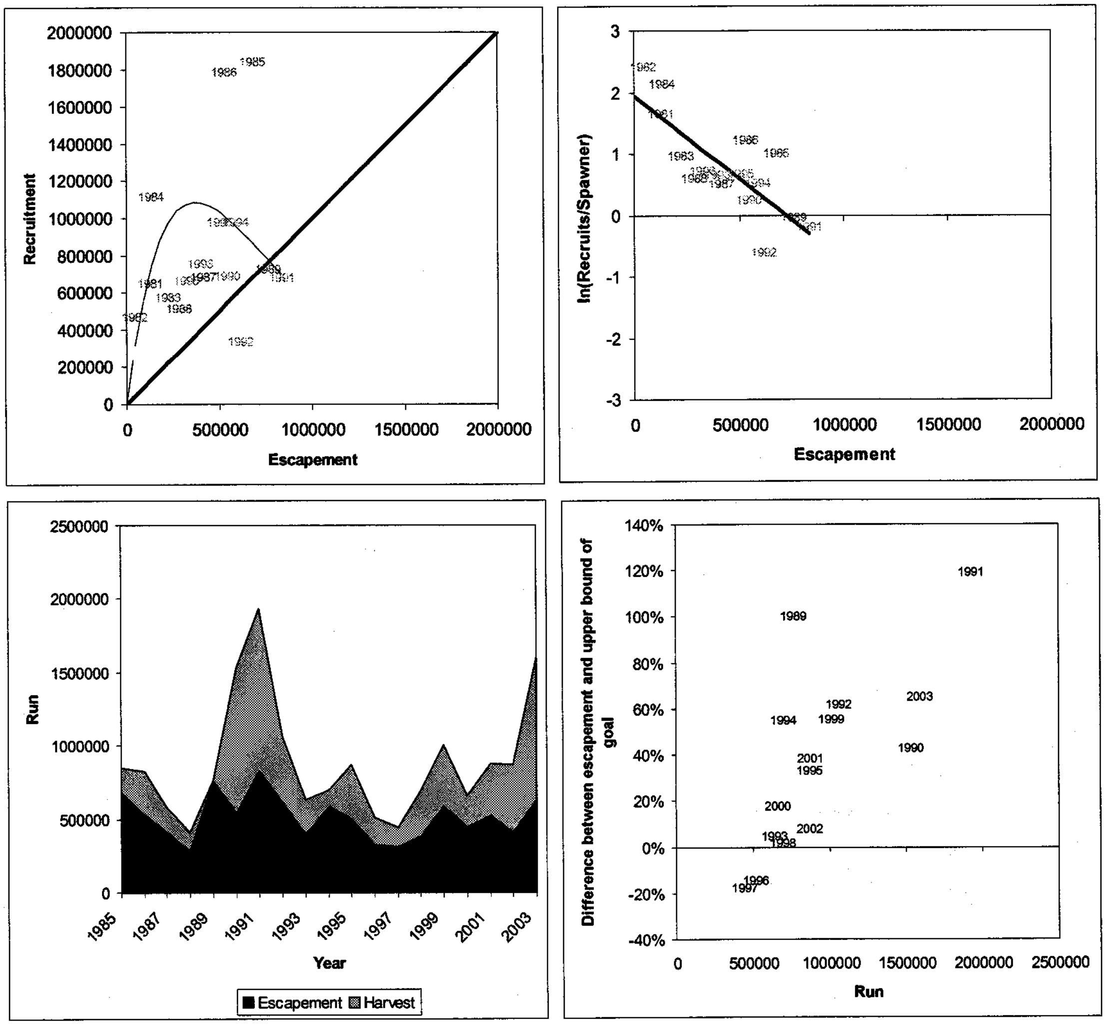
Appendix B19.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1968, 1969 and 1971-1999 brood years and 1972-2006 run years for the Crescent stock. Bottom right panel depicts run data from the most recent 15 years (1992-2006).



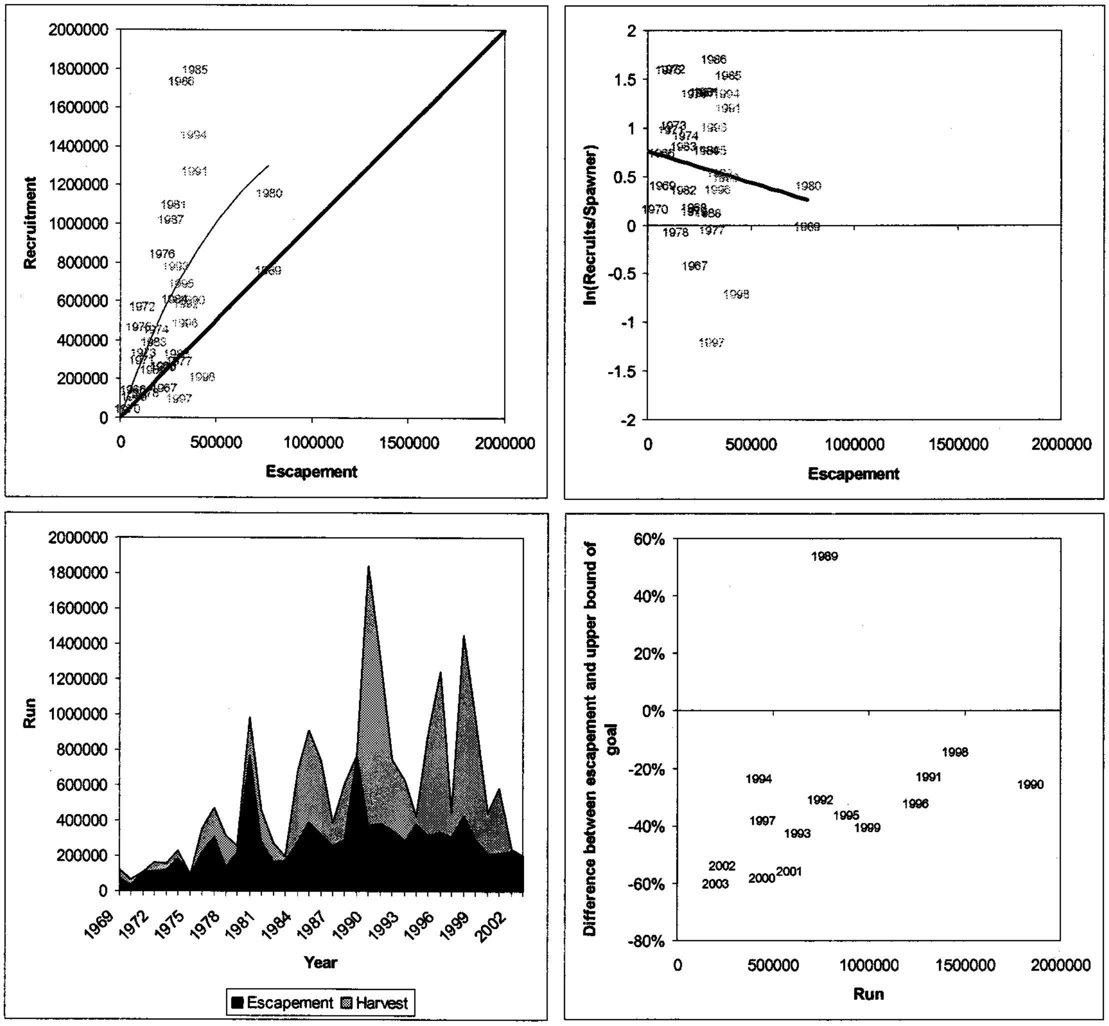
Appendix B20.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1965-1997 brood years and 1965-2003 run years for the Russian early run (ER) stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



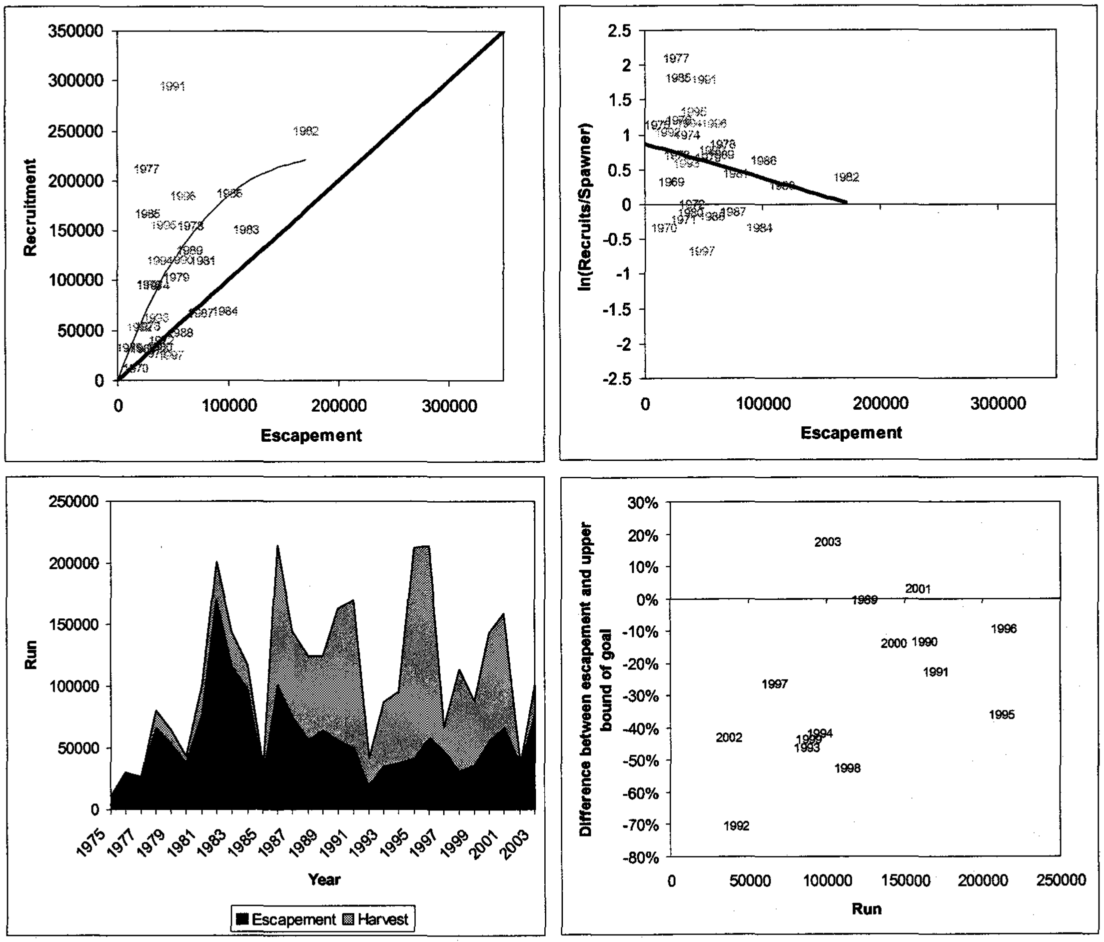
Appendix B21.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1981-1996 brood years and 1985-2003 run years for the Karluk ER stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



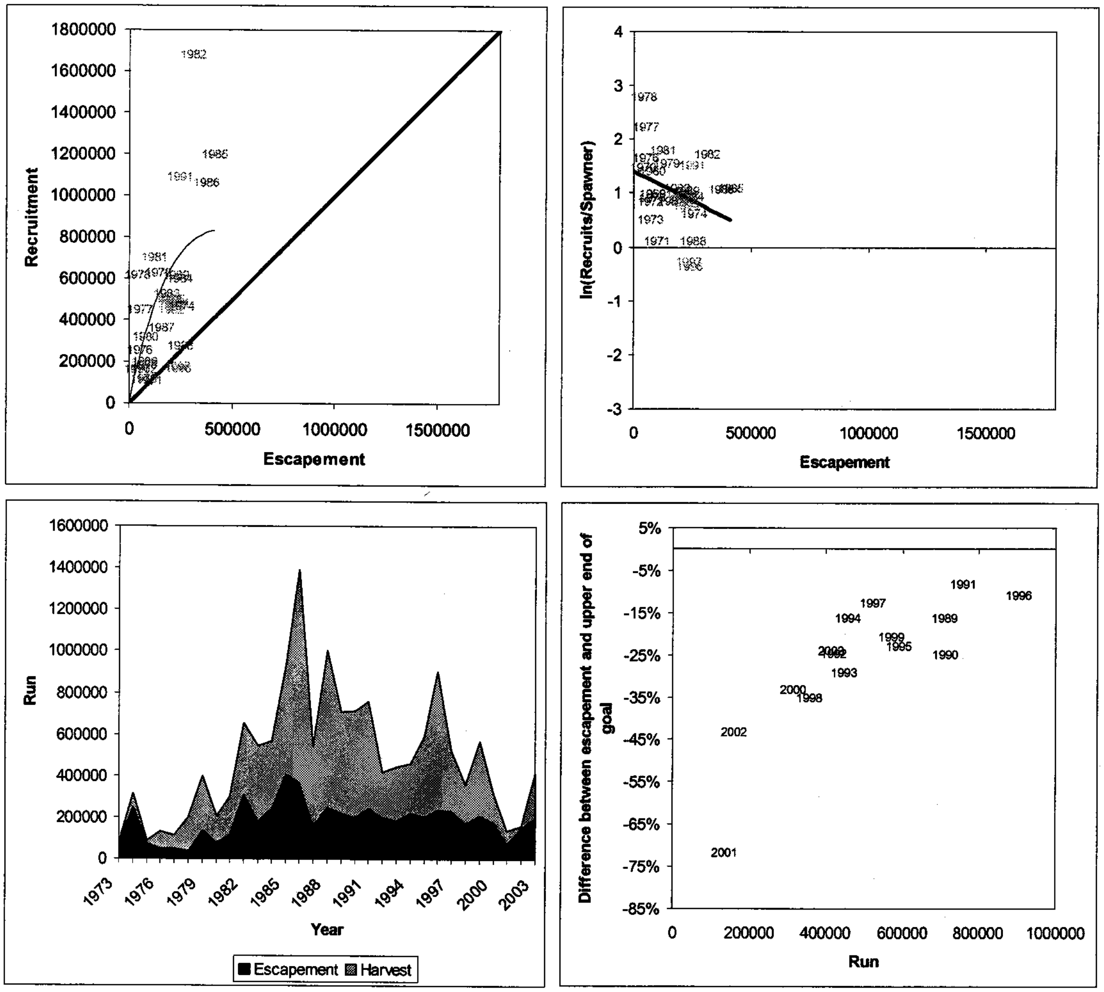
Appendix B22.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1981-1996 brood years and 1985-2003 run years for the Karluk late run (LR) stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



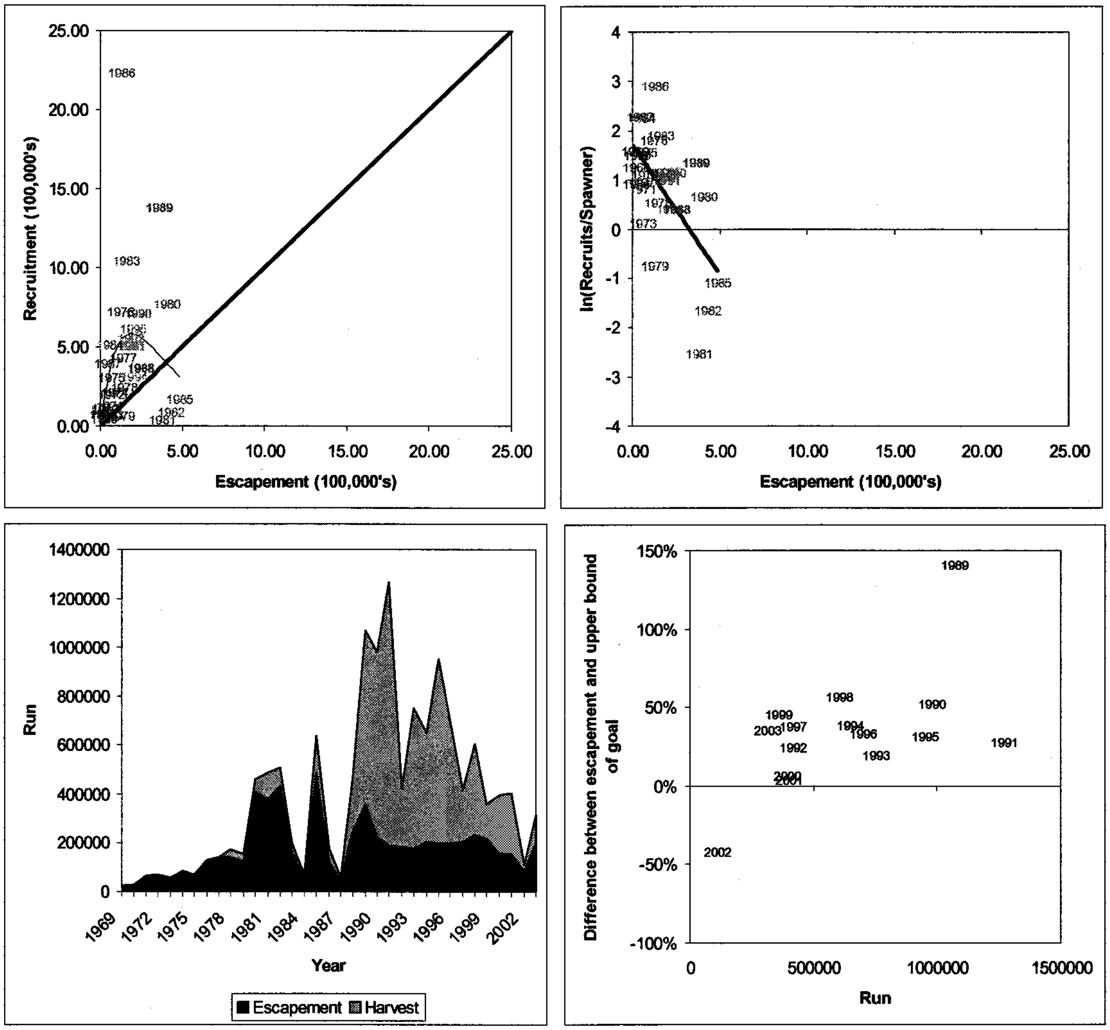
Appendix B23.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1966-1996 brood years and 1969-2003 run years for the Ayakulik stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



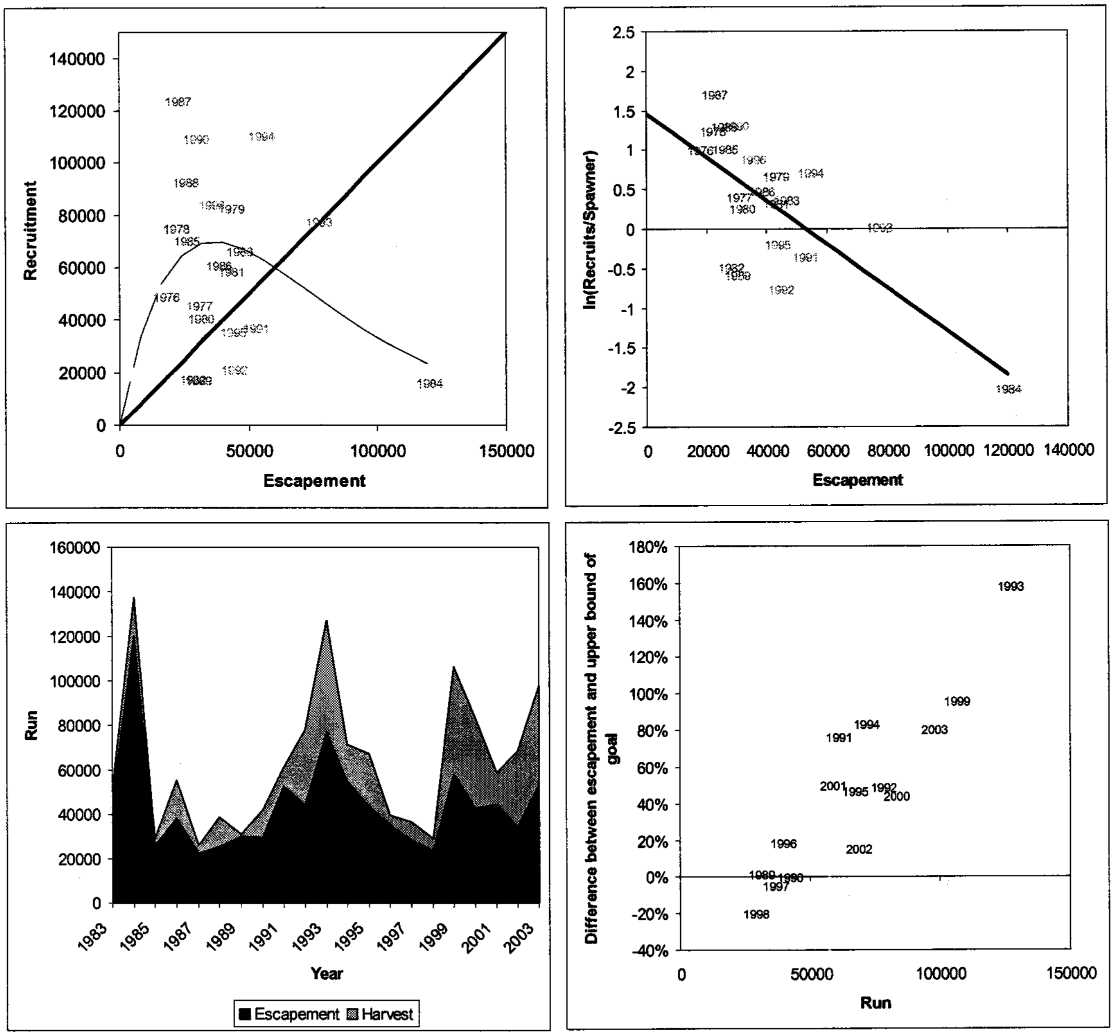
Appendix B24.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1969-1997 brood years and 1975-2002 run years for the Upper Station ER stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



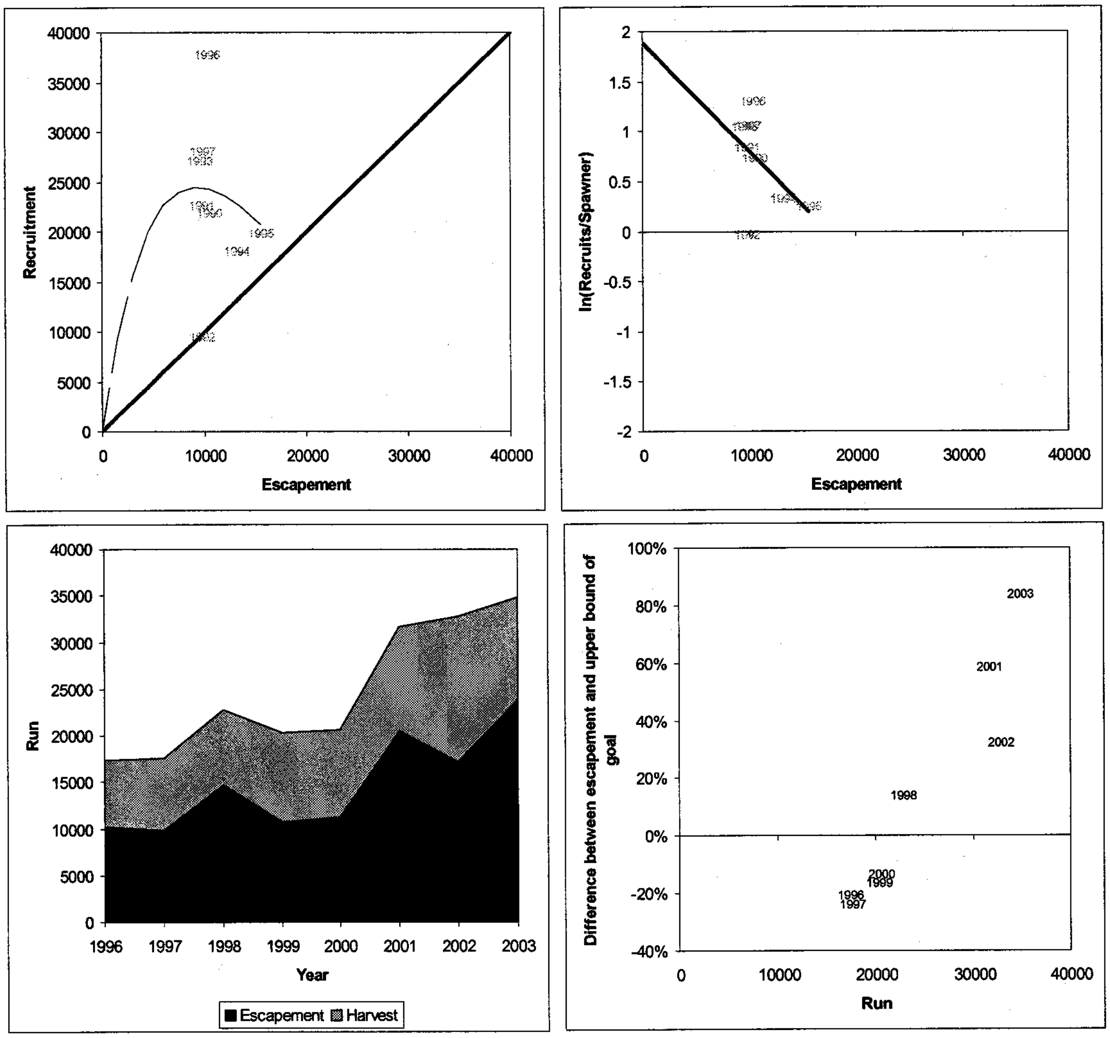
Appendix B25.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1969-1997 brood years and 1975-2002 run years for the Upper Station LR stock. Bottom right panel depicts run data from the most recent 15 years (1988-2002).



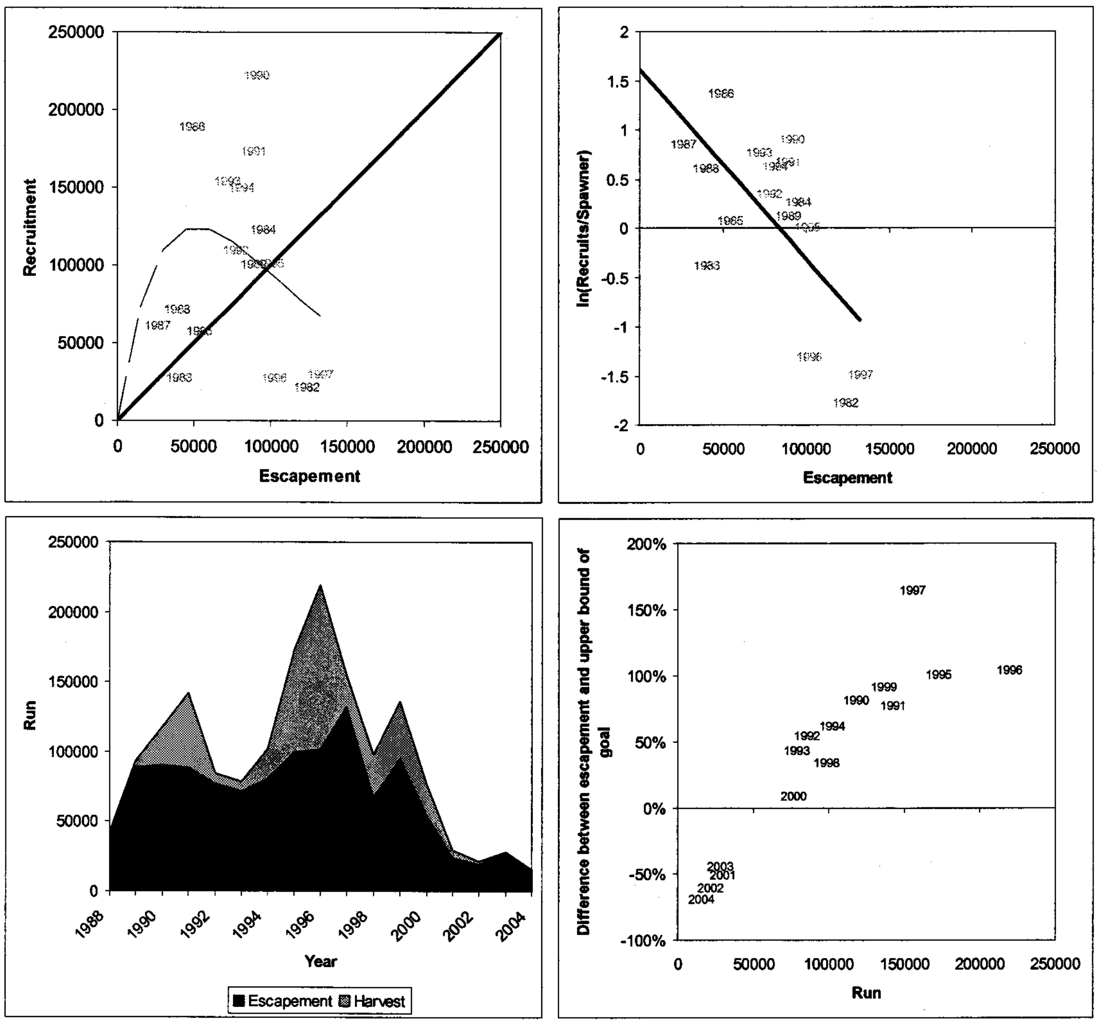
Appendix B26.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1966-1995 brood years and 1969-2003 run years for the Frazer stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



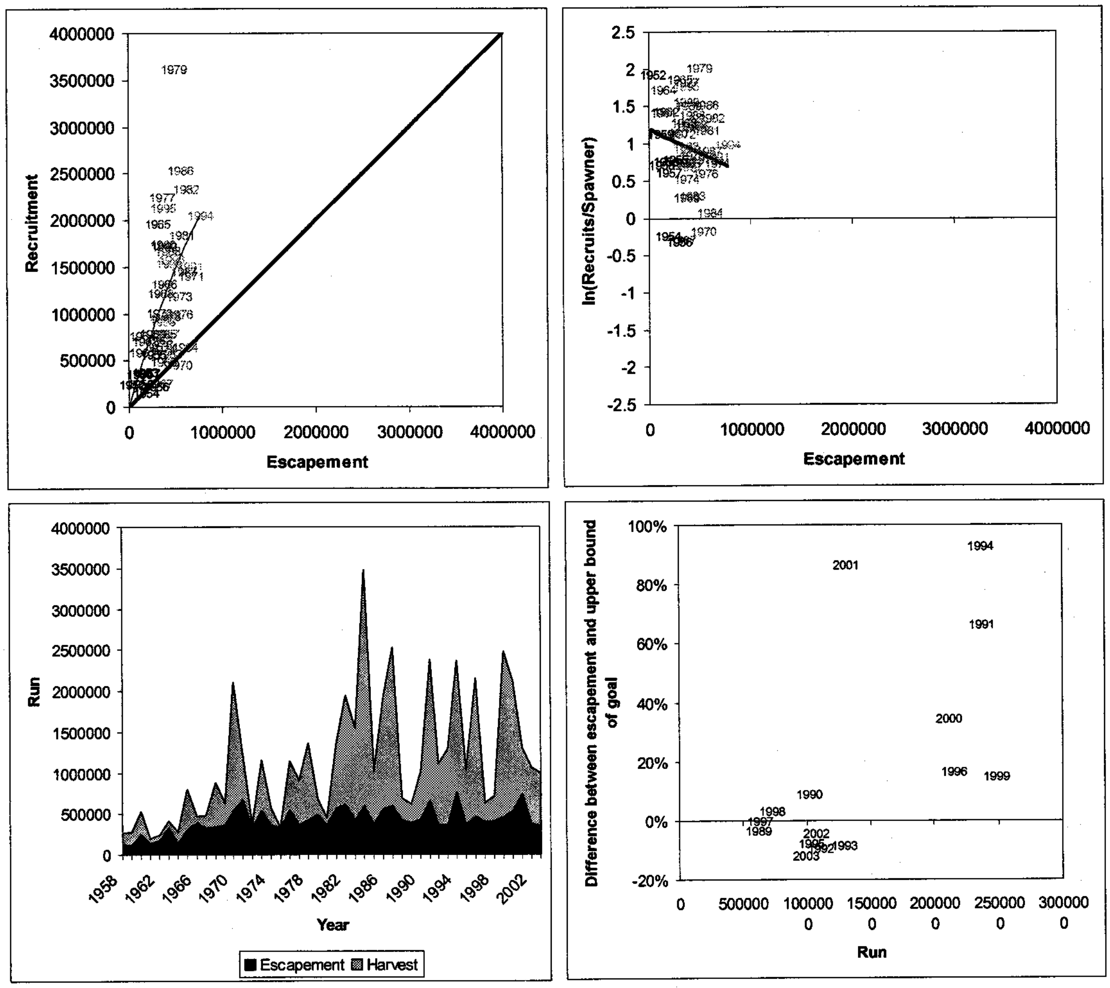
Appendix B27.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1976-1996 brood years and 1983-2003 run years for the Saltery stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



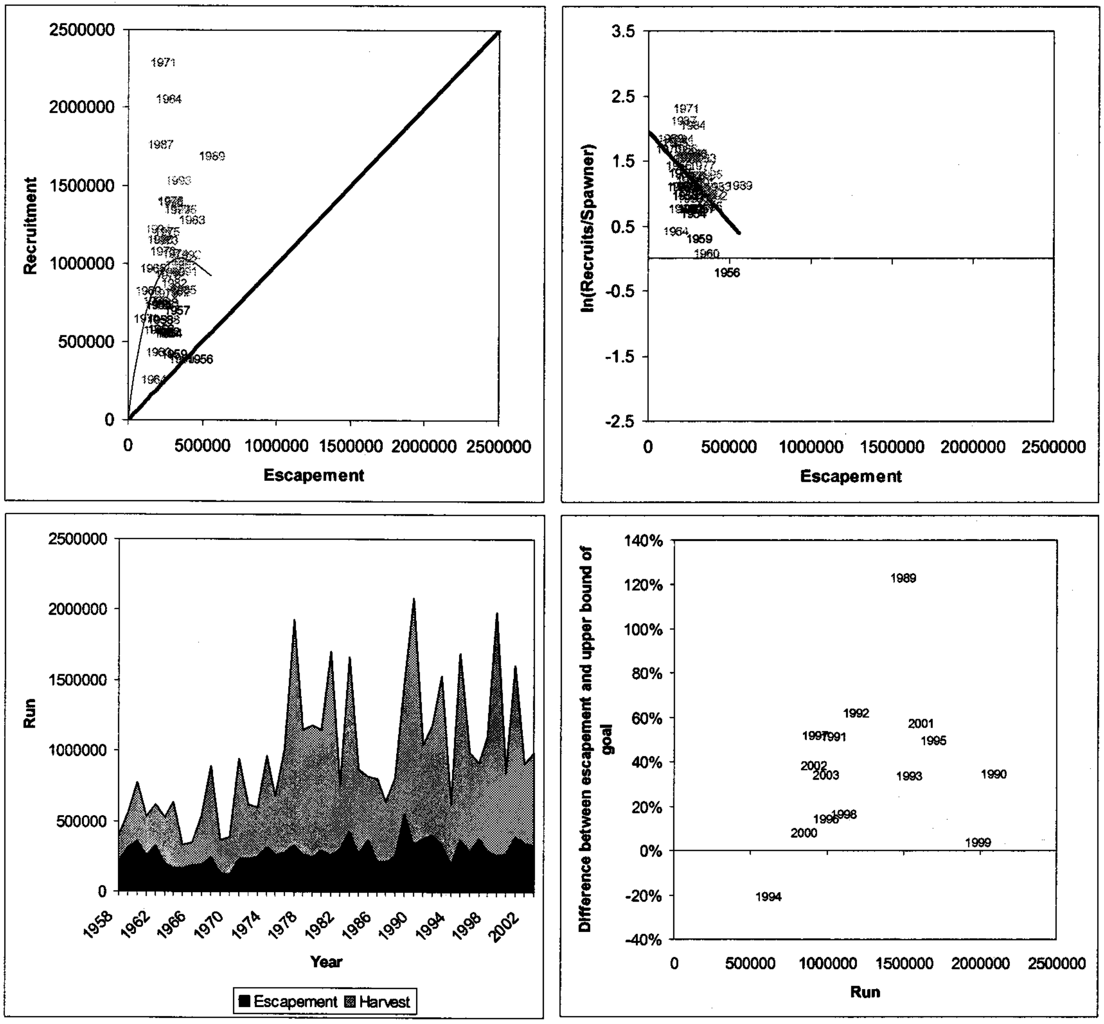
Appendix B28.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1990-1997 brood years and 1996-2003 run years for the Buskin stock.



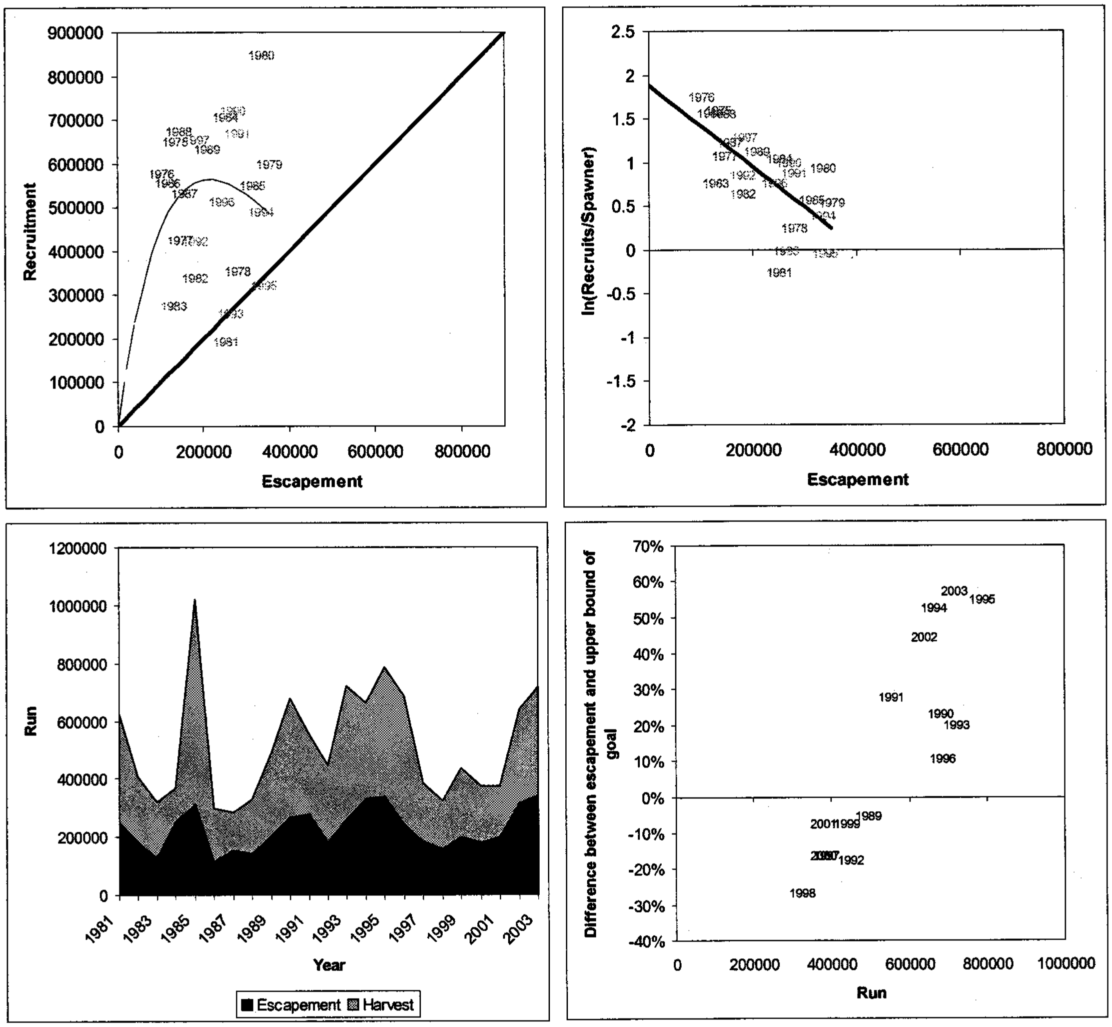
Appendix B29.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1982-1997 brood years and 1988-2004 run years for the Afognak stock. Bottom right panel depicts run data from the most recent 15 years (1990-2004).



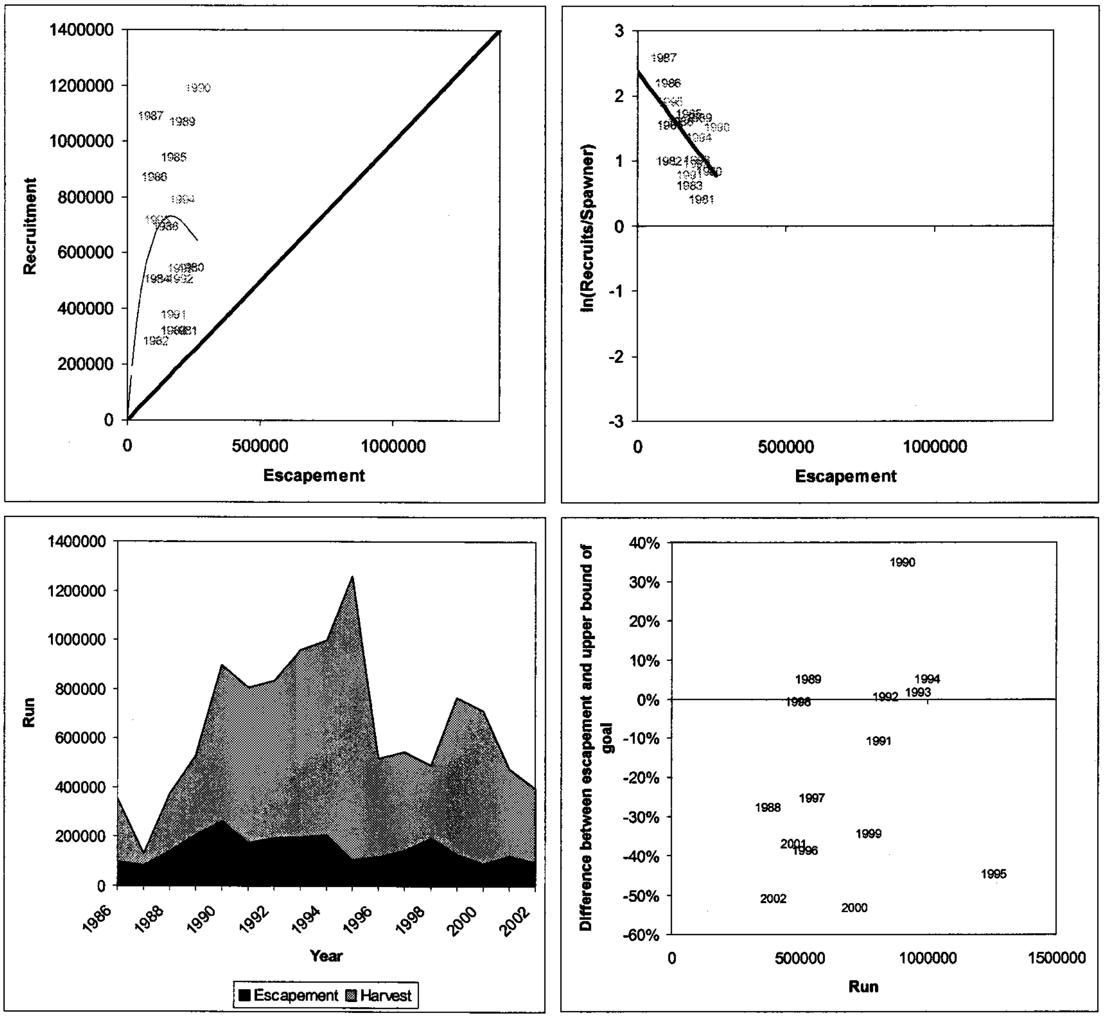
Appendix B30.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1952-1997 brood years and 1958-2003 run years for the Chignik ER stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



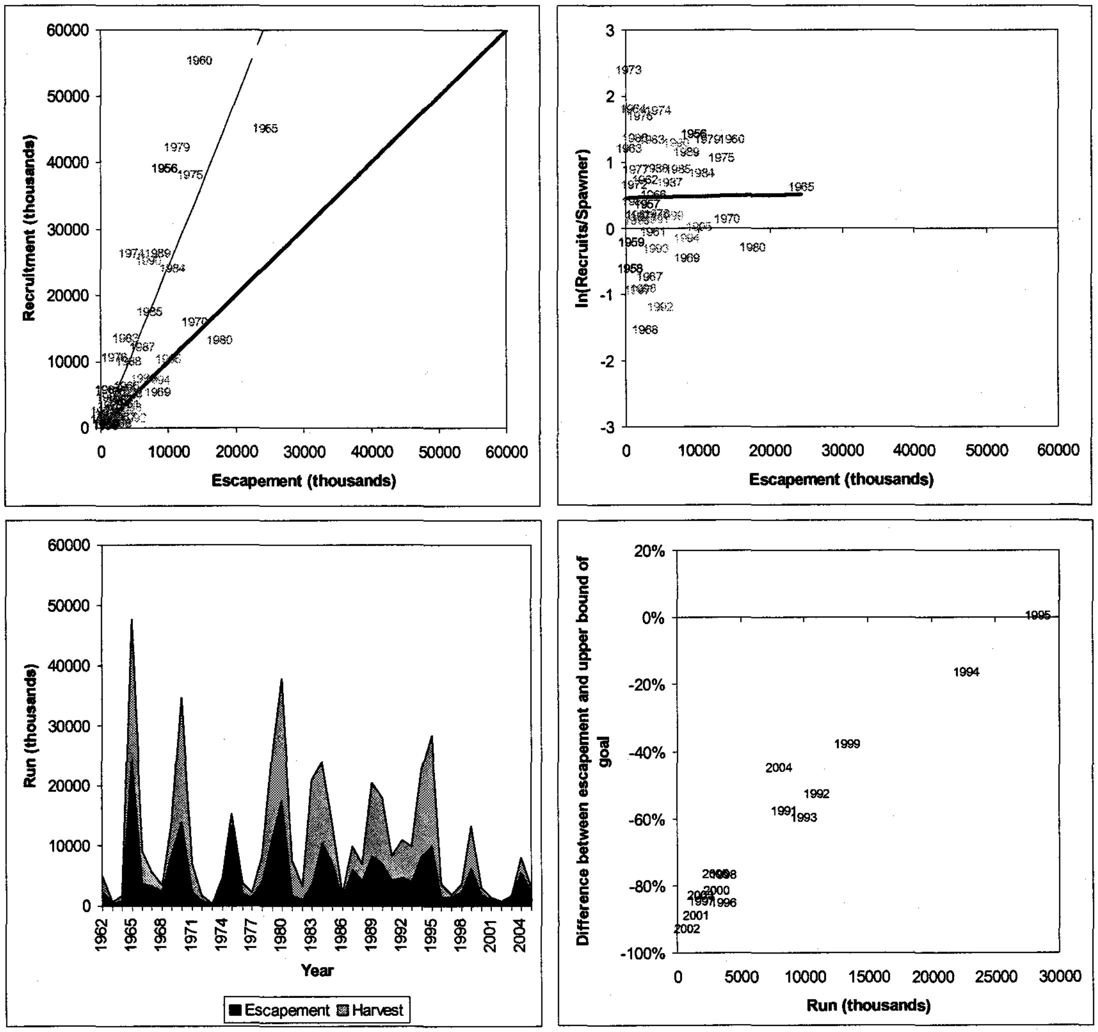
Appendix B31.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1952-1997 brood years and 1958-2003 run years for the Chignik LR stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



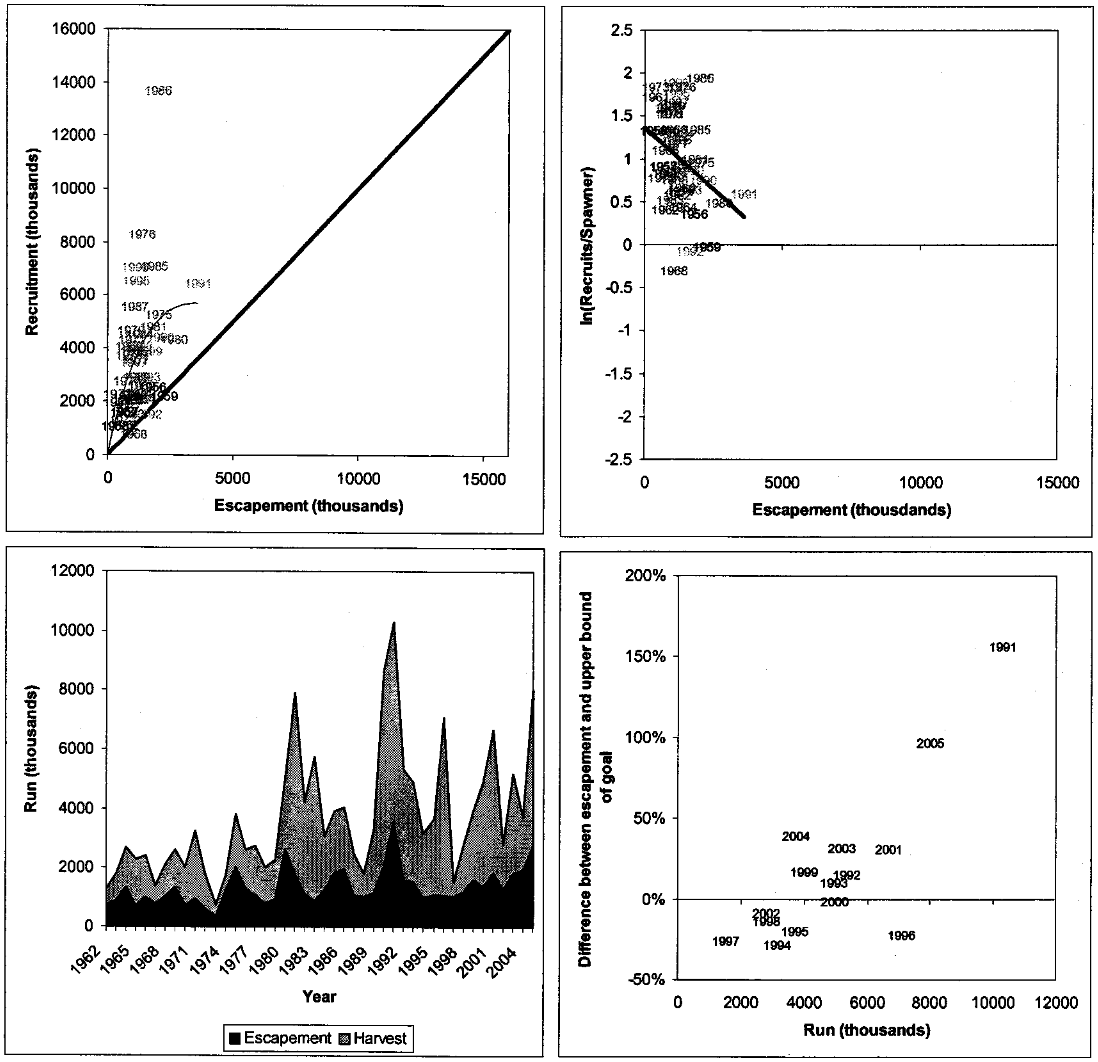
Appendix B 32.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1975-1997 brood years and 1975-2003 run years for the Nelson stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



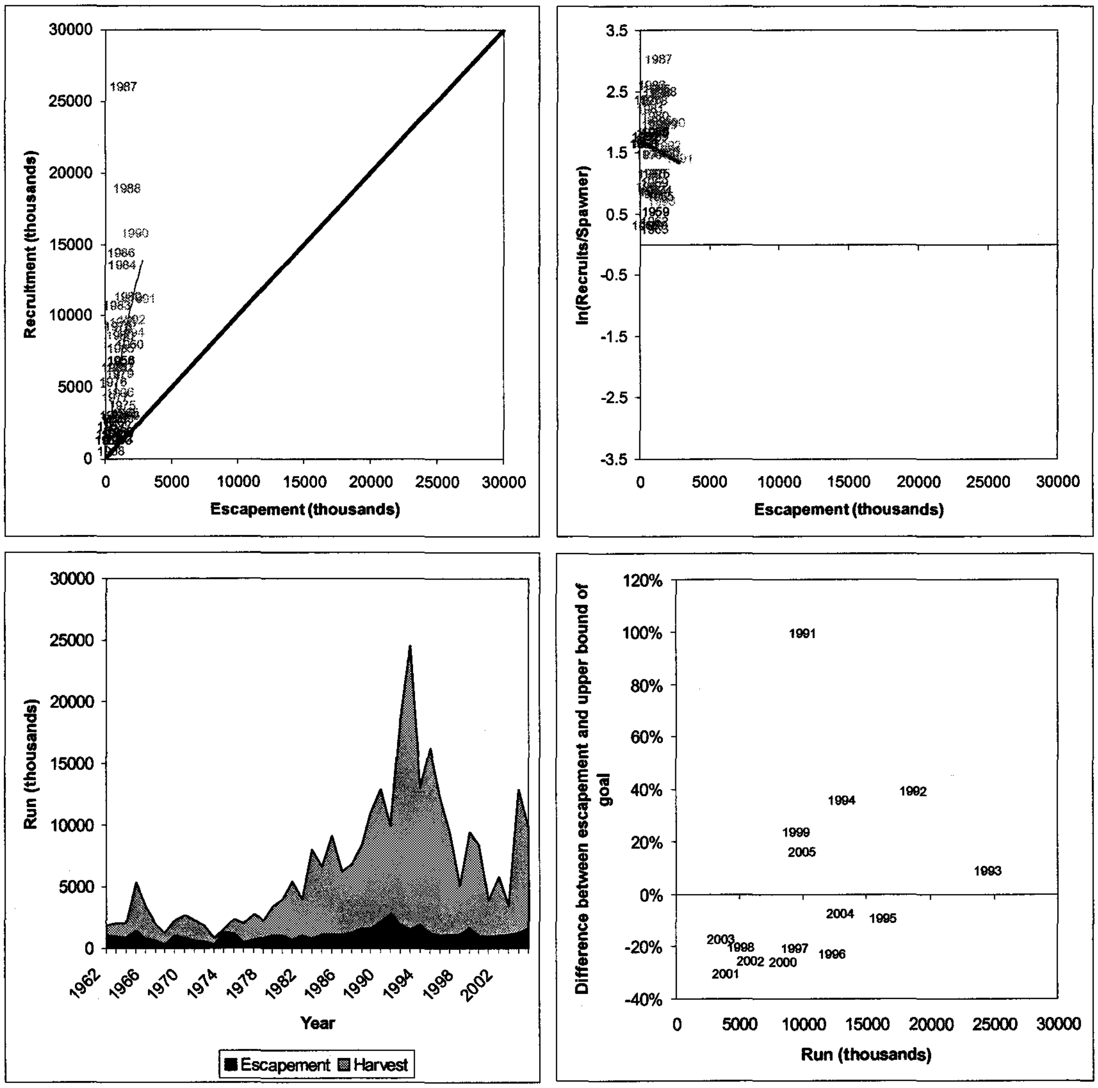
Appendix B33.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1980-1995 brood years and 1980-2003 run years for the Bear LR stock. Bottom right panel depicts run data from the most recent 15 years (1989-2003).



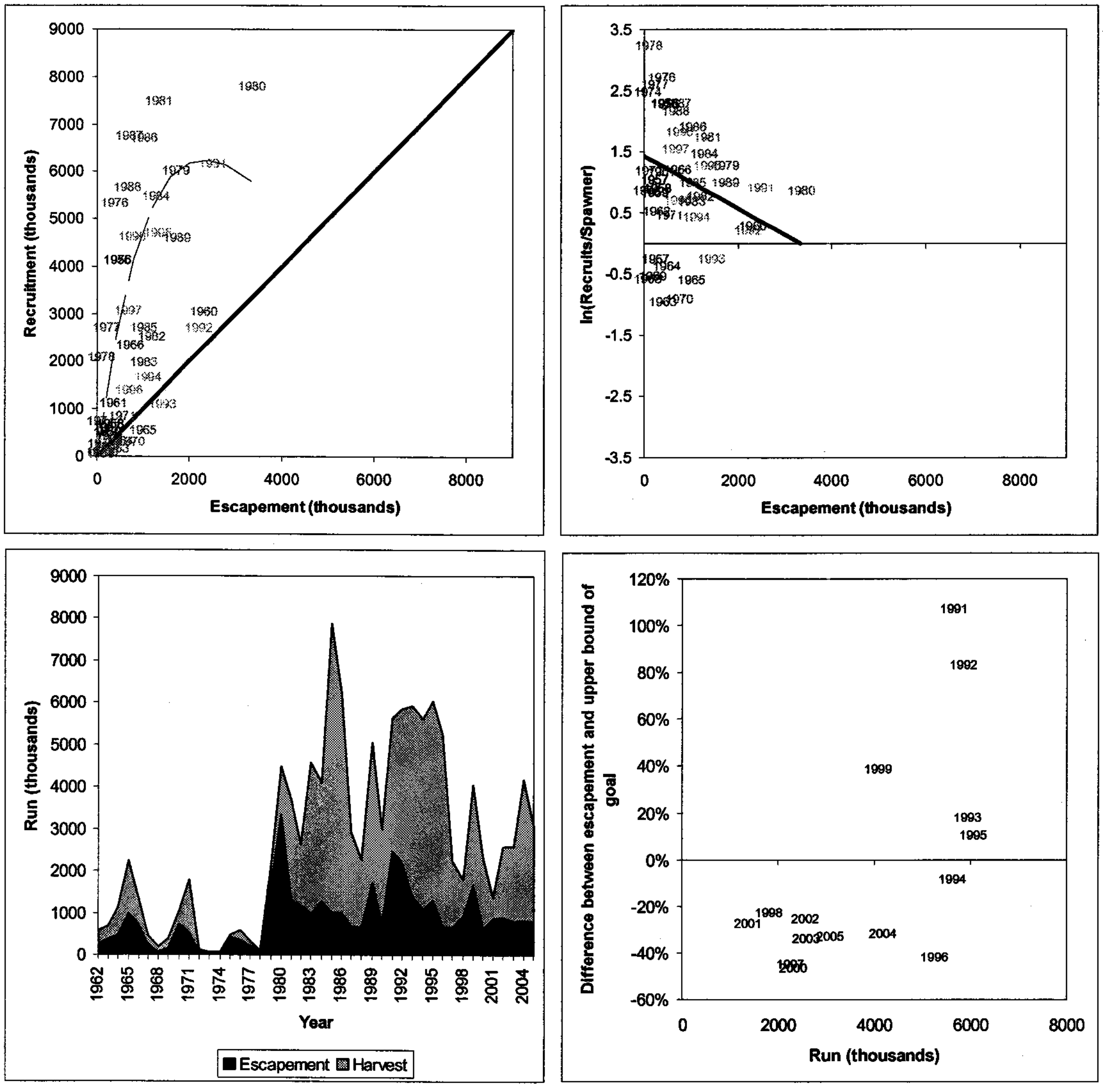
Appendix B34.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1999 brood years and 1962-2005 run years for the Kvichak stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



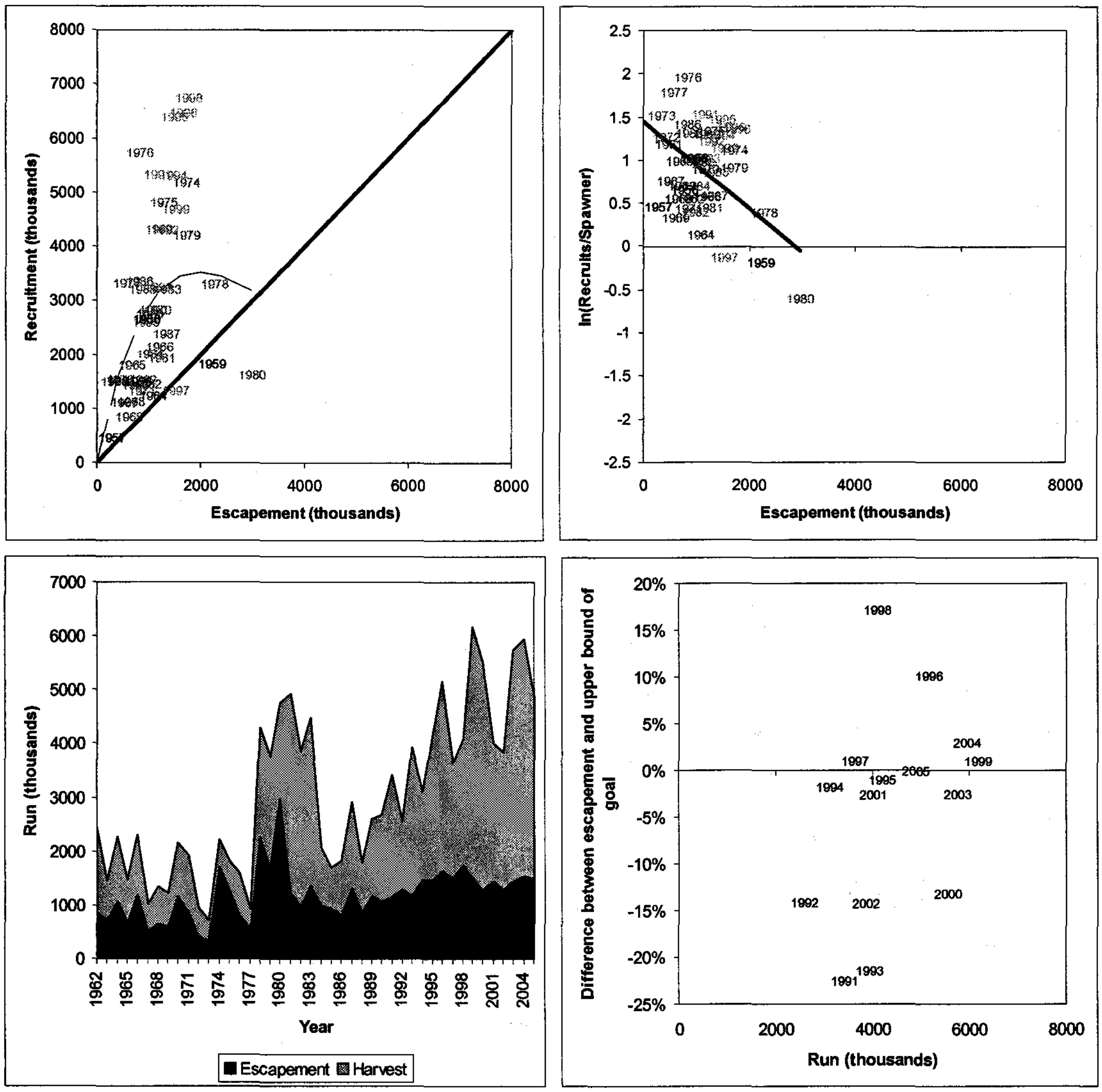
Appendix B35.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1999 brood years and 1962-2005 run years for the Naknek stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



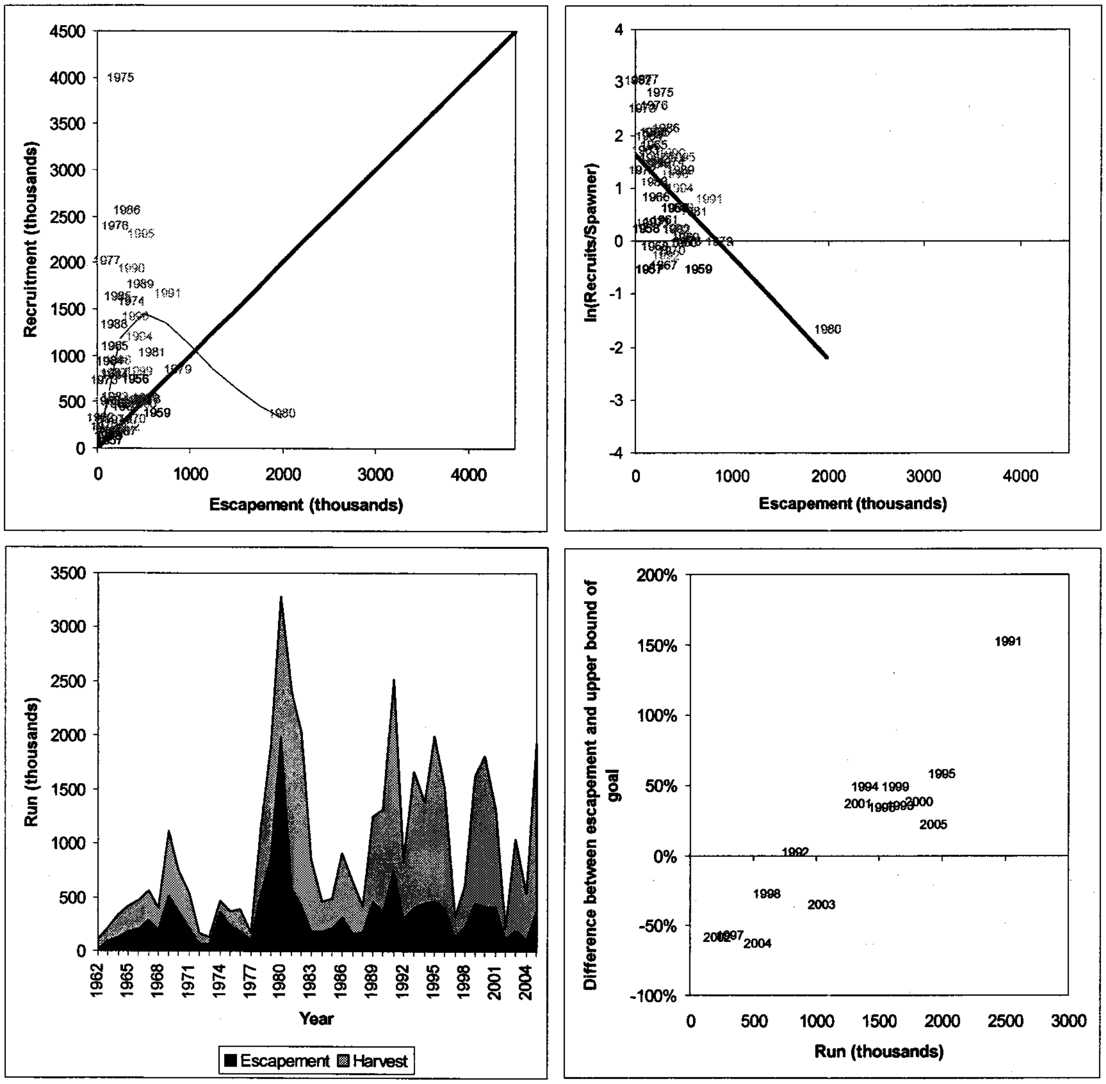
Appendix B36.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1997 brood years and 1962-2005 run years for the Egegik stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



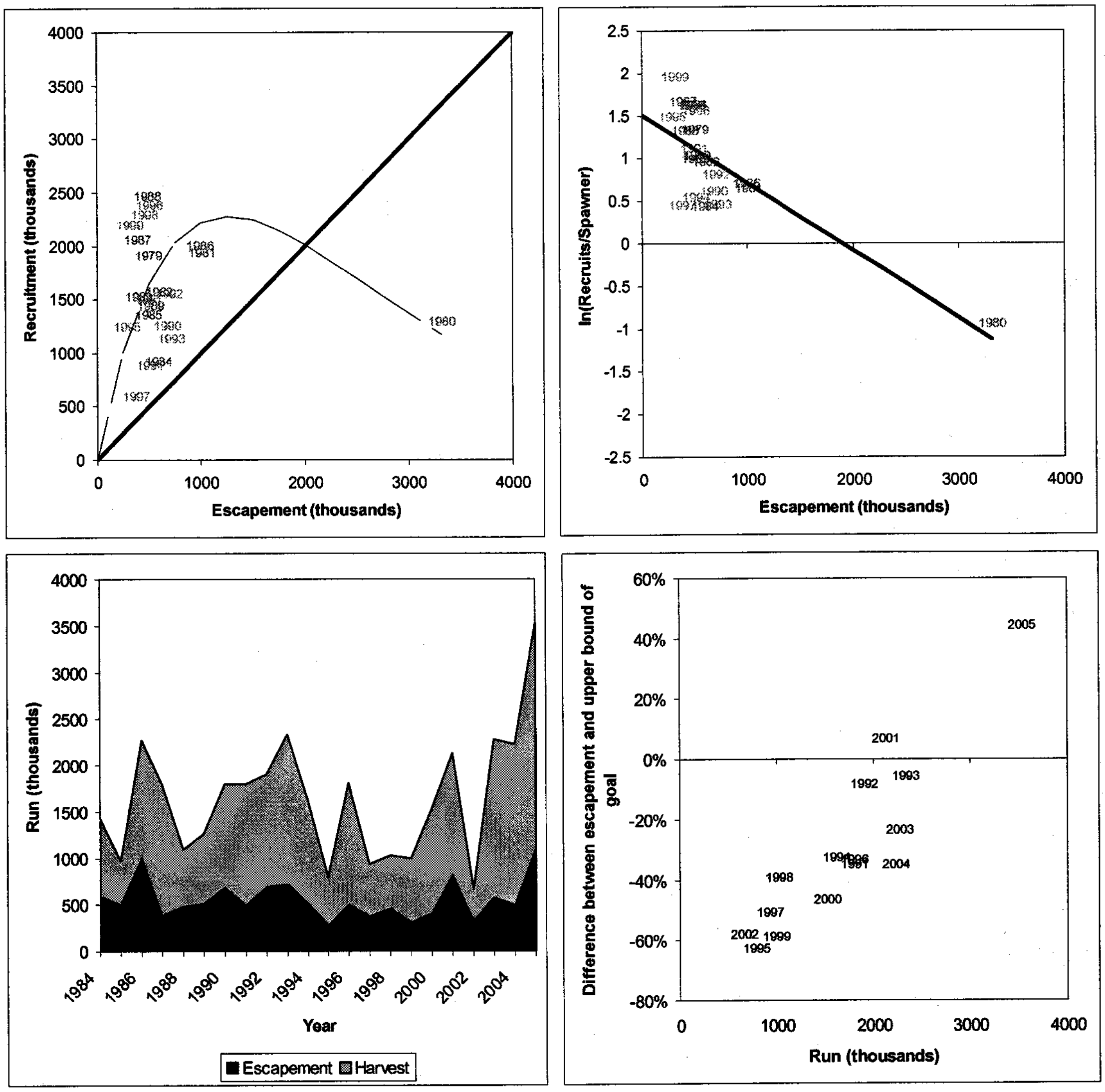
Appendix B37.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1997 brood years and 1962-2005 run years for the Ugashik stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



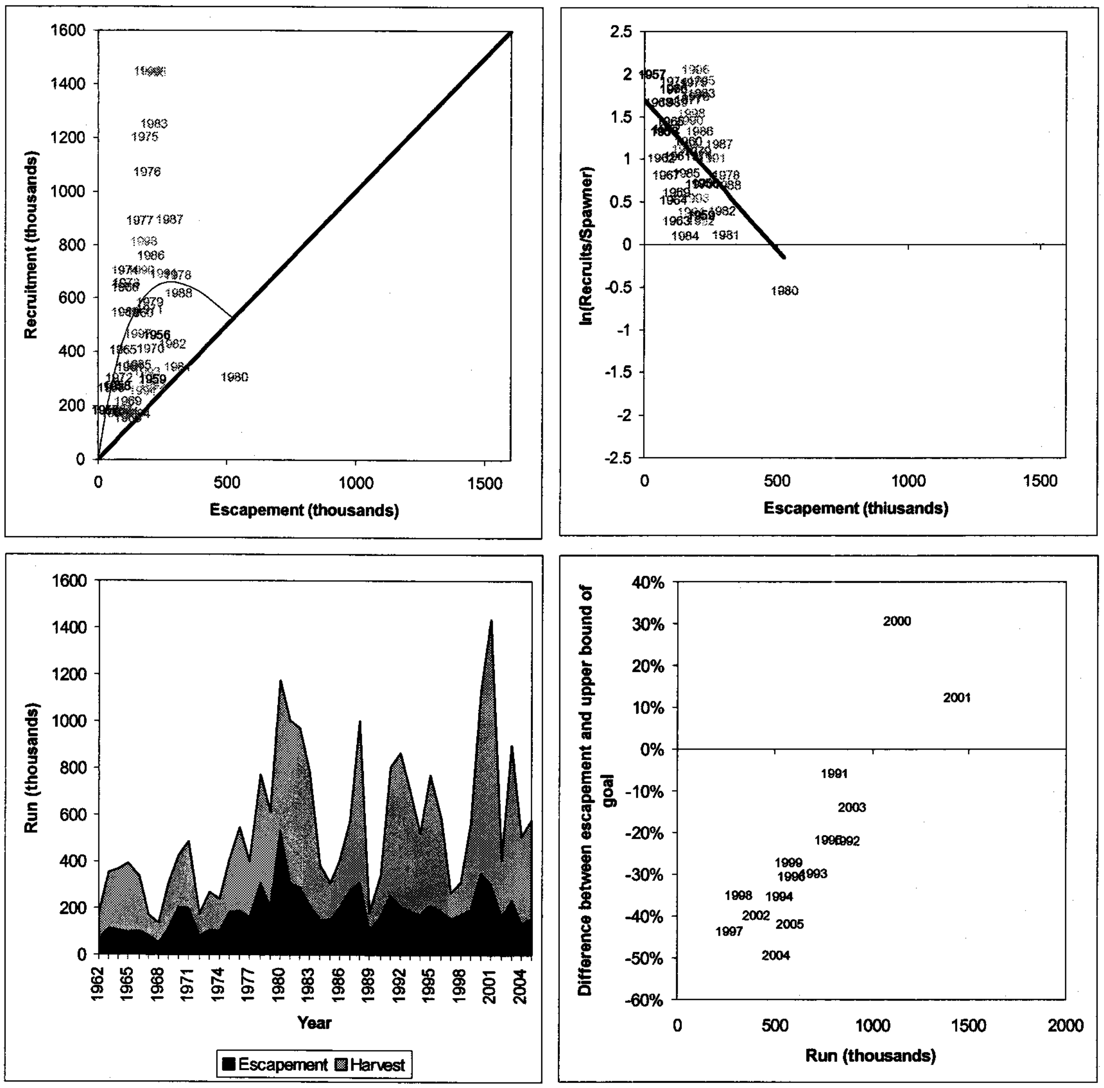
Appendix B38.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1999 brood years and 1962-2005 run years for the Wood stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



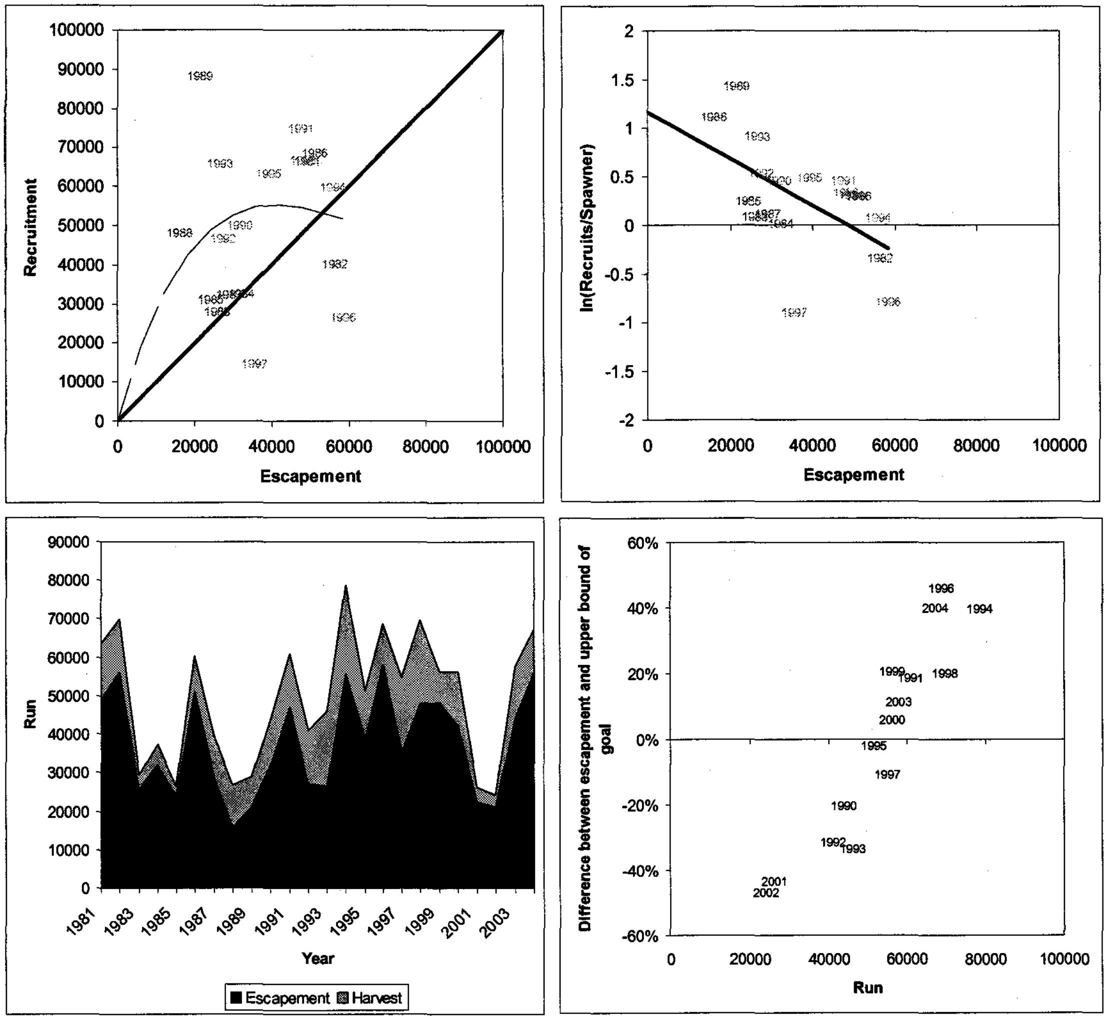
Appendix B39.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1999 brood years and 1962-2005 run years for the Igushik stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



Appendix B40.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1979-1999 brood years and 1984-2005 run years for the Nushagak stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



Appendix B41.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1956-1998 brood years and 1962-2005 run years for the Togiak stock. Bottom right panel depicts run data from the most recent 15 years (1991-2005).



Appendix B42.–Ricker stock-recruitment relation (top panels) and fishery performance data (bottom panels) for the 1981-1998 brood years and 1981-2004 run years for the Middle Fork Goodnews stock. Bottom right panel depicts run data from the most recent 15 years (1990-2004).

APPENDIX C
Stock-Recruitment Analyses

Appendix C1.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker SLR model of sockeye salmon stocks in the Southeast and Yakutat areas of Alaska.

Stock	Assessment[a]	Brood years	$\ln\alpha'$	β	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Chilkat	Weir/M-R	19	**1.878**	7.851E-6	**0.441**	**239,156**	**88,147**	**0.692**
			(0.110)	(0.274)	**(0.139)**	**(0.187)**	**(0.216)**	**(0.071)**
Chilkoot	Weir/M-R	19	NE[b]	NE	NE	NE	NE	NE
Italio	Peak aerial	26	0.865	4.717E-5	**0.914**	**18,329**	**8,055**	0.380
			(0.316)	(0.378)	**(0.106)**	**(0.232)**	**(0.240)**	(0.272)
Situk	Weir	22	**1.379**	**1.089E-5**	**0.356**	**128,231**	**51,578**	**0.562**
			(0.122)	**(0.175)**	**(0.122)**	**(0.080)**	**(0.098)**	**(0.092)**
Redoubt	Weir	15	**2.149**	4.302E-5	**1.137**	**49,969**	17,466	**0.751**
			(0.178)	(0.333)	**(0.191)**	**(0.213)**	(0.252)	**(0.105)**
East Alsek-Doame	Peak aerial	26	**1.457**	9.794E-6	**0.660**	148,811	59,223	**0.580**
			(0.228)	(0.569)	**(0.106)**	(0.390)	(0.444)	**(0.169)**
Klukshu	Weir	21	**1.391**	**6.192E-5**	**0.444**	**22,462**	**9,044**	**0.560**
			(0.183)	**(0.249)**	**(0.142)**	**(0.100)**	**(0.127)**	**(0.139)**
Lost	Peak foot	14	**1.847**	**2.790E-4**	**0.432**	**6,619**	**2,454**	**0.685**
			(0.132)	**(0.197)**	**(0.160)**	**(0.089)**	**(0.121)**	**(0.086)**
Akwe	Peak aerial	13	**1.460**	4.958E-5	**0.565**	**29,454**	**11,716**	**0.581**
			(0.189)	(0.292)	**(0.199)**	**(0.184)**	**(0.200)**	**(0.142)**
Speel	Weir	14	**2.845**	**1.110E-4**	**1.044**	**25,616**	**7,707**	**0.856**
			(0.180)	**(0.205)**	**(0.213)**	**(0.158)**	**(0.168)**	**(0.066)**
McDonald	Foot survey	17	**0.826**	7.499E-7	0.561	1,101,205	486,947	**0.365**
			(0.219)	(0.926)	(0.256)	(0.809)	(0.845)	**(0.183)**

[a] M-R = mark-recapture estimate.

[b] NE = no estimate was possible.

Appendix C2.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker SLR model of sockeye salmon stocks in the Prince William Sound area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Eshamy	Weir	27	**2.260**	**3.889E-5**	**0.727**	**58,111**	**19,863**	**0.772**
			(0.110)	**(0.226)**	**(0.140)**	**(0.165)**	**(0.191)**	**(0.060)**
Coghill	Weir	37	**2.297**	1.311E-5	**1.053**	**175,143**	**59,413**	**0.779**
			(0.125)	(0.261)	**(0.125)**	**(0.200)**	**(0.223)**	**(0.067)**
Copper	Sonar	39	**1.681**	1.036E-6	**0.415**	**1,622,767**	620,383	**0.643**
			(0.107)	(0.339)	**(0.127)**	**(0.241)**	(0.272)	**(0.074)**

Appendix C3.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker SLR model of sockeye salmon stocks in the Upper Cook Inlet area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Kenai	Sonar	32	**2.113**	5.834E-7	**0.520**	3,621,660	1,275,213	**0.744**
			(0.080)	(0.461)	**(0.118)**	(0.424)	(0.449)	**(0.046)**
Kasilof	Sonar	31	**2.131**	**3.157E-6**	**0.355**	**675,211**	**236,867**	**0.748**
			(0.062)	**(0.207)**	**(0.146)**	**(0.157)**	**(0.178)**	**(0.036)**
Crescent	Sonar	31	**1.585**	1.361E-5	**0.546**	**116,461**	**45,313**	**0.617**
			(0.159)	(0.269)	**(0.092)**	**(0.137)**	**(0.169)**	**(0.114)**
Russian ER	Weir	33	**1.176**	5.252E-6	**0.781**	223,844	93,502	**0.491**
			(0.164)	(0.807)	**(0.141)**	(0.764)	(0.799)	**(0.129)**

Appendix C4.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker SLR model of sockeye salmon stocks in the Kodiak, Chignik, and Alaska Peninsula areas of Alaska.

Stock	Assessment	Brood years	lnα'	β	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Nelson	Weir	23	**1.968**	**4.660E-6**	**0.405**	**422,374**	**152,992**	**0.713**
			(0.125)	**(0.227)**	**(0.160)**	**(0.112)**	**(0.153)**	**(0.077)**
Bear LR	Weir	16	**2.491**	6.068E-6	**0.509**	**410,506**	133,669	**0.811**
			(0.163)	(0.379)	**(0.138)**	**(0.242)**	(0.318)	**(0.076)**
Chignik ER	Weir	46	**1.265**	3.676E-7	**0.592**	3,441,344	1,415,908	**0.521**
			(0.127)	(0.773)	**(0.103)**	(0.742)	(0.769)	**(0.098)**
Chignik LR	Weir	46	**1.984**	2.502E-6	**0.463**	**792,767**	**286,305**	**0.716**
			(0.114)	(0.307)	**(0.103)**	**(0.207)**	**(0.246)**	**(0.070)**
Karluk ER	Weir	16	**1.870**	**4.655E-6**	**0.346**	**401,757**	**148,289**	**0.690**
			(0.162)	**(0.243)**	**(0.175)**	**(0.097)**	**(0.147)**	**(0.105)**
Karluk LR	Weir	16	**2.074**	**2.693E-6**	**0.507**	**770,164**	**273,255**	**0.736**
			(0.131)	**(0.198)**	**(0.165)**	**(0.107)**	**(0.139)**	**(0.078)**
Ayakulik	Weir	33	**1.063**	7.186E-7	**0.702**	1,478,967	629,452	**0.452**
			(0.179)	(0.700)	**(0.129)**	(0.622)	(0.646)	**(0.146)**
Upper Station ER	Weir	29	**1.113**	5.003E-6	**0.689**	222,410	93,880	**0.470**
			(0.188)	(0.629)	**(0.117)**	(0.522)	(0.545)	**(0.153)**
Upper Station LR	Weir	29	**1.611**	2.201E-6	**0.651**	732,141	283,490	**0.624**
			(0.146)	(0.529)	**(0.133)**	(0.435)	(0.468)	**(0.104)**
Frazer	Weir	30	**2.122**	**5.277E-6**	**0.916**	**402,117**	**141,325**	**0.746**
			(0.124)	**(0.229)**	**(0.149)**	**(0.166)**	**(0.185)**	**(0.072)**
Saltery	Weir	21	**1.654**	**2.749E-5**	**0.627**	**60,181**	**23,121**	**0.636**
			(0.160)	**(0.215)**	**(0.147)**	**(0.101)**	**(0.124)**	**(0.113)**
Buskin	Weir	8	1.979	1.086E-4	0.436	**18,219**	6,585	**0.715**
			(0.333)	(0.529)	(0.492)	**(0.209)**	(0.332)	**(0.207)**
Afognak	Weir	16	1.874	1.930E-5	**0.723**	**97,101**	**35,811**	**0.691**
			(0.266)	(0.305)	**(0.136)**	**(0.105)**	**(0.152)**	**(0.173)**

Appendix C5.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker SLR model of sockeye salmon stocks in the Bristol Bay area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Kvichak	Tower	44	**0.794**	NE[a]	**0.883**	NE	NE	**0.353**
			(0.175)		**(0.099)**			**(0.149)**
Naknek	Tower	44	**1.502**	2.903E-7	**0.527**	5,173,774	2,042,960	**0.593**
			(0.114)	(0.433)	**(0.108)**	(0.343)	(0.372)	**(0.084)**
Egegik	Tower	42	**1.670**	NE	**0.708**	NE	NE	**0.640**
			(0.083)		**(0.088)**			**(0.052)**
Ugashik	Tower	42	**1.670**	1.769E-7	**1.040**	9,437,393	3,615,720	**0.640**
			(0.129)	(0.767)	**(0.098)**	(0.753)	(0.780)	**(0.089)**
Wood	Tower	44	**1.410**	3.634E-7	**0.497**	3,880,891	1,557,326	**0.566**
			(0.121)	(0.377)	**(0.078)**	(0.286)	(0.311)	**(0.091)**
Igushik	Tower	44	**2.028**	**1.922E-6**	**0.897**	**1,055,001**	**377,765**	**0.726**
			(0.102)	**(0.230)**	**(0.088)**	**(0.171)**	**(0.189)**	**(0.062)**
Nushagak	Sonar	21	**1.590**	**7.916E-7**	**0.410**	**2,009,201**	**780,914**	**0.618**
			(0.080)	**(0.180)**	**(0.135)**	**(0.131)**	**(0.141)**	**(0.057)**
Togiak	Tower	43	**1.842**	3.506E-6	**0.546**	**525,452**	**194,973**	**0.683**
			(0.099)	(0.266)	**(0.086)**	**(0.186)**	**(0.212)**	**(0.065)**

[a] NE = no estimate possible.

Appendix C6.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker SLR model of sockeye salmon stocks in the Kuskokwim area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
MF Goodnews	Weir	18	1.287 (0.256)	2.413E-5 (0.348)	**0.494 (0.201)**	**53,358 (0.132)**	**21,870 (0.171)**	**0.528 (0.200)**

Appendix C7.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker AR1 model of sockeye salmon stocks in the Southeast and Yakutat areas of Alaska.

Stock	Assessment[a]	Brood years	$\ln\alpha'$	β	ϕ_1	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Chilkat	Weir/M-R	19	**1.893**	7.959E-6	0.377	**0.420**	**237,794**	**87,395**	**0.696**
			(0.128)	(0.277)	(1.043)	**(0.126)**	**(0.197)**	**(0.223)**	**(0.082)**
Chilkoot	Weir/M-R	19	1.469	5.648E-6	0.712	**0.759**	260,105	103,303	0.583
			(0.347)	(0.728)	(0.349)	**(0.212)**	(0.620)	(0.671)	(0.254)
Italio	Peak aerial	26	1.323	**7.937E-5**	**0.831**	**0.535**	16,670	6,791	0.539
			(0.453)	**(0.193)**	**(0.233)**	**(0.128)**	(0.440)	(0.364)	(0.369)
Situk	Weir	22	**1.361**	**1.040E-5**	0.171	**0.360**	**130,884**	**52,970**	**0.551**
			(0.144)	**(0.205)**	(3.863)	**(0.139)**	**(0.099)**	**(0.117)**	**(0.111)**
Redoubt	Weir	15	**2.157**	4.125E-5	0.232	**1.160**	52,299	18,252	**0.753**
			(0.224)	(0.404)	(4.462)	**(0.190)**	(0.290)	(0.321)	**(0.135)**
East Alsek-Doame	Peak aerial	26	**1.535**	1.132E-5	0.591	**0.557**	135,586	53,228	**0.602**
			(0.249)	(0.465)	(0.367)	**(0.102)**	(0.340)	(0.365)	**(0.184)**
Klukshu	Weir	21	**1.364**	**6.005E-5**	0.393	**0.418**	**22,715**	**9,188**	**0.552**
			(0.188)	**(0.234)**	(0.738)	**(0.135)**	**(0.126)**	**(0.136)**	**(0.145)**
Lost	Peak foot	14	ND[b]	ND	ND	ND	ND	ND	ND
Akwe	Peak aerial	13	ND	ND	ND	ND	ND	ND	ND
Speel	Weir	14	**2.845**	**1.054E-4**	-0.262	**1.058**	**26,997**	**8,121**	**0.856**
			(0.202)	**(0.232)**	(0.937)	**(0.235)**	**(0.177)**	**(0.198)**	**(0.074)**
McDonald	Foot survey	17	ND	ND	ND	ND	ND	ND	ND

[a] M-R = mark-recapture estimate.

[b] ND = consecutive brood years missing. AR1 model not run.

Appendix C8.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker AR1 model of sockeye salmon stocks in the Prince William Sound area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	ϕ_1	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Eshamy	Weir	27	ND[a]	ND	ND	ND	ND	ND	ND
Coghill	Weir	37	**2.257**	1.235E-5	0.341	**1.002**	**182,829**	62,528	**0.772**
			(0.143)	(0.300)	(0.617)	**(0.110)**	**(0.243)**	(0.262)	**(0.079)**
Copper	Weir	39	**1.928**	1.511E-6	0.570	**0.350**	**1,275,428**	**465,612**	**0.704**
			(0.124)	(0.284)	(0.313)	**(0.133)**	**(0.182)**	**(0.217)**	**(0.079)**

[a] ND = consecutive brood years missing. AR1 model not run.

Appendix C9.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker AR1 model of sockeye salmon stocks in the Upper Cook Inlet area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	ϕ_1	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Kenai	Sonar	32	**1.991**	2.825E-7	0.331	**0.508**	7,048,290	2,541,779	**0.718**
			(0.092)	(0.743)	(0.731)	**(0.115)**	(0.767)	(0.795)	**(0.056)**
Kasilof	Sonar	31	**2.263**	**3.951E-6**	0.597	**0.313**	**572,807**	**195,667**	**0.773**
			(0.083)	**(0.205)**	(0.348)	**(0.165)**	**(0.152)**	**(0.176)**	**(0.044)**
Crescent	Sonar	31	**1.477**	1.206E-5	0.594	**0.449**	**122,480**	**48,580**	**0.586**
			(0.202)	(0.321)	(0.348)	**(0.150)**	**(0.198)**	**(0.223)**	**(0.149)**
Russian ER	Weir	33	**1.124**	3.284E-6	0.177	**0.784**	342,286	144,209	**0.474**
			(0.179)	(0.841)	(1.548)	**(0.147)**	(0.813)	(0.839)	**(0.141)**

Appendix C10.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker AR1 model of sockeye salmon stocks in the Alaska Peninsula, Chignik, and Kodiak areas of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	ϕ_1	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Nelson	Weir	23	**1.945**	**4.523E-6**	0.129	**0.412**	**430,056**	**156,470**	**0.708**
			(0.135)	**(0.249)**	(6.294)	**(0.185)**	**(0.125)**	**(0.171)**	**(0.085)**
Bear LR	Weir	16	**2.209**	4.294E-6	0.545	**0.443**	514,464	177,685	**0.763**
			(0.175)	(0.458)	(0.700)	**(0.174)**	(0.335)	(0.391)	**(0.096)**
Chignik ER	Weir	46	**1.378**	6.420E-7	0.270	**0.578**	2,146,394	866,174	**0.556**
			(0.146)	(0.672)	(0.676)	**(0.110)**	(0.584)	(0.617)	**(0.110)**
Chignik LR	Weir	46	**2.062**	2.795E-6	0.427	**0.423**	**737,660**	**262,357**	**0.733**
			(0.111)	(0.260)	(0.362)	**(0.106)**	**(0.176)**	**(0.208)**	**(0.066)**
Karluk ER	Weir	16	**1.836**	4.476E-6	0.168	**0.354**	**410,132**	**152,366**	**0.682**
			(0.180)	(0.272)	(33.330)	**(0.199)**	**(0.117)**	**(0.168)**	**(0.118)**
Karluk LR	Weir	16	**1.975**	**2.448E-6**	0.229	**0.515**	**806,566**	**291,799**	**0.714**
			(0.157)	**(0.244)**	(3.490)	**(0.172)**	**(0.139)**	**(0.171)**	**(0.098)**
Ayakulik	Weir	33	**1.019**	6.482E-7	0.503	**0.621**	1,572,039	673,895	**0.437**
			(0.226)	(0.752)	(0.400)	**(0.147)**	(0.703)	(0.718)	**(0.188)**
Upper	Weir	29	**1.109**	5.239E-6	0.318	**0.669**	211,679	89,407	**0.468**
Station ER			**(0.234)**	(0.657)	(0.846)	**(0.142)**	(0.543)	(0.578)	**(0.190)**
Upper	Weir	29	**1.434**	1.397E-6	0.561	**0.562**	1,026,952	410,372	**0.573**
Station LR			**(0.191)**	(0.708)	(0.395)	**(0.138)**	(0.643)	(0.671)	**(0.142)**
Frazer	Weir	30	**2.148**	**5.350E-6**	0.083	**0.930**	**401,599**	**140,404**	**0.751**
			(0.132)	**(0.241)**	(9.124)	**(0.156)**	**(0.174)**	**(0.194)**	**(0.076)**
Saltery	Weir	21	**1.650**	**2.725E-5**	-0.251	**0.622**	**60,566**	**23,286**	**0.635**
			(0.155)	**(0.201)**	(0.717)	**(0.164)**	**(0.090)**	**(0.115)**	**(0.109)**
Buskin	Weir	8	1.893	9.926E-5	-0.083	0.476	19,067	7,007	**0.696**
			(0.339)	(0.574)	(0.926)	(0.536)	(0.251)	(0.371)	**(0.216)**
Afognak	Weir	16	1.249	1.219E-5	0.530	**0.695**	102,482	42,281	0.515
			(0.434)	(0.455)	(0.741)	**(0.188)**	(0.268)	(0.279)	(0.334)

Appendix C11.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker AR1 model of sockeye salmon stocks in the Bristol Bay area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	ϕ_1	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
Kvichak	Tower	44	0.860	NE[a]	0.520	**0.762**	NE	NE	**0.378**
			(0.282)		(0.282)	**(0.108)**			**(0.241)**
Naknek	Tower	44	**1.539**	3.199E-7	0.221	**0.520**	4,810,500	1,887,096	**0.604**
			(0.115)	(0.394)	(0.874)	**(0.109)**	(0.319)	(0.343)	**(0.083)**
Egegik	Tower	42	**1.949**	1.244E-7	**0.650**	**0.545**	15,666,693	5,696,312	**0.709**
			(0.142)	(0.807)	**(0.231)**	**(0.091)**	(0.812)	(0.852)	**(0.086)**
Ugashik	Tower	42	**1.991**	4.315E-7	**0.710**	**0.750**	4,613,891	1,663,994	**0.718**
			(0.223)	(0.390)	**(0.190)**	**(0.098)**	(0.399)	(0.390)	**(0.144)**
Wood	Tower	44	**1.580**	5.074E-7	0.377	**0.471**	**3,113,860**	**1,212,565**	**0.615**
			(0.125)	(0.280)	(0.446)	**(0.099)**	**(0.190)**	**(0.213)**	**(0.089)**
Igushik	Tower	44	**1.948**	**1.701E-6**	0.504	**0.781**	**1,145,073**	**416,411**	**0.708**
			(0.145)	**(0.234)**	(0.312)	**(0.115)**	**(0.204)**	**(0.206)**	**(0.092)**
Nushagak	Sonar	21	1.601	7.950E-7	0.066	0.420	2,013,303	781,090	0.621
			(0.084)	(0.190)	(27.900)	(0.139)	(0.137)	(0.148)	(0.060)
Togiak	Tower	43	**1.894**	3.768E-6	0.286	**0.530**	**502,704**	**184,700**	**0.696**
			(0.111)	(0.266)	(0.666)	**(0.110)**	**(0.184)**	**(0.213)**	**(0.071)**

[a] NE = no estimate was possible.

Appendix C12.–Parameter estimates (NPCV's in parentheses; NPCV's ≤ 0.250 in bold) for the Ricker AR1 model of sockeye salmon stocks in the Kuskokwim area of Alaska.

Stock	Assessment	Brood years	$\ln\alpha'$	β	ϕ_1	σ_ε	S_{EQ}	S_{MSY}	μ_{MSY}
MF	Weir	18	1.149	1.997E-5	0.214	**0.501**	**57,554**	**24,147**	**0.482**
Goodnews			(0.298)	(0.433)	(2.300)	**(0.179)**	**(0.189)**	**(0.229)**	**(0.242)**

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Fishery Management Report No. 07-64

Upper Cook Inlet Commercial Fisheries Annual Management Report, 2007

by

Pat Shields

December 2007

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

FISHERY MANAGEMENT REPORT NO. 07-64

UPPER COOK INLET COMMERCIAL FISHERIES ANNUAL MANAGEMENT REPORT, 2007

by

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December 2007

The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. 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 2007 Upper Cook Inlet (UCI) area management report describes commercial fishing activities monitored by the Alaska Department of Fish and Game, Division of Commercial Fisheries, in Soldotna. The UCI management area consists of that portion of Cook Inlet north of the latitude of Anchor Point and is divided into the Central and Northern Districts. The Central District is further subdivided into six Subdistricts, while the Northern District is divided into two Subdistricts. At present, all 5 species of Pacific salmon (sockeye *Oncorhynchus nerka*, Chinook *O. tshawytscha*, chum *O. keta*, coho *O. kisutch*, and pink *O. gorbuscha*), razor clams (*Siliqua patula*), Pacific herring (*Clupea pallasi*), and eulachon or smelt (*Thaleichthys pacificus*) are subject to commercial harvest in Upper Cook Inlet. The 2007 UCI commercial harvest of 3.7 million salmon was very close to the 1966–2007 average annual harvest of 4.2 million fish, with 23 years having greater harvests and 18 years with harvests less than that realized in 2007. However, this year's harvest of 3.3 million sockeye salmon was slightly greater than the 1966–2006 average annual harvest of 2.9 million fish, with 26 years below this amount and 15 years greater than the 2007 harvest. The 2007 estimated exvessel value of $23.4 million represents the 2nd highest value in the past 10 years and 16th highest since 1966. Sockeye salmon escapement estimates fell short of the minimum goal at the Yentna River, exceeded the goal ranges in the Kasilof and Crescent Rivers and at Packers Creek, and were within established ranges at Fish Creek and the Kenai River. For the third year in a row, the timing of the sockeye salmon run to Upper Cook Inlet was much later than the long term average, with the 2007 run estimated to be 4-days late.

Key words: Upper Cook Inlet, commercial fishery, personal use fishery, gillnet, escapement, salmon, sockeye, *Oncorhynchus nerka*, Chinook, *O. tshawytscha*, chum, *O. keta*, coho *O. kisutch*, pink *O. gorbuscha,* Pacific herring, *Clupea pallasi*, smelt, eulachon, *Thaleichthys pacificus*, razor clam, *Siliqua patula*.

INTRODUCTION

The Upper Cook Inlet (UCI) management area consists of that portion of Cook Inlet north of the latitude of Anchor Point and is divided into the Central and Northern Districts (Figures 1 and 2). The Central District is approximately 75 miles long, averages 32 miles in width, and is further subdivided into six Subdistricts. The Northern District is 50 miles long, averages 20 miles in width and is divided into two Subdistricts. At present, all 5 species of Pacific salmon (*Oncorhynchus*), razor clams (*Siliqua patula*), Pacific herring (*Clupea pallasi*), and eulachon or smelt (*Thaleichthys pacificus*) are subject to commercial harvest in Upper Cook Inlet. Harvest statistics are gathered and reported by 5-digit statistical areas and sub-areas (Figure 3).

SALMON

Since the inception of a commercial fishery in 1882, many gear types, including fish traps, gillnets, and seines have been employed with varying degrees of success to harvest salmon in UCI (Clark et al. 2006). Currently, set (fixed) gillnets are the only gear permitted in the Northern District, while both set and drift gillnets are used in the Central District. The use of seine gear is restricted to the Chinitna Bay Subdistrict, where they have been employed sporadically. Drift gillnets have accounted for approximately 50% of the average annual salmon harvest since 1966, with set gillnets harvesting virtually all of the remainder (Appendix A1–A5).

Detailed commercial salmon harvest statistics for UCI specific to gear type and area are available only back to 1966 (Appendix A6). Run-timing and migration routes utilized by all species overlap to such a degree that the commercial fishery is largely mixed-stock and mixed-species in nature. Typically, the UCI harvest represents approximately 5% of the statewide catch. Nearly 10% of all salmon permits issued statewide are for the Cook Inlet area.

In terms of their recent economic value, sockeye salmon (*O. nerka*) are by far the most important component of the catch followed by coho (*O. kisutch*), Chinook (*O. tshawytscha*), chum (*O. keta*), and pink salmon (*O. gorbuscha*) (Appendix A7).

HERRING

Commercial herring fishing began in UCI in 1973 with a modest harvest of bait-quality fish along the east side of the Central District and expanded in the late 1970s to include small-scale sac roe fisheries in Chinitna and Tuxedni bays (Appendix A8). In 1988, significant decreases in herring abundance were observed in Tuxedni Bay, as well as a shift towards older age class herring, resulting in the closure of Tuxedni Bay to commercial herring fishing prior to the 1992 season. In Chinitna Bay and along the eastside beaches, similar declines began to materialize after the 1990 season.

As a result of these declines, the Alaska Department of Fish and Game (ADF&G) submitted a proposal to the Alaska Board of Fisheries (BOF) to open the UCI herring fishery by emergency order only. This proposal passed and became regulation for the 1993 season, ending a long period with fixed opening dates of April 15 on the east side and April 22 on the west side of Cook Inlet. This action effectively closed these fisheries to provide time for herring stocks to recover.

In 1998 the Upper Subdistrict of the Central District and the Eastern Subdistrict of the Northern District were opened to commercial herring fishing to assess the status of the herring population. The herring fisheries on the west side of Cook Inlet remained closed until the status of the east side stocks was determined. Prior to the 1999 season, ADF&G again submitted proposals to the BOF, seeking to restructure the herring fishery to two 30-hour periods per week, beginning on Mondays and Thursdays. These proposals included preseason registration and requiring fishermen to report their harvests within 12 hours of the closure of a fishing period.

The proposals were passed in the form of a management plan, 5 AAC 27.409 Central District Herring Recovery Management Plan, which became active prior to the 1999 season, and limited herring fishing in UCI to the waters of the Upper, Western, and Chinitna Bay Subdistricts. In the Upper Subdistrict, fishing for herring is not allowed closer than 600 feet of the mean high tide mark on the Kenai Peninsula to reduce the interception of salmon. The management plan was amended by the BOF prior to the 2002 fishing season, extending the closing date for the fishery an additional 11 days to May 31.

In 2001, samples of herring were collected in Chinitna and Tuxedni bays. Age, sex, and size distribution of the samples revealed that the years of closed fishing in these areas had resulted in an increase of younger fish being recruited into the population. As a result of these analyses, and in accordance with the herring recovery management plan, the commercial fishery was reopened in 2002 in both the Chinitna Bay and Western Subdistricts. The management plan allowed for a very conservative harvest quota, not to exceed 40 and 50 tons, respectively. There has been very little participation in either fishery since they were reopened.

The herring management plan was again modified by the BOF at their 2005 UCI meeting. The Kalgin Island Subdistrict was included in legal waters and fishing periods in the Upper Subdistrict were expanded to 108 hours per week, or from Mondays at 6:00 a.m. until Fridays at 6:00 p.m. The season was open in all areas from April 20 to May 31. Additionally, the mesh size for herring gillnets was modified to no smaller than 2.0 inches or no greater than 2.5 inches.

Because the glacial waters of UCI preclude the use of aerial surveys to estimate the biomass of herring stocks, management of these fisheries has departed from the standard techniques employed in the more traditional herring fisheries. Gillnets are the only legal gear for herring in UCI, with set gillnets being used almost exclusively. This gear type is significantly less efficient at capturing herring than purse seines. Moreover, conservative guideline harvest levels have been set, which provide for a low-level commercial fishery on these stocks. In the Upper Subdistrict, harvests are generally concentrated in the Clam Gulch area, with very little or no participation in either the Western Subdistrict (Tuxedni Bay), Chinitna Bay, or Kalgin Island Subdistricts.

SMELT

Prior to adoption of 5 AAC 39.212 Forage Fish Management Plan, the entire UCI area was open to eulachon (smelt) fishing from October 1 to June 1 (Shields 2005). The only documented commercial harvest of eulachon occurred in 1978, 1980, 1998, and 1999, with catches of 300, 4,000, 18,900, and 100,000 pounds, respectively. Prior to 1998, there was some confusion regarding legal gear for harvesting eulachon. Fishermen were mistakenly advised that gillnets were the only legal gear. Because primary markets required undamaged fish for bait or marine mammal food, this harvest method was unacceptable. In 1998, when the interpretation of the regulation was reviewed, allowing for the use of dip nets, harvests increased to 19,000 pounds, and in 1999, the last year of the fishery, 100,000 pounds were harvested, which was the fishery harvest limit at the time. All harvests occurred in salt water near the Susitna River. While no quantitative assessment of the Susitna River smelt stocks has been conducted, they would undoubtedly be measured in thousands of tons, perhaps even tens of thousands of tons.

At the 1998 BOF meeting, the commercial eulachon fishery was closed, but the regulation did not take effect until after the 1999 season. In 2000, as part of its draft Forage Fish Management Plan, ADF&G recommended that smelt fishing be restricted to the General Subdistrict of the Northern District. Legal gear would be dip nets only, which had the benefit of eliminating non-target species harvest. The area open to fishing was designed to target Susitna River smelt stocks. In this draft policy, ADF&G recommended that active forage fish fisheries be allowed to take place in a tightly controlled and closely monitored manner through the use of an ADF&G Commissioner's Permit, while not allowing any "new" fisheries to begin. The intent was to allow the active low-level fisheries to continue, but prevent them from growing without limit. The harvest in this fishery would be maintained at a low level. When the BOF adopted the current Forage Fish Management Plan, however, they chose to close the entire commercial smelt fishery. But at the 2005 BOF meetings, proposals were submitted to reopen the commercial fishery for eulachon, which the BOF authorized beginning with the 2005 season. The fishery is conducted under 5 AAC 21.505 Cook Inlet Smelt Fishery Management Plan (Appendix C1). This fishery is allowed in salt water only, from May 1 to June 30, specifically in that area of Cook Inlet from the Chuit River to the Little Susitna River. Legal gear for the fishery is limited to a hand-operated dip net as defined in 5 AAC 39.105. The total harvest is not to exceed 100 tons of smelt. Any salmon caught during the fishery are to be immediately returned to the water unharmed. To participate in this fishery, a miscellaneous finfish permit is required, as well as a commissioner's permit, which can be obtained from the ADF&G office in Soldotna.

RAZOR CLAMS

The commercial harvest of razor clams from UCI beaches dates back to 1919 (Appendix A9). Harvest levels have fluctuated from no fishery for as many as 8 consecutive years to production in excess of half a million pounds (live weight) in 1922. The sporadic nature of the fishery was more a function of limited market opportunities rather than limited availability of the resource. Razor clams are present in many areas of Cook Inlet, with particularly dense concentrations occurring near Polly Creek on the western shore and from Clam Gulch to Ninilchik on the eastern shore (Nickerson 1975). The eastern shoreline has been set aside for sport harvest exclusively since 1959 and all commercial harvests since that time have come from the west shore, principally from the Polly Creek and Crescent River sandbar areas. A large portion of the Polly Creek beach is approved for the harvest of clams for the human food market. Within this approved area, a limit of 10% shell breakage is allowed for sale as bait clams. No overall harvest limits are in place for any area in regulation; however, ADF&G manages the commercial razor clam fishery to achieve a harvest of no more than 350,000 to 400,000 pounds (in the shell) annually. Virtually all of the commercial harvest has come by hand digging, although regulations prior to 1990 allowed the use of mechanical harvesters (dredges) south of Spring Point, or within a 1-mile section of the Polly Creek beach. Numerous attempts to develop feasible dredging operations were largely unsuccessful due to excessive shell breakage or the limited availability of clams in the area open to this gear. Currently, the use of mechanical harvesters is not permitted in any area of Cook Inlet.

2007 COMMERCIAL SALMON FISHERY

The 2007 UCI commercial harvest (Appendix A6) of 3.7 million salmon was very near the 1966–2007 average annual harvest of 4.2 million fish, with 23 years experiencing greater harvests and 18 years with harvests less than that realized in 2007. However, this year's harvest of 3.3 million sockeye salmon was slightly greater than the 1966–2006 average annual harvest of 2.9 million fish, with 26 years below this amount and 15 years greater than the 2007 harvest. The 2007 estimated exvessel value of $23.4 million represents the 2nd highest value in the past 10 years and 16th highest since 1966 (Appendix A7). The average price per pound paid for UCI salmon has slowly been increasing over the past few years (Appendix A11), although determining an average annual price is becoming increasingly more difficult to estimate. This is because more fishermen are marketing their own catch rather than selling their entire harvest to area processors. Moreover, in 2007, early season sockeye salmon harvests garnered higher prices than later in the season. Nevertheless, based on the various prices that processors and catcher/sellers reported during the season, the estimated average price of $1.05/lb for sockeye salmon was the second highest price paid since 1999.

Only 2 of the 6 sockeye salmon monitored systems in UCI (Westerman and Willette 2007) had escapements that fell within established goal ranges in 2007 (Table 1; Appendix A10). At the 2005 UCI BOF meeting, 2 sockeye salmon escapement goal ranges were modified. The Crescent River goal was changed from a range of 25,000 to 50,000 to 30,000 to 70,000 fish, while the Yentna River goal was modified from 90,000 to 160,000 to an Optimal Escapement Goal (OEG) of 75,000 to 180,000 fish, but only for years when the total run of sockeye salmon to the Kenai River exceeds 4 million. For Kenai River runs less than 4 million, the goal remains 90,000 to 160,000.

UCI commercial catch statistics refined to gear type, area, and date are available back to 1966. Currently, all commercially harvested salmon, whether sold or kept for personal use, are recorded on fish tickets and entered into the statewide fish ticket database. The 2007 commercial catch by species, gear type, area, and date can be found in Tables 14 through 18. Total harvest by statistical area and average catch per permit are reported in Tables 19 and 20. A summary of emergency orders issued in 2007 can be found in Table 21 while a summary of fishing periods by gear type and area is summarized in Table 22.

Table 1.–Upper Cook Inlet sockeye salmon goals and escapement, 2007.

		Goal Range		
System	Goal Type	Lower	Upper	2007 Escapement
Crescent River	BEG	30,000	70,000	79,406
Fish Creek	SEG	20,000	70,000	27,948
Kasilof River	OEG	150,000	300,000	336,866
Kenai River	Inriver	750,000	950,000	867,572
Yentna River	OEG	75,000	180,000	79,901
Packers Creek	SEG	15,000	30,000	46,637

Note: Escapement estimates do not account for any harvest above counting sites. BEG = biological escapement goal; SEG=sustainable escapement goal; OEG=optimal escapement goal.

CHINOOK SALMON

The 2007 UCI harvest of 17,625 Chinook salmon was approximately 12% greater than the recent 10-year average annual harvest, and 11% more than the average annual harvest during the previous 10-year period (Table 14; Appendices A1 and A6). The two fisheries where Chinook salmon are harvested in appreciable numbers occur in the set gillnet fisheries in the Northern District and in the Upper Subdistrict of the Central District.

Created by the BOF in 1986 and most recently modified in 2005, the Northern District King Salmon Management Plan (5 AAC 21.366) provides direction to ADF&G regarding management of the Northern District of UCI for the commercial harvest of Chinook (king) salmon with set gillnets. The fishing season opens on the first Monday on or after May 25 and then again on the following two consecutive Mondays. However, the most productive waters for harvesting Chinook salmon, which occur from 1 mile south of the Theodore River to the mouth of the Susitna River, are open to fishing for the second regular Monday period only. Prior to the 2005 season, fishing periods were 6 hours long, from 7:00 a.m. to 1:00 p.m. each Monday (Shields and Fox 2005). At the 2005 BOF meetings, however, fishing periods were expanded to 12 hours per day, or from 7:00 a.m. to 7:00 p.m. Each permit holder is allowed to fish only one 35-fathom set gillnet with a minimum separation of 1,200 feet between nets, which is twice the normal separation between gear. The commercial fishery is also limited to a harvest not to exceed 12,500 Chinook salmon.

In 2007, approximately 62 commercial permit holders participated in the early season Northern District Chinook salmon fishery, with an estimated harvest of 3,132 fish (Tables 2 and 14). This was the third largest harvest since 1993, which is the year when set gillnet fishermen were required to register which area they intended to fish for the entire year (Northern District, Upper Subdistrict, or Greater Cook Inlet) prior to the fishing season, which eliminated a common practice of fishing in multiple areas in UCI in the same year. The relatively small harvests from this fishery, which seem not to be strongly correlated with Northern District Chinook salmon run strength, can partly be attributed to (1) poor runs during the mid 1990s, and (2) allowing only one fishing period to occur in that area from 1 mile south of the Theodore River to the mouth of the Susitna River, and (3) limitations on gear. The doubling of the fishing time from 6 hours to 12 hours per period beginning in 2005 likely resulted in additional Chinook salmon being harvested, however, the current harvest levels remain significantly below the 12,500 cap placed on this fishery. The estimated Chinook salmon harvest for all of 2007 in the Northern District was 3,822 fish (Table 14; Appendix A1), which was approximately 17% greater than the average annual harvest from 1966–2006 and 60% more than the average annual harvest of approximately 2,400 during the previous 10 years. Nevertheless, the 2007 Northern District Chinook salmon harvest was 70% under the cap.

Table 2.–Upper Cook Inlet Northern District early season Chinook salmon fishery, 1986–2007.

Year	Chinook	Permits
1986	13,771	135
1987	11,541	129
1988	11,122	142
1989	11,068	137
1990	8,072	130
1991	6,305	140
1992	3,918	137
1993	3,072	80
1994	3,014	73
1995	3,837	65
1996	1,690	45
1997	894	51
1998	2,240	56
1999	2,259	51
2000	2,046	47
2001	1,616	43
2002	1,747	36
2003	1,172	29
2004	1,819	44
2005	3,150	52
2006	3,887	59
2007	3,132	62

In 2007, approximately 70% of UCI's Chinook salmon commercial harvest occurred in the Upper Subdistrict set gillnet fishery (Appendix A1). The estimated catch of 12,000 fish was approximately 20% greater than the average annual harvest of 10,200 fish from 1966–2006, yet only 8% above the previous 10-year (1997–2006) average annual harvest of 11,360 fish. The 2007 sonar estimate of late-run Chinook salmon passage in the Kenai River was 42,979, the 10th highest since 1987 (T. Eskelin, Sport Fish Biologist, ADF&G, Soldotna; personal communication November 8, 2007). Estimates of passage do not include harvests and mortalities that occur inriver, which are subtracted from the sonar estimates to determine if the Biological Escapement Goal (BEG) for this system was achieved. The current BEG for Kenai River late-run Chinook salmon is 17,800 to 35,700. The BEG for this stock has changed over the years, but since 1987, the escapement goal has been achieved 18 times, been exceeded two times, and has never been missed under the current lower end of the range.

The 2007 exvessel value for Chinook salmon in UCI was estimated at $630,000 which represented approximately 2.7% of the total exvessel value for all salmon (Appendix A7).

SOCKEYE SALMON

Management of the UCI sockeye salmon fishery integrates information received from a variety of programs, which together provide an inseason model of the actual return. These programs include offshore test fishing (OTF), escapement enumeration by sonar and weir, comparative analysis of historic commercial harvest and effort levels, and age composition studies. Beginning in 2005, genetic samples were collected from catch and escapement samples, with the expectation that newer methods of analysis would provide improved resolution of the stock composition of the commercial harvest. These analyses are currently ongoing, with a preliminary report expected to be published prior to the 2008 UCI BOF meeting (Habicht et al. 2007).

The OTF program employs a chartered gillnet vessel fishing 6 fixed stations along a transect crossing Cook Inlet from Anchor Point to the Red River delta (Shields and Willette 2007). The program provides an inseason estimate of sockeye salmon run-strength by determining the passage rate, which is an estimate of the number of sockeye salmon that enter the district per index point (catch per unit of effort or CPUE). The cumulative CPUE curve is then compared to historic run-timing profiles so that an estimate can be made of the final CPUE, which in turn provides for an inseason estimate of the total run to UCI. In 2007, the program was conducted aboard the F/V *Americanus,* captained by Roland Maw. The timing of the 2007 sockeye salmon run was estimated to be 4-days late relative to the July 15 midpoint measured at the OTF Anchor Point transect line (Table 12). This marked the third year in a row that the sockeye salmon run was much later than average.

Hydroacoustic technology is used to quantify sockeye salmon escapement into glacial rivers and was first employed in UCI in the Kenai and Kasilof Rivers in 1968 and expanded to the Susitna River in 1978 and the Crescent River in 1979 (Westerman and Willette 2007). Operations followed standard procedures in all systems in 2007. An adult salmon weir was operated by ADF&G, Division of Sport Fish, at Fish Creek (Knik Arm) and provided daily escapement counts for this system. A counting weir was also operational at the outlet of Packers Lake from 1988–2000 (Appendix A10). Cook Inlet Aquaculture Association (CIAA) terminated the project after 2000 since they no longer were stocking the lake with sockeye salmon fry. In 2005 and 2006, ADF&G placed a remote video camera system at the outlet of Packers Lake to estimate the adult sockeye salmon escapement into the lake; unfortunately, in 2006 an electronic malfunction did not allow for a complete census of the escapement. In 2007, CIAA again operated a counting weir at Packers Creek.

In 2006, ADF&G and CIAA began a 3-year comprehensive sockeye salmon mark–recapture study in the Susitna River drainage. ADF&G also began a similar study in the Kenai River. These projects continued in 2007, albeit with some modifications. In 2007, fish wheels were used to capture sockeye salmon at Sunshine Station in the Susitna River and at the Yentna River sockeye salmon sonar site. Radiotelemetry tags were affixed to a portion of the escapement and then were subsequently tracked via aircraft and detected as they swam through various weir sites located in tributaries to both the Susitna and Yentna River drainages. CIAA operated weirs at 7 lakes in 2007; on the Yentna River drainage, they included Judd Lake, Chelatna Lake, Shell

Lake, and Swan Lake; in the Susitna River drainage weirs were located at Larson Lake, Byers Lake, Stephan Lake (http://www.ciaanet.org). In the Kenai River, sockeye salmon were captured and tagged with radio telemetry tags at the Commercial Fisheries Division's sockeye salmon sonar site (river mile 19). Numerous fixed receivers were placed upstream of the tagging site as well as at two weir sites: Russian River weir operated by Division of Sport Fish and at Hidden Creek, which was operated by CIAA. Preliminary population estimated from both mark–recapture studies are expected to be published prior to the Upper Cook Inlet BOF meetings in February of 2008.

UCI sockeye salmon escapement estimates from 6 actively monitored drainages can be found in Table 13, while Appendix A10 provides historical escapement data for these systems.

Inseason analyses of the age composition of sockeye salmon escaping the principle watersheds of UCI provides necessary information for estimating the stock contribution in various commercial fisheries by comparing age and size data in the escapement with that in the commercial harvest. During the 2007 fishery, approximately 39,000 sockeye salmon were examined from catch and escapement samples (T. Tobias, Commercial Fisheries Technician, ADF&G, Soldotna; personal communication November 19, 2007). The age composition of adult sockeye salmon returning to monitored systems is provided in Table 23.

The UCI preseason forecast for 2007 projected a total run of 4.9 million sockeye salmon (Table 3). At the time this report was published, harvest data from 2007 sport fisheries were not available; therefore, sport fishery harvests were estimated. The 2007 total sockeye salmon run was estimated at 5.2 million fish, which was only 5% above the preseason projection. Approximately 1.5 million fish were required for escapement objectives, which left an estimated projection of 3.3 million sockeye salmon available for harvest to all users in 2007. Assuming that sport and personal use harvests would be similar in proportion to that observed in 2006, the commercial catch in 2007 was projected to be approximately 2.9 million fish; the actual harvest was approximately 3.3 million fish (Table 15; Appendix A2), or 14% above preseason expectations. Drifters harvested approximately 55% of the total, or 1.82 million fish, while set gillnetters caught 45% of the total, or 1.49 million fish.

Table 3.–Upper Cook Inlet 2007 sockeye salmon forecast and return.

System	Forecast	Actual	Difference
Crescent River	109,000	135,434	24%
Fish Creek	37,000	48,764	32%
Kasilof River	1,247,000	1,071,935	-14%
Kenai River	2,411,000	3,120,843	29%
Susitna River	487,000	321,053	-34%
Minor Systems	644,000	492,869	-23%
All Systems	4,935,000	5,190,898	5%

Estimating the average price paid per pound for UCI salmon has become more difficult than in past years, as an increasing number of fishermen are marketing their own product. This is especially true for Chinook, sockeye and coho salmon, where selling to individual niche markets can often provide a much better price. Moreover, in 2007 there was a mid-season drop in sockeye salmon pricing, followed by an increase a short time period later, but not back to the first part of the season. By late season pricing had stabilized somewhere in the $0.95 to $1.10/lb range for sockeye salmon, down from the $1.20 paid during the first few weeks of the year. The estimated average price paid per pound for all salmon during the 2007 season can be found in Appendix A11. Based on these estimates, the total 2007 UCI exvessel value of $23.4 million was approximately 38% greater than the previous 10-year average annual value of $16.9 million (Appendix A7). For sockeye salmon, the 2007 estimated exvessel value of $21.9 million represented 94% of the total exvessel value for all salmon, and was also approximately 38% more than the previous 10-year average annual value of $15.9 million.

Table 30 summarizes sockeye salmon harvests from all sources in UCI since 1996. In 2007, the estimated harvest from commercial, sport, personal use, and subsistence/educational fisheries was 3.8 million fish, which was very close to the average annual harvest of 3.6 million fish during this 12-year time period. It should be noted that the sport harvest of approximately 239,000 fish is an estimate based on the size of the run and previous year's sport harvest. The state-wide harvest survey that details annual sport harvest of all salmon will not be final until later in 2008 for the 2007 season. For more details on the specifics of personal use harvests, including demographics, see Reimer and Sigurdsson (2004).

The first commercial sockeye salmon fishery to open in UCI in 2007 was the Big River fishery, which is managed under the Big River Sockeye Salmon Management Plan (5 AAC 21.368). This plan, which was adopted in 1989, allows for a small set gillnet fishery in the northwest corner of the Central District beginning on June 1. At the 2005 BOF meetings the plan was modified, expanding the area open to fishing to include the waters along the west side of Kalgin Island. Between June 1 and June 24, fishing is allowed each Monday, Wednesday, and Friday from 7:00 a.m. to 7:00 p.m. Permit holders are limited to a single 35-fathom gillnet and the minimum distance between nets is 1,800 feet, which is three times the normal separation of gear. Targeting an early run of sockeye salmon returning to Big River, this fishery also encounters Chinook salmon migrating through the area. The management plan limits the harvest of Chinook salmon to no more than 1,000 fish per year. In recent years, harvests have been well below that level. The 2007 fishery began on Friday, June 1 and yielded a total catch of approximately 15,000 sockeye salmon and 312 Chinook salmon (Tables 14 and 15). Of the total harvest, 86% of both sockeye and Chinook salmon were caught in the Kalgin Island west-side waters, which is statistical area 246-10 (Figure 3). Twenty-three permit holders reported participating in the fishery, which was up from recent years, but less than the peak level of effort of 33 permit holders.

The next commercial fishery to open in 2007 was the set gillnet fishery in the Western Subdistrict of the Central District. Harvesting sockeye salmon bound primarily for the Crescent River, this fishery opens on the first Monday or Thursday on or after June 16^{th}. The regular fishing schedule consists of two 12-hour weekly fishing periods throughout the season, unless modified by emergency order. Commercial harvest data and escapement levels estimated by sonar in the Crescent River indicated early in the 2007 season that the lower end of the escapement goal would be met and continuous fishing (24 hours/day) was allowed in the set gillnet fishery in the Western Subdistrict south of Redoubt Point from June 30 through August 9 (Table 21). The harvest from this area was approximately 46,000 sockeye salmon (Table 15); however because relatively few permit holders participated in the fishery, even with all the extra fishing time, the upper end of the Crescent River sockeye salmon BEG was exceeded for the 9^{th} straight year. The final escapement into Crescent Lake was estimated at 79,400 fish, which was approximately 9,000 fish beyond the upper end of the BEG (Appendix A10).

In 2005, the BOF made substantial changes to the management plans that regulate the Upper Subdistrict set gillnet and the Central District drift gillnet fisheries. Since 2002, the early part of the drift and set gillnet season had been managed under the Kasilof River Salmon Management Plan (KRSMP) (5AAC 21.365). To provide clarity in what can often be a confusing management scenario, the BOF established a new management plan in 2005 for the drift gillnet fishery, namely the Central District Drift Gillnet Fishery Management Plan (CDDGFMP) (5 AAC 21.353). In both the KRSMP and CDDGFMP, the BOF provided for earlier opening dates, largely in response to strong Kasilof River sockeye salmon runs. Under the new plans, the drift gillnet fishery opened on the third Monday in June, or June 19, whichever was later, and the set gillnet fishery in the Kasilof Section of the Upper Subdistrict opened on June 25, unless ADF&G had estimated that 50,000 sockeye salmon were in the Kasilof River before June 25, at which time the fishery could be opened immediately by emergency order, but not before June 20 (5 AAC 21.310 (b)(2)(C)(i)).

Management of the set gillnet fishery in the Upper Subdistrict is primarily guided by the KRSMP and the Kenai River Late-Run Sockeye Salmon Management Plan (KRLSSMP) (5 AAC 21.360). Within these plans, there are two principal restrictions to the set gillnet fisheries that must be met: (1) a limit on the number of additional hours that may be fished each week beyond the two regular 12-hour fishing periods, and (2) implementation of closed fishing times (windows) each week. By regulation, a week is defined as a period of time beginning at 12:00:01 a.m. Sunday and ending at 12:00 midnight the following Saturday (5 AAC 21.360 (i)). The weekly limitations vary according to the time of year and the size of the sockeye salmon run returning to the Kenai River. In the Upper Cook Inlet Salmon Management Plan (5 AAC 21.363 (e)), the BOF clarified that it was their intent, that while in most circumstances ADF&G will adhere to the management plans, nothing in the management plans was intended to override the commissioner's emergency order authority under AS 16.05.060 should significant new information arise that, in the commissioner's judgment, warrants departure from the provisions in the management plans. Determining whether or not to override a management plan, as warranted by "new" information, however, is always problematic in the fully allocated UCI fishery.

From June 25 through July 7 the KRSMP states that the set gillnet fishery in the Kasilof Section is to be limited to no more than 48-hours of additional fishing time per week, and must also be closed for at least 48 consecutive hours per week. Beginning July 8, the Kasilof Section is to be managed in combination with the Kenai and East Forelands Sections per the KRLSSMP. Until an assessment of the Kenai River sockeye salmon run strength can be made, which is traditionally on or after July 20, the Upper Subdistrict set gillnet fishery is to be managed based on the size of the Kenai River run that was projected in the preseason forecast. In essence, there are three basic options available for the management of this fishery. First, if the Kenai River sockeye salmon run is projected to be less than 2 million fish, there may be no more than 24-hours of additional fishing time per week in the Upper Subdistrict set gillnet fishery. If the Kenai and East Forelands Sections are not open during regular or additional fishing periods, ADF&G may limit fishing in the Kasilof Section to an area within ½ mile of the shoreline. There are no mandatory window closures on Kenai River sockeye salmon runs of less than 2 million fish. For runs of this strength, if ADF&G projects that the Kasilof River optimum escapement goal of 300,000 may be exceeded, an additional 24 hours of fishing time per week may be allowed within ½ mile of the shoreline in the Kasilof Section after July 15.

The second management option is for Kenai River runs of between 2 and 4 million sockeye salmon. In this scenario, the Upper Subdistrict set gillnet fishery will fish regular weekly fishing periods, with no more than 51 additional fishing hours allowed per management week. In addition, the fishery will be closed for one continuous 36-hour period per week, beginning between 7:00 p.m. Thursday and 7:00 a.m. Friday, and for an additional 24-hour period during the same management week.

Finally, for Kenai River sockeye salmon runs exceeding 4 million fish, ADF&G may allow up to 84-hours of additional fishing time per week in addition to regular fishing periods, but the fishery will also be closed for one continuous 36-hour period per week beginning between 7:00 p.m. Thursday and 7:00 a.m. Friday.

According to the KRLSSMP, ADF&G is to manage Kenai River late-run sockeye salmon stocks primarily for commercial uses based on abundance. Commercial, sport, and personal use fisheries are to be managed to meet an Optimum Escapement Goal (OEG) range of 500,000 to 1,000,000 late-run sockeye salmon, which is accomplished by achieving inriver goals that are distributed evenly within the OEG range in proportion to the size of the run. For runs less than 2.0 million fish, the inriver goal range was changed in 2005 from 600,000–850,000 fish to 650,000–850,000 fish; at run strengths between 2 and 4 million fish, the goal is 750,000 to 950,000; and for Kenai River runs greater than 4 million, the inriver goal is 850,000 to 1,100,000 sockeye.

With that brief history, a description of the 2007 Upper Subdistrict set gillnet fishery and Central District drift gillnet fishery will be summarized by actions taken each management week, including estimates of commercial harvest and effects on sockeye salmon passage into the Kenai and Kasilof Rivers.

The regular season for drift gillnetting began on Thursday, June 21, as provided for in the CDDGFMP. The estimated harvest of 3,800 sockeye salmon from 69 boats (Table 15) was pretty typical for early season drift catches, which generally range from 50 to 100 fish per boat. As of midnight on Saturday, June 23, the estimated sockeye salmon passage into the Kasilof River had reached only 27,000 fish (Table 13), so there was no set gillnetting during the first management week of June 17 to June 23. The Kasilof River sonar project began operating on June 15, while the Kenai River sonar project did not begin estimating sockeye salmon passage until July 1.

The Kasilof Section first opened to set gillnetting on Monday, June 25, while drift gillnetters fished their second regular scheduled inlet wide period. Because the estimated sockeye salmon escapement at the Kasilof River sonar site was only 29,000 fish as of midnight on June 24, an earlier opening for set gillnetting, triggered by a 50,000 fish escapement before June 25, did not take place. The setnet harvest on June 25 was approximately 8,400 sockeye salmon, while 102 drift boats harvested 5,800 fish. The next commercial opening did not occur until the regular period on Thursday, June 28 at 7:00 a.m., thus fulfilling the 48-hour set gillnet no fishing window required by the KRSMP. Emergency Order No. 2 (Table 21) extended set gillnetting in the Kasilof Section from 7:00 p.m. on Thursday, June 28, until 7:00 p.m. on Saturday, June 30, which in effect utilized all the additional fishing hours allowed for in the management plan. Drift gillnetting was also opened in the Kasilof Section (corridor fishing) from 7:00 p.m. until 12:00 midnight on June 28, from 5:00 a.m. until 12:00 midnight on June 29, and from 5:00 a.m. until 7:00 p.m. on June 30. The estimated harvest in the set gillnet fishery from these 3 days of fishing was 55,000 fish. Drifters harvested approximately 16,000 sockeye salmon from 158 boats on June 28, while only 13 boats fished the Kasilof corridor on June 29, harvesting 230 fish, and 9 boats fished the corridor on June 30 harvesting another 800 fish. The estimated set gillnet sockeye salmon harvest during the management week of June 24 to June 30 was 63,000 fish, with an additional 23,000 fish coming from the drift gillnet fishery. The estimated Chinook salmon harvest in the Kasilof Section set gillnet fishery through June 30 was 777 (Table 14). Sockeye salmon passage in the Kasilof River as of June 30 had reached 41,000 fish, which was the lowest cumulative passage through that time period since 1995.

The management week of July 1–7 started with no commercial fishing on Sunday, July 1. Drifters fished inlet wide on Monday, July 2 while set gillnetting was open in the Kasilof Section. Emergency Order No. 4 extended both groups from 7:00 p.m. until 10:00 p.m. on July 2, with drifters being confined to the Kasilof corridor for the extension. Emergency Order No. 5 opened set gillnetting in the Kasilof Section from 1:00 p.m. on Wednesday, July 4, until 7:00 a.m. on Thursday, July 5. Drift gillnetting was open in the Kasilof corridor from 1:00 p.m. until 12:00 midnight on July 4, and from 5:00 until 7:00 a.m. on July 5. Both gear types fished the regular period on Thursday, July 5, with Emergency Order No. 6 extending the fishing period from 7:00 p.m. until 11:00 p.m., with drifters once again confined to the Kasilof corridor during the extension. The weekly 48-hour no fishing window for set gillnetters was met by not fishing from 11:00 p.m. on July 5 through midnight on Saturday, July 7. Estimated harvests for the week were 52,000 sockeye salmon and 515 Chinook salmon in the Kasilof Section set gillnet fishery and 86,000 sockeye salmon in the drift gillnet fishery. On Thursday, July 5, 286 boats harvested 63,000 sockeye salmon, or 220 fish/boat. The cumulative sockeye salmon passage in the Kasilof River had reached only 59,000 fish through July 7, which represented the lowest estimated passage through that date since 1990. The Kenai River sonar project began on July 1 with a total passage estimate of 26,000 through July 7.

Prior to the 2007 commercial fishing season, and again early in this management week, Divisions of Sport and Commercial Fisheries area, regional, and headquarters staff met to discuss management options for the season. During these meetings the commissioner provided commercial fisheries management staff with the authority to fish the Kasilof Section set gillnet fishery during the closed window periods through July 7. The rationale for this decision was to avoid a large escapement event during a window period, which could jeopardize achieving the escapement goal for this system (the Kasilof River escapement goal had been exceeded in 9 of the previous 10 years; see Appendix A10). When the option to fish during the window period was made available, the necessity to fish very aggressively outside of the window periods was negated. Therefore, only 25 of the 48 hours of emergency order time allowed for in the management plan was used during the week. Typically all of the emergency order hours available in the plans have been used because of the uncertainty of how many fish might escape during a no-fishing window period.

According to the KRSMP, beginning on July 8 the set gillnet fishery in the Kasilof Section shall be managed as specified in the KRLSSMP. So, for the management week of July 8–14, the Kenai, Kasilof, and East Forelands Sections (Upper Subdistrict) fell under management of the KRLSSMP, except for provisions in the KRSMP that were specific to the Kasilof Section. The preseason forecast for the Kenai River was for a total sockeye salmon return of between 2 and 4 million fish (Appendix B1). For runs of that size, the KRLSSMP required two no-fishing windows to be implemented in the Upper Subdistrict set gillnet fishery each management week. One window was discretionary as to when it could be implemented and was to be 24-hours in duration, while the second window was to be 36 hours long and was "prescriptive," i.e., it was to begin some time between 7:00 p.m. on Thursdays and 7:00 a.m. on Fridays.

The management week of July 8–14 began like the previous week, that is, no commercial fishing took place on Sunday. The Kenai and East Forelands Sections set gillnet fisheries were open for their first period of the year on Monday, July 9 (by management plan). The CDDGFMP directed ADF&G to restrict drift gillnetting for two regular periods between July 9–15 to the Kenai and Kasilof Sections (full corridor) and drift Area 1, which is that portion of the Central District south of the south tip of Kalgin Island (Figure 4). In 2007, these fishing area restrictions occurred on July 9 and July 12 and were designed to reduce the exploitation on Susitna River sockeye salmon. From 7:00 p.m. on Monday, July 9, until 8:00 a.m. on Wednesday, July 11, the Upper Subdistrict set gillnet fishery did not fish, which fulfilled the 24-hour no fishing window. Emergency Order No. 7 opened set and drift gillnetting in the Kasilof Section only on Wednesday, July 11, from 8:00 a.m. until 9:00 p.m. Only the Kasilof Section was fished in order to reduce the harvest of Kenai River sockeye salmon, which had a passage estimate of just 47,000 fish through July 10. The regular period was fished on Thursday, July 12, with drifters being confined to Drift Area 1. Emergency Order No. 8 once again opened set and drift gillnetting in the Kasilof Section only from 7:00 a.m. until 7:00 p.m. on Saturday, July 14. The 36-hour prescriptive set gillnet no-fishing window was met by not fishing from 7:00 p.m. on July 12 until 7:00 a.m. on July 14. Early in the week, staff had met to assess the sockeye salmon run to date. During this meeting the commissioner again consented to opening the set gillnet fishery during either or both of the mandatory no-fishing window periods, but again only to avoid a large escapement event in either the Kenai or Kasilof Rivers during the window period. This management option again freed staff to not have to fish aggressively outside the window periods, resulting in only 25 of the 51 hours of emergency order time allowed for in the management plan to be used during the week. For the week, the drift gillnet fishery harvested approximately 306,000 sockeye salmon, with only 11,000 of that coming from corridor fishing. For the season, drifters had now harvested 419,000 fish. Upper Subdistrict set gillnetters harvested 148,000 sockeye salmon and 1,940 Chinook salmon, bringing the season totals for these species to 264,000 and 3,200, respectively. Sockeye salmon passage rate estimates in the Kasilof River had now reached 90,000 fish through July 14, while Kenai River passage estimates were at 63,000 fish.

The week of July 15–21 started off with Emergency Order No. 9, which restricted the regular scheduled inlet-wide drift gillnet fishing period on Monday, July 16, to the Kenai & Kasilof Sections (corridor) and that area of the Central District south of the south end of Kalgin Island (drift area 1). This action was taken to conserve Susitna River sockeye salmon, as passage at the Yentna River sonar site was estimated at only 372 fish through July 15. Both set (Upper Subdistrict) and drift gillnetting (Kenai/Kasilof corridor) were extended from 7:00 p.m. until 10:00 p.m. on July 16, via Emergency Order No. 10. No commercial fishing took place on July 17. Emergency Order No. 11 opened set gillnetting in the Kasilof Section, but limited open waters to within ½ mile of shore, on Wednesday, July 18, from 11:00 a.m. until 11:00 p.m. The KRSMP states that beginning July 8, if the set gillnet fishery in the Kenai and East Forelands Sections are not open for the fishing period, that fishing in the Kasilof Section may be limited to the waters within ½ mile of shore. Because sockeye salmon passage in the Kenai River had reached only 83,000 by July 17, harvest of Kenai River sockeye salmon stocks was significantly reduced by fishing the ½ mile fishery in the Kasilof Section. The regular period on Thursday, July 19, was limited to the same area as on July 16 for drift gillnetting, via Emergency Order No.

12. Again, this restriction was implemented to conserve Yentna River sockeye salmon, where passage estimates were still lagging. Set and drift gillnetting were both extended for 4 hours on July 19, via Emergency Order No. 13, with drifters confined to the Kenai/Kasilof corridor. Emergency Order No. 14 opened set gillnetting in the Kasilof Section on Friday, July 20, from 2:00 p.m. until 12:00 midnight, but again only in those waters within ½ mile of shore. The final management action during the week came via Emergency Order No. 15, opening set gillnetting in the Upper Subdistrict and drift gillnetting in the Kenai/Kasilof corridor on Saturday, July 21, from 11:00 a.m. until 12:00 midnight. For the week, Upper Subdistrict setnetters harvested approximately 419,000 sockeye salmon and 3,700 Chinook salmon, bringing the season totals for these two species to 682,000 and 6,900, respectively. Drift gillnetters had a very productive week, with two of the best average sockeye salmon catches per boat ever observed in UCI. For the two regular periods occurring on July 16 and July 19, which were both restricted to drift area 1 and the Kenai/Kasilof corridor, drifters averaged 1,263 fish per boat from 381 boats on the 16th and 1,139 fish per boat from 396 boats on the 19th. For the week, drifters harvested approximately 1.01 million sockeye salmon, bringing their season total to 1.43 million. Conditional authorization had once again been granted by the commissioner to fish the set gillnet fishery during the no-fishing windows. During the week, the 24-hour no-fishing window was met by not fishing setnetters from 10:00 p.m. on July 16 until 11:00 a.m. on July 18 (37 hours). The 36-hour prescriptive window was met in the Kenai and East Forelands Sections by not fishing from 11:00 p.m. on July 19 until 11:00 a.m. on July 21. However, the Kasilof Section ½ mile set gillnet fishery was open for 10 hours during the prescriptive window to slow down the escapement of Kasilof River sockeye salmon, which had reached 143,000 fish through July 19, with nearly 43,000 fish escaping on July 18–19. Of the 51 hours of emergency order authority allowed in the management plan, 41 were used during the week, with 21 of those hours being used in the Kasilof Section ½ mile fishery. Passage rate estimates through July 21 had reached 182,000 in the Kenai River and 175,000 in the Kasilof River, but only 7,300 in the Yentna River.

The week of July 22–28 began with Upper Subdistrict set gillnetters fishing from 3:00 p.m. on Sunday, July 22, until 7:00 a.m. on Monday, July 23, as provided in Emergency Order No.'s 16 and 18. Drift gillnetting was also opened in the full corridor from 3:00 p.m. until 11:00 p.m. on July 22 and from 5:00 a.m. until 7:00 a.m. on July 23. Emergency Order No. 17 restricted the drift gillnet regular fishing period on July 23 to the full corridor and that area of the Central District south of the latitude of the Blanchard Line. In addition, this announcement also reduced legal gear in the Northern District set gillnet fishery to no more than one 35-fathom net per permit. These actions were taken to conserve Yentna River sockeye salmon, which were still lagging behind levels that would ensure the minimum sockeye salmon escapement goal would be achieved. No commercial fishing took place on Tuesday, July 24, in order to meet the 24-hour no fishing window in the set gillnet fishery. Emergency Order No. 19 opened set gillnetting in the Kasilof Section, but only within ½ mile of shore, on Wednesday, July 25, from 10:00 a.m. to 6:00 p.m. Like previous ½ mile fishing, this action was taken to target harvest as much as possible on Kasilof River stocks. Emergency Order No. 20 once again restricted the regular drift gillnet fishing period on July 26 to the full corridor and that area south of the latitude of the Blanchard Line. The order also closed the entire Northern District to commercial salmon fishing, with both actions taken to conserve Susitna/Yentna River sockeye salmon. The CDDGFMP states that for Kenai River sockeye salmon runs of 2 to 4 million fish that two of the regular 12-hour fishing periods that occur between July 16 and July 31 should be restricted to the Kenai and Kasilof Sections (full corridor) and Drift Gillnet Areas 1 and 2 (Figure 4). The two drift gillnet restrictions taken during the week fulfilled the management plan mandate, as they were even more restrictive than required in the plan. On July 27, the Kasilof Section ½ mile fishery was opened to set gillnetting from 8:00 a.m. until 8:00 p.m., via Emergency Order No. 21. Furthermore, this order also opened the KRSHA to set and drift gillnetting, with setnetting being opened from 8:00 a.m. until further notice and drift gillnetting opened from 8:00 a.m. until 11:00 p.m. on July 27. This was the first time the KRSHA was used in 2007. Emergency Order No. 22 opened set gillnetting in the Upper Subdistrict from 9:00 a.m. until 12:00 midnight on Saturday, July 28, with drift gillnetting allowed in the full corridor from 9:00 a.m. until 11:00 p.m. This announcement also closed set gillnetting in the KRSHA at 8:00 a.m. on July 28. For the week, all 51 hours of emergency order authority provided in the management plan for the set gillnet fishery was used (time used in the KRSHA does not count toward this allotment). The 24-hour no-fishing window was implemented as was the 36-hour prescriptive window, but only in the Kenai and East Forelands Sections. In the Kasilof Section, 12 hours of ½ mile fishing was allowed during the 36-hour window in order to slow the escapement rate of Kasilof River sockeye salmon, which had reached 281,000 through July 28. The passage of sockeye salmon into the Kenai River was estimated at 485,000 fish through July 28, while the Yentna River sonar estimate stood at 41,000 fish. Setnetters harvested approximately 341,000 sockeye salmon during the week, for a season total of 1.0 million and 2,100 Chinook salmon for a season total of 9,000. Drifters caught approximately 211,000 sockeye salmon for a season total of 1.6 million.

The first formal inseason assessment of the timing and strength of the 2007 sockeye salmon run was made during the week of July 22–28. On July 25, UCI commercial fisheries staff estimated that the total UCI sockeye salmon run would likely range between 4.66 and 5.43 million fish. This estimate was made using OTF data to date and an assessment that the run would likely be 2–3 days late. Approximately 3.19 million sockeye salmon had returned to the inlet to date, indicating that 1.47 to 2.24 million fish remained in the run. The total Kenai River sockeye salmon run was estimated to range between 2.51 and 2.91 million fish. Because 1.77 million Kenai River sockeye salmon were already accounted for in the current run, this meant that 0.75 to 1.14 million fish remained in the run. This assessment of the 2007 run resulted in no change to management plan guidelines, as the Kenai River sockeye salmon run was projected to fall in the 2 to 4 million fish range. In reality, the 2007 UCI sockeye salmon run ended up being approximately 5.3 million fish, so this inseason assessment was quite accurate and very helpful to the management of the fishery.

The management week of July 29–August 4 was busy, with 9 announcements issued modifying commercial fishing times and areas. Emergency Order No. 23 opened the Kalgin Island Subdistrict to set gillnetting on Sunday, July 29, and moved the regular period in this area on July 30 to July 31. Announcement No. 24 opened the KRSHA to both set and drift gillnetting from 2:00 p.m. to 10:00 p.m. on July 29 in order to slow the escapement rate of Kasilof River sockeye salmon. Emergency Order No. 25 closed the Northern District to commercial fishing on Monday, July 30, and restricted drift gillnetting to that area of the Central District south of the latitude of the north end of Kalgin Island. Passage of sockeye salmon into the Yentna River was still not at a level where the escapement goal could be projected, so continued restrictions of commercial fishing on this stock were warranted. Emergency Order No. 26 extended set and drift gillnetting for 3 hours at the end of the regular period on July 30, with the drift extension confined to the full corridor. Set and drift gillnetting (full corridor) were opened from 10:00 a.m. until 11:00 p.m. on July 31, via Emergency Order No. 27 and from 5:00 a.m. until 12:00

midnight (11:00 p.m. for drift gillnet) on August 1, via Emergency Order No. 28. With Yentna River sockeye salmon passage estimated at less than 50,000 fish through August 1, the regular fishing period on Thursday, August 2, was closed in the Northern District, via Emergency Order No. 29. Drift gillnetting was also restricted in this announcement to that area south of a line from Collier's Dock to the northwest point on Kalgin Island to the western shore at 60° 31.25' N. Latitude. The regular period was extended from 7:00 to 11:00 p.m. per Emergency Order No. 30 for set and drift gillnetting (full corridor for drifting). The KRSHA was also opened in this order for both set and drift gillnetting from 8:00 a.m. until 8:00 p.m. on August 1, and again on Saturday, August 2, from 2:00 p.m. until 10:00 p.m., via Emergency Order No. 31. Passage of sockeye salmon in the Kasilof River had now exceeded the upper end of the OEG of 300,000 fish, with an August 4 cumulative passage estimate of 311,000 fish. The Kenai River passage estimate was at 611,000; the Yentna River estimate was 58,000; Fish Creek had met its minimum objective by reaching 22,000; and a weir at Packers Creek showed that 22,000 fish had escaped into Packers Lake. The 24-hour no-fishing window was implemented in the Upper Subdistrict set gillnet fishery by not fishing for 36-hrs on July 29–30 (fishing in the KRSHA does not violate the no-fishing windows). The 36-hour prescriptive window was also met by not fishing from 11:00 p.m. on August 2 through midnight on August 4 (49 hours). For the week, only 39 hours of emergency order time was used in the Upper Subdistrict set gillnet fishery, as staff had been given permission to fish during the window periods if needed, again negating the need to fish aggressively during non-window periods. The KRSHA was used for 28 hours during the week in an attempt to slow down the escapement of Kasilof River sockeye salmon. Harvest estimates for the week showed Upper Subdistrict set gillnetters taking 177,000 sockeye salmon for a season total of 1.20 million, and 2,000 Chinook salmon for a season total of 11,100 fish. Drift gillnetters caught 135,000 sockeye salmon for a season total of 1.77million.

The time period of August 5–11 represented the final week of the season for Upper Subdistrict set gillnetting and Central District drift gillnetting in most areas. Emergency Order No. 32 opened the KRSHA to set gillnetting from 10:00 p.m. on August 4 through 2:00 p.m. on Sunday, August 5. Drift gillnetting was open in this area from 5:00 a.m. until 2:00 p.m. on August 5. Announcement No. 33 then opened set gillnetting in the Upper Subdistrict from 12:00 noon on August 5 to 7:00 a.m. on August 6. Drift gillnetting was open in the full corridor from 12:00 p.m. until 11:00 p.m. on August 5 and from 5:00 a.m. until 7:00 a.m. on August 6. As sockeye salmon passage in the Yentna River was still not at a level that would ensure the minimum escapement goal would be met, Emergency Order No. 34 closed commercial fishing in the Northern District on August 6 and restricted drift gillnetting to that area of the Central District south of a line from Collier's Dock to the northwest point on Kalgin Island to the western shore at 60° 31.25' N. Latitude. Set gillnetting was extended from the end of the August 6 regular period at 7:00 p.m. until 3:00 p.m. on August 7, per Emergency Order No. 35. In this announcement, drift gillnetting was open in the full corridor from 7:00 to 11:00 p.m. on August 6 and from 5:00 a.m. until 3:00 p.m. on August 7. With the sockeye salmon passage rate estimate in the Kenai River at 653,000 through August 6, combined with an OTF assessment of the 2007 return, which strongly suggested the run was multiple days late, staff were alerted to the need to fish aggressively, even though the minimum escapement goal was still 100,000 fish away. Moreover, the Kasilof River OEG had already been exceeded. Therefore, all of the remaining emergency order hours available in the management plan were utilized. Emergency Order No. 37 opened set gillnetting in the Upper Subdistrict from 7:00 p.m. on August 8 until the beginning of the regular period at 7:00 a.m. on August 9. Drift gillnetting was opened in the full corridor from 7:00 p.m. to 11:00 p.m. on August 8 and from 5:00 a.m. until 7:00 a.m. on August 9. For set gillnetting, all 51 hours of additional fishing time for the week had been used, so in effect the season ended at 7:00 p.m. on August 9. Emergency Order No. 38 opened set and drift gillnetting in the KRSHA from 7:00 p.m. on August 9 until 11:00 p.m. on August 10 and Emergency Order No. 39 opened drift gillnetting in the full corridor from 5:00 a.m. until 11:00 p.m. on August 10. Both no-fishing window periods were implemented in the set gillnet fishery during the week. The 24-hour window occurred when no fishing was allowed from 3:00 p.m. on August 7 until 7:00 p.m. on August 8 (28 hours) and the 36-hour window was implemented by not fishing from 7:00 p.m. on August 9 until midnight on August 11 (53 hours). For the week, set gillnetters harvested approximately 153,000 sockeye salmon and 1,200 Chinook salmon for season totals of 1.35 million and 12,300 fish, respectively. Drifters caught 49,000 sockeye salmon for a season total of 1.82 million fish. Sockeye salmon passage into the Kenai River had now reached an estimated 742,000 fish through August 11, with more than 130,000 fish entering the river during the week. The inriver escapement goal was 750,000 to 950,000 fish. In the Kasilof River, approximately 23,000 fish were estimated to have migrated past the sonar site during the week, for a season total of 333,000 fish, which was more than 30,000 above the upper end of the OEG. So, for the 10th time in the past 11 years, the upper end of the sockeye salmon escapement goal for this system was exceeded.

For the remainder of the season, drift gillnetters harvested approximately 2,200 additional sockeye salmon in Drift Areas 3 and 4 (Figure 5) and in Chinitna Bay, which was opened for regular periods beginning on Monday, September 3, via Emergency Order No. 42. Chinitna Bay was opened to drift gillnetting because aerial census data indicated that the upper end of the chum salmon escapement goal of 3,400–8,400 had been exceeded. The last reported drift gillnet harvest took place on September 10. Participation declined rapidly after the final regular inlet-wide fishing period on August 9.

Due to the weak sockeye salmon run to the Susitna River, numerous restrictions and closures to both the Central District drift gillnet and Northern District set gillnet fisheries were employed in a concerted effort to attempt to achieve the Sustainable Escapement Goal (SEG) of 90,000 to 160,000 fish past the Yentna River sonar site. In 2007, nine consecutive drift gillnet inlet-wide fishing periods were restricted in order to reduce the exploitation of Susitna River sockeye salmon. The July 9 and July 12 reduction of open waters met management plan mandates, while the July 16 and 19 limitations were even more restrictive than called for in the management plan. The other five periods (July 23, 26, 30, and August 2 and 6) were implemented entirely for conservation of Susitna River sockeye salmon. In the Northern District set gillnet fishery, four regular fishing periods were completely closed and one period had legal gear reduced from 3 nets per permit to 1 net per permit. All of these measures undoubtedly saved thousands of sockeye salmon (and coho salmon) from being harvested, yet the Yentna River sockeye salmon goal was not achieved, as the final passage estimate was only 80,000 fish. So in the past 10 years, the escapement goal at the Yentna River has been achieved five times and missed five times.

In 2006, the KRSHA was opened to set and drift gillnet fishing for part or all of 21 different days, with approximately 688,000 sockeye salmon being harvested by both gear types (Shields 2007). Part of the management strategy in 2007 focused on not using this area until all other means had been exhausted. The result was far fewer days where the KRSHA was utilized, and then not until later in the season (Tables 4, 13 and 14). In 2006, for example, 2 days were fished in June, 19 days in July, and no days in August. In 2007, 5 of the 8 days the KRSHA was open were in August. The total harvest from both gear types was approximately 20,000 sockeye salmon and 180 Chinook salmon.

Three additional 12-hour fishing periods were allowed in the Kalgin Island Subdistrict in 2007 (Emergency Orders No. 23, 40, and 41). The extra periods occurred on July 29, August 11, and August 18, and were provided for in the Packers Creek Sockeye Salmon Management Plan (5 AAC 21.370). The extra fishing time was justified by strong sockeye salmon catches around the island and more importantly by the weir counts of sockeye salmon escapement into Packers Lake. The sockeye salmon SEG for Packers Lake is 15,000 to 25,000 fish and even with the extra fishing time, the final escapement was nearly 47,000 fish (Table 13).

Table 4.–Kasilof River terminal harvest area sockeye salmon harvest, 2007.

	Set Gillnet		Drift Gillnet		Total	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
27-Jul	979	979	2,689	2,477	3,668	3,668
28-Jul	2,304	3,283			2,304	5,972
29-Jul	2,102	5,385	618	3,307	2,720	8,692
3-Aug	2,385	7,770	582	3,889	2,967	11,659
4-Aug	2,605	10,375	549	4,438	3,154	14,813
5-Aug	1,853	12,228			1,853	16,666
9-Aug	246	12,474			246	16,912
10-Aug	3,157	15,631	221	4,659	3,378	20,290

Fishing with set gillnets in the Western Subdistrict south of Redoubt Point was allowed 24-hours a day from Sunday, July 1, through Thursday, August 9, or for 40 consecutive days. Since 1999, this area has been open to set gillnetting for extended periods of time in July and August in an attempt to target harvest on the strong Crescent Lake sockeye salmon runs. However, since 1999, the upper end of the BEG range has been exceeded (Appendix A10).

All other areas remained open for regular 12-hour Monday and Thursday fishing periods. The last reported commercial fishing activity in any area of UCI in 2007 was September 13.

For the 2007 season, only 2 of 6 UCI sockeye salmon goals were achieved (see Tables 5 and 13; Appendix A10). The Kenai River and Fish Creek goals were met, but escapement ranges were exceeded in the Crescent and Kasilof Rivers, and Packers Creek, while the minimum goal was not achieved in the Yentna River.

Table 5.–Sockeye salmon estimates of passage, 2007.

System	Passage	Goal Range
Kenai River	867,572	750,000–950,000
Kasilof River	336,866	150,000–300,000
Crescent River	79,406	30,000–70,000
Yentna River	79,901	90,000–160,000
Fish Creek	27,948	20,000–70,000
Packers Creek	46,637	15,000–25,000

As part of the Susitna River mark–recapture studies, CIAA operated sockeye salmon counting weirs at 7 lakes with the following enumeration estimates: Judd Lake: 58,134; Chelatna Lake: 11,671 (partial count); Shell Lake: 26,784, Swan Lake: 5,849, Larson Lake: 47,819; Byers Lake: 1,701 and Stephan Lake: 4,120 (http://www.ciaanet.org).

Beginning with the 2005 commercial salmon season, the BOF authorized the use of monofilament mesh gillnet for fishermen in UCI (5 AAC 21.331(h)). Set gillnetters were allowed to fish no more than 35 fathoms of monofilament mesh in their total allotment of 105 fathoms of allowable gear per permit, but no more than 1 net per permit could have monofilament web. Drift gillnetters were allowed to use up to 50 fathoms (one shackle) of monofilament gear with the option of dividing up the 50 fathoms into different segments in their maximum of 150 fathoms of total gear. Any fishermen wishing to fish monofilament had to register their intent to do so with ADF&G prior to fishing. The feedback from this experiment has been mixed. Some fishermen have reported discontentment with the gear while others have expressed that it was more efficient than their regular multi-strand mesh web. The current monofilament regulation will be taken up at the 2008 BOF meetings.

COHO SALMON

The 2007 commercial coho salmon harvest of approximately 177,000 fish was slightly less than the previous 10-year average annual harvest of 185,000 fish, and nearly 142,000 fish less than the 1966–2006 average annual harvest (Appendix A3). However, considering the numerous restrictions to inlet-wide drift gillnet fishing periods and 4 complete closures to the Northern District set gillnet fishery, the harvest of 175,000 coho salmon would seem to indicate that this year's run of coho salmon was likely average or above average (see the Stock Status and Outlook section of this report for further discussion on coho salmon stocks). Drift gillnetters were allowed to fish beyond August 10, but only in Areas 3 and 4 (Figure 5) and in Chinitna Bay beginning on September 3. Fishing periods were 12-hours in duration and occurred on Mondays and Thursdays. The estimated coho salmon harvest by drift gillnetters after August 10, 2007, was approximately 8,500 fish (Table 16).

The exvessel value of coho salmon from the 2007 UCI commercial fishery was approximately $683,000 or 2.9% of the total exvessel value (Appendix A7.). The average price paid for coho salmon was estimated at $0.60/lb (Appendix A11), which matched the 2006 price, both representing the highest price paid for coho salmon since 1993.

PINK SALMON

The 2007 UCI harvest of approximately 147,000 pink salmon was 17% greater than the average annual odd-year harvest of 121,000 that occurred from 1966–2006 (Appendix A4). Furthermore, it was the highest odd-year harvest since 1977. Similar to coho salmon, judging the strength of the 2007 pink salmon run based on harvest statistics alone was made difficult because of the number of restrictions made to the Central District drift gillnet fishery and closures to the Northern District set gillnet fisheries. Had these restrictions not been implemented, pink salmon harvests would have undoubtedly been significantly higher this year. It appears therefore that the 2007 run of pink salmon was likely a very robust odd-year return.

The average price paid for pink salmon in 2007 was approximately $0.10/lb (Appendix A11), resulting in an exvessel value for this species of $53,000, or 0.2% of the total exvessel value (Appendix A7).

CHUM SALMON

The 1966–2006 average annual chum salmon harvest in UCI was approximately 479,000 fish (Appendix A5). For the past decade (1997–2006), however, harvests have declined to an average of 122,000 fish annually, with the 2007 harvest of approximately 77,000 fish being 37% less than the previous decadal average annual harvest. Analyzing commercial harvest data for the purpose of making assessments about chum salmon abundance from year to year is somewhat problematic. First, the numerous restrictions made to the Central District drift gillnet fishery and closures in the Northern District set gillnet fisheries in 2007 for sockeye salmon conservation had negative effects on this year's (and previous years) chum salmon harvest. These groups are the two primary harvesters of chum salmon in UCI. And, it is common knowledge that most drifters will actually pick up their fishing gear and move when they begin to encounter chum salmon. The reason for this is the large disparity in the price paid for sockeye and chum salmon.

The 2007 exvessel value for chum salmon was approximately $141,000, which was just 0.6% of the overall exvessel value of the 2007 fishery (Appendix A7). The average price paid for chum salmon in 2007 was estimated to be $0.25/lb (Appendix A11), which was equal to the amount received in 2006, and the highest price paid since 1995.

PRICE, AVERAGE WEIGHT AND PARTICIPATION

The average price per pound paid to fishermen for their catch in 2007 was very similar to what they received in 2006 (Appendix A11), with both years reflecting significant increases from the average prices paid during 2000–2005. However, calculating the average price for what fishermen actually receive is becoming more and more difficult. The reason for this is due to the increasing number of fishermen who are marketing their own product. In the late 1990's farmed salmon were finding a niche in global markets. In UCI, the 1998 and 2000 sockeye salmon harvests were some of the poorest catches on record. These factors led to a marked reduction in the prices paid for wild-caught salmon, which forced many fishermen to go in search of markets where they could receive higher payments for their catches. These market forces further helped to expedite the change the UCI salmon fishing industry has made in emphasizing quality of the final product as much as quantity (http://www.kenaiwild.org/history.php). More than ever before, many fishermen are bleeding and icing their catch immediately upon harvest. This emphasis on quality has resulted in an increase in the price that fishermen are receiving from both processors as well as in individual markets.

Average prices reported here are generated from inseason grounds prices and do not reflect any postseason adjustments. It is unknown whether this occurred to any significant degree for fish harvested in 2007.

As determined from fish ticket calculations, the average weight by species of the 2007 commercial harvest was very close to historical averages, other than for Chinook salmon (Table 24; Appendix A12). The average Chinook salmon weight of 20.4 lbs in the 2007 harvest was nearly 6 lbs less than the 1969–2006 average of 26.2 lbs. Much of this can be explained by examining the age composition of the harvest. In 2007, approximately 48% of Chinook salmon harvested in Upper Subdistrict set gillnets, which are the primary commercial harvesters of Chinook salmon in UCI, had spent 2 years or less at sea. This compares to the 1987–2006 average for these same age classes of approximately 29%. This shift toward younger aged Chinook salmon in the commercial harvest was also observed in 2006 (Shields 2007). In 2003, approximately 56% of Chinook salmon harvest in the Upper Subdistrict set gillnet fishery was comprised of 2-ocean fish or younger, which was the highest percentage of small Chinook ever measured in the harvest since age data has been collected. The smallest average weight of Chinook salmon ever observed in the UCI commercial harvest was 18.2 lbs in 2001. That year the 2-ocean and younger age-composition in the Upper Subdistrict set gillnet harvest was 52%, which was the second highest percentage ever observed for small Chinook.

In 2007, the Commercial Fisheries Entry Commission (CFEC) reported that there were 571 active drift gillnet permits in the Cook Inlet area, with 70% issued to Alaskan residents (Appendix A13). Of this total, 417 reported fishing in 2007 (Table 20). CFEC also shows that there were 738 active set gillnet permits in Cook Inlet, with 83% being issued to Alaskan residents. From this total, 468 reported fishing in UCI in 2007. A total of 27 firms purchased UCI fishery products during 2007, while 41 catcher/seller or direct marketers reported selling fish from their sites or vessels. A list of the major fishery processors is identified in Table 25.

SALMON ENHANCEMENT

Salmon enhancement through hatchery stocking has been a part of UCI salmon production since the early 1970s. Presently, only a single commercially-oriented hatchery remains fully operational in UCI, that being the Trail Lakes facility, which is operated by CIAA. Trail Lakes Hatchery is located in the upper Kenai River drainage near Moose Pass. This hatchery was originally built and operated by the ADF&G Fisheries Rehabilitation and Enhancement Division, but was subsequently leased to CIAA in 1990 as the state operating budget declined. Trail Lakes Hatchery has functioned primarily to produce sockeye salmon, with minor production of coho and Chinook salmon. In 2005, the water wells at Trail Lakes Hatchery were unable to supply enough volume to rear all the fish in the facility, so some had to be transferred to the Eklutna Hatchery, a separate facility owned by CIAA, but not operational for the past few years. In 2007, the Eklutna facility was again used by CIAA, but the fish raised in the hatchery benefited Lower Cook Inlet commercial and recreational fishermen.

Until recently, two lakes located on the Kenai Peninsula, Hidden Lake and Tustumena Lake, were stocked with sockeye salmon fry, with the adult production from these enhancement programs available to both the UCI common property commercial fishery and the personal use and recreational fisheries. In 2007, CIAA released approximately 658,000 sockeye salmon fry into Hidden Lake (http://www.ciaanet.org). These fry were otolith-marked, which allows for identification and enumeration of hatchery stocks when the smolt emigrate to sea and again when they return as adults. From May 18 through June 27, 2007, CIAA enumerated approximately 217,000 smolt emigrating Hidden Lake.

In December, 2003, the U.S. Ninth Circuit Court of Appeals issued a ruling stating that the 30-year old stocking program in Tustumena Lake amounted to a commercial enterprise and violated provisions of the 1964 Wilderness Act. The Wilderness Society and the Alaska Center for the Environment brought suit against the U.S. Fish and Wildlife Service over the stocking program being conducted by CIAA. In essence, the ruling meant that the 6 million sockeye salmon fry being incubated at Trail Lakes Hatchery could not be released into Tustumena Lake in 2004 and thus would have to be destroyed. At the request of fishing groups and other citizens, Alaska's Governor Murkowski had asked United States Department of the Interior Secretary, Gale Norton, to request a full hearing before the 9th Circuit Court on the matter. The Department of Justice, which handled the case for the Department of the Interior, instead petitioned only on the issue of the injunction regarding the fate of the fry. The court granted a rehearing on that issue and amended its order halting the stocking program. In the end, the U.S. Ninth Circuit Court of Appeals allowed the district court in Alaska discretion in what to do with the 6 million sockeye salmon fry, which they permitted to be stocked into Tustumena Lake in 2004 only. This was the last year that Tustumena Lake received any hatchery supplementation.

Since 1975, a sockeye salmon enhancement project has been conducted at Big Lake, which is located in the Matanuska-Susitna Valley approximately 24km west of Wasilla (Figure 1). ADF&G directed the stocking program through 1992, but since then CIAA has conducted the gamete collection, incubation, and fry release activities. In 2007, there were three different releases of sockeye salmon into Big Lake. On May 22, 2007, approximately 316,000 smolt (~15–17g) were released into Big Lake (http://www.ciaanet.org). On May 28, 2007, approximately 3.8 million fry were stocked into Meadow Creek, a tributary of Big Lake. And in October, 2007, another 703,000 pre-smolt were released into Big Lake. The purpose of stocking at different times and at various juvenile life cycles was to evaluate smolt survival based on the size and timing of release. All three of these releases were uniquely otolith-marked so when the fish emigrate as smolt they could be identified and enumerated. From May 15 through June 23, 2007, CIAA enumerated approximately 305,000 smolt emigrating Big Lake. The otoliths were being read at the time this report was published, but the preliminary results would suggest that the smolt that were released into the lake in May, 2007 either did not survive well or held over in the lake and will emigrate as age-2 smolt in 2008.

In 2007, the estimated number of hatchery-produced adult sockeye salmon that returned to UCI was 404,000 (335,000 Tustumena Lake origin; 35,000 Hidden Lake origin; and 34,000 Big Lake origin), which was approximately 7.7% of the total UCI run (T. Tobias, Commercial Fisheries Technician, ADF&G, Soldotna; personal communication November 19, 2007).

STOCK STATUS AND OUTLOOK

On the whole, the status of UCI's monitored salmon stocks is generally very positive, with only one stock (Susitna sockeye salmon) meriting detailed review. A run of 4.9 million sockeye salmon was forecast to return to UCI in 2007, with an expected harvest by all user groups of approximately 3.3 million fish (Table 6). The harvest forecast for 2007 was about 1.2 million fish below the 20-year average annual harvest by all user groups. The actual run of approximately 5.3 million sockeye salmon in 2007 resulted in a total harvest of approximately 3.8 million fish, with 3.3 million caught by commercial gillnet fishermen and an estimated 500,000 fish taken by sport and personal use fishermen. Sockeye salmon escapement goals were met or exceeded in five of six systems, and fell below the established goal range in one system (Appendix A10).

Table 6.–Upper Cook Inlet sockeye salmon run, 2007.

System	Commercial Harvest	Escapement	Other Harvest	Total
Crescent River	56,854	79,306	100	136,260
Fish Creek	21,285	24,034	4,229	49,548
Kasilof River	710,587	337,366	72,452	1,120405
Kenai River	2,082,346	682,902	359,103	3,124,351
Susitna River	164,941	152,907	3,252	321,100
All Others	280,772	218,710	26,731	526,213
Totals	3,316,785	1,495,225	465,867	5,277,877

Sockeye Salmon

Susitna River

Sockeye salmon runs to the Susitna River drainage have declined recently, with an average annual total run of 325,000 fish from 2000–2007 compared to the average annual total run of 530,000 fish from 1980–1999. However, in 2003, the total sockeye salmon run to this drainage was 604,000 fish (Tobias and Willette 2004b), which represents the second largest run in the past 10 years and the seventh largest run overall. The estimated escapement in 2003 of 341,000 sockeye salmon was the largest number of spawning adults ever estimated for this system. Although the total return from this escapement won't be fully realized until 2009, the 4-year old adults (age 1.2) that returned in 2007 were from the 2003 escapement and were estimated at less than 50,000 fish. From 2000–2007, the escapement goal at the Yentna River was not achieved five times (Appendix A10), with the estimated sonar passage of 37,000 fish in 2005 being the smallest on record. Substantial commercial fishing restrictions and closures have been made in attempts to achieve the Yentna River sockeye salmon escapement goal. For example, in 2005, numerous restrictions were made to the drift gillnet fishery in the Central District, as well as five consecutive closures of the Northern District set gillnet fishery, all implemented in order to reduce harvest rates of northern-bound sockeye salmon (Shields 2006). In 2006, the most restrictive actions ever taken in the commercial fishery were employed in order to narrowly achieve the Yentna River escapement goal (Shields 2007). These actions included 8 consecutive closures to the Northern District set gillnet fishery and 6 consecutive restrictions to the drift gillnet fishery, including 4 inlet-wide closures. In 2007, as already described in the sockeye salmon commercial harvest section of this report, 9 drift gillnet area restrictions were implemented, as well as 4 Northern District closures and a fifth period where legal gear was reduced to one net per permit; again, all these actions were taken to conserve Susitna River sockeye salmon. Yet, the final estimated escapement at the Yentna River sonar site still fell approximately 10,000 fish short of the minimum escapement objective.

As a result of the depressed sockeye salmon runs to the Susitna River drainage, research objectives were defined and studies began in 2006 to identify and assess the causes for the poor sockeye salmon production. These studies included: (1) mark–recapture and radio telemetry projects intended to estimate the number of sockeye salmon entering the system, which also allowed for the identification of spawning areas in the drainage; (2) limnological investigations of numerous lakes throughout the drainage to assess production potential; (3) fry and smolt population estimates in as many as 7 different lakes; (4) evaluation of the effects of northern pike (*Esox lucius*) predation and beaver dams on production; and (5) a comprehensive genetic stock identification study of sockeye salmon fisheries in Upper Cook Inlet to determine the river of origin of all harvested fish . The first year of the mark–recapture study was completed in 2006. In 2007, modifications to the project were implemented based upon the results of the 2006 field season. Although final population estimates were not available at the time this report was published, preliminary estimates, including the number of adult salmon counted through weirs at lakes in the Yentna River drainage, indicate the Yentna River sonar project is under-estimating sockeye salmon passage (Yanusz et al 2007). As the data from these studies continues to be collected, analyzed, and published, our understanding of sockeye salmon production in this watershed should be enhanced. For more details on previous studies pertaining to sockeye salmon in the Susitna drainage, see Tarbox and Kyle 1989; Kyle et al. 1994; King and Walker 1997; Edmundson et al. 2000; and Todd et al. 2001.

Crescent River

After experiencing record-level runs through the mid to late 1980s, Crescent River sockeye salmon runs declined dramatically and remained depressed throughout most of the 1990s. In 1996, limnological studies were initiated to determine whether the decline in sockeye salmon production was related to changing conditions in Crescent Lake, the major nursery lake in this watershed. These studies revealed a low abundance of the primary food resource for juvenile sockeye salmon in Crescent Lake, namely, the cyclopoid copepod *Cyclops scutifer* (Edmundson and Edmundson 2002). Unfortunately, these studies were terminated in 2001 due to lack of funding. However, within the limited scope of these investigations, some hypotheses were developed. First, it was theorized that that increased turbidity levels in the lake prior to 1996 resulted in a reduction in primary production associated with a lack of light penetration, which drives photosynthesis. Another possible source of the decline in production was attributed to a top-down grazing effect on the *Cyclops* population from sockeye salmon fry produced from large escapements beginning in 1984. In speculating on the mechanisms responsible for the reduced sockeye salmon runs to this system, Edmundson and Edmundson (2002) cited that it was likely some combination of increased turbidity and over-grazing of the forage base. The exact cause for the shift in turbidity could not be isolated before the project was terminated, but the limited data set did provide the grounds for a recommendation that the sockeye salmon BEG for this system should be reduced, which it was beginning in 1999 from 50,000 to 100,000 fish to 25,000 to 50,000 fish. Since 2000, however, sockeye salmon runs to Crescent Lake have improved (Table 7). Therefore, in 2005, the BOF, acting on recommendations from ADF&G, modified the BEG at Crescent Lake from 25,000 to 50,000 fish to 30,000 to 70,000 fish. Approximately 79,000 sockeye salmon were estimated to have escaped Crescent Lake in 2007 (Table 13), which means that since the escapement goal was changed in 1998 and then again in 2005, it has been exceeded every year. For the past few years, set gillnet fishing in the Western Subdistrict south of Redoubt Point has been allowed 24 hours per day nearly all of July; in 2007 this area was open continuously from July 1 through August 9 (Table 22). Many fishermen and nearly all processors abandoned the fishery during the 1990s because of diminished returns and considerable restrictions placed on the fishery in order to achieve escapement goals. As a result of the reduced fishing effort, the average annual exploitation rate on Crescent River sockeye salmon stocks from 2000–2007 was only 33%, even with all the extra fishing time allowed.

Table 7.–Crescent Lake sockeye salmon average escapement, harvest and run, 1976–2007.

Decade	Average Annual Escapement (thousands)	Average Annual Commercial Harvest (thousands)	Average Annual Total Run (thousands)
1976–1979	75	56	130
1980–1989	87	82	169
1990–1999	50	23	73
2000–2007	90	44	134

Fish Creek

Similar to Crescent Lake, recent sockeye salmon runs to Fish Creek, which drains Big Lake and flows into Knik Arm, have been below average, yet the escapement goal for this system has been met or exceeded in 5 of the past 6 years (Table 8; Appendix A10). The average annual total sockeye salmon run to Big Lake from 1980 to 1997 was 212,000 fish, but from 1998–2001 the average annual return fell to 50,000 (Tobias and Willette 2004a) For the past 4 years, the average annual return has been only 38,000 fish. Prior to the 2002 BOF meeting, an ADF&G escapement goal review team recommended the Fish Creek goal be changed from a point goal of 50,000 to an SEG of 20,000 to 70,000 fish. In 2002 and 2003, escapement into this system exceeded the upper end of the new SEG by approximately 20,000 fish in each year. Moreover, the total sockeye salmon run to Fish Creek in 2002 was nearly 134,000 fish, while in 2003 it was approximately 150,000 fish. However, runs since that time have been significantly lower, ranging from 22,000 to 49,000 fish. The number of smolt emigrating Big Lake the past 5 years has ranged from 117,000 to 309,000 fish (http://www.ciaanet.org/).

Table 8.–Production of sockeye salmon in Big Lake, 1997–2007.

Year	Total Run	Weir	Spawners	Fry Release	Pre Smolt Release	Smolt Release	Smolt Emigration Age-1	Smolt Emigration Age-2
1997	131,814	54,656	48,513					
1998	45,622	22,859	18,789	5,000,000				
1999	45,714	26,749	25,199	197,000				
2000	37,635	19,533	16,704	846,000				
2001	70,013	43,486	39,093	0				
2002	133,640	90,483	86,181	4,316,000				
2003	149,586	91,743	86,858	3,589,000			114,654	2,340
2004	42,160	22,157	20,065	5,000,000			251,195	25,632
2005	21,967	14,215	12,140	1,742,300			135,739	22,623
2006	36,567	32,562	26,712	444,200	426,000		205,135	19,307
2007	49,548	27,948	24,034	3,812,400	702,500	315,700	278,351	30,928

A technical review assessing Big Lake sockeye salmon production was completed prior to the 2002 BOF meeting (Litchfield and Willette 2002). This report proposed two likely causes for the decline in sockeye salmon production: (1) degradation of spawning habitat as a result of questionable hatchery practices and (2) placement of a coffer dam at the outlet of the lake, which prevented many wild fry from being able to recruit into the lake as well as causing a productive spawning area at the lake outlet to be filled in with silt and mud. At the 2002 BOF meeting, Fish Creek sockeye salmon were found to be a stock of yield concern and ADF&G proposed additional studies to more clearly define the limitations to sockeye salmon production in this system. As a result of identifying the coffer dam as a barrier to upstream migration of juvenile sockeye salmon fry, modifications were made at the lake outlet that allowed fry to more easily recruit into Big Lake. It is expected that more adults will again utilize this productive spawning area. However, the long-term outlook for Big Lake sockeye salmon is unclear. The escapement goal was exceeded in 2002 and 2003, narrowly achieved in 2004, 2006, and 2007, and not met in 2005 (Appendix A10). Fish-hatchery culture methods and stocking procedures have changed with the hope that these changes combined with the modifications at the lake outlet would improve sockeye salmon production in Big Lake. This cautious optimism led ADF&G to recommend removing Big Lake sockeye salmon as a stock of yield concern at the 2005 BOF meetings. Yet sockeye salmon production from Big Lake remains somewhat of a mystery. Even when the recommended number of spawners for the system has been met, the production of wild-produced smolt is poor. Furthermore, CIAA has been stocking the lake with sockeye salmon fry for a number of years, but recent fry to smolt survival has also been very poor (Dodson 2006). In an attempt to try and isolate the mechanism leading to poor juvenile survival, CIAA released fish at three different time intervals, summer (fry), fall (pre-smolt), and spring (smolt). The data from these varied releases was not available at the time this report was published, but it may provide some clarity into the cloudy issue of sockeye salmon production from Big Lake. The forecasted total run to Big Lake in 2008 is estimated at only 53,000 fish (Appendix B2).

2008 Sockeye Salmon Outlook

A run of 5.6 million sockeye salmon is forecasted to return to UCI in 2008, with a harvest by all user groups of 3.9 million sockeye salmon (Appendix B2). The forecasted harvest in 2008 is about 200,000 fish below the 20-year average harvest by all user groups. The sockeye salmon run forecast for the Kenai River of 3.1 million is 16% less than the 20-year average run of 3.7 million. The sockeye salmon run forecast for the Kasilof River of 1.3 million is 33% greater than the 20-year average run of 968,000. For the Susitna River, the run forecast of 344,000 is 24% less than the 20-year average run of 453,000 fish.

Pink Salmon

Pink salmon runs in UCI are even-year dominant, with odd year average annual harvests typically less than 1/7th of even-year harvests (Appendix A4). The 2006 pink salmon harvest of 404,000 was approximately 50,000 fish greater than the average from the previous 5 even-year harvests. This harvest figure was really quite surprising considering the numerous restrictions that were placed on the drift fleet in 2006 in order to preserve Susitna and Kenai River sockeye salmon. The 2007 harvest of 145,000 pink salmon represents the largest odd-year harvest since 1977, which was not expected given the Central District drift gillnet restrictions and Northern District set gillnet closures. But, assessing pink salmon abundance based solely on commercial harvest data is problematic. For example, the 2000 UCI commercial harvest of pink salmon was the smallest even-year harvest since 1966, even though the 2000 run of pink salmon was characterized as very strong, especially considering the Deshka River weir count of more than 1.2 million fish (Table 9). In contrast, only 83,000 fish were counted through the Deshka River weir in 2006, while the commercial harvest was nearly three times greater than in 2000, even with numerous drift gillnet restrictions. Therefore, caution should be taken when assessing the strength or weakness of pink salmon runs in UCI with the limited information that is currently available. Pink salmon data are limited to commercial fish harvests, recreational fishing success, and limited escapement monitoring. There are no enumeration projects in all of UCI designed to specifically monitor pink salmon escapements, but they are counted as part of programs designed to enumerate Chinook, sockeye, and coho salmon. In general, pink salmon stocks in UCI are maintaining their even-year dominance and continue to return in numbers that reveal no obvious problems with the stock. Furthermore, a marine tagging project designed to estimate the total population size, escapement, and exploitation rates for coho, pink, and chum salmon returning to Upper Cook Inlet in 2002 (Willette et al. 2003) suggested the exploitation rate on pink salmon by the UCI commercial fishery was no more than 12% and likely very much lower. These data would strongly indicate that that this stock, if anything, is largely under-exploited and is in no apparent danger from over fishing.

Table 9.–Upper Cook Inlet pink salmon, commercial harvest, 1996–2007.

Year	UCI Commercial Harvest	Deshka River Enumeration Even-Year	Deshka River Enumeration Odd-Year
1996	243,000	37,000	
1997	70,933		1,101
1998	551,000	542,000	
1999	16,174		766
2000	146,000	1,200,000	
2001	72,559		3,845
2002	447,000	946,000	
2003	48,782		9,214
2004	357,000	390,000	
2005	48,599		7,088
2006	404,000	83,000	
2007	144,958		3,954

Chum Salmon

While ADF&G lacks long-term quantitative chum salmon escapement information, escapements to streams throughout UCI have undoubtedly benefited by management actions or regulatory changes aimed principally at other species. These actions have included significant reductions in the offshore drift gillnet and Northern District set gillnet fisheries to conserve Yentna River sockeye salmon, the adoption of a Northern District Coho Salmon Management Plan (allocation of coho salmon to non-commercial users), the lack of a directed chum salmon fishery in Chinitna Bay, and harvest avoidance by the drift fishery as a result of lower prices being paid for chum salmon than for sockeye salmon. Assessments of annual chum salmon runs are made difficult because of the lack of data other than commercial harvest figures. Indications from the OTF project, the commercial fishery, and the few escapement programs where chum salmon are encountered would in general support the characterization that the 2000–2004 runs were much improved from those realized during the 1990s. For example, the 2000 OTF cumulative chum salmon CPUE of 672 was the 3rd largest since 1983, the first year chum salmon were enumerated by this project. Aerial census counts of chum salmon in Chinitna Bay revealed an escapement estimate of nearly 23,000 fish in 2000, which is the largest aerial census estimate ever recorded for this area. The 2002 escapement counts of chum salmon at the Little Susitna River, Willow Creek, and Wasilla Creek weirs were the highest counts ever observed for these systems, while the 2001 chum salmon escapement in the Little Susitna River was the second largest ever observed. The 2004 OTF cumulative chum salmon CPUE also would seem to indicate that the 2004 run was of average abundance, as the cumulative CPUE of 447 was very close to the 1988-2003 mean CPUE of 465. Assessing the 2005–2007 runs of chum salmon in UCI, however, was difficult. For example, although the commercial harvest of chum salmon during these 3 years was the lowest observed during the past 40 years, the 2005 OTF cumulative chum salmon CPUE of 300 was only about 35% less than the 1988–2004 average cumulative CPUE of 464, while the 2006 OTF cumulative chum salmon CPUE of 632 was the 6th highest in the past 19 years. In addition, the 2006–2007 peak aerial census estimates of chum salmon escapement in streams draining into Chinitna Bay showed 11,000 and 12,100 fish, respectively, which led to Chinitna Bay being opened to drift gillnetting for regular Monday and Thursday fishing periods during both years to harvest excess chum salmon. Chum salmon are no longer enumerated at any weir sites in UCI, but they are encountered and enumerated at the Yentna River sockeye salmon sonar project. However, it must be pointed out that this is a sockeye salmon project and therefore chum salmon enumeration estimates must be viewed only as rough trends. That said, the 2005–2007 apportioned chum salmon estimates of 9,753, 11,745 and 8,120 fish, respectively, were the 4th, 7th, and 3rd lowest since apportioned estimates began 27 years ago (D. Westerman, Commercial Fisheries Biologist, ADF&G; Soldotna; personal communication November 6, 2007). Although information is limited, the past 3 years of chum salmon returns may have been less than average, but there are no obvious concerns for UCI chum salmon stocks at this time.

Coho Salmon

Commercial coho salmon harvests in UCI during the 1980s and early 1990s were much higher than the long term average (Appendix A3). This can be attributed to good coho salmon production, but also due to strong sockeye salmon runs to UCI, which resulted in additional fishing time in the Central District, which in turn resulted in increased coho salmon harvests. Recent coho salmon harvest statistics, however, may or may not be a true indication of run strength, largely due to regulatory changes that were made to reduce coho salmon commercial harvests. For example, coho salmon runs in 1997 and 1999 were viewed as mediocre to poor, prompting BOF measures in 1997, 1999 and 2000 that placed restrictions on sport and commercial fishermen in much of UCI. From 2000–2004, the commercial set gillnet fishery in the Upper Subdistrict was closed no later than August 7, and no more than one emergency order, not to exceed 24 hours in duration, was allowed during the month of August. These actions resulted in marked reductions in commercial coho salmon harvests. Ironically, the 2000 coho salmon run appeared to be much improved (Table 10), with the 2001 run being even stronger yet, and finally the 2002 run being exceptional, perhaps even a record run (Yanusz et al. 2002). Therefore, at the 2005 BOF meetings, the restrictions on fishing in August in the Upper Subdistrict set gillnet fishery and Central District drift gillnet fishery were moderately relaxed. Both fisheries' closing dates were changed to no later than August 10, with the set gillnet fishery to be managed under the same set of weekly guidelines in August that were applicable in July.

Northern District

Because coho salmon are strongly dominated by a 4-year cycle, the returns from the 1997 and 1999 brood years occurred primarily in 2001 and 2003. The 2003 run, while not exceptionally strong, still produced escapements nearly three times the level of the 1999 brood year (the aggregate escapement of coho salmon from Cottonwood, Fish, and Wasilla Creeks and Little Susitna River in 1999 was 6,470 and produced an aggregate escapement to these same systems in 2003 of 17,872). In 2004, ADF&G Division of Sport Fish terminated coho salmon enumeration at Wasilla Creek, and for the 2005 season they began using escapement counts at the Little Susitna River as a gauge of coho salmon escapement from all Knik Arm stocks. Based on the Little Susitna River coho salmon weir count, the 2004 run appears to have been very strong. The 2005 Little Susitna River weir count of coho salmon was estimated at 16,839; however, the weir was partly submerged due to high water on September 7 and completely submerged beginning September 10, in effect stopping all counting. In 2006, the weir was flooded from the 25th to 75th percentile of run. Therefore, the 2005 and 2006 estimates of escapement were not complete, which means the upper end of the escapement goal range of 10,100–17,700 fish may have been exceeded. Based on the inriver sport fishing performance, the 2006 coho salmon run in the Little Susitna River was categorized as "very early and very, very strong" (D. Rutz, Sport Fish Biologist, ADF&G, Palmer; personal communication February 1, 2007). The 2007 Little Susitna River coho salmon run was late, prompting Sport Fish Division to issue an emergency order (2-SS-2-36-07) prohibiting the retention of coho salmon while sport fishing in all waters of the Knik Arm Management Area, excluding the Eklutna Tailrace and Fish Creek. This emergency order became effective at 12:01 a.m., Tuesday, September 4, 2007. However, a week later (12:01 a.m., Tuesday, September 11, 2007) Emergency Order No. 2-SS-2-37-07 rescinded Emergency Order No. 2-SS-2-36-07, allowing anglers to retain a bag limit of 2 coho salmon in waters of the Knik Arm Management Area. The final estimated coho salmon passage through the Little Susitna River weir in 2007 was approximately 17,500 fish, just a couple hundred fish short of the upper end of the escapement goal range. At this time, there are no apparent concerns for Northern District coho salmon stocks.

Table 10.–Coho salmon escapement and enumeration, 1996–2007.

Year	Cottonwood Creek	Fish Creek	Little Susitna River	Wasilla Creek	Deep Creek	OTF CPUE
1996			15,803			534
1997	936	2,578	9,894	670	2,017	362
1998	2,114	5,463	15,159	3,777	1,541	403
1999	478	1,766	3,017	1,587	2,267	294
2000	1,888	5,979	14,436	6,154	3,408	766
2001	3,525	10,047	30,587	6,784	3,747	838
2002	4,270	15,187	48,308	13,195	6,132	798
2003	791	2,142	11,127	3,712		368
2004	2,004	3,234[a]	40,199			785
2005			16,839[b]			367
2006			8,786[b]			1,034
2007			17,573			482

[a] Represents a partial count, the weir was pulled before the coho salmon run was complete.

[b] Weir washed out, count incomplete.

Kenai River

From 1999 to 2004, the total return of Kenai River adult coho salmon was estimated annually by: (A) the population specific harvest in marine commercial fisheries, (B) the inriver sport and personal use harvest, and (C) the spawning escapement (Carlon and Evans *In prep*; Massengill and Evans *In prep*). The sum of these three components (A+B+C) provided the estimates of annual adult production, although no escapement goal exists for this system. Smolt enumeration studies have been conducted in the Moose River, a Kenai River tributary that has been shown to be a very important rearing environment for juvenile coho salmon, since 1992 (Massengill and Carlon 2007). As a result of increasing sport and commercial harvest levels in the early 1990s, combined with a decreasing trend in smolt production from 1993–1997, the BOF implemented conservation measures at the 1997 and 2000 meetings to reduce sport and commercial exploitation of Kenai River coho salmon. Since 1997, the drainage-wide coho salmon smolt emigrations have stabilized. Interestingly, the 1999 record low adult escapement estimate of 7,364 fish produced a smolt emigration in 2001 that was only slightly below the historical average. Conversely, the record low smolt emigration in 1997 of 374,225 fish produced what was believed to be a very weak return of adults in 1998, although the total return strength for that year is unknown. Since 2000, Kenai River adult coho salmon runs have been considered good to excellent. In response to an emergency petition from the Kenai-Soldotna Fish and Game Advisory Committee in 2004, the BOF extended the Kenai River sport fishing season for coho salmon from September 30 to October 31. This decision was based upon ADF&G data that projected an escapement of Kenai River coho salmon above the 1999–2003 average. In 2005, the BOF repealed the Kenai River Coho Salmon Conservation Management Plan (5 AAC 21.357) and extended the Kenai River coho salmon sport fishing season in regulation through October 31. This latter change was based on an expectation of low October fishing effort and recent (2000–2004) exploitation data, which indicated that recent returns were exploited at a rate below that deemed sustainable. Unfortunately, 2004 was the final year that mark–recapture abundance estimates were generated for Kenai River adult coho salmon. Beginning in 2005, fish wheel catch rate data has provided a tool to index the inriver abundance into one of three general classes (low<50K; 50<med<120K; high>120K) by utilizing inseason fish wheel catch rate data plotted into a regression of historical fish wheel catch rates to abundance estimates. The index level assigned to the 2005 Kenai River adult coho salmon return arriving the fish wheel site (river mile 28) was characterized as "**medium**" based upon inriver fish wheel catch data; in 2006 the run was characterized as '**medium,**' and the 2007 run was characterized as "**low**", however, the 2007 index may have been biased low as preliminary information indicates an unexpected drop in fish wheel efficacy may have occurred (R. Massengill, Sport Fish Biologist, ADF&G, Soldotna; personal communication). At this time, continued monitoring of Kenai River coho salmon smolt and adult production is questionable. The 2008 adult fish wheel project is scheduled to occur, but research beyond that point has not been planned.

Chinook Salmon

Northern District

After experiencing a marked decline in abundance in the early to mid 1990s, Northern District Chinook salmon stocks have rebounded, with exceptional runs to the Deshka River weir, the only site where Chinook salmon are totally enumerated in the Northern District (Table 11). In recent years, the Division of Sport Fish has liberalized the recreational fishery at the Deshka River in response to the strong runs. In 2007, the liberalization occurred on Friday, May 25, increasing the bag and possession limit for Chinook salmon from one (1) per day and two (2) in possession to two (2) per day and four (4) in possession in that part of the Deshka River open to Chinook salmon (Emergency Order No. 2-KS-2-09-07). Sport fishing was also allowed 24-hours per day. The justification for the liberalization was that Chinook salmon returns to the Deshka River had been above the upper range of the biological escapement goal (BEG) for the past 8 years. It was anticipated that the 2007 Chinook salmon return would be well above the upper end of the BEG, thus creating a surplus of Chinook salmon needed for spawning. Moreover, in response to strong Chinook salmon runs, the BOF lengthened commercial fishing periods in the Northern District commercial Chinook salmon fishery from 6 to 12 hours beginning with the 2005 season. In general, no Northern District Chinook salmon conservation issues are currently known.

Table 11.–Deshka River Chinook salmon passage, 1995–2007.

Year	Passage
1995	10,044
1996	14,349
1997	35,587
1998	15,409
1999	29,649
2000	35,242
2001	29,004
2002	29,427
2003	40,069
2004	57,934
2005	37,725
2006	31,150
2007	18,714

Kenai River

Since 1986, Kenai River late-run Chinook salmon estimates of inriver passage have been completed via sonar by the Division of Sport Fish. The late-run Chinook salmon returns have been relatively stable and escapement objectives have been consistently achieved or exceeded. The early-run Kenai River Chinook salmon return migrates through Cook Inlet in May and June, and therefore receives very little to no commercial exploitation.

COMMERCIAL HERRING FISHERY

The 2007 UCI herring fishery resulted in a harvest of 13.4 tons (Appendix A8), with all of the harvest coming from the Upper Subdistrict. A total of 15 permit holders reported fishing, which is up slightly from previous years. The moderate increase in participation was likely the result of the expansion of fishing hours in the Upper Subdistrict in 2005. Table 27 summarizes the age, weight, size, and sex distribution from samples collected during the 2007 fishery. It must be noted that these samples were obtained from the set gillnet fishery and may reflect biases in the gear type used to collect the samples as much as variation in the population structure of the stock. Nevertheless, three age classes dominated the population, with 5, 6, and 7 year olds comprising from 82–96% of the sample. On May 10 and May 16 there were no spawned females in the population, but by May 30, approximately 56% of the sample was spawned females. Currently, all herring harvested in UCI are used exclusively for personal use or bait. Because Prince William Sound and Kamishak Bay herring fisheries have remained closed for many years, bait herring from UCI has risen in value. Demand by commercial and sport halibut fishermen has resulted in an average price of approximately $0.75/lb or $1,500/ton. Based on this price, the estimated exvessel value of the 2007 commercial herring fishery was $20,000.

COMMERCIAL SMELT FISHERY

In 2007, 11 permit holders participated in the commercial smelt fishery (5 AAC 21.505 Cook Inlet Smelt Fishery Management Plan) harvesting approximately 62.5 tons. With an average price of $0.50/lb, the exvessel value was $63,000. The harvest quota for this fishery was 100 tons, which easily could have been caught based on reports from those fishermen who took part in the fishery. They observed significant quantities of smelt migrating up the Susitna River and even had to modify (make smaller) their dip nets to facilitate lifting the fish into their skiffs. The harvest was limited by the logistics of getting the product to a location where the smelt could be off-loaded and processed. Most of the 2007 harvest was put on board vessels and transported to the Kenai River, where it was unloaded. In 2006, an analysis of samples collected from the harvest showed that two age-classes dominate the population. Age-4 smelt comprised 79% of the sample and averaged 192mm in fork length; age-5 smelt were 19% of the sample and averaged 201mm fork length (Table 28). The male to female ratio was 72% to 28%. Samples collected for age-analyses from the 2007 harvest had not yet been analyzed when this report was published.

COMMERCIAL RAZOR CLAM FISHERY

Historically the razor clam fishery on the west side of Cook Inlet has been confined to the area between Crescent River and Redoubt Point. All clams harvested in this area are directed by regulation to be sold for human consumption, except for the small percentage (less than 10% of the total harvest) of broken clams, which may be sold for bait. Razor clams are present throughout this area, with especially dense concentrations in the Polly Creek and Crescent River areas. Beginning in 1993, the Department of Environmental Conservation certified additional beach area for harvesting clams for human consumption. The additional area is located north of the existing certified beach at Polly Creek, north to Redoubt Creek. In 1994, this certification was extended further north to Harriet Point. In the remainder of the Upper Cook Inlet Management Area, there are no restrictions on the amount of clams that can be sold for bait. Currently though, there is no directed effort to harvest razor clams for the bait market. The minimum legal size for razor clams is 4.5 inches (114 mm) in shell length.

The 2007 harvest, taken primarily from the Polly Creek/Crescent River area, was approximately 283,000 pounds (in the shell) (Table 31; Appendix A9). A total of 15 diggers participated during the season, reporting harvest from 60 different days from May 13 to August 3. Diggers were paid an average of $.62 per pound for their harvest, resulting in an exvessel value for this fishery of $175,000.

The 2007 summer tide schedule can be found in Table 29.

SUBSISTENCE FISHERIES

There is a long history of Alaskans harvesting fish and game for their personal consumptive needs under sport, subsistence, and commercial fishing regulations in the Cook Inlet area (Braund 1982). Since 1978, when the State of Alaska passed its first subsistence statute (AS 16.05.258), many changes have occurred in the regulations governing the harvest of fish and game for personal consumption in Cook Inlet. Beginning in 1981, a new category of fisheries was established. Personal use fishing was created to provide for the personal consumptive needs of state residents not able to meet their needs under other fisheries. Since their creation, numerous changes have occurred in the personal use or subsistence fisheries in Cook Inlet, with many of the changes coming as a result of challenges in the State of Alaska Court System, the Alaska State Legislature, or the BOF process. The only personal use or subsistence fishery that has occurred consistently in Cook Inlet during this entire period is the Tyonek Subsistence fishery. A review of the various personal use and subsistence fisheries that have been conducted in Cook Inlet are reported in Brannian and Fox (1996) and Reimer and Sigurdsson (2004).

TYONEK SUBSISTENCE SALMON FISHERY

The present subsistence fishery in the Tyonek Subdistrict was created by an Anchorage Superior Court order in May 1980. In March 1981, the BOF adopted permanent regulations for this fishery. Originally open only to those individuals living in the village of Tyonek, recent court decisions allow any Alaskan resident to participate, although very few non-villagers seek permits. Fishing is allowed only in the Tyonek Subdistrict of the Northern District. A limit of 1 permit per household can be obtained and each permit holder is allowed a single 10-fathom gillnet, having a mesh size no greater than 6 inches. Fishing is allowed from 4:00 a.m. to 8:00 p.m. each Tuesday, Thursday, and Friday from May 15 to June 15, or until 4,200 Chinook salmon have been harvested. Fishing is again allowed from 6:00 a.m. to 6:00 p.m. each Saturday after June 15, although the opening is delayed until July 1, if 4,200 Chinook salmon were taken before June 16. The permit allows 25 salmon per permit holder and 10 salmon for each additional member. However, 5 AAC 01.595(a)(3) allows for up to 70 Chinook salmon per permit holder in the Tyonek Subsistence fishery. Annual Chinook salmon harvests have ranged from a low of 639 in 1997 to as many as 2,665 in 1983 (Appendix A15).

In 2007, preliminary reports from the Tyonek subsistence fishery show a harvest of 1,275 Chinook, 327 sockeye, 604 coho, 16 pink, and 11 chum salmon.

UPPER YENTNA RIVER SUBSISTENCE SALMON FISHERY

A subsistence salmon fishery is allowed in the Yentna River drainage outside the Anchorage-Matsu-Kenai non subsistence area described in 5 AAC 99.015(a)(3). The provisions for this fishery allow for the harvest of 25 salmon per head of household, plus 10 more for each dependent; however, all Chinook salmon and rainbow trout must be returned to the water alive. The specific area open for this fishery is in the main stem Yentna River from its confluence with Martin Creek upstream to its confluence with the Skwenta River. Legal gear consists only of fish wheels. The subsistence fishing season occurs from July 15 through July 31 from 4:00 a.m. to 8:00 p.m. each Monday, Wednesday, and Friday during this time frame. The preliminary harvest reports from the 2007 Yentna River subsistence fishery show that 367 sockeye, 66 coho, 17 pink, and 18 chum salmon were harvested by 21 permit holders (Appendix A15).

EDUCATIONAL FISHERY

Educational fisheries first began in UCI in 1989 with the Federal Court-ordered subsistence fishery for the Kenaitze Indian Tribe (Sweet et al. 2004). The fishery was labeled as a subsistence fishery due to differences in interpretations of subsistence. Beginning with the 1993 fishing season, the Alaska Superior Court ordered ADF&G to issue educational fishing permits. The present guidelines for educational fisheries are established by the BOF under chapter 93 of the Alaska Administrative Code. The standards for an educational fishery program include: (1) instructors must be qualified to teach the subject matter; (2) students must be enrolled; (3) there are minimum attendance requirements; (4) procedures for testing a student's knowledge of the subject matter or the student's proficiency in performing learned tasks must be administered; and (5) standards for successful completion of the program must be set. According to 5 AAC 93.210, the commissioner will issue a nontransferable, no-cost educational fishery permit to an applicant who proposes to operate an educational fishery program that meets the above standards, except in the following cases: (1) when the commissioner determines that the educational objective of the program can be accomplished under existing fisheries statutes and regulations; (2) the sustained yield of any fishery resource would be jeopardized or the fishery resource would be significantly reallocated among existing users; (3) the applicant failed to provide the information required by the permit; (4) the applicant violated a condition or requirement of an educational fishery permit; or (5) the applicant failed to comply with the reporting requirements of the permit.

CENTRAL DISTRICT EDUCATIONAL FISHERIES

In the Central District of UCI there currently are 5 groups conducting educational fisheries, including the Kenaitze Tribal Group, the Ninilchik Traditional Council, the Ninilchik Native Descendents, the Ninilchik Emergency Services, and the Anchor Point VFW.

In 1993 a state court ordered ADF&G to create an educational fishery for the Kenaitze Indian Tribe, pending final court rulings on other subsistence cases. The objectives for educational fisheries are specified in 5 AAC 93.235 as "educating persons concerning historic, contemporary, or experimental methods for locating, harvesting, handling, or processing fishery resources." Appendices A15 and A16 summarize the harvest from the Kenaitze educational fishery since 1994. In 2007, this amounted to 25 Chinook, 3,941 sockeye, 543 pink and 119 coho salmon, for a total of 4,628 salmon. The 2007 total salmon harvest was the 5th largest since this fishery began, but well within the 8,000 total fish harvest quota provided to the fishery.

In 1993 the Ninilchik Traditional Council (NTC) applied for and was granted a permit for an educational fishery (Szarzi and Begich 2004). In 1998, a group of NTC members formed a new organization, the Ninilchik Native Descendents (NND), and requested a separate permit with similar goals of passing on traditional knowledge and providing food for needy tribal members. Initially 1 permit was issued for both groups, but this was not acceptable to the NTC and both groups were allowed to fish concurrently. There have been a number of changes to the annual harvest limits allowed under these permits, but the total salmon quota more than tripled in 2007 from 850 to 2,800 fish for both the NTC and NND groups. In 2007 the NTC harvested 300 Chinook, 1,363 sockeye, 483 coho and 2 pink salmon (Appendix A15 and A16). The NND caught 65 Chinook, 210 sockeye, 102 coho and 12 pink salmon. The 2007 catch of more than 2,500 fish represents the largest harvest ever observed since the inception of the NNT/NND educational fisheries. The previous record harvest occurred in 2001 when the combined harvest from the two groups was slightly more than 1,500 fish.

In 2004, another group from Ninilchik, the Ninilchik Emergency Services (NES), applied for and was granted an educational fishery. In 2007, the NES group did not report any harvest from their educational fishery permit (Appendix A16).

The Anchor Point VFW applied for and was granted an educational fishery permit in 2007. They reported the following harvest from their 2007 fishing activities: 56 sockeye and 74 coho salmon (Appendix A16).

NORTHERN DISTRICT EDUCATIONAL FISHERIES

In the Northern District of Upper Cook Inlet, 6 groups have received permits for educational fisheries, these being (1) the Knik Tribal Council, (2) Big Lake Cultural Outreach, (3) Intertribal Native Leadership, (4) Eklutna Village, (5) Tyonek Village, and (6) Tim O'Brien (Appendix A16).

The Knik Tribal Council began an educational fishery in 1994 (Sweet et al. 2004). Their harvest in 2007 totaled 19 Chinook, 7 sockeye, 75 coho, and 16 chum salmon for a total of 117 fish. The peak harvest from this group of 823 fish occurred in 2003.

Big lake Cultural Outreach group harvested 17 Chinook, 100 sockeye, 46 coho, and 14 pink salmon for a total of 177 fish.

Intertribal Native leadership did not report fishing for the 2007 season.

The Eklutna Native Village group was also issued an educational fisheries permit beginning in 1994. They have harvested an average of 320 fish per year from 1994–2006 with a peak harvest of 733 fish occurring in 2004. No fishing activities were reported for 2007.

Tyonek Village did not report any educational fishing activities for the 2007 season.

A local resident from the Kenai Peninsula, Tim O'Brien, also applied for and received an educational fishery permit for the 2007 season. This fishery is located near Moose Point in the Eastern Subdistrict of the Northern District. In 2007, the harvest from this fishery was 49 Chinook, 75 sockeye, 103 coho, 9 pink, and 4 chum salmon for a total of 240 fish.

PERSONAL USE SALMON FISHERY

Under the Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540), personal use fishing is allowed in limited areas in Cook Inlet. The management plan received substantial changes at the BOF meeting in January of 1996. In 1995, personal use fishing was allowed with set gillnets in most areas of Cook Inlet normally open to commercial set gillnet fishing. However, for the 1996 season, most of this area was closed, but to compensate for the lost opportunity, dip net fisheries were expanded to allow for approximately the same level of harvest that had occurred with gillnets in 1995. Currently, personal use fishing using gillnets is only open near the Kasilof River in the waters of UCI normally closed to commercial set gillnet fishing. This area encompasses approximately 1 mile on either side of the Kasilof River terminus, extending out from shore for 1 mile. In addition, personal use fishing with dip nets is allowed at the terminus of the Kenai and Kasilof Rivers. The personal use management plan was again amended at the 2002 BOF meeting, modifying how the dip net fishery at Fish Creek in Knik Arm was to be managed, as well as making time changes to both the Kenai and Kasilof personal use fisheries. The Fish Creek dip net fishery was continued in regulation, but opens only if the upper end of the escapement goal of 70,000 is projected to be exceeded. The Kasilof River gillnet fishery was also modified, expanding the days and hours that the fishery was open. The fishery now opens on June 15 and takes place from 6:00 a.m. until 11:00 p.m. daily. Instead of being managed for a harvest goal of 10,000 to 20,000 fish, the fishery remains open until 11:00 p.m. on June 24, regardless of how many fish are harvested. The Kasilof River dip net personal use fishery occurs from June 25 through August 7, 24-hours per day. The BOF amended management plan also changed how the Kenai River dip net fishery was prosecuted. This fishery is open from July 10 through July 31, 7 days per week, but only from 6:00 a.m. to 11:00 p.m. daily. However, if ADF&G determines that the abundance of Kenai River late-run sockeye salmon is greater than 2 million fish, this fishery may be extended, by emergency order, to 24 hours per day.

A permit issued by ADF&G, along with a valid resident sport fishing license, or an exemption from licensing under AS 16.05.400, is required to participate in the personal use fisheries. The annual bag and possession limits are 25 salmon per head of household, with an additional 10 salmon for each household member. In the Kasilof River dip net fishery, however, Chinook salmon may not be retained and must be released immediately to the water unharmed. In the

Kenai River dip net fishery, 1 Chinook salmon may be retained per household. There are no Chinook salmon harvest restrictions in the Kasilof River gillnet personal use fishery. Legal gear under the management plan are set gillnets and dip nets. A set gillnet cannot exceed 10 fathoms (60 feet) in length or 45 meshes in depth. Mesh size must be greater than 4 inches, but may not exceed 6 inches. Gillnets must be set at least 100 feet apart at all times. A legal dip net has been defined in regulation (5 AAC 39.105) as a bag-shaped net supported on all sides by a rigid frame. The maximum straight-line distance between any two points on the net frame, as measured through the net opening, may not exceed 5 feet. The depth of the bag must be at least one-half of the greatest straight-line distance, as measured through the net opening. No portion of the bag may be constructed of webbing that exceeds a stretched measurement of 4.5 inches; the frame must be attached to a single rigid handle and be operated by hand.

KASILOF RIVER GILLNET

The personal use fishery using gillnets at the mouth of the Kasilof River opened on June 15 and closed at 11:00 p.m. on Saturday, June 24, 2007, as stipulated in the personal use management plan. Table 26 shows the personal use harvest data from 2006. The 2007 data was still being tabulated when this report was published.

KASILOF RIVER DIP NET

The Kasilof River dip net fishery was open from June 25 to August 7, 2007. However, in response to projections that the upper end of the Kasilof River sockeye salmon OEG would be exceeded, the Division of Sport Fish liberalized the area that was open to shore dip netting effective on July 23, extending it from the ADF&G markers located at the river terminus upstream to the bridge at the Sterling highway (Emergency Order No. 2-RS-1-26-07). Dip netting from boats in the Kasilof River was also liberalized, with the upstream closed marker moved to river mile 3. Both liberalizations were in effect from July 23 through August 7. Table 26 shows the personal use harvest data from 2006. The 2007 data was still being tabulated when this report was published.

KENAI RIVER DIP NET

The personal use dip net fishery located at the mouth of the Kenai River opened by regulation on July 10. The fishery was open from 6:00 a.m. to 11:00 p.m. daily through July 24, 2007. The Upper Cook Inlet Personal Use Salmon Fishery Management Plan states that the personal use fishery may be expanded to 24-hours per day if the Department determines that the abundance of the Kenai River late-run sockeye salmon will be greater than 2 million fish. Inseason assessments indicated the 2007 late-run Kenai River sockeye salmon run would exceed 2 million fish and the lower end of the optimal escapement goal (500,000–1,000,000 sockeye salmon) would be achieved. Sport Fish Division Emergency Order No. 2-RS-1-31-07 subsequently increased legal hours for dip netting to 24-hours per day effective 11:00 p.m., Wednesday, July 25. The fishery closed as scheduled on July 31. Table 26 shows the personal use harvest data from 2006. The 2007 data was still being tabulated when this report was published.

FISH CREEK DIP NET FISHERY

The Fish Creek personal use dip net fishery was not opened in 2007.

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TABLES AND FIGURES

Table 12.–Offshore test fish sockeye salmon catch results, F/V Americanus, 2007.

Date	No. of Stations	Fishing Time (min)	Catch	Cum Catch	Index	Cum Index	Mean Length (mm)	Water Temp (°C)	Air Temp (°C)	Salinity (ppm)	Beginning Wind Vel	Beginning Wind Dir	Ending Wind Vel	Ending Wind Dir
1-Jul	6	234.5	62	62	46	46	555	8.6	9.7	30.1	8	SE	1	E
2-Jul	6	224.5	33	95	26	73	570	8.1	20.7	30.7	2	E	3	SE
3-Jul	6	227.0	47	142	35	108	563	8.5	10.3	30.2	2	SE	8	SW
4-Jul	6	223.0	36	178	29	137	569	8.1	10.2	30.8	3	SW	2	SE
5-Jul	6	221.0	49	227	40	177	552	8.5	10.1	30.4	7	SE	7	SE
6-Jul	6	222.5	30	257	24	200	556	8.4	11.7	30.6	3	S	3	E
7-Jul	6	217.5	8	265	7	207	572	8.8	10.4	30.5	3	S	8	S
8-Jul	6	239.0	22	287	17	224	563	8.8	10.4	30.3	5	E	3	S
9-Jul	6	229.5	91	378	69	293	576	9.0	11.0	30.4	2	W	16	NW
10-Jul	6	236.5	140	518	102	395	591	9.1	11.7	30.4	8	N	11	N
11-Jul	6	249.0	177	695	125	520	586	9.2	11.6	30.5	2	E	4	NE
12-Jul	6	242.0	141	836	94	613	587	9.5	11.1	30.0	10	S	4	SW
13-Jul	6	243.5	186	1,022	130	744	581	9.3	11.4	30.4	4	SE	5	SW
14-Jul	6	252.0	273	1,295	153	897	591	9.4	11.7	30.2	2	SW	1	S
15-Jul	6	280.5	370	1,665	215	1,112	590	9.3	11.3	30.5	2	S	4	S
16-Jul	6	230.0	52	1,717	40	1,152	572	8.9	10.9	30.6	3	SE	2	S
17-Jul	4[a]	306.5	566	2,283	225	1,377	578	9.2	11.2	30.4	14	S	3	SE
18-Jul	6	236.0	63	2,346	47	1,424	571	9.2	11.9	30.4	3	S	8	N
19-Jul	6	259.0	264	2,610	165	1,588	578	9.9	12.0	30.2	5	S	4	SE
20-Jul	6	256.0	241	2,851	157	1,745	576	9.6	11.2	30.3	8	SE	9	SW
21-Jul	6	223.5	27	2,878	20	1,765	569	10.1	12.3	30.1	4	SE	6	S
22-Jul	6	220.5	36	2,914	29	1,794	563	10.2	11.1	29.9	5	S	3	S
23-Jul	6	268.5	274	3,188	154	1,948	569	10.2	11.8	29.7	3	NE	4	NW
24-Jul	6	256.0	237	3,425	151	2,099	568	10.0	11.6	29.8	10	N	3	NE
25-Jul	0[b]	241.3	135	3,560	88	2,187	568	10.1	12.0	29.7	4	S	6	SE
26-Jul	6	226.5	32	3,592	25	2,212	569	10.1	12.3	29.6	5	NW	3	NW
27-Jul	6	221.5	40	3,632	32	2,243	577	10.8	12.1	28.3	7	S	3	SE
28-Jul	6	222.5	205	3,837	196	2,440	562	10.3	13.6	29.6	2	NW	4	W
29-Jul	6	215.0	7	3,844	6	2,446	545	10.3	12.3	29.6	5	SE	3	SE
30-Jul	5[a]	239.8	127	3,971	86	2,531	566	10.1	12.1	29.9	17	SW	8	S
31-Jul	6	215.0	37	4,008	31	2,562	562	10.1	11.7	29.8	11	S	8	SW
1-Aug	6	217.0	2	4,010	2	2,564	586	9.8	12.0	30.1	1	SE	3	SW
2-Aug	6	222.5	26	4,036	21	2,584	564	8.7	12.2	30.6	4	N	4	N

[a] All stations not fished due to inclement weather; the data for missed stations was interpolated.

[b] No stations fished due to inclement weather; the data for all stations was interpolated.

Table 13.–Upper Cook Inlet sockeye salmon enumeration by river and date, 2007.

	Kenai River		Kasilof River		Crescent River		Yentna River		Fish Creek		Packers Creek	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15-Jun	0	0	3,927	3,927	0	0	0	0				
16-Jun	0	0	4,474	8,401	0	0	0	0				
17-Jun	0	0	2,597	10,998	0	0	0	0				
18-Jun	0	0	2,154	13,152	0	0	0	0				
19-Jun	0	0	1,892	15,044	0	0	0	0				
20-Jun	0	0	2,093	17,137	0	0	0	0				
21-Jun	0	0	2,111	19,248	0	0	0	0				
22-Jun	0	0	3,269	22,517	0	0	0	0				
23-Jun	0	0	4,185	26,702	0	0	0	0				
24-Jun	0	0	2,424	29,126	387	387	0	0				
25-Jun	0	0	2,390	31,516	429	816	0	0				
26-Jun	0	0	909	32,425	108	924	0	0				
27-Jun	0	0	2,222	34,647	704	1,628	0	0				
28-Jun	0	0	5,605	40,252	4,581	6,209	0	0				
29-Jun	0	0	748	41,000	2,019	8,228	0	0				
30-Jun	0	0	492	41,492	3,267	11,495	0	0				
1-Jul	3,740	3,740	1,770	43,262	1,817	13,312	0	0				
2-Jul	4,467	8,207	3,637	46,899	3,350	16,662	0	0				
3-Jul	3,860	12,067	1,282	48,181	1,778	18,440	0	0			89	89
4-Jul	2,671	14,738	2,990	51,171	1,783	20,223	0	0			78	167
5-Jul	2,916	17,654	1,282	52,453	1,317	21,540	0	0			33	200
6-Jul	3,322	20,976	1,294	53,747	1,697	23,237	0	0	0	0	75	275
7-Jul	5,161	26,137	4,880	58,627	1,364	24,601	19	19	0	0	354	629
8-Jul	7,884	34,021	9,068	67,695	1,102	25,703	41	60	0	0	253	882
9-Jul	8,633	42,654	5,631	73,326	1,384	27,087	37	97	0	0	247	1,129
10-Jul	3,918	46,572	2,486	75,812	1,418	28,505	22	119	0	0	197	1,326
11-Jul	4,617	51,189	6,144	81,956	2,704	31,209	19	138	14	14	274	1,600
12-Jul	4,925	56,114	1,565	83,521	1,991	33,200	45	183	3	17	69	1,669
13-Jul	2,792	58,906	1,602	85,123	1,468	34,668	106	289	0	17	77	1,746
14-Jul	4,528	63,434	4,791	89,914	1,331	35,999	47	336	99	116	108	1,854
15-Jul	6,896	70,330	3,254	93,168	1,399	37,398	36	372	24	140	149	2,003
16-Jul	6,911	77,241	4,312	97,480	1,195	38,593	111	483	72	212	128	2,131
17-Jul	5,428	82,669	2,939	100,419	2,544	41,137	224	707	6	218	216	2,347
18-Jul	8,881	91,550	24,008	124,427	4,956	46,093	314	1,021	231	449	69	2,416
19-Jul	42,649	134,199	18,801	143,228	2,470	48,563	162	1,183	85	534	139	2,555
20-Jul	15,780	149,979	8,087	151,315	2,975	51,538	2,025	3,208	0	534	192	2,747
21-Jul	31,596	181,575	23,787	175,102	3,731	55,269	4,067	7,275	337	871	228	2,975
22-Jul	46,797	228,372	22,104	197,206	1,893	57,162	5,527	12,802	996	1,867	84	3,059
23-Jul	39,078	267,450	12,569	209,775	2,019	59,181	7,251	20,053	1,937	3,804	1,226	4,285
24-Jul	34,129	301,579	13,572	223,347	1,866	61,047	5,504	25,557	4,626	8,430	884	5,169
25-Jul	34,135	335,714	22,008	245,355	3,783	64,830	4,322	29,879	1,848	10,278	1,534	6,703
26-Jul	46,487	382,201	18,915	264,270	3,042	67,872	3,424	33,303	2,361	12,639	2,079	8,782

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Table 13.–Page 2 of 2.

	Kenai River		Kasilof River		Crescent River		Yentna River		Fish Creek		Packers Creek	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jul	60,260	442,461	11,496	275,766	1,600	69,472	2,674	35,977	2,118	14,757	2,176	10,958
28-Jul	42,378	484,839	4,750	280,516	707	70,179	5,125	41,102	1,853	16,610	967	11,925
29-Jul	31,615	516,454	5,147	285,663	674	70,853	3,998	45,100	1,158	17,768	501	12,426
30-Jul	19,949	536,403	4,968	290,631	1,134	71,987	1,927	47,027	775	18,543	2,331	14,757
31-Jul	19,122	555,525	6,241	296,872	1,457	73,444	1,176	48,203	181	18,724	887	15,644
1-Aug	19,436	574,961	4,209	301,081	935	74,379	1,251	49,454	888	19,612	811	16,455
2-Aug	14,422	589,383	3,115	304,196	838	75,217	2,210	51,664	1,333	20,945	350	16,805
3-Aug	8,741	598,124	2,514	306,710	777	75,994	3,245	54,909	218	21,163	436	17,241
4-Aug	12,540	610,664	4,039	310,749	1,161	77,155	3,037	57,946	807	21,970	4,521	21,762
5-Aug	18,479	629,143	2,928	313,677	770	77,925	1,387	59,333	1,564	23,534	2,439	24,201
6-Aug	23,445	652,588	2,465	316,142	739	78,664	1,253	60,586	1,501	25,035	953	25,154
7-Aug	15,681	668,269	3,701	319,843	742	79,406	2,568	63,154	297	25,332	1,605	26,759
8-Aug	13,134	681,403	4,113	323,956			2,878	66,032	357	25,689	1,060	27,819
9-Aug	24,429	705,832	4,125	328,081			3,559	69,591	225	25,914	1,912	29,731
10-Aug	14,279	720,111	2,199	330,280			2,125	71,716	293	26,207	307	30,038
11-Aug	21,572	741,683	2,992	333,272			2,862	74,578	190	26,397	87	30,125
12-Aug	22,302	763,985	2,410	335,682			3,345	77,923	784	27,181	3,561	33,686
13-Aug	14,462	778,447	1,184	336,866			1,235	79,158	271	27,452	867	34,553
14-Aug	10,610	789,057					284	79,442	438	27,890	171	34,724
15-Aug	10,925	799,982					201	79,643	58	27,948	540	35,264
16-Aug	9,970	809,952					258	79,901			585	35,849
17-Aug	9,330	819,282									370	36,219
18-Aug	8,206	827,488									334	36,553
19-Aug	10,544	838,032									206	36,759
20-Aug	10,166	848,198									132	36,891
21-Aug	6,558	854,756									559	37,450
22-Aug	6,252	861,008									617	38,067
23-Aug	6,564	867,572									806	38,873
24-Aug											2,141	41,014
25-Aug											1,564	42,578
26-Aug											526	43,104
27-Aug											807	43,911
28-Aug											303	44,214
29-Aug											266	44,480
30-Aug											494	44,974
31-Aug											440	45,414
31-Aug											172	45,586
31-Aug											223	45,809
31-Aug											188	45,997
31-Aug											261	46,258
31-Aug											142	46,400
31-Aug											237	46,637

Note: Days without data indicate days when the project was not operational.

Table 14.–Commercial Chinook salmon catch by area and date, Upper Cook Inlet, 2007.

Upper Subdistrict Set Gillnet																
	244-21 Ninilchik		244-22 Cohoe		244-25 Kasilof Terminal		244-31 South K. Beach		244-32 North K. Beach		244-41 Salamatof		244-42 East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
6/25	73	73	29	29			13	13							115	115
6/28	119	192	54	83			37	50							210	325
6/29	64	256	46	129			29	79							139	464
6/30	49	305	67	196			197	276							313	777
7/2	39	344	53	249			17	293							109	886
7/4	55	399	42	291			28	321							125	1,011
7/5	123	522	118	409			40	361							281	1,292
7/9	78	600	226	635			65	426	42	42	156	156	3	3	570	1,862
7/11	96	696	96	731			109	535							301	2,163
7/12	123	819	123	854			102	637	102	144	218	374	4	7	672	2,835
7/14	128	947	171	1,025			98	735							397	3,232
7/16	231	1,178	236	1,261			213	948	142	286	471	845	20	27	1,313	4,545
7/18	70	1,248	199	1,460			46	994							315	4,860
7/19	194	1,442	192	1,652			211	1,205	152	438	456	1,301	15	42	1,220	6,080
7/20	91	1,533	102	1,754			48	1,253							241	6,321
7/21	162	1,695	120	1,874			100	1,353	66	504	171	1,472	3	45	622	6,943
7/22	42	1,737	78	1,952			47	1,400	40	544	75	1,547	1	46	283	7,226
7/23	136	1,873	86	2,038			115	1,515	85	629	99	1,646	4	50	525	7,751

-continued-

Table 14.–Page 2 of 7.

Upper Subdistrict Set Gillnet																
	244-21 Ninilchik		244-22 Cohoe		244-25 Kasilof Terminal		244-31 South K. Beach		244-32 North K. Beach		244-41 Salamatof		244-42 East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7/25	29	1,902	46	2,084			45	1,560							120	7,871
7/26	36	1,938	60	2,144			121	1,681	62	691	80	1,726	7	57	366	8,237
7/27	33	1,971	93	2,237	8	8	28	1,709							162	8,399
7/28	35	2,006	79	2,316	27	35	129	1,838	109	800	254	1,980	10	67	643	9,042
7/29					21	56									21	9,063
7/30	90	2,096	125	2,441			116	1,954	104	904	152	2,132	6	73	593	9,656
7/31	13	2,109	102	2,543			114	2,068	54	958	98	2,230	8	81	389	10,045
8/1	31	2,140	71	2,614			127	2,195	88	1,046	217	2,447	20	101	554	10,599
8/2	44	2,184	31	2,645			91	2,286	92	1,138	151	2,598	13	114	422	11,021
8/3					38	94									38	11,059
8/4					21	115									21	11,080
8/5	14	2,198	31	2,676	16	131	25	2,311	16	1,154	19	2,617	5	119	126	11,206
8/6	24	2,222	46	2,722			62	2,373	31	1,185	67	2,684	8	127	238	11,444
8/7	17	2,239	52	2,774			117	2,490	86	1,271	118	2,802	12	139	402	11,846
8/8		2,239	9	2,783			7	2,497	2	1,273	24	2,826	1	140	43	11,889
8/9	17	2,256	29	2,812	3	134	127	2,624	71	1,344	120	2,946	2	142	369	12,258
8/10					30	164									30	12,288

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Table 14.–Page 3 of 7.

Central District - West Side Set Gillnet

	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/1															41	41			41	41
6/4											7	7			30	71			37	78
6/6											19	26			92	163			111	189
6/8												26			18	181			18	207
6/11												26			23	204			23	230
6/13											4	30			19	223			23	253
6/15												30			26	249			26	279
6/18					8	8					7	37			11	260			26	305
6/20						8					6	43			9	269			15	320
6/21					40	48										269			40	360
6/25					12	60									13	282	6	6	31	391
6/28					16	76									6	288	1	7	23	414
7/1					18	94										288		7	18	432
7/2					11	105			1	1					3	291		7	15	447
7/4					17	122				1						291		7	17	464
7/5					7	129				1					4	295		7	11	475
7/7					10	139				1						295		7	10	485
7/8					9	148				1						295		7	9	494
7/9					10	158				1					8	303		7	18	512
7/10					2	160				1						303		7	2	514

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Table 14.–Page 4 of 7.

Central District - West Side Set Gillnet

	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
11-Jul					6	166				1						303		7	6	520
12-Jul					11	177				1					6	309		7	17	537
13-Jul					7	184				1						309		7	7	544
14-Jul					2	186				1						309		7	2	546
16-Jul					3	189			2	3					6	315		7	11	557
18-Jul					6	195										315		7	6	563
19-Jul					1	196									4	319		7	5	568
20-Jul					4	200										319		7	4	572
21-Jul					2	202										319		7	2	574
22-Jul					3	205										319		7	3	577
23-Jul					0	205									4	323		7	4	581
26-Jul					4	209									1	324		7	5	586
27-Jul					1	210										324		7	1	587
28-Jul					1	211										324		7	1	588
29-Jul						211									2	326		7	2	590
30-Jul					2	213										326		7	2	592
31-Jul															1	327	1	8	2	594
2-Aug															7	334	2	10	9	603

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Table 14.–Page 5 of 7.

Northern District Set Gillnet																				
	247-10		247-20		247-30		247-41		247-42		247-43		247-70		247-80		247-90			
	Trading Bay		Tyonek		Beluga		Susitna Flats		Pt. McKenzie		Fire Island		Pt. Possession		Birch Hill		#3 Bay		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
5/28	178	178	99	99	21	21	15	15	42	42	7	7	78	78	28	28	30	30	498	498
6/4	237	415	162	261	228	249	131	146	94	136	124	131	240	318	36	64	18	48	1,270	1,768
6/11	94	509	366	627	126	375	120	266	87	223	181	312	346	664	24	88	20	68	1,364	3,132
6/25			106	733	152	527	23	289	8	231			72	736	11	99	5	73	377	3,509
6/28	36	545			82	609	10	299					25	761	2	101	4	77	159	3,668
7/2	37	582			44	653							1	762			1	78	83	3,751
7/5	5	587			41	694		299					5	767			1	79	52	3,803
7/9					5	699	1	300		231			1	768				79	7	3,810
7/12	1	588			2	701		300	1	232							1	80	5	3,815
7/16		588			1	702		300		232								80	1	3,816
7/19	4	592		733		702	1	301		232								80	5	3,821
8/13		592				702		301		232							1	81	1	3,822

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Table 14.–Page 6 of 7.

Central District Drift Gillnet

		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/21	69							60	60	60	60
6/25	102							45	105	45	105
6/28	158							55	160	55	160
7/29	13			2	2					2	162
6/30	9			1	3					1	163
7/2	241							74	234	74	237
7/4	17			3	6					3	240
7/5	286							88	322	88	328
7/9	356							76	398	76	404
7/11	126			36	42					36	440
7/12	290							68	466	68	508
7/14	161			36	78					36	544
7/16	381							55	521	55	599
7/19	396							55	576	55	654
7/21	251			12	90	59	59			71	725
7/22	91					9	68			9	734
7/23	385							7	583	7	741
7/26	373							15	598	15	756
7/27	44	3								3	759
7/28	153					24	92			24	783

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Table 14.–Page 7 of 7.

Central District Drift Gillnet											
		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/29	13	2								2	785
7/30	322							47	645	47	832
7/31	114					19	111			19	851
8/1	102					10	121			10	861
8/2	230							10	655	10	871
8/3	10	7								7	878
8/4	5	2								2	880
8/5	28					8	129			8	888
8/6	109							4	659	4	892
8/7	35					1	130			1	893
8/8	7									0	893
8/9	164							6	665	6	899
8/10	7	2				1	131			3	902
8/13	22							5	670	5	907
8/16	17							2	672	2	909
8/20	15							1	673	1	910
8/23	8								673	0	910
8/27	11								673	0	910
8/30	10							2	675	2	912

Note: Days without data indicate days when there was no harvest.

Table 15.–Commercial sockeye salmon catch by area and date, Upper Cook Inlet, 2007.

Upper Subdistrict Set Gillnet

	244-21 Ninilchik		244-22 Cohoe		244-25 Kasilof Terminal		244-31 South K. Beach		244-32 North K. Beach		244-41 Salamatof		244-42 East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
6/25	4,911	4,911	1,560	1,560			1,901	1,901							8,372	8,372
6/28	14,922	19,833	4,916	6,476			3,233	5,134							23,071	31,443
6/29	10,247	30,080	1,891	8,367			2,818	7,952							14,956	46,399
6/30	9,335	39,415	4,436	12,803			2,883	10,835							16,654	63,053
7/2	13,446	52,861	3,511	16,314			2,533	13,368							19,490	82,543
7/4	11,836	64,697	3,661	19,975			2,147	15,515							17,644	100,187
7/5	9,136	73,833	3,924	23,899			2,068	17,583							15,128	115,315
7/9	21,989	95,822	6,592	30,491			3,531	21,114	1,712	1,712	4,545	4,545	559	559	38,928	154,243
7/11	36,869	132,691	12,530	43,021			4,404	25,518							53,803	208,046
7/12	13,622	146,313	2,882	45,903			1,127	26,645	783	2,495	2,822	7,367	204	763	21,440	229,486
7/14	18,094	164,407	8,888	54,791			7,113	33,758							34,095	263,581
7/16	12,816	177,223	6,312	61,103			3,776	37,534	1,380	3,875	7,129	14,496	1,040	1,803	32,453	296,034
7/18	23,769	200,992	15,240	76,343			23,339	60,873							62,348	358,382
7/19	16,951	217,943	37,934	114,277			7,533	68,406	5,390	9,265	33,275	47,771	3,409	5,212	104,492	462,874
7/20	12,087	230,030	27,709	141,986			15,164	83,570							54,960	517,834
7/21	12,183	242,213	13,231	155,217			17,772	101,342	15,804	25,069	97,335	145,106	8,271	13,483	164,596	682,430
7/22	11,554	253,767	5,636	160,853			7,363	108,705	9,509	34,578	40,110	185,216	3,978	17,461	78,150	760,580
7/23	7,927	261,694	3,125	163,978			5,320	114,025	6,955	41,533	32,198	217,414	7,889	25,350	63,414	823,994

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Table 15.–Page 2 of 7.

Upper Subdistrict Set Gillnet

	244-21		244-22		244-25		244-31		244-32		244-41		244-42			
	Ninilchik		Cohoe		Kasilof Terminal		South K. Beach		North K. Beach		Salamatof		East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7/25	9,248	270,942	9,341	173,319			10,626	124,651							29,215	853,209
7/26	5,210	276,152	7,341	180,660			14,085	138,736	22,463	63,996	47,138	264,552	7,152	32,502	103,389	956,598
7/27	4,538	280,690	3,844	184,504	979	979	4,636	143,372							13,997	970,595
7/28	4,002	284,692	4,399	188,903	2,304	3,283	4,259	147,631	3,368	67,364	31,603	296,155	5,212	37,714	55,147	1,025,742
7/29					2,102	5,385									2,102	1,027,844
7/30	4,454	289,146	5,067	193,970			6,610	154,241	8,504	75,868	30,919	327,074	4,550	42,264	60,104	1,087,948
7/31	5,326	294,472	6,118	200,088			6,810	161,051	5,166	81,034	13,604	340,678	3,525	45,789	40,549	1,128,497
8/1	3,504	297,976	2,916	203,004			3,338	164,389	3,879	84,913	24,208	364,886	6,416	52,205	44,261	1,172,758
8/2	3,484	301,460	2,008	205,012			1,883	166,272	1,655	86,568	10,795	375,681	3,307	55,512	23,132	1,195,890
8/3					2,385	7,770									2,385	1,198,275
8/4					2,605	10,375									2,605	1,200,880
8/5	3,826	305,286	4,120	209,132	1,853	12,228	1,366	167,638	1,391	87,959	9,867	385,548	2,090	57,602	24,513	1,225,393
8/6	3,867	309,153	2,700	211,832			4,211	171,849	4,033	91,992	17,948	403,496	7,403	65,005	40,162	1,265,555
8/7	1,540	310,693	2,548	214,380			2,908	174,757	3,603	95,595	10,339	413,835	4,308	69,313	25,246	1,290,801
8/8	1,034	311,727	1,130	215,510			1,438	176,195	1,342	96,937	8,552	422,387	1,355	70,668	14,851	1,305,652
8/9	4,108	315,835	4,163	219,673	246	12,474	7,169	183,364	8,243	105,180	16,813	439,200	3,856	74,524	44,598	1,350,250
8/10					3,157	15,631									3,157	1,353,407

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Table 15.–Page 3 of 7.

Central District - West Side Set Gillnet

	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/1											92	92			1,524	1,524			1,616	1,616
6/4											255	347			2,753	4,277			3,008	4,624
6/6											705	1,052			1,992	6,269			2,697	7,321
6/8															1,480	7,749			1,480	8,801
6/11															1,518	9,267			1,518	10,319
6/13											255	1,307			851	10,118			1,106	11,425
6/15											183	1,490			1,293	11,411			1,476	12,901
6/18					582	582					272	1,762			740	12,151			1,594	14,495
6/20											238	2,000			648	12,799			886	15,381
6/21					864	1,446													864	16,245
6/22											74	2,074			95	12,894			169	16,414
6/25					2,107	3,553									1,427	14,321	1,232	1,232	4,766	21,180
6/28					1,774	5,327			176	176					1,472	15,793	1,342	2,574	4,764	25,944
7/1					1,143	6,470													1,143	27,087
7/2					2,346	8,816			103	279					2,316	18,109	326	2,900	5,091	32,178
7/4					2,686	11,502													2,686	34,864
7/5					3,123	14,625			142	421					2,371	20,480	523	3,423	6,159	41,023
7/7					2,620	17,245													2,620	43,643
7/8					1,605	18,850													1,605	45,248
7/9					1,537	20,387									2,118	22,598	343	3,766	3,998	49,246
7/10					1,084	21,471													1,084	50,330
7/11					2,195	23,666													2,195	52,525
7/12					1,165	24,831			514	935					1,117	23,715	278	4,044	3,074	55,599
7/13					1,508	26,339													1,508	57,107
7/14					774	27,113													774	57,881

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Table 15.–Page 4 of 7.

Central District - West Side Set Gillnet																				
	245-10		245-20		245-30		245-40		245-50		245-55		245-60		246-10		246-20			
	Chinitna Bay		Silver Salmon		Tuxedni Bay		Polly Cr.		L. J. Slough		Big River		West Forelands		Kalgin - West		Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/15					228	27,341													228	58,109
7/16					1,039	28,380			469	1,404					446	24,161	129	4,173	2,083	60,192
7/18					3,193	31,573													3,193	63,385
7/19					1,828	33,401			1,146	2,550	86	2,160			2,508	26,669	640	4,813	6,208	69,593
7/20					2,477	35,878													2,477	72,070
7/21					1,378	37,256													1,378	73,448
7/22					1,618	38,874													1,618	75,066
7/23					423	39,297			1,123	3,673	60	2,220	33	33	2,831	29,500	1,765	6,578	6,235	81,301
7/25					1,889	41,186													1,889	83,190
7/26					1,330	42,516			2,118	5,791	97	2,317	88	121	3,148	32,648	2,048	8,626	8,829	92,019
7/27					296	42,812													296	92,315
7/28					242	43,054													242	92,557
7/29															1,792	34,440	764	9,390	2,556	95,113
7/30					1,311	44,365			560	6,351	15	2,332							1,886	96,999
7/31					508	44,873									1,248	35,688	792	10,182	2,548	99,547
8/2									627	6,978					2,439	38,127	1,094	11,276	4,160	103,707
8/6					245	45,118			871	7,849					1,455	39,582	1,830	13,106	4,401	108,108
8/8					61	45,179													61	108,169
8/9					896	46,075			1,944	9,793					2,508	42,090	777	13,883	6,125	114,294
8/11															1,799	43,889	973	14,856	2,772	117,066
8/13					70	46,145			378	10,171					1,265	45,154	436	15,292	2,149	119,215
8/16					54	46,199			262	10,433					2,102	47,256			2,418	121,633
8/18															569	47,825			569	122,202
8/20					25	46,224													25	122,227
8/23					18	46,242			117	10,550									135	122,362
8/27					13	46,255			49	10,599									62	122,424

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Table 15.–Page 5 of 7.

Northern District Set Gillnet

	247-10 Trading Bay		247-20 Tyonek		247-30 Beluga		247-41 Susitna Flats		247-42 Pt. McKenzie		247-43 Fire Island		247-70 Pt. Possession		247-80 Birch Hill		247-90 #3 Bay		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
28-May	8	8			1	1			2	2	1	1	19	19	20	20	38	38	89	89
4-Jun	53	61	1	1	5	6	6	6	8	10	3	4	68	87	53	73	114	152	311	400
11-Jun	100	161	12	13	4	10	4	10	7	17	10	14	352	439	26	99	162	314	677	1,077
25-Jun			9	22	2	12	4	14		17	19	33	89	528	14	113	57	371	194	1,271
28-Jun	9	170			43	55	8	22					123	651	32	145	86	457	301	1,572
2-Jul	35	205			223	278							116	767	51	196	159	616	584	2,156
5-Jul	19	224			161	439	3	25					205	972	82	278	132	748	602	2,758
9-Jul					350	789	22	47	6	23	70	103	366	1,338	72	350	54	802	940	3,698
12-Jul	8	232			183	972	32	79	25	48	190	293	158	1,496	59	409	5	807	660	4,358
16-Jul	164	396			618	1,590	143	222	195	243			148	1,644	79	488	32	839	1,379	5,737
19-Jul	303	699	124	146	1,005	2,595	203	425	169	412	323	616	1,039	2,683	194	682	233	1,072	3,593	9,330
23-Jul	208	907	78	224	789	3,384	210	635	224	636	208	824	739	3,422	286	968	255	1,327	2,997	12,327
9-Aug	41	948			317	3,701	303	938	156	792	147	971	393	3,815	211	1,179	156	1,483	1,724	14,051
13-Aug	4	952			104	3,805	108	1,046	41	833	80	1,051	217	4,032	283	1,462	295	1,778	1,132	15,183
16-Aug					87	3,892	50	1,096	37	870	35	1,086	124	4,156	144	1,606	255	2,033	732	15,915
20-Aug					19	3,911	22	1,118			41	1,127	274	4,430	122	1,728	28	2,061	506	16,421
23-Aug						3,911					24	1,151	171	4,601	257	1,985	69	2,130	521	16,942
27-Aug							6	1,124			2	1,153	32	4,633	18	2,003	114	2,244	172	17,114
30-Aug							4	1,128			6	1,159	97	4,730	19	2,022	108	2,352	234	17,348
3-Sep													48	4,778	35	2,057			83	17,431
6-Sep													25	4,803	8	2,065			33	17,464
10-Sep													2	4,805					2	17,466
13-Sep							1	1,129											1	17,467

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Table 15.–Page 6 of 7.

Central District Drift Gillnet

		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		245-10 Chinitna Bay		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/21	69							3,788	3,788			3,788	3,788
6/25	102							5,772	9,560			5,772	9,560
6/28	158							16,445	26,005			16,445	26,005
6/29	13			234	234				26,005			234	26,239
6/30	9			806	1,040				26,005			806	27,045
7/2	241				1,040			22,276	48,281			22,276	49,321
7/4	17			619	1,659				48,281			619	49,940
7/5	286				1,659			63,019	111,300			63,019	112,959
7/9	356				1,659			104,709	216,009			104,709	217,668
7/11	126			5,731	7,390				216,009			5,731	223,399
7/12	290				7,390			190,505	406,514			190,505	413,904
7/14	161			5,358	12,748				406,514			5,358	419,262
7/16	381				12,748			481,204	887,718			481,204	900,466
7/19	396				12,748			451,216	1,338,934			451,216	1,351,682
7/21	251			13,580	26,328	60,384	60,384		1,338,934			73,964	1,425,646
7/22	91					9,033	69,417		1,338,934			9,033	1,434,679
7/23	385						69,417	126,001	1,464,935			126,001	1,560,680
7/26	373						69,417	63,008	1,527,943			63,008	1,623,688
7/27	44	2,689	2,689									2,689	1,626,377
7/28	153					10,743	80,160		1,527,943			10,743	1,637,120
7/29	13	618	3,307									618	1,637,738
7/30	322						80,160	78,552	1,606,495			78,552	1,716,290
7/31	114					12,174	92,334		1,606,495			12,174	1,728,464

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Table 15.–Page 7 of 7.

Central District Drift Gillnet													
		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		245-10 Chinitna Bay		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
8/1	102					7,399	99,733		1,606,495			7,399	1,735,863
8/2	230						99,733	35,434	1,641,929			35,434	1,771,297
8/3	10	582	3,889									582	1,771,879
8/4	5	549	4,438									549	1,772,428
8/5	28					3,958	103,691		1,641,929			3,958	1,776,386
8/6	109						103,691	16,232	1,658,161			16,232	1,792,618
8/7	35					1,009	104,700		1,658,161			1,009	1,793,627
8/8	7					501	105,201		1,658,161			501	1,794,128
8/9	164						105,201	26,585	1,684,746			26,585	1,820,713
8/10	7	221	4,659			359	105,560		1,684,746			580	1,821,293
8/13	22							756	1,685,502			756	1,822,049
8/16	17							840	1,686,342			840	1,822,889
8/20	15							240	1,686,582			240	1,823,129
8/23	8							79	1,686,661			79	1,823,208
8/27	11							180	1,686,841			180	1,823,388
8/30	10							77	1,686,918			77	1,823,465
9/3	<4							4	1,686,922	4	4	8	1,823,473
9/6	<4							4	1,686,926			4	1,823,477
9/10	<4							4	1,686,930			4	1,823,481

Note: Days without data indicate days when there was no harvest.

Table 16.–Commercial coho salmon catch by area and date, Upper Cook Inlet, 2007.

Upper Subdistrict Set Gillnet

	244-21 Ninilchik		244-22 Cohoe		244-25 Kasilof Terminal		244-31 South K. Beach		244-32 North K. Beach		244-41 Salamatof		244-42 East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
6/25	2	2	32	32											34	34
6/28	7	9	5	37			3	3							15	49
6/29		9	2	39				3							2	51
6/30	3	12	4	43			3	6							10	61
7/2	14	26	7	50			5	11							26	87
7/4	17	43	8	58			10	21							35	122
7/5	9	52	15	73			9	30							33	155
7/9	18	70	68	141			19	49	12	12	38	38	44	44	199	354
7/11	23	93	76	217			12	61							111	465
7/12	25	118	20	237			9	70	30	42	33	71	20	64	137	602
7/14	23	141	75	312			31	101							129	731
7/16	37	178	93	405			67	168	92	134	345	416	118	182	752	1,483
7/18	247	425	332	737			117	285							696	2,179
7/19	160	585	497	1,234			239	524	283	417	673	1,089	440	622	2,292	4,471
7/20	28	613	69	1,303			177	701							274	4,745
7/21	83	696	204	1,507			95	796	72	489	224	1,313	209	831	887	5,632
7/22	113	809	208	1,715			59	855	131	620	230	1,543	215	1,046	956	6,588
7/23	221	1,030	312	2,027			104	959	138	758	327	1,870	675	1,721	1,777	8,365

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Table 16.–Page 2 of 7.

Upper Subdistrict Set Gillnet

	244-21		244-22		244-25		244-31		244-32		244-41		244-42			
	Ninilchik		Cohoe		Kasilof Terminal		South K. Beach		North K. Beach		Salamatof		East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7/25	112	1,142	145	2,172			15	974							272	8,637
7/26	66	1,208	50	2,222			44	1,018	28	786	812	2,682	639	2,360	1,639	10,276
7/27	72	1,280	99	2,321			62	1,080							233	10,509
7/28	68	1,348	133	2,454	8	8	33	1,113	26	812	99	2,781	117	2,477	484	10,993
7/29					14	22									14	11,007
7/30	133	1,481	180	2,634	7	29	102	1,215	216	1,028	477	3,258	244	2,721	1,359	12,366
7/31	126	1,607	193	2,827			165	1,380	199	1,227	479	3,737	225	2,946	1,387	13,753
8/1	149	1,756	76	2,903			111	1,491	115	1,342	374	4,111	263	3,209	1,088	14,841
8/2	153	1,909	82	2,985			81	1,572	69	1,411	244	4,355	171	3,380	800	15,641
8/3					38	67									38	15,679
8/4					119	186									119	15,798
8/5	218	2,127	250	3,235	92	278	47	1,619	56	1,467	290	4,645	290	3,670	1,243	17,041
8/6	378	2,505	274	3,509			234	1,853	300	1,767	691	5,336	514	4,184	2,391	19,432
8/7	165	2,670	196	3,705			249	2,102	177	1,944	924	6,260	387	4,571	2,098	21,530
8/8	6	2,676	78	3,783			21	2,123	16	1,960	274	6,534	48	4,619	443	21,973
8/9	276	2,952	177	3,960	8	286	179	2,302	99	2,059	487	7,021	213	4,832	1,439	23,412
8/10					166	452									166	23,578

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Table 16.–Page 3 of 7.

Central District - West Side Set Gillnet																				
	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/21					3	3													3	3
6/25					42	45									11	11	10	10	63	66
6/28					4	49			1	1					37	48	0	10	42	108
7/1					1	50				1						48		10	1	109
7/2					32	82			5	6					84	132	4	14	125	234
7/4					36	118				6						132		14	36	270
7/5					61	179			3	9					191	323	8	22	263	533
7/7					73	252				9						323		22	73	606
7/8					50	302				9						323		22	50	656
7/9					83	385				9					441	764	15	37	539	1,195
7/10					48	433				9						764		37	48	1,243
7/11					161	594				9						764		37	161	1,404
7/12					93	687			17	26					700	1,464	39	76	849	2,253
7/13					103	790				26						1,464		76	103	2,356
7/14					30	820				26						1,464		76	30	2,386
7/15					7	827				26						1,464		76	7	2,393
7/16					100	927			10	36					424	1,888	44	120	578	2,971
7/18					489	1,416				36						1,888		120	489	3,460
7/19					187	1,603			53	89	268	268			2,292	4,180	399	519	3,199	6,659
7/20					298	1,901				89		268				4,180		519	298	6,957

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Table 16.–Page 4 of 7.

Central District - West Side Set Gillnet																				
	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/21					130	2,031				89		268				4,180		519	130	7,087
7/22					170	2,201				89		268				4,180		519	170	7,257
7/23					56	2,257			66	155	185	453	12	12	2,077	6,257	390	909	2,786	10,043
7/25					385	2,642				155		453		12		6,257		909	385	10,428
7/26					463	3,105			126	281	629	1,082	132	144	910	7,167	562	1,471	2,822	13,250
7/27					91	3,196				281		1,082				7,167		1,471	91	13,341
7/28					40	3,236				281		1,082				7,167		1,471	40	13,381
7/29						3,236				281		1,082			418	7,585	204	1,675	622	14,003
7/30					461	3,697			44	325	125	1,207				7,585		1,675	630	14,633
7/31					215	3,912				325					282	7,867	251	1,926	748	15,381
8/2						3,912			369	694					1,288	9,155	414	2,340	2,071	17,452
8/6					102	4,014			184	878					1,159	10,314	577	2,917	2,022	19,474
8/9					114	4,128			144	1,022					708	11,022	83	3,000	1,049	20,523
8/11						4,128				1,022					607	11,629	201	3,201	808	21,331
8/13					49	4,177			244	1,266					523	12,152	58	3,259	874	22,205
8/16					54	4,231			242	1,508					441	12,593			737	22,942
8/18						4,231				1,508					85	12,678			85	23,027
8/20					138	4,369				1,508									138	23,165
8/23					101	4,470			77	1,585									178	23,343
8/27					27	4,497			125	1,710									152	23,495

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Table 16.–Page 5 of 7.

Northern District Set Gillnet

	247-10		247-20		247-30		247-41		247-42		247-43		247-70		247-80		247-90			
	Trading Bay		Tyonek		Beluga		Susitna Flats		Pt. McKenzie		Fire Island		Pt. Possession		Birch Hill		#3 Bay		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
25-Jun			3	3			1	1									3	3	7	7
28-Jun	7	7					3	4					4	4			2	5	16	23
2-Jul		7											19	23	1	1	4	9	24	47
5-Jul	24	31			138	138	1	5			10	10	20	43	2	3	4	13	199	246
9-Jul					217	355	7	12	8	8	33	43	57	100	1	4	2	15	325	571
12-Jul	31	62			337	692	18	30	29	37			27	127	4	8		15	446	1,017
16-Jul	259	321			620	1,312	48	78	131	168	71	114	32	159		8	3	18	1,164	2,181
19-Jul	495	816	181	184	1,188	2,500	223	301	220	388	484	598	561	720	83	91	130	148	3,565	5,746
23-Jul	239	1,055	210	394	1,229	3,729	183	484	213	601	267	865	827	1,547	165	256	73	221	3,406	9,152
9-Aug	62	1,117			284	4,013	897	1,381	153	754	493	1,358	225	1,772	283	539	19	240	2,416	11,568
13-Aug	12	1,129			568	4,581	288	1,669	112	866	537	1,895	273	2,045	650	1,189	172	412	2,612	14,180
16-Aug					324	4,905	245	1,914	79	945	407	2,302	209	2,254	613	1,802	302	714	2,179	16,359
20-Aug					76	4,981	70	1,984			109	2,411	139	2,393	339	2,141	138	852	871	17,230
23-Aug					33	5,014					144	2,555	392	2,785	489	2,630	211	1,063	1,269	18,499
27-Aug							41	2,025			20	2,575	118	2,903	487	3,117	480	1,543	1,146	19,645
30-Aug							6	2,031			44	2,619	225	3,128	332	3,449	246	1,789	853	20,498
3-Sep													97	3,225	473	3,922			570	21,068
6-Sep													72	3,297	356	4,278			428	21,496
10-Sep													65	3,362					65	21,561
13-Sep							2	2,033											2	21,563

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Table 16.–Page 6 of 7.

Central District Drift Gillnet													
		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		245-10 Chinitna Bay		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/21	69							10	10			10	10
6/25	102							80	90			80	90
6/28	158							303	393			303	393
6/29	7			2	2				393			2	395
6/30	9			2	4				393			2	397
7/2	241				4			845	1,238			845	1,242
7/4	17			1	5				1,238			1	1,243
7/5	286				5			2,534	3,772			2,534	3,777
7/9	356				5			5,480	9,252			5,480	9,257
7/11	126			38	43				9,252			38	9,295
7/12	290				43			9,487	18,739			9,487	18,782
7/14	161			144	187				18,739			144	18,926
7/16	381				187			24,758	43,497			24,758	43,684
7/19	396				187			18,242	61,739			18,242	61,926
7/21	251			192	379	1,103	1,103		61,739			1,295	63,221
7/22	91					223	1,326		61,739			223	63,444
7/23	385						1,326	6,636	68,375			6,636	70,080
7/26	373						1,326	5,083	73,458			5,083	75,163
7/27	44	12	12				1,326		73,458			12	75,175
7/28	153		12			213	1,539		73,458			213	75,388
7/29	13	3	15				1,539		73,458			3	75,391
7/30	322		15				1,539	10,973	84,431			10,973	86,364
7/31	114		15			761	2,300		84,431			761	87,125

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Table 16.–Page 7 of 7.

Central District Drift Gillnet													
		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		245-10 Chinitna Bay		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
8/1	102		15			286	2,586		84,431			286	87,411
8/2	230		15				2,586	3,771	88,202			3,771	91,182
8/3	10	6	21				2,586		88,202			6	91,188
8/4	5	16	37				2,586		88,202			16	91,204
8/5	28		37			315	2,901		88,202			315	91,519
8/6	109		37				2,901	3,441	91,643			3,441	94,960
8/7	35		37			81	2,982		91,643			81	95,041
8/8	7		37			7	2,989		91,643			7	95,048
8/9	164		37				2,989	5,095	96,738			5,095	100,143
8/10	7	17	54			18	3,007		96,738			35	100,178
8/13	22							2,180	98,918			2,180	102,358
8/16	17							1,391	100,309			1,391	103,749
8/20	15							1,215	101,524			1,215	104,964
8/23	8							621	102,145			621	105,585
8/27	11							1,077	103,222			1,077	106,662
8/30	10							1,131	104,353			1,131	107,793
9/3	<4							69	104,422	280	280	349	108,142
9/6	<4							296	104,718	134	414	430	108,572
9/10	<4							131	104,849			131	108,703

Note: Days without data indicate days when there was no harvest.

Table 17.–Commercial pink salmon catch by area and date, Upper Cook Inlet, 2007.

Upper Subdistrict Set Gillnet

	244-21 Ninilchik		244-22 Cohoe		244-25 Kasilof Terminal		244-31 South K. Beach		244-32 North K. Beach		244-41 Salamatof		244-42 East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
6/25	13	13	1	1											14	14
6/28	36	49	31	32			3	3							70	84
6/29	52	101	21	53			3	6							76	160
6/30	48	149	33	86			7	13							88	248
7/2	123	272	39	125			14	27							176	424
7/4	259	531	146	271			16	43							421	845
7/5	379	910	277	548			18	61							674	1,519
7/9	1,462	2,372	809	1,357			118	179	56	56	159	159	215	215	2,819	4,338
7/11	1,892	4,264	730	2,087			116	295							2,738	7,076
7/12	3,360	7,624	847	2,934			55	350	55	111	527	686	401	616	5,245	12,321
7/14	2,874	10,498	1,103	4,037			246	596							4,223	16,544
7/16	5,036	15,534	2,539	6,576			678	1,274	350	461	1,698	2,384	569	1,185	10,870	27,414
7/18	2,516	18,050	929	7,505			181	1,455							3,626	31,040
7/19	3,215	21,265	2,407	9,912			455	1,910	307	768	972	3,356	782	1,967	8,138	39,178
7/20	1,647	22,912	674	10,586			36	1,946							2,357	41,535
7/21	2,139	25,051	1,211	11,797			148	2,094	99	867	510	3,866	452	2,419	4,559	46,094
7/22	1,869	26,920	1,063	12,860			84	2,178	94	961	241	4,107	436	2,855	3,787	49,881
7/23	3,437	30,357	851	13,711			73	2,251	21	982	341	4,448	1,030	3,885	5,753	55,634

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Table 17.–Page 2 of 7.

Upper Subdistrict Set Gillnet

	244-21 Ninilchik		244-22 Cohoe		244-25 Kasilof Terminal		244-31 South K. Beach		244-32 North K. Beach		244-41 Salamatof		244-42 East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7/25	112	1,142	145	2,172			15	974							272	8,637
7/26	66	1,208	50	2,222			44	1,018	28	786	812	2,682	639	2,360	1,639	10,276
7/27	72	1,280	99	2,321	8	8	62	1,080							241	10,517
7/28	68	1,348	133	2,454	14	22	33	1,113	26	812	99	2,781	117	2,477	490	11,007
7/29					7	29									7	11,014
7/30	133	1,481	180	2,634			102	1,215	216	1,028	477	3,258	244	2,721	1,352	12,366
7/31	126	1,607	193	2,827			165	1,380	199	1,227	479	3,737	225	2,946	1,387	13,753
8/1	149	1,756	76	2,903			111	1,491	115	1,342	374	4,111	263	3,209	1,088	14,841
8/2	153	1,909	82	2,985			81	1,572	69	1,411	244	4,355	171	3,380	800	15,641
8/3					38	67									38	15,679
8/4					119	186									119	15,798
8/5	218	2,127	250	3,235	92	278	47	1,619	56	1,467	290	4,645	290	3,670	1,243	17,041
8/6	378	2,505	274	3,509			234	1,853	300	1,767	691	5,336	514	4,184	2,391	19,432
8/7	165	2,670	196	3,705			249	2,102	177	1,944	924	6,260	387	4,571	2,098	21,530
8/8	6	2,676	78	3,783			21	2,123	16	1,960	274	6,534	48	4,619	443	21,973
8/9	276	2,952	177	3,960	8	286	179	2,302	99	2,059	487	7,021	213	4,832	1,439	23,412
8/10					166	452									166	23,578

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Table 17.–Page 3 of 7.

Central District - West Side Set Gillnet																				
	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/25					36	36									7	7			43	43
6/28					12	48									7	14	1	1	20	63
7/1					24	72										14		1	24	87
7/2					28	100									43	57		1	71	158
7/4					48	148										57		1	48	206
7/5					75	223									89	146		1	164	370
7/7					58	281										146		1	58	428
7/8					86	367										146		1	86	514
7/9					69	436									258	404		1	327	841
7/10					27	463										404		1	27	868
7/11					48	511										404		1	48	916
7/12					92	603									501	905		1	593	1,509
7/13					96	699										905		1	96	1,605
7/14					47	746										905		1	47	1,652
7/15					30	776										905		1	30	1,682
7/16					82	858									469	1,374		1	551	2,233
7/18					121	979										1,374		1	121	2,354
7/19					65	1,044									939	2,313	27	28	1,031	3,385

-continued-

Table 17.–Page 4 of 7.

Central District - West Side Set Gillnet

	245-10		245-20		245-30		245-40		245-50		245-55		245-60		246-10		246-20			
	Chinitna Bay		Silver Salmon		Tuxedni Bay		Polly Cr.		L. J. Slough		Big River		West Forelands		Kalgin - West		Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/20					100	1,144										2,313		28	100	3,485
7/21					81	1,225										2,313		28	81	3,566
7/22					62	1,287										2,313		28	62	3,628
7/23					10	1,297							15	15	539	2,852	110	138	674	4,302
7/25					54	1,351								15		2,852		138	54	4,356
7/26					22	1,373							35	50	635	3,487	37	175	729	5,085
7/27					5	1,378										3,487		175	5	5,090
7/28					7	1,385										3,487		175	7	5,097
7/29						1,385									275	3,762	38	213	313	5,410
7/30					7	1,392										3,762		213	7	5,417
7/31					3	1,395									62	3,824		213	65	5,482
8/2						1,395									263	4,087	59	272	322	5,804
8/6					1	1,396									80	4,167	8	280	89	5,893
8/9					1	1,397									154	4,321	14	294	169	6,062
8/11						1,397									47	4,368			47	6,109
8/13					2	1,399									24	4,392			26	6,135
8/16						1,399									38	4,430			38	6,173
8/20					4	1,403													4	6,177

-continued-

Table 17.–Page 5 of 7.

Northern District Set Gillnet																				
	247-10		247-20		247-30		247-41		247-42		247-43		247-70		247-80		247-90			
	Trading Bay		Tyonek		Beluga		Susitna Flats		Pt. McKenzie		Fire Island		Pt. Possession		Birch Hill		#3 Bay		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
25-Jun													2	2					2	2
28-Jun													24	26			4	4	28	30
2-Jul													23	49			8	12	31	61
5-Jul													98	147	1	1	5	17	104	165
9-Jul							17	17					793	940	9	10	14	31	833	998
12-Jul					4	4	12	29	28	28			615	1,555	31	41	11	42	701	1,699
16-Jul	15	15			20	24	31	60	2	30	81	81	80	1,635	22	63	4	46	255	1,954
19-Jul	16	31			21	45	17	77	69	99	86	167	239	1,874	73	136	82	128	603	2,557
23-Jul	2	33			4	49	13	90		99	101	268	482	2,356	72	208	131	259	805	3,362
9-Aug						49	4	94		99	31	299	66	2,422	8	216	1	260	110	3,472
13-Aug					1	50	1	95	4	103	8	307	15	2,437		216	10	270	39	3,511
16-Aug						50	1	96	3	106		307	2	2,439	3	219	2	272	11	3,522
20-Aug						50	1	97			1	308		2,439		219		272	2	3,524
23-Aug						50						308		2,439		219	1	273	1	3,525
27-Aug												308		2,439		219	2	275	2	3,527

-continued-

Table 17.–Page 6 of 7.

Central District Drift Gillnet											
		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/21	69							21	21	21	21
6/25	102							56	77	56	77
6/28	158							354	431	354	431
6/29	7			5	5				431	5	436
6/30	9			7	12				431	7	443
7/2	241				12			583	1,014	583	1,026
7/4	17			52	64				1,014	52	1,078
7/5	286				64			1,895	2,909	1,895	2,973
7/9	356				64			4,142	7,051	4,142	7,115
7/11	126			1,039	1,103				7,051	1,039	8,154
7/12	290				1,103			5,203	12,254	5,203	13,357
7/14	161			869	1,972				12,254	869	14,226
7/16	381				1,972			14,914	27,168	14,914	29,140
7/19	396				1,972			13,262	40,430	13,262	42,402
7/21	251			727	2,699	3,046	3,046		40,430	3,773	46,175
7/22	91					569	3,615		40,430	569	46,744
7/23	385						3,615	5,926	46,356	5,926	52,670
7/26	373						3,615	4,750	51,106	4,750	57,420
7/27	44	20	20				3,615		51,106	20	57,440

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Table 17.–Page 7 of 7.

Central District Drift Gillnet											
		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/28	153		20			620	4,235		51,106	620	58,060
7/29	13	2	22				4,235		51,106	2	58,062
7/30	322		22				4,235	3,920	55,026	3,920	61,982
7/31	114		22			810	5,045		55,026	810	62,792
8/1	102		22			326	5,371		55,026	326	63,118
8/2	230		22				5,371	2,279	57,305	2,279	65,397
8/4	5	1	23				5,371		57,305	1	65,398
8/5	28		23			106	5,477		57,305	106	65,504
8/6	109		23				5,477	1,020	58,325	1,020	66,524
8/7	35		23			34	5,511		58,325	34	66,558
8/8	7		23			10	5,521		58,325	10	66,568
8/9	164		23				5,521	744	59,069	744	67,312
8/10	7	1	24			6	5,527		59,069	7	67,319
8/13	22							38	59,107	38	67,357
8/16	17							31	59,138	31	67,388
8/20	15							4	59,142	4	67,392
8/23	8							1	59,143	1	67,393
8/27	11							5	59,148	5	67,398

Note: Days without data indicate days when there was no harvest.

Table 18.–Commercial chum salmon catch by area and date, Upper Cook Inlet, 2007.

Upper Subdistrict Set Gillnet

	244-21		244-22		244-25		244-31		244-32		244-41		244-42			
	Ninilchik		Cohoe		Kasilof Terminal		South K. Beach		North K. Beach		Salamatof		East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
6/25															0	0
6/28	3	3													3	3
6/29	1	4													1	4
6/30	1	5													1	5
7/2	2	7	1	1											3	8
7/4	1	8		1			1	1							2	10
7/5	4	12		1				1							4	14
7/9	2	14		1				1	1	1			1	1	4	18
7/11	1	15		1			6	7							7	25
7/12	2	17	2	3				7		1	5	5	4	5	13	38
7/14	1	18		3				7							1	39
7/16		18		3				7	3	4	17	22	3	8	23	62
7/18	2	20		3			1	8							3	65
7/19	2	22	2	5			1	9	1	5	2	24	6	14	14	79
7/20	1	23		5			4	13							5	84
7/21		23	2	7				13		5	6	30	3	17	11	95
7/22	3	26	1	8				13		5	2	32	1	18	7	102

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Table 18.–Page 2 of 7.

Upper Subdistrict Set Gillnet

	244-21		244-22		244-25		244-31		244-32		244-41		244-42			
	Ninilchik		Cohoe		Kasilof Terminal		South K. Beach		North K. Beach		Salamatof		East Forelands		TOTAL	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7/23	8	34	8	16			1	14		5	2	34	3	21	22	124
7/25	14	48	2	18			1	15							17	141
7/26	2	50	1	19			1	16	1	6	18	52	41	62	64	205
7/27		50		19			3	19							3	208
7/28	3	53	9	28				19		6		52	10	72	22	230
7/30	1	54	1	29			1	20		6	34	86	18	90	55	285
7/31	4	58	5	34			1	21	2	8	17	103	15	105	44	329
8/1	1	59	1	35				21	1	9	9	112	20	125	32	361
8/2	8	67		35			1	22	1	10	6	118	16	141	32	393
8/3															0	393
8/4															0	393
8/5	1	68	1	36				22		10	7	125	6	147	15	408
8/6	1	69		36				22	1	11	32	157	23	170	57	465
8/7	2	71		36			1	23		11	18	175	5	175	26	491
8/8		71	1	37			1	24		11	6	181	1	176	9	500
8/9	2	73		37				24		11	6	187	13	189	21	521
8/10															0	521

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Table 18.–Page 3 of 7.

Central District - West Side Set Gillnet																				
	245-10		245-20		245-30		245-40		245-50		245-55		245-60		246-10		246-20			
	Chinitna Bay		Silver Salmon		Tuxedni Bay		Polly Cr.		L. J. Slough		Big River		West Forelands		Kalgin - West		Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/25					15	15											1	1	16	16
6/28					1	16									1	1		1	2	18
7/2						16									1	2		1	1	19
7/4					1	17										2		1	1	20
7/5						17									5	7		1	5	25
7/7					4	21										7		1	4	29
7/8					2	23										7		1	2	31
7/9					1	24									4	11		1	5	36
7/10					1	25										11		1	1	37
7/11					8	33										11		1	8	45
7/12					2	35									1	12		1	3	48
7/13					6	41										12		1	6	54
7/15					3	44										12		1	3	57
7/16					11	55									3	15		1	14	71
7/18					9	64										15		1	9	80
7/19					8	72									23	38		1	31	111
7/20					18	90										38		1	18	129
7/21					15	105										38		1	15	144
7/22					47	152										38		1	47	191

-continued-

Table 18.–Page 4 of 7.

Central District - West Side Set Gillnet																				
	245-10 Chinitna Bay		245-20 Silver Salmon		245-30 Tuxedni Bay		245-40 Polly Cr.		245-50 L. J. Slough		245-55 Big River		245-60 West Forelands		246-10 Kalgin - West		246-20 Kalgin - East		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/23					5	157			1	1					6	44	4	5	16	207
7/25					17	174				1						44		5	17	224
7/26					57	231			3	4			5	5	59	103		5	124	348
7/27					14	245				4						103		5	14	362
7/28					15	260				4						103		5	15	377
7/29						260				4					26	129	2	7	28	405
7/30					34	294				4						129		7	34	439
7/31					16	310				4					27	156		7	43	482
8/2						310			5	9					45	201	6	13	56	538
8/6					20	330			1	10					37	238		13	58	596
8/8					18	348				10						238		13	18	614
8/9					82	430			14	24					127	365	9	22	232	846
8/11						430				24					63	428			63	909
8/13					31	461			7	31					41	469			79	988
8/16					22	483			3	34					104	573			129	1,117
8/18						483				34					33	606			33	1,150
8/20					57	540				34									57	1,207
8/23					29	569			26	60									55	1,262
8/27					13	582													13	1,275

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Table 18.–Page 5 of 7.

Northern District Set Gillnet

	247-10 Trading Bay		247-20 Tyonek		247-30 Beluga		247-41 Susitna Flats		247-42 Pt. McKenzie		247-43 Fire Island		247-70 Pt. Possession		247-80 Birch Hill		247-90 #3 Bay		Total	
Date	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
2-Jul																	1	1	1	1
5-Jul	2	2			6	6												1	8	9
12-Jul		2			12	18	2	2	12	12								1	26	35
16-Jul	14	16			35	53	12	14		12	5	5	3	3				1	69	104
19-Jul		16			32	85	21	35	43	55	13	18	4	7				1	113	217
23-Jul	12	28			8	93	9	44	2	57	2	20	39	46	6	6		1	78	295
9-Aug	19	47			9	102	60	104		57	58	78	10	56		6		1	156	451
13-Aug	9	56			22	124	22	126	10	67	10	88	6	62	1	7		1	80	531
16-Aug						124	34	160	5	72	3	91	1	63		7		1	43	574
20-Aug						124	5	165			1	92	3	66	1	8		1	10	584
23-Aug						124					5	97	7	73	1	9		1	13	597
27-Aug							1	166				97	2	75	2	11	4	5	9	606
6-Sep														75	1	12			1	607
10-Sep													1	76					1	608

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Table 18.–Page 6 of 7.

Central District Drift Gillnet

		244-25 Kasilof Terminal		244-61 Kasilof Section		244-55 Kenai/Kasilof Section		244-60 District Wide		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
6/21	251					745	745	87	87	832	832
6/22	91					19	764		87	19	851
6/25	102						764	69	156	69	920
6/28	158					97	861	291	447	388	1,308
6/29	7			2	2		861		447	2	1,310
6/30	9			5	7		861		447	5	1,315
7/1	114				7	563	1,424		447	563	1,878
7/2	241				7	295	1,719	279	726	574	2,452
7/4	17			1	8		1,719		726	1	2,453
7/5	286				8		1,719	1,210	1,936	1,210	3,663
7/6	28				8	360	2,079		1,936	360	4,023
7/8	35				8	28	2,107		1,936	28	4,051
7/9	356				8	1	2,108	2,013	3,949	2,014	6,065
7/11	126			14	22	3	2,111		3,949	17	6,082
7/12	290				22			3,619	7,568	3,619	9,701
7/14	161			56	78				7,568	56	9,757
7/16	381				78			10,836	18,404	10,836	20,593

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Table 18.–Page 7 of 7.

Central District Drift Gillnet											
		244-25		244-61		244-55		244-60			
		Kasilof Terminal		Kasilof Section		Kenai/Kasilof Section		District Wide		Total	
Date	Deliveries	Day	Cum	Day	Cum	Day	Cum	Day	Cum	Day	Cum
7/19	396				78			13,407	31,811	13,407	34,000
7/21	47			119	197				31,811	119	34,119
7/23	385							4,647	36,458	4,647	38,766
7/26	373							6,203	42,661	6,203	44,969
7/27	44	2	2						42,661	2	44,971
7/30	322							11,881	54,542	11,881	56,852
8/2	230							11,310	65,852	11,310	68,162
8/6	109							2,004	67,856	2,004	70,166
8/9	164							4,291	72,147	4,291	74,457
8/13	22							140	72,287	140	74,597
8/16	17							157	72,444	157	74,754
8/20	15							29	72,473	29	74,783
8/23	8							12	72,485	12	74,795
8/27	11							11	72,496	11	74,806
8/30	10							21	72,517	21	74,827
9/3	<4							9	72,526	9	74,836

Note: Days without data indicate days when there was no harvest.

Table 19.–Commercial salmon catch by gear, statistical area and species, Upper Cook Inlet, 2007.

Gear	District	Subdistrict	Stat Area	Permits[a]	Chinook	Sockeye	Coho	Pink	Chum	Total
Drift	Central	All	**All**	**417**	**912**	**1,823,481**	**108,703**	**67,398**	**74,836**	**2,075,330**
Set Net	Central	Upper	24421	79	2,256	315,835	2,952	35,294	73	356,410
			24422	80	2,812	219,673	3,960	16,858	37	243,340
			24425	51	164	15,631	452	104	0	16,351
			24431	77	2,624	183,364	2,302	2,893	24	191,207
			24432	39	1,344	105,180	2,059	1,339	11	109,933
			24441	59	2,946	439,200	7,021	7,122	187	456,476
			24442	29	142	74,524	4,832	6,308	189	85,995
			All	**339**	**12,288**	**1,353,407**	**23,578**	**69,918**	**521**	**1,459,712**
		Kalgin Is.	24610	20	334	47,825	12,678	4,430	606	65,873
			24620	<4	10	15,292	3,259	294	22	18,877
			All	**22**	**344**	**63,117**	**15,937**	**4,724**	**628**	**84,750**
		Chinitna	24510	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		Western	24520	0	0	0	0	0	0	0
			24530	23	213	46,255	4,497	1,403	582	52,950
			24540	0						0
			24550	4	3	10,599	1,710		60	12,372
			All	**25**	**216**	**56,854**	**6,207**	**1,403**	**642**	**65,322**
		Kustatan	24555	8	43	2,332	1,207			3,582
			24560	<4		121	144	50	5	320
			All	**9**	**43**	**2,453**	**1,351**	**50**	**5**	**3,902**
		All	**All**	**390**	**12,891**	**1,475,831**	**47,073**	**76,095**	**1,796**	**1,613,686**
	Northern	General	24710	12	592	952	1129	33	56	2,762
			24720	12	733	224	394			1,351
			24730	9	702	3,911	5,014	50	124	9,801
			24741	8	301	1,129	2,033	97	166	3,726
			24742	8	232	870	945	106	72	2,225
			24743	5	312	1,159	2,619	308	97	4,495
			All	**50**	**2,872**	**8,245**	**12,134**	**594**	**515**	**24,360**
		Eastern	24770	17	768	4,805	3,362	2439	76	11,450
			24780	7	101	2065	4,278	219	12	6,675
			24790	6	81	2,352	1,789	275	5	4,502
			All	**29**	**950**	**9,222**	**9,429**	**2,933**	**93**	**22,627**
		All	**All**	**79**	**3,822**	**17,467**	**21,563**	**3,527**	**608**	**46,987**
	All	**All**	**All**	**468**	**16,713**	**1,493,298**	**68,636**	**79,622**	**2,404**	**1,660,673**
Seine	**All**	**All**	**All**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
All	**All**	**All**	**All**	**885**	**17,625**	**3,316,779**	**177,339**	**147,020**	**77,240**	**3,736,003**

[a] Permit totals may be less than the sum of individual stat areas if some permits were fished in multiple stat areas.

Table 20.–Commercial salmon catch per permit by statistical area, Upper Cook Inlet, 2007.

Gear	District	Sub District	Stat Area	Permits[a]	Chinook	Sockeye	Coho	Pink	Chum	Total
Drift	Central	**All**	**All**	**417**	**2**	**4,373**	**261**	**162**	**179**	**4,977**
Set	Central	Upper	24421	79	29	3,998	37	447	1	4,512
			24422	80	35	2,746	50	211	0	3,042
			24425	51	3	306	9	2	0	321
			24431	77	34	2,381	30	38	0	2,483
			24432	39	34	2,697	53	34	0	2,819
			24441	59	50	7,444	119	121	3	7,737
			24442	29	5	2,570	167	218	7	2,965
			All	**339**	**36**	**3,992**	**70**	**206**	**2**	**4,306**
		Kalgin Is.	24610	20	17	2,391	634	222	30	3,294
			24620	<4	na	na	na	na	na	na
			All	**22**	**16**	**2,869**	**724**	**215**	**29**	**3,852**
		Chinitna	24510	0	na	na	na	na	na	na
		Western	24520	0	na	na	na	na	na	na
			24530	23	9	2,011	196	61	25	2,302
			24540	0	na	na	na	na	na	na
			24550	4	1	2,650	428	0	15	3,093
			All	**25**	**9**	**2,274**	**248**	**56**	**26**	**2,613**
		Kustatan	24555	8	5	292	151	0	0	448
			24560	<4	na	na	na	na	na	na
			All	**9**	**5**	**273**	**150**	**6**	**1**	**434**
		All	**All**	**390**	**33**	**3,784**	**121**	**195**	**5**	**4,138**
	Northern	General	24710	12	49	79	94	3	5	230
			24720	12	61	19	33	0	0	113
			24730	9	78	435	557	6	14	1,089
			24741	8	38	141	254	12	21	466
			24742	8	29	109	118	13	9	278
			24743	5	62	232	524	62	19	899
			All	**50**	**57**	**165**	**243**	**12**	**10**	**487**
		Eastern	24770	17	45	283	198	143	4	674
			24780	7	14	295	611	31	2	954
			24790	6	14	392	298	46	1	750
			All	**29**	**33**	**318**	**325**	**101**	**3**	**780**
		All	**All**	**79**	**48**	**221**	**273**	**45**	**8**	**595**
	All	**All**	**All**	**468**	**36**	**3,191**	**147**	**170**	**5**	**3,548**
Seine	**All**	**All**	**All**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
All	**All**	**All**	**All**	**885**	**20**	**3,748**	**200**	**166**	**87**	**4,221**

[a] Permit totals may be less than the sum of individual stat areas if some permits were fished in multiple stat areas.

Table 21.–Commercial fishing emergency orders issued during the 2007 Upper Cook Inlet fishing season.

Emergency Order No.	Effective Date	Action	Reason
1	25-May	Authorized the use of up to 50 fathoms of monofilament mesh web per permit for drift gillnets. For set gillnets in Upper Cook Inlet, no more than 35 fathoms of the allowable 105 fathoms per permit could be monofilament mesh web and no more than one net per permit could contain monofilament mesh web.	To comply with regulations passed by the Alaska Board of Fisheries.
2	28-Jun	Extended set gillnetting in the Kasilof Section of the Upper Subdistrict from 7:00 p.m. on Thursday, June 28, 2007, until 7:00 p.m. on Saturday, June 30, 2007. Drift gillnetting was opened in the Kasilof Section on Thursday, June 28, 2007, from 7:00 p.m. until 12:00 midnight, and from 5:00 a.m. until 12:00 midnight on Friday, June 29, and from 5:00 a.m. until 7:00 p.m. on Saturday, June 30, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
3	30-Jun	Opened set gillnets in that portion of the Western Subdistrict of the Central District south of the latitude of Redoubt Point from 7:00 a.m. on Sunday July 1, 2007 until further notice.	To reduce the escapement rate of Crescent River sockeye salmon.
4	2-Jul	Extended set gillnetting in the Kasilof Section of the Upper Subdistrict from 7:00 p.m. until 10:00 p.m. on Monday, July 2, 2007. Drift gillnetting was opened in the Kasilof Section from 7:00 p.m. until 10:00 p.m. on Monday, July 2, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
5	3-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict from 1:00 p.m. on Wednesday July 4, 2007 until 7:00 a.m. on Thursday, July 5, 2007. Drift gillnetting was opened in the Kasilof Section from 1:00 p.m. until 12:00 midnight on Wednesday, July 4, 2007, and from 5:00 a.m. until 7:00 a.m. on Thursday, July 5, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
6	5-Jul	Extended set gillnetting in the Kasilof Section of the Upper Subdistrict from 7:00 p.m. until 11:00 p.m. on Thursday, July 5, 2007. Drift gillnetting was opened in the Kasilof Section from 7:00 p.m. until 11:00 p.m. on Thursday, July 5, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.

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Table 21.–Page 2 of 9.

Emergency Order No.	Effective Date	Action	Reason
7	10-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict from 8:00 a.m. until 9:00 p.m. on Wednesday July 11, 2007. Drift gillnetting was opened in the Kasilof Section from 8:00 a.m. until 9:00 p.m. on Wednesday July 11, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
8	13-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict from 7:00 a.m. until 7:00 p.m. on Saturday, July 14, 2007. Drift gillnetting was opened in the Kasilof Section from 7:00 a.m. until 7:00 p.m. on Saturday, July 14, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
9	15-Jul	Closed drift gillnetting in all areas of the Central District of Upper Cook Inlet north of 60^0 20.43' North latitude, except in the Kenai and Kasilof Sections of the Upper Subdistrict from 7:00 a.m. until 7:00 p.m. on Monday, July 16, 2007.	To reduce the exploitation rate of Susitna River sockeye salmon.
10	16-Jul	Extended set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 7:00 p.m. until 10:00 p.m. on Monday, July 16, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections from 7:00 p.m. until 10:00 p.m. on Monday, July 16, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
11	18-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict within ½ mile of the mean high tide mark on the Kenai Peninsula shoreline from 11:00 a.m. until 10:00 p.m. on Wednesday, July 18, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
12	18-Jul	Closed drift gillnetting in all areas of the Central District north of 60^0 20.43' North latitude, except in the Kenai and Kasilof Sections of the Upper Subdistrict, from 7:00 a.m. until 7:00 p.m. on Thursday, July 19, 2007.	To reduce the exploitation rate of Susitna River sockeye salmon.
13	19-Jul	Extended set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 7:00 p.m. until 11:00 p.m. on Thursday, July 19, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections from 7:00 p.m. until 11:00 p.m. on Thursday, July 19, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.

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Table 21.–Page 3 of 9.

Emergency Order No.	Effective Date	Action	Reason
14	20-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict within ½ mile of the mean high tide mark on the Kenai Peninsula shoreline from 2:00 p.m. until 12:00 midnight on Friday, July 20, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.
15	21-Jul	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 11:00 a.m. until 12:00 midnight on Saturday, July 21, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 11:00 a.m. until 12:00 midnight on Saturday, July 21, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
16	22-Jul	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 3:00 p.m. until 12:00 midnight on Sunday, July 22, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 3:00 p.m. until 11:00 p.m. on Sunday, July 22, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
17	22-Jul	Closed commercial salmon fishing with drift gillnets in that portion of the Central District north of 60^0 27.10' North latitude, except in the Kenai Section of the Upper Subdistrict, from 7:00 a.m. until 7:00 p.m. on Monday, July 23, 2007. In the Northern District, legal gear was reduced to one set gillnet per permit, measuring no more than 35 fathoms in length, from 7:00 a.m. until 7:00 p.m. on Monday, July 23, 2007	To reduce the exploitation rate of Susitna River sockeye salmon.
18	22-Jul	Extended set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 12:00 midnight on Sunday, July 22, 2007 until 7:00 a.m. on Monday, July 23, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 5:00 a.m. until 7:00 a.m. on Monday, July 23, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
19	25-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict within ½ mile of the mean high tide mark on the Kenai Peninsula shoreline from 10:00 a.m. until 6:00 p.m. on Wednesday, July 25, 2007.	To reduce the escapement rate of Kasilof River sockeye salmon.

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Table 21.–Page 4 of 9.

Emergency Order No.	Effective Date	Action	Reason
20	25-Jul	Closed commercial salmon fishing with set gillnets in the Northern District of Upper Cook Inlet from 7:00 a.m. until 7:00 p.m. on Thursday, July 26, 2007. Commercial salmon fishing with drift gillnets was closed in that portion of the Central District north of 60^0 27.10' North latitude, except in the Kenai Section of the Upper Subdistrict, from 7:00 a.m. until 7:00 p.m. on Thursday, July 26, 2007.	To reduce the exploitation rate of Susitna River sockeye salmon.
21	26-Jul	Opened set gillnetting in the Kasilof Section of the Upper Subdistrict within ½ mile of the mean high tide mark on the Kenai Peninsula shoreline from 8:00 a.m. until 8:00 p.m. on Friday, July 27, 2007. Set gillnetting was also opened in the Kasilof River Special Harvest Area from 8:00 a.m. on Friday, July 27, 2007, until further notice. Drift gillnetting was be open from 8:00 a.m. to 11:00 p.m. on Friday, July 27, 2007 in a portion of the Kasilof River Special Harvest Area bounded by the following four points: 1.) 60^0 22.589' N. lat. 151^0 20.336' W. lon. 2.) 60^0 23.062' N. lat. 151^0 20.531' W. lon. 3.) 60^0 24.130' N. lat. 151^0 18.838' W. lon. 4.) 60^0 24.147' N. lat. 151^0 17.716' W. lon.	To reduce the escapement rate of Kasilof River sockeye salmon.
22	27-Jul	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 9:00 a.m. until 12:00 midnight on Saturday, July 28, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 9:00 a.m. until 11:00 p.m. on Saturday, July 28, 2007. Set gillnetting closed in the Kasilof River Special Harvest Area at 8:00 a.m. on Saturday, July 28, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
23	28-Jul	Opened set gillnetting in the Kalgin Island Subdistrict of the Central District from 7:00 a.m. until 7:00 p.m. on Sunday July 29, 2007. The regular period on Monday for set gillnets in the Kalgin Island Subdistrict was closed and moved to Tuesday, July 31, 2007.	To reduce the escapement rate of Packers Lake sockeye salmon.

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Table 21.–Page 5 of 9.

Emergency Order No.	Effective Date	Action	Reason
24	29-Jul	Opened set gillnetting in the Kasilof River Special Harvest Area from 2:00 p.m. until 10:p.m. on Sunday, July 29, 2007. Drift gillnetting was opened from 2:00 p.m. until 10:p.m. on Sunday, July 29, 2007, in a portion of the Kasilof River Special Harvest Area bounded by the following four points: 1.) 60^0 22.589' N. lat. 151^0 20.336' W. lon. 2.) 60^0 23.062' N. lat. 151^0 20.531' W. lon. 3.) 60^0 24.130' N. lat. 151^0 18.838' W. lon. 4.) 60^0 24.147' N. lat. 151^0 17.716' W. lon.	To reduce the escapement rate of Kasilof River sockeye salmon.
25	29-Jul	Closed commercial salmon fishing in the Northern District of Upper Cook Inlet on Monday, July 30, 2007. The Kalgin Island Subdistrict, which includes all waters within 1 mile of mean lower low water on Kalgin Island, was closed to both set and drift gillnets on Monday, July 30, 2007. Commercial salmon fishing with drift gillnets was closed in all areas of the Central District of Upper Cook Inlet, except in the Kenai Section of the Upper Subdistrict and that portion of the Central District south of 60^0 31.25' N. latitude, which is the latitude of the Northwest Point on Kalgin Island, from 7:00 a.m. to 7:00 p.m. on Monday, July 30, 2007.	To reduce the exploitation rate of Susitna River sockeye salmon.
26	30-Jul	Extended set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 7:00 p.m. until 10:00 p.m. on Monday, July 30, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 7:00 p.m. until 10:00 p.m. on Monday, July 30, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
27	30-Jul	Opened the Kalgin Island Subdistrict for set gillnetting from 7:00 a.m. until 7:00 p.m. on Tuesday, July 31, 2007. Set gillnetting was opened in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 10:00 a.m. until 11:00 p.m. on Tuesday, July 31, 2007. Drift gillnetting was opened in the Kenai and Kasilof sections of the Upper Subdistrict from 10:00 a.m. until 11:00 p.m. on Tuesday, July 31, 2007	To reduce the escapement rate of Packers Lake and Kenai and Kasilof River sockeye salmon.

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Emergency Order No.	Effective Date	Action	Reason
28	31-Jul	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 5:00 a.m. until 12:00 midnight on Wednesday, August 1, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 5:00 a.m. until 11:00 p.m. on Wednesday, August 1, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
29	1-Aug	Closed commercial salmon fishing in the Northern District of Upper Cook Inlet on Thursday, August 2, 2007. Drift gillnetting was closed in all areas of the Central District of Upper Cook Inlet, except in that portion of the Central District south of a line from Collier's Dock at 60^0 40.35' N. Latitude, 151^0 23.00 minutes W. Longitude to Northwest Point on Kalgin Island at 60^0 31.25' N. Latitude, 151^0 55.75' W. Longitude to a point on the western shore at on 60^0 31.25' N. Latitude from 7:00 a.m. to 7:00 p.m. on Thursday, August 2, 2007.	To reduce the exploitation rate of Susitna River sockeye salmon.
30	2-Aug	Opened set gillnetting in the Kenai, Kasilof and East Forelands sections of the Upper Subdistrict from 7:00 p.m. until 11:00 p.m. on Thursday, August 2, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 7:00 p.m. until 11:00 p.m. on Thursday, August 2, 2007. Set gillnetting was opened in the Kasilof River Special Harvest Area from 8:00 a.m. until 8:00 p.m. on Friday, August 3, 2007. Drift gillnetting was opened from 8:00 a.m. until 8:00 p.m. on Friday, August 3, 2007 in a portion of the Kasilof River Special Harvest Area bounded by the following four points: 1.) 60^0 22.589' N. lat. 151^0 20.336' W. long. 2.) 60^0 23.288' N. lat. 151^0 20.618' W. long. 3.) 60^0 24.130' N. lat. 151^0 19.250' W. long. 4.) 60^0 24.147' N. lat. 151^0 17.716' W. long.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.

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Table 21.–Page 7 of 9.

Emergency Order No.	Effective Date	Action	Reason
31	4-Aug	Opened set gillnetting in the Kasilof River Special Harvest Area from 2:00 p.m. until 10:00 p.m. on Saturday, August 4, 2007. Drift gillnetting was opened from 2:00 p.m. until 10:00 p.m. on Saturday, August 4, 2007 in a portion of the Kasilof River Special Harvest Area bounded by the following four points: 1.) 60^0 22.589' N. lat. 151^0 20.336' W. long. 2.) 60^0 23.288' N. lat. 151^0 20.618' W. long. 3.) 60^0 24.130' N. lat. 151^0 19.250' W. long. 4.) 60^0 24.147' N. lat. 151^0 17.716' W. long.	To reduce the escapement rate of Kasilof River sockeye salmon.
32	4-Aug	Extended set gillnetting in the Kasilof River Special Harvest Area from 10:00 p.m. on Saturday, August 4, 2007 until 2:00 p.m. on Sunday August 5, 2007. Drift gillnetting was opened from 5:00 a.m. until 2:00 p.m. on Sunday, August 5, 2007 in a portion of the Kasilof River Special Harvest Area bounded by the following four points: 1.) 60^0 22.589' N. lat. 151^0 20.336' W. long. 2.) 60^0 23.288' N. lat. 151^0 20.618' W. long. 3.) 60^0 24.130' N. lat. 151^0 19.250' W. long. 4.) 60^0 24.147' N. lat. 151^0 17.716' W. long.	To reduce the escapement rate of Kasilof River sockeye salmon.
33	5-Aug	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 12:00 noon on Sunday, August 5, 2007 until 7:00 a.m. on Monday, August 6, 2007. Drift gillnetting was opened in the Kenai and Kasilof sections of the Upper Subdistrict from 12:00 noon until 11:00 p.m. on Sunday, August 5, 2007 and from 5:00 a.m. until 7:00 a.m. on Monday, August 6, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.

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Emergency Order No.	Effective Date	Action	Reason
34	5-Aug	Closed commercial salmon fishing in the Northern District of Upper Cook Inlet on Monday, August 6, 2007. Commercial salmon fishing with drift gillnets was closed in all areas of the Central District of Upper Cook Inlet, except in that portion of the Central District south of a line from Collier's Dock at 60^0 40.35' N. Latitude 151^0 23.00' W. Longitude to Northwest Point on Kalgin Island at 60^0 31.25' N. Latitude 151^0 55.75' W. Longitude to a point on the western shore at on 60^0 31.25' N. Latitude from 7:00 a.m. to 7:00 p.m. on Monday, August 6, 2007.	To reduce the exploitation rate of Susitna River sockeye salmon.
35	6-Aug	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 7:00 p.m. on Monday, August 6, 2007 until 3:00 p.m. on Tuesday, August 7, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 7:00 p.m. until 11:00 p.m. on Monday August 6, 2007 and from 5:00 a.m. until 3:00 p.m. on Tuesday, August 7, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
36	7-Aug	Rescinded Emergency Order 2S-03-07 and closed set gillnetting in that portion of the Western Subdistrict south of Redoubt Point at 7:00 p.m. on Thursday August 9, 2007. This area reopened to set gillnetting during regular fishing periods only on Mondays and Thursdays from 7:00 a.m. to 7:00 p.m. beginning on Monday, August 13, 2007.	To reduce the exploitation rate of coho salmon in the Western Subdistrict.
37	8-Aug	Opened set gillnetting in the Kenai, Kasilof and East Forelands Sections of the Upper Subdistrict from 7:00 p.m. on Wednesday, August 8, 2007 until 7:00 a.m. on Thursday, August 9, 2007. Drift gillnetting was opened in the Kenai and Kasilof Sections of the Upper Subdistrict from 7:00 p.m. until 11:00 p.m. on Wednesday August 8, 2007 and from 5:00 a.m. until 7:00 a.m. on Thursday, August 9, 2007.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.

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Table 21.–Page 9 of 9.

Emergency Order No.	Effective Date	Action	Reason
38	9-Aug	Opened set gillnetting in the Kasilof River Special Harvest Area from 7:00 p.m. on Thursday, August 9, 2007 until 11:00 p.m. on Friday, August 10, 2007. Drift gillnetting will be open from 7:00 p.m. on Thursday, August 9, 2007 until 11:0 p.m. on Friday, August 10, 2007, in a portion of the Kasilof River Special Harvest Area bounded by the following four points: 1.) 60^0 22.589' N. lat. 151^0 20.336' W. long. 2.) 60^0 23.536' N. lat. 151^0 20.726' W. long. 3.) 60^0 24.087' N. lat. 151^0 20.032' W. long. 4.) 60^0 24.147' N. lat. 151^0 17.716' W. long.	To reduce the escapement rate of Kasilof River sockeye salmon.
39	9-Aug	Opened drift gillnetting in the Kenai and Kasilof Sections of the Upper Subdistrict from 5:00 a.m. until 11:00 p.m. on Friday, August 10, 2007. During this fishing period, the area within 1 mile of the mean high tide mark north of the Kenai River, and within 1.5 miles of the mean high tide mark south of the Kenai River is closed to drift gillnets.	To reduce the escapement rate of Kenai and Kasilof River sockeye salmon.
40	9-Aug	Opened set gillnetting in the Kalgin Island Subdistrict from 7:00 a.m. until 7:00 p.m. on Saturday, August 11, 2007.	To reduce the exploitation rate of Packers Lake sockeye salmon
41	17-Aug	Opened set gillnetting in the Kalgin Island Subdistrict from 7:00 a.m. until 7:00 p.m. on Saturday August 18, 2007.	To reduce the exploitation rate of Packers Lake sockeye salmon
42	31-Aug	Opened drift gillnetting in the Chinitna Bay Subdistrict of the Central District for regular periods on Mondays and Thursdays from 7:00 a.m. until 7:00 p.m. beginning on Monday, September 3, 2007 for the remainder of the season.	To provide an opportunity to harvest surplus chum salmon, as escapement goals for Clearwater Creek and Chinitna River had been achieved.

Table 22.–Commercial salmon fishing periods, Upper Cook Inlet, 2007.

Date	Day	Time	Set Gill Net	Drift Gill Net
28-May	Mon	0700–1900	Northern District	
1-Jun	Fri	0700–1900	Kustatan - Big River - Kalgin Island	
4-Jun	Mon	0700–1900	N. District-Kustatan-Big River-Kalgin Island	
6-Jun	Wed	0700–1900	Kustatan - Big River - Kalgin Island	
8-Jun	Fri	0700–1900	Kustatan - Big River - Kalgin Island	
11-Jun	Mon	0700–1900	N. Dist.-Kustatan-Big River-Kalgin Island	
13-Jun	Wed	0700–1900	Kustatan - Big River - Kalgin Island	
15-Jun	Fri	0700–1900	Kustatan - Big River - Kalgin Island	
18-Jun	Mon	0700–1900	Western - Kustatan - Big River - Kalgin Isl.	
20-Jun	Wed	0700–1900	Kustatan - Big River - Kalgin Island	
21-Jun	Thu	0700–1900	Western Subdistrict	
22-Jun	Fri	0700–1900	Kustatan - Big River - Kalgin Island	
25-Jun	Mon	0700–1900	All except Kenai and& East Forelands Sections	All
28-Jun	Thu	0700–1900	All except Kenai and East Forelands Sections	All
		1900–2400	Kasilof Section	Kasilof Section
29-Jun	Fri	0000–2400	Kasilof Section	
		0500–2400		Kasilof Section
30-Jun	Sat	0000–1900	Kasilof Section	
		0500–1900		Kasilof Section
1-Jul	Sun	0700–2400	Western Subdistrict south of Redoubt Pt.	
2-Jul	Mon	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All except Kenai and East Forelands Sections	All
		1900–2200	Kasilof Section	Kasilof Section
3-Jul	Tue	0000–2400	Western Subdistrict south of Redoubt Pt.	
4-Jul	Wed	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1300–2400	Kasilof Section	Kasilof Section
5-Jul	Thu	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0000–0700	Kasilof Section	
		0500–0700		Kasilof Section
		0700–1900	All except Kenai and East Forelands Sections	All
		1900–2300	Kasilof Section	Kasilof Section
6-Jul	Fri	0000–2400	Western Subdistrict south of Redoubt Pt.	
7-Jul	Sat	0000–2400	Western Subdistrict south of Redoubt Pt.	
8-Jul	Sun	0000–2400	Western Subdistrict south of Redoubt Pt.	

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Table 22.–Page 2 of 4.

Date	Day	Time	Set Gill Net	Drift Gill Net
9-Jul	Mon	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All	Drift Area 1 and Kenai/Kasilof Sections
10-Jul	Tue	0000–2400	Western Subdistrict south of Redoubt Pt.	
11-Jul	Wed	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0800–2100	Kasilof Section	Kasilof Section
12-Jul	Thu	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All	Drift Area 1 and Kenai/Kasilof Sections
13-Jul	Fri	0000–2400	Western Subdistrict south of Redoubt Pt.	
14-Jul	Sat	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	Kasilof Section	Kasilof Section
15-Jul	Sun	0000–2400	Western Subdistrict south of Redoubt Pt.	
16-Jul	Mon	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All	Drift Area 1 and Kenai/Kasilof Sections
		1900–2200	Kenai, Kasilof, & East Forelands Sections	Kenai and Kasilof Sections
17-Jul	Tue	0000–2400	Western Subdistrict south of Redoubt Pt.	
18-Jul	Wed	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1100–2200	Kasilof Section within 1/2 mile of shore	
19-Jul	Thu	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All	Drift Area 1 and Kenai/Kasilof Sections
		1900–2300	Kenai, Kasilof, & East Forelands Sections	Kenai and Kasilof Sections
20-Jul	Fri	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1400–2400	Kasilof Section within 1/2 mile of shore	
21-Jul	Sat	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1100–2400	Kenai, Kasilof, & East Forelands Sections	Kenai and Kasilof Sections
22-Jul	Sun	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1500–2400	Kenai, Kasilof, & East Forelands Sections	
		1500–2300		Kenai and Kasilof Sections
23-Jul	Mon	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0000–0700	Kenai, Kasilof, & East Forelands Sections	
		0500–0700		Kenai and Kasilof Sections
		0700–1900	All	S. of Blanchard Line & Kenai/Kasilof Sections
24-Jul	Tue	0000–2400	Western Subdistrict south of Redoubt Pt.	
25-Jul	Wed	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1000–1800	Kasilof Section within 1/2 mile of shore	
26-Jul	Thu	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All except Northern District	S. of Blanchard Line & Kenai/Kasilof Sections

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Date	Day	Time	Set Gill Net	Drift Gill Net
27-Jul	Fri	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0800–2000	Kasilof Section within 1/2 mile of shore	
		0800–2400	Kasilof River Special Harvest Area	
		0800–2300		Kasilof River Special Harvest Area
28-Jul	Sat	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0000–0800	Kasilof River Special Harvest Area	
		0900–2400	Kenai, Kasilof, & East Forelands Sections	
		0900–2300		Kenai and Kasilof Sections
29-Jul	Sun	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	Kalgin Island Subdistrict	
		1400–2200	Kasilof River Special Harvest Area	Kasilof River Special Harvest Area
30-Jul	Mon	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All except N. District & Kalgin Isl. Subdistrict	S. of n. end of Kalgin Isl. & Kenai/Kasilof Sec.
		1900–2200	Kenai, Kasilof, & East Forelands Sections	Kenai and Kasilof Sections
31-Jul	Tue	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	Kalgin Island Subdistrict	
		1000–2300	Kenai, Kasilof, & East Forelands Sections	Kenai and Kasilof Sections
1-Aug	Wed	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0500–2400	Kenai, Kasilof, & East Forelands Sections	
		0500–2300		Kenai and Kasilof Sections
2-Aug	Thu	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All except Northern District	S. of lat. from N. Kalgin Isl. to Colliers dock
		1900–2300	Kenai, Kasilof, & East Forelands Sections	Kenai and Kasilof Sections
3-Aug	Fri	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0800–2000	Kasilof River Special Harvest Area	Kasilof River Special Harvest Area
4-Aug	Sat	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1400–2400	Kasilof River Special Harvest Area	
		1400–2200		Kasilof River Special Harvest Area
5-Aug	Sun	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0000–1400	Kasilof River Special Harvest Area	
		1200–2400	Kenai, Kasilof, & East Forelands Sections	
		1200–2300		Kenai and Kasilof Sections
6-Aug	Mon	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0700–1900	All except Northern District	S. of lat. from N. Kalgin Isl. to Colliers dock
		1900–2400	Kenai, Kasilof, & East Forelands Sections	
		1900–2300		Kenai and Kasilof Sections

-continued-

Table 22.–Page 4 of 4.

Date	Day	Time	Set Gill Net	Drift Gill Net
7-Aug	Tue	0000–2400	Western Subdistrict south of Redoubt Pt.	
		0000–1500	Kenai, Kasilof, & East Forelands Sections	
		0500–1500		Kenai and Kasilof Sections
8-Aug	Wed	0000–2400	Western Subdistrict south of Redoubt Pt.	
		1900–2400	Kenai, Kasilof, & East Forelands Sections	
		1900–2300		Kenai and Kasilof Sections
9-Aug	Thu	0000–1900	Western Subdistrict south of Redoubt Pt.	
		0000–0700	Kenai, Kasilof, & East Forelands Sections	
		0500–0700		Kenai and Kasilof Sections
		0700–1900	All	All
		1900–2400	Kasilof River Special Harvest Area	Kasilof River Special Harvest Area
10-Aug	Fri	0000–2300	Kasilof River Special Harvest Area	Kasilof River Special Harvest Area
		0500–2300		Kenai and Kasilof Sections
11-Aug	Sat	0700–1900	Kalgin Island Subdistrict	
13-Aug	Mon	0700–1900	All except Upper Subdistrict	Drift Areas 3 and 4
16-Aug	Thu	0700–1900	All except Upper Subdistrict	Drift Areas 3 and 4
18-Aug	Sat	0700–1900	Kalgin Island Subdistrict	
20-Aug	Mon	0700–1900	All except Upper Subdistrict	Drift Areas 3 and 4
23-Aug	Thu	0700–1900	All except Upper Subdistrict	Drift Areas 3 and 4
27-Aug	Mon	0700–1900	All except Upper Subdistrict	Drift Areas 3 and 4
30-Aug	Thu	0700–1900	All except Upper Subdistrict	Drift Areas 3 and 4
3-Sep	Mon	0700–1900	All except Upper Subdistrict	Drift Areas 3, 4 and Chinitna Bay
6-Sep	Thu	0700–1900	All except Upper Subdistrict	Drift Areas 3, 4 and Chinitna Bay
10-Sep	Mon	0700–1900	All except Upper Subdistrict	Drift Areas 3, 4 and Chinitna Bay

Table 23.–Age composition (in percent) of sockeye salmon escapements, Upper Cook Inlet, 2007.

	Age Class												
Stream	0.2	0.3	1.1	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
Kenai River		0.1		5.9	0.7	78.8	4.4	1.5	7.8	0.1	0.7	0.1	100
Kasilof River			0.6	44.8	0.2	25.3	19.3		9.9				100
Yentna River	1.9	3.6	0.3	18.9	0.6	60.9	6.3		7.4	0.3			100
Crescent River			1.1	8.1	1.3	64.6	3.5	0.2	21.2				100
Fish Creek			2.5	54.1	0.6	36.7	5.2		1.0				100
Hidden Creek				66.5		20.5	9.9		3.1				100

Table 24.–Upper Cook Inlet salmon average weights (in pounds) by area, 2007.

Fishery		Chinook	Sockeye	Coho	Pink	Chum
Upper Cook Inlet Total		20.4	6.3	6.4	3.6	7.3
A. Northern District Total		17.8	5.8	6.4	3.7	6.0
1. Northern District West		17.5	5.7	5.9	3.3	5.8
a. Trading Bay	247-10	18.9	6.1	6.0	4.1	7.2
b. Tyonek	247-20	18.0	5.9	6.8		
c. Beluga	247-30	17.3	5.9	5.7	78.0	2.0
d. Susitna Flat	247-41	15.0	5.1	6.7	2.9	7.2
e. Pt. Mackenzie	247-42	18.6	5.4	6.2	3.1	6.8
f. Fire Island	247-43	16.0	5.1	5.5	3.8	6.8
2. Northern District East		18.4	6.0	7.0	3.8	6.8
a. Pt. Possession	247-70	18.2	6.0	7.2	3.8	6.9
b. Birch Hill	247-80	18.5	6.1	7.0	3.7	6.2
c. Number 3 Bay	247-90	20.5	6.0	6.8	3.7	6.0
B. Central District Total		21.2	6.3	6.4	3.6	7.3
1. East Side Set Total		21.7	6.0	6.3	3.5	6.9
a. Salamatof/East Forelands		22.9	6.7	6.4	3.7	7.0
1. Salamatof	244-41	22.9	6.8	6.3	3.8	7.1
2. East Forelands	244-42	22.6	6.2	6.4	3.7	6.9
b. Kalifonsky Beach		22.1	5.8	6.2	3.6	5.7
1. South K. Beach	244-31	21.6	5.5	6.0	3.5	5.2
2. North K. Beach	244-32	23.0	6.4	6.3	3.8	6.7
c. Kasilof Terminal	244-25	25.1	4.5	6.8	3.2	
d. Cohoe/Ninilchik		20.7	5.6	6.2	3.5	6.6
1. Cohoe	244-22	19.1	5.5	5.9	3.5	7.2
2. Ninilchik	244-21	22.6	5.7	6.5	3.5	6.4
2. West Side Set Total		23.4	6.1	6.3	3.1	7.0
a. Little Jack Slough	245-50	18.0	5.5	6.2		6.4
b. Polly Creek	245-40	-	-	-	-	-
c. Tuxedni Bay	245-30	23.5	6.3	6.3	3.1	7.1
d. Silver Salmon	245-20	-	-	-	-	-

-continued-

Table 24.–Page 2 of 2.

Fishery		Chinook	Sockeye	Coho	Pink	Chum
3. Kustatan Total		19.9	5.4	5.9	3.9	8.2
a. Big River	245-55	19.9	5.4	5.9	-	-
b. West Foreland	245-60	-	5.7	6.0	3.9	8.2
4. Kalgin Island Total		21.7	5.6	5.9	3.6	6.8
a. West Side	246-10	21.3	5.7	5.9	3.6	6.8
b. East Side	246-20	35.8	5.4	6.0	3.8	7.3
5. Chinitna Bay Total		-	6.3	7.8	-	-
a. Set	245-10	-	6.3	7.8	-	-
b. Drift	245-10	-	-	-	-	-
6. Central District Set Total		21.8	6.0	6.1	3.5	6.9
7. Central District Drift Total		12.5	6.5	6.5	3.7	7.3
b. East Side	244-50,60,70	11.4	6.5	6.5	3.7	7.3
c. East Side Corridor Total		15.5	6.5	6.3	3.7	7.0
2. Kasilof Corridor	244-61	14.0	6.5	6.1	3.7	7.1
3. E. Side Corridor	244-55	16.6	6.5	6.3	3.7	7.0
e. Kasilof Terminal	244-26	19.9	4.3	6.9	3.4	6.5

Note: Average weights determined from total pounds of fish divided by numbers of fish from commercial harvest tickets.

Table 25.–Major buyers and processors of Upper Cook Inlet fishery products, 2007.

Buyer/Processor	Code	Plant Site	Contact	Address
Alaska Salmon Purchasers	F4665	Kenai	Mark Powell	HC01 Box 240 Kenai, AK 99611-0240
The Auction Block	F3785	Homer	Cade Smith	P.O. Box 2228 Homer, AK 99603
Coal Point Seafood Co.	F1757	Homer	John	4306 Homer Spit Homer, AK 99603
Copper River Seafoods	F6426	Kasilof	Daryl	4000 W. 50th, Suite 2 Anchorage, AK 99502
Favco	F0398	Anchorage	Greg Favretto	P.O. Box 190968 Anchorage, AK 99519
Fisherman's Express	F6705	Anchorage	Barb	417 D Street Anchorage, AK 99501
Fishhawk Fisheries	F1540	Kenai	Steve Fick	P.O. Box 715 Astoria, OR 97103
The Fish Factory	F4449	Homer	Mike McCune	800 Fish Dock Rd. Homer, AK 99603
Fred's AK Wholesale Seafood	F6676	Anchorage	Fred D Thoerner	230 E Potter # 11 Anchorage, AK 99502
Icicle Seafoods	F0135	Seward	Melody Jordan	P.O. Box 79003 Seattle, WA 98119
Inlet Fisheries Inc.	F4682	Kenai	Patrick Klier	P.O. Box 530 Kenai, AK 99611
Inlet Fish Producers	F2806	Kenai	Ellie Tikka	200 Columbia St Kenai, AK 99611
Kenai River Seafoods	F7323	Kenai	Karin	2101 Bowpicker Ln. Kenai, AK 99611
Ocean Beauty	F5204	Kenai	Pat Hardina	Box 8163 Nikiski, AK 99635
Pacific Star Seafoods	F1834	Kenai	Dan Foley	520 Bridge Access Rd. Kenai, AK 99611
Peninsula Processing	F3789	Soldotna	Annette	720 K. Beach Rd. Soldotna, AK 99669
R & J Seafoods	F6087	Kasilof	Randy Meier	P.O. Box 165 Kasilof, AK 99610
Salamatof Seafoods	F0037	Kenai	Wylie Reed	P.O. Box 1450 Kenai, AK 99615
Smoky Bay Seafoods	F7318	Ninilchik	Diedre	206 SW Michigan St Seattle, WA 98106
Snug Harbor Seafoods	F3894	Kenai	Paul Dale	P.O. Box 701 Kenai, AK 99611

Table 26.–Number of personal use salmon harvested by gear, area, and species, Upper Cook Inlet, 2006.

	Harvest					
Fishery	Chinook	Sockeye	Coho	Pink	Chum	Total
Did Not Fish						
Kasilof Gillnet	287	28,867	420	11	6	29,591
Kasilof Dip Net	55	56,144	1,057	992	105	58,353
Kenai Dip Net	1,034	127,630	2,235	11,127	551	142,577
Fish Creek Dip Net						0
No Site Reported	29	3,406	47	304	84	3,870
Total	1,405	216,047	3,759	12,434	746	234,391

Note: Preliminary estimates.

Table 27.–Age, weight, sex, and size distribution of Pacific herring sampled by gillnet in Upper Cook Inlet, 2007.

Sample date = May 10, 2007

		No. of Fish						Percent	Weight			Length		
Sample Period	Age	Male	Imm. Female	Ripe Female	Spawned Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
ESSN	3			1			1	1	82	NA	1	180	NA	1
	4	2		3			5	5	106	8.6	5	185	6.0	5
	5	5		8			13	14	147	19.5	13	206	7.8	13
	6	25		11			36	39	170	21.0	36	218	10.0	36
	7	17		13			30	32	190	23.1	30	223	8.2	30
	8	5					5	5	211	10.7	5	233	5.6	5
	9	3					3	3	187	23.0	3	223	7.3	3
Sample Total		57	0	36	0	0	93	100	172	32.0	93	217	13.7	93
Sex Composition		61%	0%	39%	0%	0%								

Sample date = May 16, 2007

		No. of Fish						Percent	Weight			Length		
Sample Period	Age	Male	Imm. Female	Ripe Female	Spawned Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
ESSN	3	1					1	1	104	NA	1	191	NA	1
	4	2		7			9	11	112	22.5	9	191	13.3	9
	5	7		15			22	26	143	22.3	22	207	9.7	22
	6	14		12			26	31	167	22.4	26	216	8.9	26
	7	10		12			22	26	189	20.1	22	222	7.3	22
	8	2		3			5	6	201	26.3	5	226	6.4	5
	9													
Sample Total		36	0	49	0	0	85	100	162	33.9	85	213	13.3	85
Sex Composition		42%	0%	58%	0%	0%								

-continued-

Table 27.–Page 2 of 2.

Sample date = May 23, 2007

		No. of Fish						Percent	Weight			Length		
Sample Period	Age	Male	Imm. Female	Ripe Female	Spawned Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
ESSN	3													
	4	1		3			4	4	108	10.4	4	189	5.0	4
	5	19		21	2		42	38	138	23.0	42	207	10.9	42
	6	13		31	4		48	43	157	18.4	48	215	9.7	48
	7	8		9			17	15	179	25.4	17	219	9.8	17
	8			1			1	1	199	NA	1	216	NA	1
	9													
Sample Total		41	0	65	6	0	112	100	152	26.9	112	212	11.7	112
Sex Composition		37%	0%	58%	5%	0%								

Sample date = May 30, 2007

		No. of Fish						Percent	Weight			Length		
Sample Period	Age	Male	Imm. Female	Ripe Female	Spawned Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
ESSN	3			1			1	2	108	NA	1	212	NA	1
	4			4			4	7	116	17.6	6	197	10.0	6
	5			7	7		14	25	126	26.9	20	207	11.4	20
	6			9	16		25	45	147	22.6	46	217	6.7	46
	7			3	8		11	20	153	18.5	38	223	9.3	38
	8								160	24.7	8	224	8.4	8
	9													
Sample Total		0	0	24	31	0	55	100	140	24.9	119	214	11.3	119
Sex Composition		0%	0%	44%	56%	0%								

Table 28.–Age, sex, and size distribution of Eulachon (smelt) in Upper Cook Inlet, 2006.

Age	Sex	Avg. Length (mm)	No. Sampled	%
3	1	185	1	1%
	2	-	0	-
4	1	194	46	53%
	2	186	22	26%
5	1	200	14	16%
	2	203	2	2%
6	1	216	1	1%
	2	-	0	-
			86	100%

Table 29.–Seldovia District tide tables, May through August, 2007.

MAY											
HIGH TIDES						LOW TIDES					
		A.M.		P.M.				A.M.		P.M.	
Date	Day	Time	Feet	Time	Feet	Date	Day	Time	Feet	Time	Feet
1	Tue	02:26a	18.4	03:12p	17.2	1	Tue	08:51a	**-1.0**	08:53p	2.6
2	Wed	02:53a	18.8	03:46p	17.4	2	Wed	09:22a	**-1.5**	09:25p	2.9
3	Thu	03:22	18.9	04:21p	17.2	3	Thu	09:53a	**-1.7**	09:58p	3.4
4	Fri	03:53a	18.7	04:58p	16.6	4	Fri	10:26a	**-1.5**	10:33p	4.0
5	Sat	04:24a	18.2	05:37p	15.7	5	Sat	11:01a	**-1.0**	11:08p	4.8
6	Sun	04:58a	17.4	06:20p	14.8	6	Sun	11:38a	**-0.4**	11:48p	5.6
7	Mon	05:37a	16.5	07:11p	13.9	7	Mon	-	-	12:21p	0.5
8	Tue	06:24a	15.4	08:11p	13.4	8	Tue	12:36a	6.4	01:13p	1.3
9	Wed	07:26a	14.4	09:17p	13.5	9	Wed	01:38a	6.8	02:15p	2.0
10	Thu	08:45a	13.7	10:21p	14.3	10	Thu	02:56a	6.6	03:27p	2.4
11	Fri	10:12a	13.8	11:16p	15.6	11	Fri	04:18a	5.4	04:36p	2.3
12	Sat	11:29a	14.7	05:38p	1.9	12	Sat	05:28a	3.3	-	-
13	Sun	12:04a	17.2	12:36p	16.0	13	Sun	06:25a	0.8	06:32p	1.5
14	Mon	12:48a	18.8	01:33p	17.4	14	Mon	07:15a	**-1.7**	07:21p	1.2
15	Tue	01:31a	20.2	02:25p	18.5	15	Tue	08:02a	**-3.7**	08:09p	1.0
16	Wed	02:15a	21.2	03:15p	19.1	16	Wed	08:48a	**-5.1**	08:55p	1.1
17	Thu	02:58a	21.6	04:04p	19.1	17	Thu	09:34a	**-5.6**	09:41p	1.4
18	Fri	03:43a	21.3	04:52p	18.7	18	Fri	10:20a	**-5.3**	10:28p	2.0
19	Sat	04:29a	20.4	05:42p	17.8	19	Sat	11:07a	**-4.3**	11:17p	2.9
20	Sun	05:16a	19.0	06:34p	16.7	20	Sun	11:55a	**-2.9**	-	-
21	Mon	06:07a	17.3	07:30p	15.7	21	Mon	12:09a	3.9	12:47p	**-1.1**
22	Tue	07:03a	15.5	08:29p	14.9	22	Tue	01:07a	4.9	01:42p	0.6
23	Wed	08:08a	14.0	09:31p	14.5	23	Wed	02:14a	5.5	02:43p	2.1
24	Thu	09:23a	12.9	10:29p	14.6	24	Thu	03:32a	5.5	03:47p	3.2
25	Fri	10:42a	12.6	11:19p	15.0	25	Fri	04:48a	4.9	04:48p	3.9
26	Sat	11:52a	12.9	-	-	26	Sat	05:49a	3.8	05:41p	4.4
27	Sun	12:00a	15.5	12:49p	13.6	27	Sun	06:36a	2.5	06:27p	4.5
28	Mon	12:36a	16.2	01:36p	14.5	28	Mon	07:15a	1.3	07:08p	4.6
29	Tue	01:10a	16.9	02:17p	15.3	29	Tue	07:51a	0.2	07:46p	4.5
30	Wed	01:44a	17.5	02:55p	15.9	30	Wed	08:25a	**-0.7**	08:24p	4.3
31	Thu	02:19a	18.0	03:33p	16.3	31	Thu	09:00a	**-1.4**	09:01p	4.3

-continued-

Table 29.–Page 2 of 4.

JUNE											
		HIGH TIDES						LOW TIDES			
		A.M.		P.M.				A.M.		P.M.	
Date	Day	Time	Feet	Time	Feet	Date	Day	Time	Feet	Time	Feet
1	Fri	2:54A	18.3	4:11P	16.5	1	Fri	9:35A	**-1.8**	9:39P	4.3
2	Sat	3:31A	18.3	4:49P	16.3	2	Sat	10:11A	**-2.0**	10:18P	4.4
3	Sun	4:09A	18.1	5:30P	16.1	3	Sun	10:49A	**-1.9**	10:58P	4.6
4	Mon	4:49A	17.7	6:12P	15.7	4	Mon	11:28A	**-1.5**	11:42P	4.8
5	Tue	5:32A	17.0	6:56P	15.4	5	Tue	-	-	12:11P	**-1.0**
6	Wed	6:22A	16.1	7:44P	15.3	6	Wed	12:31A	5.0	12:57P	**-0.2**
7	Thu	7:20A	15.1	8:34P	15.5	7	Thu	1:28A	5.0	1:48P	0.8
8	Fri	8:29A	14.2	9:27P	16.0	8	Fri	2:34A	4.5	02:46P	1.8
9	Sat	9:46A	13.8	10:22P	16.7	9	Sat	3:45A	3.4	3:49P	2.6
10	Sun	11:04A	14.0	11:16P	17.6	10	Sun	4:54A	1.9	4:54P	3.2
11	Mon	-	-	12:17P	14.9	11	Mon	5:57P	3.4	5:57P	3.4
12	Tue	12:09A	18.6	1:21P	15.9	12	Tue	6:54A	**-1.9**	6:55P	3.3
13	Wed	1:01A	19.5	2:18P	17.0	13	Wed	7:46A	**-3.4**	7:49P	3.0
14	Thu	1:52A	20.1	3:10P	17.8	14	Thu	8:36A	**-4.4**	8:40P	2.6
15	Fri	2:42A	20.5	3:58P	18.2	15	Fri	9:23A	**-4.9**	9:30P	2.5
16	Sat	3:31A	20.4	4:45P	18.2	16	Sat	10:09A	**-4.7**	10:18P	2.5
17	Sun	4:18A	19.8	5:30P	17.9	17	Sun	10:54A	**-4.0**	11:06P	2.8
18	Mon	5:05A	18.8	6:15P	17.4	18	Mon	11:39A	**-2.9**	11:54P	3.2
19	Tue	5:53A	17.5	6:59P	16.8	19	Tue	-	-	12:22P	**-1.4**
20	Wed	6:41A	16.0	7:43P	16.1	20	Wed	12:45A	3.8	1:06P	0.2
21	Thu	7:34A	14.4	8:28P	15.5	21	Thu	1:39A	4.3	1:51P	1.9
22	Fri	8:33A	13.1	9:12P	15.1	22	Fri	2:38A	4.6	2:39P	3.6
23	Sat	9:41A	12.2	9:59P	14.9	23	Sat	3:42A	4.6	3:32P	5.0
24	Sun	10:57A	12.0	10:47P	15.0	24	Sun	4:49A	4.1	4:31P	6.0
25	Mon	12:11P	12.4	11:35P	15.3	25	Mon	5:49A	3.3	5:31P	6.5
26	Tue	-	-	1:12P	13.2	26	Tue	6:40A	2.2	6:26P	6.5
27	Wed	12:23A	15.9	2:01P	14.1	27	Wed	7:24A	1.1	7:16P	6.1
28	Thu	1:10A	16.6	2:43P	15.0	28	Thu	8:05A	0.0	8:01P	5.6
29	Fri	1:54A	17.3	3:22P	15.8	29	Fri	8:43A	**-1.0**	8:43P	5.0
30	Sat	02:36A	18.1	3:59P	16.5	30	Sat	9:20A	**-1.8**	9:24P	4.3

-continued-

Table 29.–Page 3 of 4.

JULY											
HIGH TIDES						LOW TIDES					
		A.M.		P.M.				A.M.		P.M.	
Date	Day	Time	Feet	Time	Feet	Date	Day	Time	Feet	Time	Feet
1	Sun	3:18A	18.6	4:36P	17.0	1	Sun	09:57A	**-2.5**	10:05P	3.8
2	Mon	3:59A	18.8	5:13P	17.3	2	Mon	10:35A	**-2.7**	10:47P	3.4
3	Tue	4:42A	18.7	5:50P	17.5	3	Tue	11:13A	**-2.6**	11:30P	3.1
4	Wed	5:26A	18.2	6:28P	17.6	4	Wed	11:52A	**-2.0**	-	-
5	Thu	6:14A	17.3	7:08P	17.6	5	Thu	12:17A	2.9	12:34P	-1.0
6	Fri	7:07A	16.1	7:51P	17.5	6	Fri	1:08A	2.6	1:19P	0.5
7	Sat	8:10A	14.8	8:40P	17.4	7	Sat	2:06A	2.4	2:10P	2.1
8	Sun	9:23A	13.8	9:35P	17.3	8	Sun	3:12A	2.0	3:09P	3.7
9	Mon	10:45A	13.5	10:37P	17.4	9	Mon	4:24A	1.3	4:19P	4.8
10	Tue	12:09P	21:36	11:42P	17.7	10	Tue	5:37A	0.2	5:32P	5.3
11	Wed	-	-	1:20P	15.0	11	Wed	6:42A	**-1.1**	6:41P	5.0
12	Thu	12:46A	18.3	2:17P	16.2	12	Thu	7:39A	**-2.3**	7:41P	4.2
13	Fri	1:44A	19.1	3:06P	17.3	13	Fri	8:30A	**-3.3**	8:34P	3.4
14	Sat	2:37A	19.6	3:50P	18.1	14	Sat	9:15A	**-3.8**	9:22P	2.6
15	Sun	3:24A	19.9	4:30P	18.5	15	Sun	9:58A	**-3.8**	10:07P	2.1
16	Mon	4:09A	19.7	5:07P	18.6	16	Mon	10:37A	**-3.4**	10:49P	2.0
17	Tue	4:51A	19.1	5:43P	18.4	17	Tue	11:14A	**-2.5**	11:31P	2.2
18	Wed	5:32A	18.1	6:17P	18.0	18	Wed	11:50A	**-1.1**	-	-
19	Thu	6:13A	16.7	6:51P	17.3	19	Thu	12:13A	2.6	12:25P	0.5
20	Fri	6:56A	15.3	7:24P	16.6	20	Fri	12:55A	3.2	1:00P	2.3
21	Sat	7:44A	13.8	8:00P	15.8	21	Sat	1:40A	3.8	1:37P	4.2
22	Sun	8:43A	12.4	8:42P	15.1	22	Sun	2:32A	4.3	2:21P	5.9
23	Mon	9:59A	11.6	9:34P	14.6	23	Mon	3:37A	4.6	3:20P	7.3
24	Tue	11:34A	11.6	10:38P	14.5	24	Tue	4:54A	4.4	4:35P	8.0
25	Wed	12:55P	9:36	11:45P	15.0	25	Wed	6:07A	3.5	5:52P	8.0
26	Thu	-	-	1:49P	13.6	26	Thu	7:03A	2.3	6:55P	7.2
27	Fri	12:46A	15.9	2:29P	14.9	27	Fri	7:47A	0.8	7:44P	6.1
28	Sat	1:37A	17.2	3:04P	16.2	28	Sat	8:26A	**-0.6**	8:28P	4.8
29	Sun	2:23A	18.4	3:37P	17.3	29	Sun	9:02A	**-1.9**	9:08P	3.5
30	Mon	3:06A	19.5	4:10P	18.4	30	Mon	9:38A	**-2.8**	9:48P	2.3
31	Tue	3:48A	20.1	4:43P	19.1	31	Tue	10:13A	**-3.2**	10:29P	1.4

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Table 29.–Page 4 of 4.

AUGUST												
HIGH TIDES						LOW TIDES						
		A.M.		P.M.				A.M.		P.M.		
Date	Day	Time	Feet	Time	Feet	Date	Day	Time	Feet	Time	Feet	
1	Wed	4:30A	20.2	05:17P	19.6	1	Wed	10:50A	**-3.0**	11:11P	0.7	
2	Thu	5:14A	19.7	5:52P	19.8	2	Thu	11:27A	**-2.1**	11:55P	0.4	
3	Fri	6:00A	18.6	6:29P	19.6	3	Fri	-	-	12:07P	**-0.7**	
4	Sat	6:52A	17.1	7:10P	19	4	Sat	12:43A	0.4	12:49P	1.2	
5	Sun	7:51A	15.3	7:58P	18.1	5	Sun	1:37A	0.8	1:38P	3.3	
6	Mon	9:05A	13.8	8:58P	17.2	6	Mon	2:42A	1.4	2:39P	5.2	
7	Tue	10:37A	13.2	10:11P	16.5	7	Tue	4:00A	1.6	3:57P	6.5	
8	Wed	12:12P	13.7	11:33P	16.6	8	Wed	5:26A	1.2	5:25P	6.7	
9	Thu	-	-	1:23P	15.0	9	Thu	6:39A	0.1	6:42P	5.8	
10	Fri	12:47A	17.4	2:14P	16.4	10	Fri	7:37A	**-1.1**	7:41P	4.5	
11	Sat	1:46A	18.4	2:55P	17.7	11	Sat	8:23A	**-2.0**	8:29P	3.1	
12	Sun	2:34A	19.3	3:31P	18.6	12	Sun	9:02A	**-2.6**	9:11P	2.0	
13	Mon	3:16A	19.8	4:04P	19.3	13	Mon	9:38A	**-2.7**	9:50P	1.3	
14	Tue	3:54A	19.9	4:34P	12:00	14	Tue	10:11A	**-2.3**	10:26P	0.9	
15	Wed	4:31A	19.5	5:02P	19.5	15	Wed	10:43A	**-1.4**	11:01P	1.0	
16	Thu	5:07A	18.7	5:30P	19.1	16	Thu	11:13A	**-0.1**	11:36P	1.4	
17	Fri	5:43A	17.5	5:58P	18.4	17	Fri	11:43A	1.4	-	-	
18	Sat	6:21A	16.1	6:26P	17.5	18	Sat	12:11A	2.0	12:14P	3.2	
19	Sun	7:02A	14.5	6:56P	16.4	19	Sun	12:47A	2.9	12:46P	5.0	
20	Mon	7:54A	12.9	7:34P	15.3	20	Mon	1:30A	3.9	1:24P	6.7	
21	Tue	9:08A	11.7	8:27P	14.4	21	Tue	2:26A	4.9	2:17P	8.3	
22	Wed	11:02A	11.4	9:47P	13.8	22	Wed	3:52A	5.3	3:48P	9.2	
23	Thu	12:40P	12.4	11:17P	14.3	23	Thu	5:33A	4.6	5:29P	8.8	
24	Fri	-	-	1:29P	13.8	24	Fri	6:40A	3.1	6:38P	7.5	
25	Sat	12:28A	15.6	2:03P	15.4	25	Sat	7:24A	1.4	7:27P	5.8	
26	Sun	1:22A	17.3	2:34P	17.1	26	Sun	8:01A	**-0.2**	8:09P	3.8	
27	Mon	2:07A	19.0	3:04P	18.7	27	Mon	8:36A	**-1.6**	8:48P	1.9	
28	Tue	2:50A	20.4	3:34P	20.1	28	Tue	9:11A	**-2.5**	9:27P	0.2	
29	Wed	3:32A	21.2	4:06P	2:24	29	Wed	9:46A	**-2.8**	10:07P	**-1.1**	
30	Thu	4:15A	21.3	4:40P	21.6	30	Thu	10:22A	**-2.3**	10:48P	**-1.9**	
31	Fri	4:59A	20.7	5:15P	21.6	31	Fri	11:00A	**-1.2**	11:31P	**-1.9**	

Table 30.–Total sockeye salmon harvest from all sources in Upper Cook Inlet, 1996–2007.

	Commercial				Sport[a,b,c]			Personal Use[d]					Subsistence/Educational		
Year	Drift	Set	Test Fishery	All	Kenai River	All Other UCI	All	Kasilof Gillnet	Kasilof Dipnet	Kenai Dipnet	Other[e]	All	Subsistence	Educational[f]	Total
1996	2,205,067	1,683,855	2,424	3,891,346	205,959	16,863	222,822	9,506	11,197	102,821	22,021	145,545	310	2,199	**4,262,222**
1997	2,197,736	1,979,002	2,301	4,179,039	190,629	23,591	214,220	17,997	9,737	114,619	6,587	148,940	650	1,962	**4,544,811**
1998	599,202	620,040	5,456	1,224,698	190,159	23,477	213,636	15,975	45,161	103,847	11,598	176,581	658	2,295	**1,617,868**
1999	1,413,995	1,266,515	11,766	2,692,276	233,768	26,078	259,846	12,832	37,176	149,504	9,077	208,589	660	2,235	**3,163,606**
2000	656,427	666,055	9,450	1,331,932	261,902	32,194	294,096	14,774	23,877	98,262	12,354	149,267	442	1,934	**1,777,671**
2001	846,257	980,576	3,381	1,830,214	219,507	30,953	250,460	17,201	37,612	150,766	13,109	218,688	717	1,986	**2,302,065**
2002	1,367,251	1,405,867	37,983	2,811,101	259,829	21,770	281,599	17,980	46,769	180,028	14,846	259,623	663	2,678	**3,355,664**
2003	1,593,638	1,882,521	13,968	3,490,127	314,603	36,076	350,679	15,706	43,870	223,580	15,675	298,831	664	4,151	**4,144,452**
2004	2,528,910	2,397,310	10,677	4,936,897	317,561	28,823	346,384	25,417	48,315	223,580	13,527	310,839	534	4,784	**5,599,438**
2005	2,520,300	2,718,006	12,064	5,250,370	312,871	21,826	334,697	26,609	43,151	295,496	4,520	369,776	241	4,962	**5,960,046**
2006	784,771	1,407,959	10,698	2,203,428	203,502	24,146	227,648	28,867	56,144	127,630	3,406	216,047	409	4,769	**2,652,301**
2007	1,823,477	1,493,302	3,851	3,320,630	210,400	28,700	239,100	15,000	50,000	150,000	4,000	219,000	450	4,319	**3,783,499**

[a] Sport harvest in the Kenai River includes late-run stock only; early-run Russian River sockeye salmon harvest is excluded.

[b] Sport harvest is estimated from the annual sate-wide sport fish harvest survey.

[c] Sport harvest in 2007 is unknown until the state-wide harvest survey is finalized; these figures are estimates based on size of 2007 sockeye salmon run.

[d] 2007 personal use harvest reports have not been finalized; therefore, the 2007 data represents preliminary estimates

[e] Specific area of harvest not identified on returned permits, other than Fish Creek dip net, which was open from 1996–2001.

[f] Educational fisheries consist of Kenaitze Tribal Council, Ninilchik Traditional Council, Ninilchik Native Descendents (since 1998), Ninilchik Emergency Services (since 2004), Knik Tribal Group (since 1994), Eklutna Village (since 1994), Tyonek Village (1998–2000), Big Lake Cultural Outreach (since 2005), Intertribal Native Leadership (since 2006), Tim Obrien (2007), and Anchor Pt VFW (2007). All groups had not reported their 2007 harvests (see Appendix A16).

Table 31.–Daily commercial harvest of razor clams, Upper Cook Inlet, 2007.

Date	Lbs	No. Diggers	Date	Lbs	No. Diggers
5/13	1,908	12	6/20	5,602	15
5/14	1,523	8	6/27	6,519	15
5/15	3,813	14	6/28	5,503	15
5/16	3,857	14	6/29	6,628	15
5/17	5,643	10	6/30	6,230	15
5/18	5,426	12	7/1	6,531	15
5/19	5,912	14	7/2	6,331	15
5/20	6,007	14	7/3	6,407	15
5/21	5,957	14	7/4	5,275	15
5/22	3,330	14	7/5	4,330	15
5/28	3,718	15	7/6	3,802	15
5/29	4,923	15	7/10	3,180	15
5/30	4,278	15	7/11	3,890	15
5/31	5,738	15	7/12	3,846	15
6/1	2,657	13	7/13	5,241	15
6/2	4,886	15	7/14	5,018	15
6/3	6,024	15	7/15	5,355	15
6/4	4,717	15	7/16	5,460	14
6/5	3,152	14	7/17	5,344	15
6/6	4,157	15	7/18	4,707	15
6/7	1,791	15	7/19	2,989	15
6/11	3,083	15	7/20	2,235	15
6/12	5,477	15	7/27	3,205	14
6/13	6,461	15	7/28	4,315	15
6/14	5,571	15	7/29	5,690	15
6/15	5,559	15	7/30	5,152	15
6/16	6,502	15	7/31	5,070	15
6/17	5,485	15	8/1	4,070	15
6/18	5,555	15	8/2	3,189	15
6/19	6,537	15	8/3	2,324	15
2007 Total = 283,085 lbs					

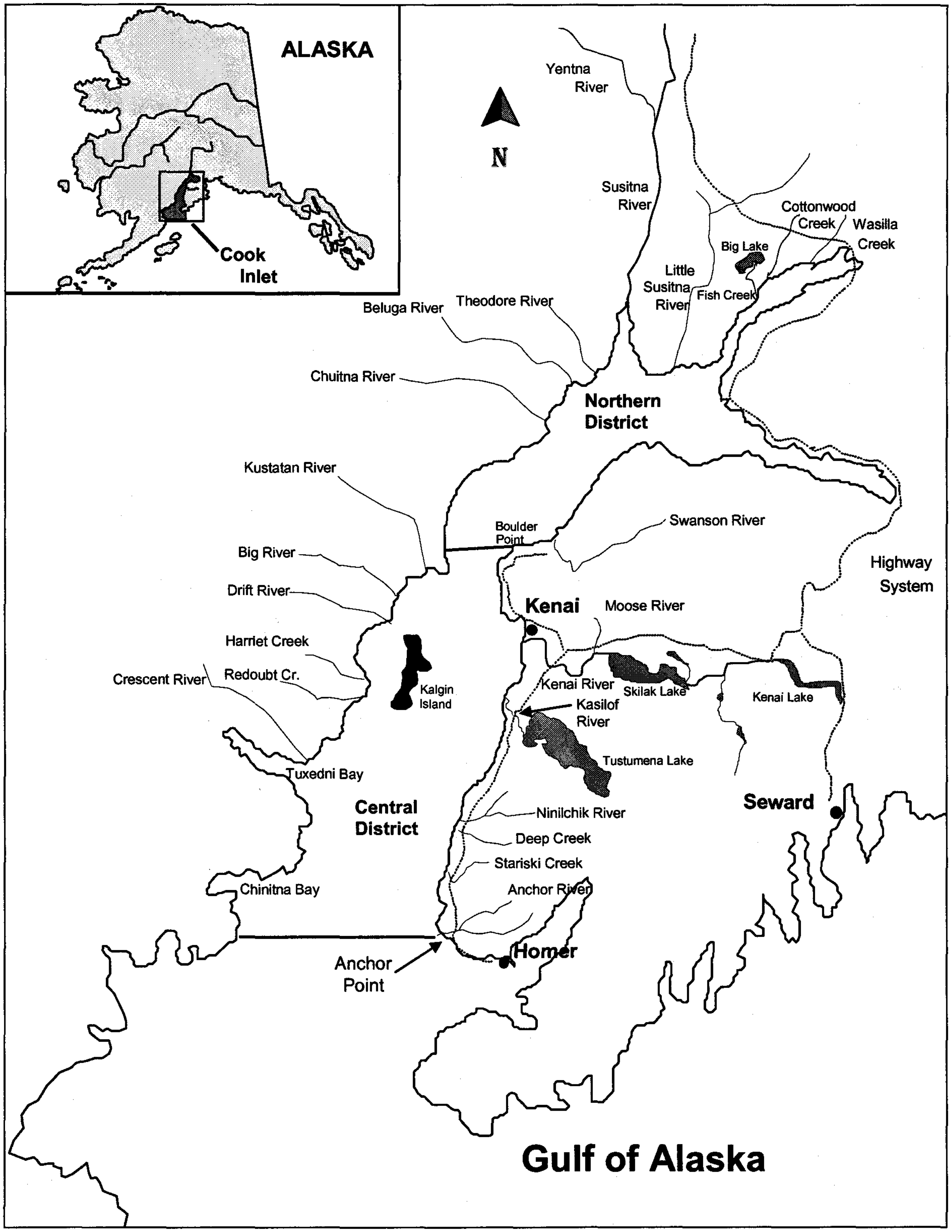

Figure 1.–Major tributaries of the Cook Inlet basin.

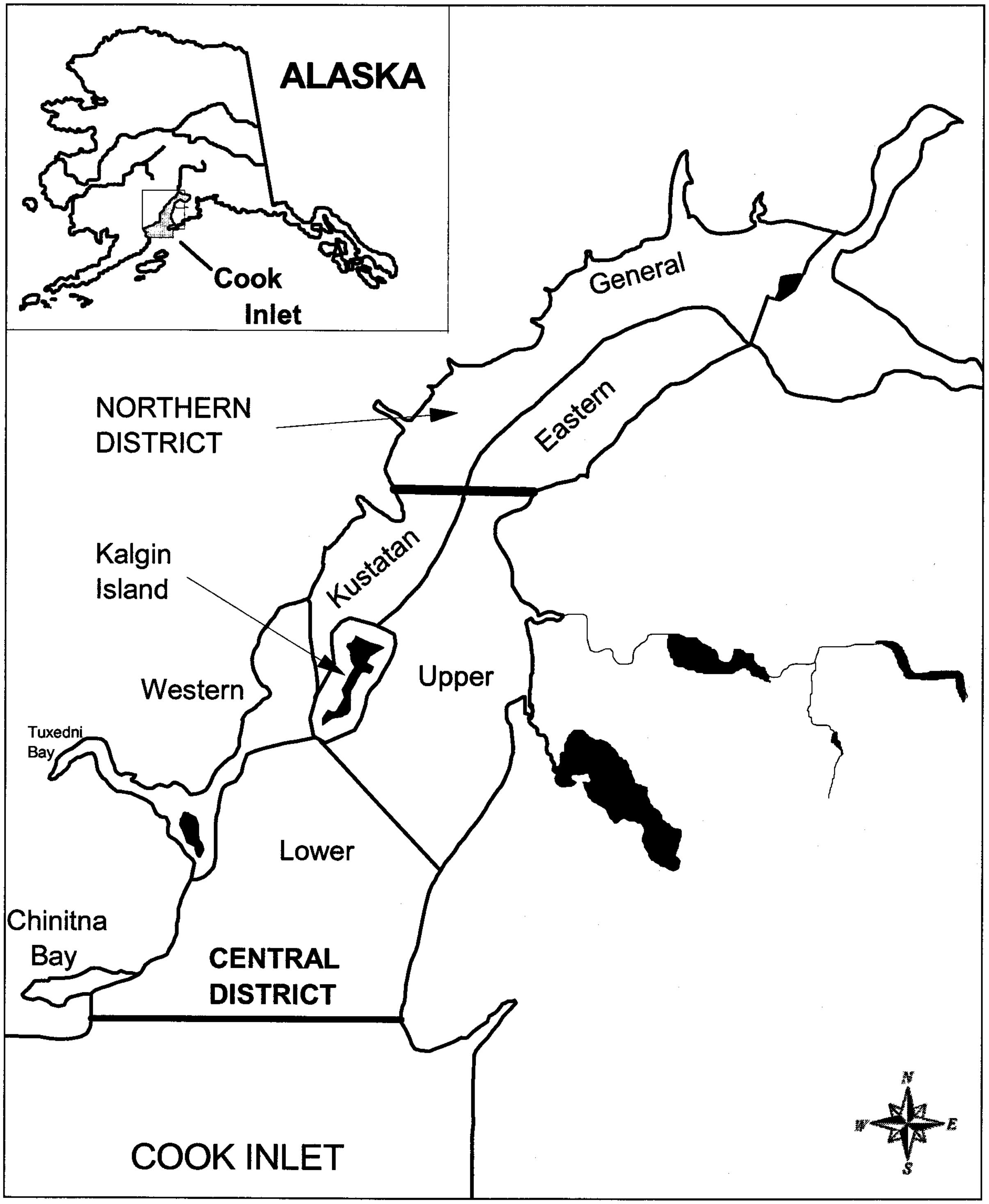

Figure 2.–Upper Cook Inlet commercial fisheries Subdistrict fishing boundaries.

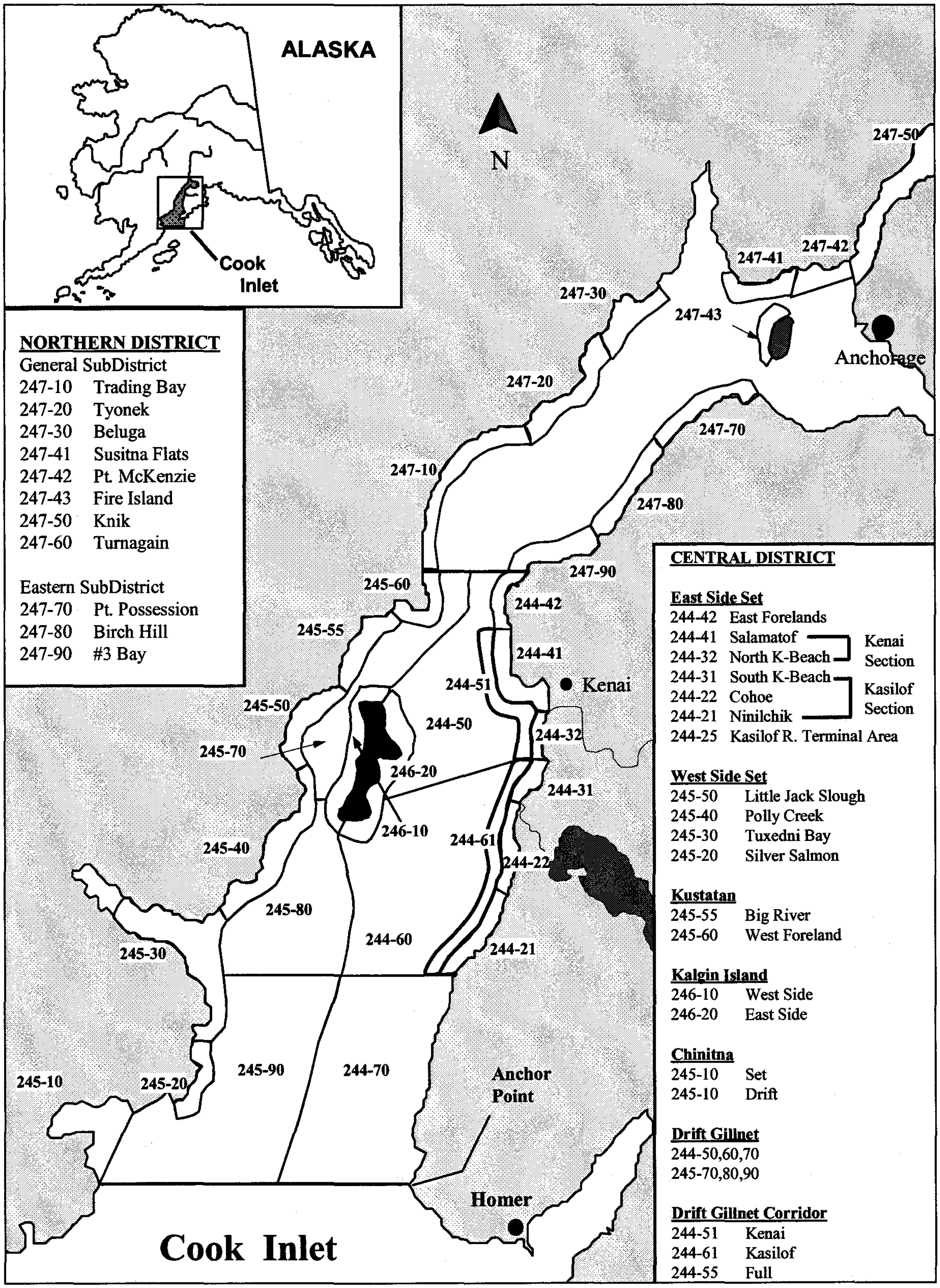

Figure 3.–Upper Cook Inlet commercial fisheries statistical areas.

Drift Gillnet Area 1 & Area 2 Descriptions

AREA 2 DESCRIPTION	COORDINATES
A. Southwest Corner	60° 20.43' N. lat., 151 ° 54.83' W. long.
B. Northwest Corner	60° 41.08' N. lat., 151 ° 39.00' W. long.
C. Northeast Corner	60° 41.08' N. lat., 151 ° 24.00' W. long.
D. Blanchard Line Corridor Boundary	60° 27.10' N. lat., 151 ° 25.70' W. long.
E. Southeast Corner	60° 20.43' N. lat., 151 ° 28.00' W. long.

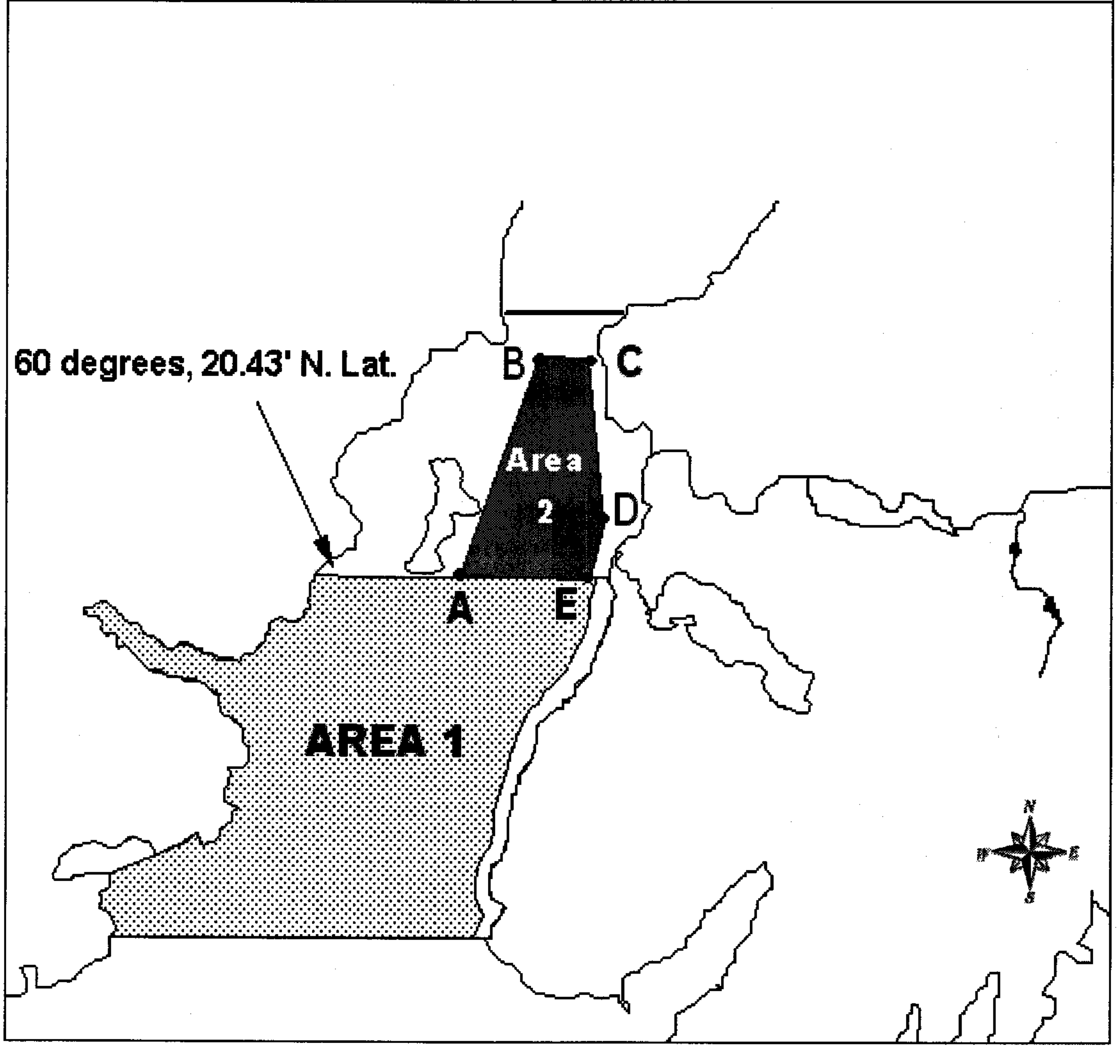

Figure 4.–Drift gillnet boundaries for fishing areas 1 and 2.

AREA 4 LOCATION	COORDINATES
A. Southwest Corner	59° 46.15' N. lat., 153° 00.20' W. long.
B. Northwest Corner	60° 04.70' N. lat., 152° 34.74' W. long.
C. Northeast Corner (Kalgin Buoy)	60° 04.70' N. lat., 152° 09.90' W. long.
D. Southeast Corner	59° 46.15' N. lat., 152° 18.62' W. long.

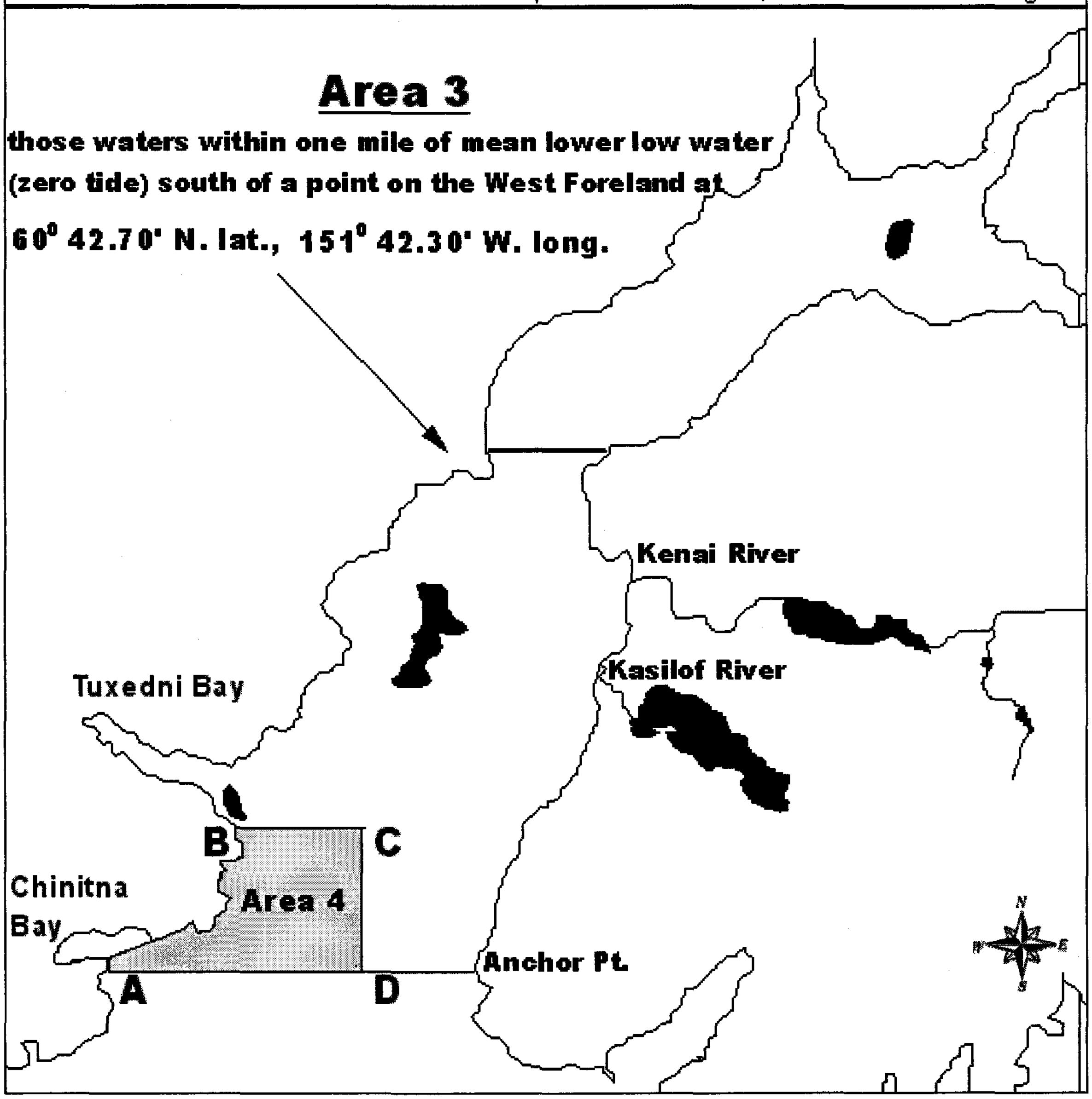

Figure 5.–Drift gillnet boundaries for fishing areas 3 and 4.

Appendix A1.–Upper Cook Inlet commercial Chinook salmon harvest by gear type and area, 1966–2007.

	Central District Drift Gillnet		Central District Set Gillnet: East Side		Central District Set Gillnet: Kalgin/West Side		Northern District Set Gillnet		
Year	Number[a]	%	Number[a]	%	Number[a]	%	Number[a]	%	Total
1966	392	4.6	7,329	85.8	401	4.7	422	4.9	8,544
1967	489	6.2	6,686	85.1	500	6.4	184	2.3	7,859
1968	182	4.0	3,304	72.8	579	12.8	471	10.4	4,536
1969	362	2.9	5,834	47.1	3,286	26.5	2,904	23.4	12,386
1970	356	4.3	5,368	64.4	1,152	13.8	1,460	17.5	8,336
1971	237	1.2	7,055	35.7	2,875	14.5	9,598	48.6	19,765
1972	375	2.3	8,599	53.5	2,199	13.7	4,913	30.5	16,086
1973	244	4.7	4,411	84.9	369	7.1	170	3.3	5,194
1974	422	6.4	5,571	84.5	434	6.6	169	2.6	6,596
1975	250	5.2	3,675	76.8	733	15.3	129	2.7	4,787
1976	690	6.4	8,249	75.9	1,469	13.5	457	4.2	10,865
1977	3,411	23.1	9,730	65.8	1,084	7.3	565	3.8	14,790
1978	2,072	12.0	12,468	72.1	2,093	12.1	666	3.8	17,299
1979	1,089	7.9	8,671	63.1	2,264	16.5	1,714	12.5	13,738
1980	889	6.4	9,643	69.9	2,273	16.5	993	7.2	13,798
1981	2,320	19.0	8,358	68.3	837	6.8	725	5.9	12,240
1982	1,293	6.2	13,658	65.4	3,203	15.3	2,716	13.0	20,870
1983	1,125	5.5	15,042	72.9	3,534	17.1	933	4.5	20,634
1984	1,377	13.7	6,165	61.3	1,516	15.1	1,004	10.0	10,062
1985	2,048	8.5	17,723	73.6	2,427	10.1	1,890	7.8	24,088
1986	1,834	4.7	19,824	50.5	2,108	5.4	15,488	39.5	39,254

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Appendix A1.–Page 2 of 2.

Year	Central District Drift Gillnet		Central District Set Gillnet: East Side		Central District Set Gillnet: Kalgin/West Side		Northern District Set Gillnet		Total
	Number[b]	%	Number[b]	%	Number[b]	%	Number[b]	%	
1987	4,552	11.5	21,150	53.6	1,029	2.6	12,700	32.2	39,431
1988	2,237	7.7	12,859	44.2	1,137	3.9	12,836	44.2	29,069
1989			10,914	40.8	3,092	11.6	12,731	47.6	26,737
1990	621	3.9	4,139	25.7	1,763	10.9	9,582	59.5	16,105
1991	246	1.8	4,893	36.1	1,544	11.4	6,859	50.6	13,542
1992	615	3.6	10,718	62.4	1,284	7.5	4,554	26.5	17,171
1993	765	4.1	14,079	74.6	720	3.8	3,307	17.5	18,871
1994	464	2.3	15,575	78.1	730	3.7	3,185	16.0	19,954
1995	594	3.3	12,068	67.4	1,101	6.2	4,130	23.1	17,893
1996	389	2.7	11,564	80.8	395	2.8	1,958	13.7	14,306
1997	627	4.7	11,325	85.2	207	1.6	1,133	8.5	13,292
1998	335	4.1	5,087	62.6	155	1.9	2,547	31.4	8,124
1999	575	4.0	9,463	65.8	1,533	10.7	2,812	19.6	14,383
2000	270	3.7	3,684	50.1	1,089	14.8	2,307	31.4	7,350
2001	619	6.7	6,009	64.6	856	9.2	1,811	19.5	9,295
2002	415	3.3	9,478	74.5	926	7.3	1,895	14.9	12,714
2003	1,240	6.7	14,810	80.1	770	4.2	1,670	9.0	18,490
2004	1,526	5.6	21,684	78.9	2,208	8.0	2,058	7.5	27,476
2005	1,958	7.0	22,101	78.5	739	2.6	3,373	12.0	28,171
2006	2,782	15.4	9,956	55.2	1,030	5.7	4,261	23.6	18,029
2007	912	5.2	12,288	69.7	603	3.4	3,822	21.7	17,625
1966-2006 Avg [a]	1,057	6	10,200	66	1,364	9	3,264	18	15,885
1997-2006 Avg	1,035	6	11,360	70	951	7	2,387	18	15,732

[a] Harvest data prior to 2007 reflect minor adjustments to historical catch database.

[b] 1989 not used in average as the drift fleet did not fish due to the Exxon Valdez oil spill; this had an effect on all other fisheries.

Appendix A2.–Upper Cook Inlet commercial sockeye salmon harvest by gear type and area, 1966–2007.

	Central District Drift Gillnet		Central District Set Gillnet: East Side		Central District Set Gillnet: Kalgin/West Side		Northern District Set Gillnet		
Year	Number[a]	%	Number[a]	%	Number[a]	%	Number[a]	%	Total
1966	1,103,261	59.6	485,330	26.2	132,443	7.2	131,080	7.1	1,852,114
1967	890,152	64.5	305,431	22.1	66,414	4.8	118,065	8.6	1,380,062
1968	561,737	50.8	317,535	28.7	85,049	7.7	140,575	12.7	1,104,896
1969	371,747	53.7	210,834	30.5	71,184	10.3	38,050	5.5	691,815
1970	460,690	62.9	142,701	19.5	62,723	8.6	66,458	9.1	732,572
1971	423,107	66.5	111,505	17.5	61,144	9.6	40,533	6.4	636,289
1972	506,281	57.5	204,599	23.3	83,176	9.5	85,755	9.7	879,811
1973	375,695	56.1	188,816	28.2	59,973	8.9	45,614	6.8	670,098
1974	265,771	53.5	136,889	27.5	52,962	10.7	41,563	8.4	497,185
1975	368,124	53.8	177,336	25.9	73,765	10.8	65,526	9.6	684,751
1976	1,055,786	63.4	476,376	28.6	62,338	3.7	69,649	4.2	1,664,149
1977	1,073,098	52.3	751,178	36.6	104,265	5.1	123,750	6.0	2,052,291
1978	1,803,479	68.8	660,797	25.2	105,767	4.0	51,378	2.0	2,621,421
1979	454,707	49.2	247,359	26.8	108,422	11.7	113,918	12.3	924,406
1980	770,247	48.9	559,812	35.6	137,882	8.8	105,647	6.7	1,573,588
1981	633,380	44.0	496,003	34.5	60,217	4.2	249,662	17.3	1,439,262
1982	2,103,429	64.5	971,423	29.8	66,952	2.1	118,060	3.6	3,259,864
1983	3,222,428	63.8	1,508,511	29.9	134,575	2.7	184,219	3.6	5,049,733
1984	1,235,337	58.6	490,273	23.3	162,139	7.7	218,965	10.4	2,106,714
1985	2,032,957	50.1	1,561,200	38.4	285,081	7.0	181,191	4.5	4,060,429
1986	2,837,857	59.2	1,658,161	34.6	153,714	3.2	141,830	3.0	4,791,562

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	Central District Drift Gillnet		Central District Set Gillnet: East Side		Central District Set Gillnet: Kalgin/West Side		Northern District Set Gillnet		
Year	Number[b]	%	Number[b]	%	Number[b]	%	Number[b]	%	Total
1987	5,638,916	60	3,454,470	36	208,036	2	164,572	2	9,465,994
1988	4,139,358	60	2,428,385	35	146,377	2	129,713	2	6,843,833
1989			4,543,492	91	186,831	4	280,801	6	5,011,124
1990	2,305,331	64	1,117,581	31	84,949	2	96,398	3	3,604,259
1991	1,118,115	51	844,156	39	99,859	5	116,201	5	2,178,331
1992	6,069,495	67	2,838,076	31	131,304	1	69,478	1	9,108,353
1993	2,558,732	54	1,941,783	41	108,181	2	146,633	3	4,755,329
1994	1,901,452	53	1,458,162	41	85,830	2	120,142	3	3,565,586
1995	1,773,873	60	961,216	33	107,640	4	109,098	4	2,951,827
1996	2,205,067	57	1,483,008	38	96,719	2	104,128	3	3,888,922
1997	2,197,736	53	1,832,824	44	48,723	1	97,455	2	4,176,738
1998	599,202	49	512,225	42	47,165	4	60,650	5	1,219,242
1999	1,413,995	53	1,092,946	41	114,454	4	59,115	2	2,680,510
2000	656,427	50	529,747	40	92,477	7	43,831	3	1,322,482
2001	846,257	46	870,019	48	59,709	3	50,848	3	1,826,833
2002	1,367,251	49	1,303,158	47	69,609	3	33,100	1	2,773,118
2003	1,593,638	46	1,746,841	50	87,193	3	48,487	1	3,476,159
2004	2,528,910	51	2,235,810	45	134,356	3	27,144	1	4,926,220
2005	2,520,300	48	2,533,841	48	157,612	3	26,415	1	5,238,168
2006	784,771	36	1,301,275	59	94,054	4	12,630	1	2,192,730
2007	1,823,481	55	1,353,407	41	122,424	4	17,467	1	3,316,779
1966-2006 Avg[a]	1,619,202	55	1,053,690	35	102,611	5	96,188	5	2,871,691
1997-2006 Avg	1,450,849	48	1,395,869	46	90,535	3	45,968	2	2,983,220

[a] Harvest data prior to 2007 reflect minor adjustments to the historical catch database.

[b] 1989 not used in average, as the drift fleet did not fish due to the Exxon Valdez oil spill; this had an effect on all other fisheries.

Appendix A3.–Upper Cook Inlet commercial coho salmon harvest by gear type and area, 1966–2007.

	Central District		Central District Set Gillnet				Northern District		
	Drift Gillnet		East Side		Kalgin/West Side		Set Gillnet		
Year	Number[a]	%	Number[a]	%	Number[a]	%	Number[a]	%	Total
1966	80,901	27.9	68,877	23.8	59,509	20.5	80,550	27.8	289,837
1967	53,071	29.9	40,738	22.9	40,066	22.5	43,854	24.7	177,729
1968	167,383	35.8	80,828	17.3	63,301	13.5	156,648	33.5	468,160
1969	33,053	32.8	18,988	18.9	28,231	28.0	20,412	20.3	100,684
1970	110,070	40.0	30,114	10.9	52,299	19.0	82,722	30.1	275,205
1971	35,491	35.4	16,589	16.5	26,188	26.1	22,094	22.0	100,362
1972	21,577	26.7	24,673	30.5	15,300	18.9	19,346	23.9	80,896
1973	31,784	30.4	23,901	22.9	24,784	23.7	23,951	22.9	104,420
1974	75,640	37.8	36,837	18.4	40,610	20.3	47,038	23.5	200,125
1975	88,579	39.0	46,209	20.3	59,537	26.2	33,051	14.5	227,376
1976	80,712	38.7	47,873	22.9	42,243	20.2	37,835	18.1	208,663
1977	110,184	57.2	23,693	12.3	38,093	19.8	20,623	10.7	192,593
1978	76,259	34.8	34,134	15.6	61,711	28.2	47,089	21.5	219,193
1979	114,496	43.2	29,284	11.0	68,306	25.8	53,078	20.0	265,164
1980	89,510	33.0	40,281	14.8	51,527	19.0	90,098	33.2	271,416
1981	226,366	46.7	36,024	7.4	88,390	18.2	133,625	27.6	484,405
1982	416,274	52.5	108,393	13.7	182,205	23.0	85,352	10.8	792,224
1983	326,965	63.3	37,694	7.3	97,796	18.9	53,867	10.4	516,322
1984	213,423	47.4	37,166	8.3	84,618	18.8	114,786	25.5	449,993
1985	357,388	53.6	70,657	10.6	147,331	22.1	91,837	13.8	667,213
1986	506,818	66.9	76,461	10.1	85,932	11.4	88,108	11.6	757,319

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	Central District Drift Gillnet		Central District Set Gillnet				Northern District Set Gillnet		
			East Side		Kalgin/West Side				
Year	Number[b]	%	Number[b]	%	Number[b]	%	Number[b]	%	Total
1987	202,506	44.8	74,923	16.6	74,930	16.6	97,062	21.9	449,421
1988	278,828	49.6	54,975	9.9	77,403	13.8	149,742	26.7	560,948
1989	743	0.2	82,333	24.1	81,004	23.9	175,738	51.8	339,818
1990	247,357	49.3	40,351	8.0	73,429	14.6	140,506	28.0	501,643
1991	175,782	41.2	30,435	7.1	87,968	20.6	132,302	31.0	426,487
1992	267,300	57.0	57,078	12.2	53,419	11.4	91,133	19.4	468,930
1993	121,829	39.7	43,098	14.0	35,661	11.6	106,294	34.6	306,882
1994	310,114	52.7	68,449	11.9	61,166	10.5	144,064	24.8	583,793
1995	241,473	54.0	44,750	10.0	71,431	16.0	89,300	20.0	446,954
1996	171,434	53.3	40,724	12.6	31,405	9.8	78,105	24.3	321,668
1997	78,662	51.6	19,668	12.9	16,705	11.0	37,369	24.5	152,404
1998	83,338	51.9	18,677	11.6	24,286	15.1	34,359	21.4	160,660
1999	64,814	51.5	11,923	9.3	17,725	14.1	31,446	25.1	125,908
2000	131,478	55.5	11,078	4.7	22,840	9.6	71,475	30.2	236,871
2001	39,418	34.8	4,246	3.7	23,719	20.9	45,928	40.5	113,311
2002	125,831	51.1	35,153	14.3	35,005	14.2	50,292	20.4	246,281
2003	52,432	51.5	10,171	10.0	15,138	14.9	24,015	23.6	101,756
2004	199,585	64.2	30,154	9.7	36,498	11.7	44,819	14.4	311,056
2005	144,753	64.4	19,543	8.7	29,502	13.1	30,859	13.7	224,657
2006	98,473	55.4	22,167	12.5	36,845	20.7	20,368	11.5	177,853
2007	108,703	61.3	23,578	13.3	23,495	13.2	21,563	12.2	177,339
1966-2006 Avg[a]	156,284	46	39,174	13	54,576	18	69,135	23	319,170
1997-2006 Avg	101,878	53	18,278	10	25,826	15	39,093	23	185,076

[a] Harvest data prior to 2007 reflect minor adjustments to historical catch database.

[b] 1989 not used in average as the drift fleet did not fish due to the Exxon Valdez oil spill; this had an effect on all other fisheries.

Appendix A4.–Upper Cook Inlet commercial pink salmon harvest by gear type and area, 1966–2007.

	Central District Drift Gillnet		Central District Set Gillnet East Side		Central District Set Gillnet Kalgin/West Side		Northern District Set Gillnet		
Year	Number[a]	%	Number[a]	%	Number[a]	%	Number[a]	%	Total
1966	593,654	29.6	969,624	48.3	70,507	3.5	371,960	18.5	2,005,745
1967	7,475	23.2	13,038	40.5	3,256	10.1	8,460	26.2	32,229
1968	880,512	38.7	785,887	34.5	75,755	3.3	534,839	23.5	2,276,993
1969	8,233	25.3	10,968	33.7	5,711	17.6	7,587	23.3	32,499
1970	334,737	41.1	281,067	34.5	24,763	3.0	174,193	21.4	814,760
1971	6,433	18.1	18,097	50.8	2,637	7.4	8,423	23.7	35,590
1972	115,117	18.3	403,706	64.2	18,913	3.0	90,830	14.5	628,566
1973	91,901	28.2	80,596	24.7	16,437	5.0	137,250	42.1	326,184
1974	140,432	29.0	291,408	60.2	9,014	1.9	42,876	8.9	483,730
1975	113,868	33.9	112,423	33.4	19,086	5.7	90,953	27.0	336,330
1976	599,594	47.7	479,024	38.1	30,030	2.4	148,080	11.8	1,256,728
1977	286,308	51.7	125,817	22.7	25,212	4.6	116,518	21.0	553,855
1978	934,442	55.3	372,601	22.1	54,785	3.2	326,614	19.3	1,688,442
1979	19,554	26.8	19,983	27.4	7,061	9.7	26,382	36.1	72,980
1980	964,526	54.0	299,444	16.8	47,963	2.7	474,488	26.6	1,786,421
1981	53,888	42.4	15,654	12.3	4,276	3.4	53,325	41.9	127,143
1982	270,380	34.2	432,715	54.7	14,242	1.8	73,307	9.3	790,644
1983	26,629	37.9	18,309	26.0	3,785	5.4	21,604	30.7	70,327
1984	273,565	44.3	220,895	35.8	16,708	2.7	106,284	17.2	617,452
1985	34,228	39.0	17,715	20.2	5,653	6.4	30,232	34.4	87,828
1986	615,522	47.3	530,955	40.8	15,460	1.2	139,002	10.7	1,300,939

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	Central District Drift Gillnet		Central District Set Gillnet: East Side		Central District Set Gillnet: Kalgin/West Side		Northern District Set Gillnet		
Year	Number[b]	%	Number[b]	%	Number[b]	%	Number[b]	%	Total
1987	38,714	35.4	47,235	43.2	5,229	4.8	18,203	16.6	109,381
1988	227,885	48.4	176,043	37.4	12,938	2.7	54,210	11.5	471,076
1989	1	0.0	37,982	56.3	5,580	8.3	23,878	35.4	67,441
1990	323,759	53.7	225,429	37.4	10,302	1.7	43,944	7.3	603,434
1991	5,791	39.5	2,670	18.2	1,049	7.2	5,153	35.1	14,663
1992	423,738	60.9	244,068	35.1	4,250	0.6	23,805	3.4	695,861
1993	46,463	46.0	41,690	41.3	2,313	2.3	10,468	10.4	100,934
1994	256,248	49.0	234,827	44.9	3,178	0.6	29,181	5.6	523,434
1995	64,632	48.4	53,420	40.0	3,810	2.9	11,713	8.8	133,575
1996	122,728	50.5	95,717	39.4	3,792	1.6	20,674	8.5	242,911
1997	29,917	42.2	32,046	45.2	4,701	6.6	4,269	6.0	70,933
1998	200,382	36.3	332,092	60.2	7,231	1.3	11,555	2.1	551,260
1999	3,552	22.0	9,355	57.8	2,674	16.5	593	3.7	16,174
2000	90,508	61.8	23,746	16.2	11,983	8.2	20,245	13.8	146,482
2001	31,218	43.0	32,998	45.5	3,988	5.5	4,355	6.0	72,559
2002	224,229	50.2	214,771	48.1	1,736	0.4	6,224	1.4	446,960
2003	30,376	62.3	16,474	33.8	375	0.8	1,564	3.2	48,789
2004	235,524	65.8	107,838	30.1	12,560	3.5	2,017	0.6	357,939
2005	31,230	64.5	13,619	28.1	2,747	5.7	823	1.7	48,419
2006	212,808	52.7	184,990	45.8	4,684	1.2	1,629	0.4	404,111
2007	67,398	45.8	69,918	47.6	6,177	4.2	3,527	2.4	147,020
1966-2006 Avg [a]	224,268	42	189,724	37	14,270	4	81,346	16	509,607
1997-2006 Avg	108,974	50	96,793	41	5,268	5	5,327	4	216,363

[a] Harvest data prior to 2007 reflect minor adjustments to historical catch database.

[b] 1989 not used in average as the drift fleet did not fish due to the Exxon Valdez oil spill; this had an effect on all other fisheries.

Appendix A5.–Upper Cook Inlet commercial chum salmon harvest by gear type and area, 1966–2007.

	Central District Drift Gillnet		Central District Set Gillnet: East Side		Central District Set Gillnet: Kalgin/West Side		Northern District Set Gillnet		
Year	Number[a]	%	Number[a]	%	Number[a]	%	Number[a]	%	Total
1966	424,972	79.8	7,461	1.4	64,725	12.1	35,598	6.7	532,756
1967	233,041	78.5	399	0.1	25,013	8.4	38,384	12.9	296,837
1968	1,002,900	90.5	1,563	0.1	44,986	4.1	58,454	5.3	1,107,903
1969	238,497	89.1	399	0.1	16,954	6.3	11,836	4.4	267,686
1970	678,448	90.4	1,228	0.2	48,591	6.5	22,507	3.0	750,774
1971	274,567	84.8	128	0.0	32,647	10.1	16,603	5.1	323,945
1972	564,726	90.2	1,727	0.3	40,179	6.4	19,782	3.2	626,414
1973	605,738	90.7	1,965	0.3	29,019	4.3	30,851	4.6	667,573
1974	344,496	86.8	506	0.1	15,346	3.9	36,492	9.2	396,840
1975	886,474	93.2	980	0.1	33,347	3.5	30,787	3.2	951,588
1976	405,769	86.5	1,484	0.3	47,882	10.2	14,045	3.0	469,180
1977	1,153,454	93.5	1,413	0.1	54,708	4.4	23,861	1.9	1,233,436
1978	489,119	85.5	4,563	0.8	40,946	7.2	37,151	6.5	571,779
1979	609,239	93.8	867	0.1	30,342	4.7	9,310	1.4	649,758
1980	339,970	87.7	2,147	0.6	28,970	7.5	16,728	4.3	387,815
1981	756,922	91.0	2,386	0.3	26,461	3.2	46,208	5.6	831,977
1982	1,348,510	94.1	4,777	0.3	36,647	2.6	43,006	3.0	1,432,940
1983	1,044,636	93.7	2,822	0.3	38,079	3.4	29,321	2.6	1,114,858
1984	568,097	83.5	3,695	0.5	34,207	5.0	74,727	11.0	680,726
1985	700,848	90.7	4,133	0.5	31,746	4.1	36,122	4.7	772,849
1986	1,012,669	89.2	7,030	0.6	39,078	3.4	76,040	6.7	1,134,817

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Year	Central District Drift Gillnet Number[b]	%	Central District Set Gillnet East Side Number[b]	%	Central District Set Gillnet Kalgin/West Side Number[b]	%	Northern District Set Gillnet Number[b]	%	Total
1987	211,745	60.7	16,605	4.8	53,558	15.4	66,901	19.2	348,809
1988	582,699	82.0	11,763	1.7	40,425	5.7	75,728	10.7	710,615
1989	72	0.1	12,326	10.1	27,705	22.7	81,948	67.1	122,051
1990	289,447	82.4	4,611	1.3	21,355	6.1	35,710	10.2	351,123
1991	215,469	76.9	2,387	0.9	22,974	8.2	39,393	14.1	280,223
1992	232,955	84.9	2,867	1.0	13,180	4.8	25,301	9.2	274,303
1993	88,826	72.4	2,977	2.4	5,566	4.5	25,401	20.7	122,770
1994	249,748	82.4	2,927	1.0	10,443	3.4	40,059	13.2	303,177
1995	468,224	88.4	3,711	0.7	13,820	2.6	43,667	8.2	529,422
1996	140,968	90.1	1,448	0.9	2,314	1.5	11,771	7.5	156,501
1997	92,163	89.4	1,222	1.2	1,770	1.7	7,881	7.6	103,036
1998	88,036	92.0	688	0.7	2,953	3.1	3,977	4.2	95,654
1999	166,612	95.5	373	0.2	3,567	2.0	3,989	2.3	174,541
2000	118,074	92.9	325	0.3	4,386	3.5	4,284	3.4	127,069
2001	75,599	89.5	248	0.3	6,445	7.6	2,202	2.6	84,494
2002	224,587	94.4	1,790	0.8	6,671	2.8	4,901	2.1	237,949
2003	106,468	88.2	1,933	1.6	7,883	6.5	4,483	3.7	120,767
2004	137,040	93.8	2,019	1.4	4,957	3.4	2,148	1.5	146,164
2005	65,671	94.2	710	1.0	2,632	3.8	727	1.0	69,740
2006	59,965	93.6	347	0.5	3,241	5.1	480	0.7	64,033
2007	74,836	96.9	521	0.7	1,275	1.7	608	0.8	77,240
1966-2006 Avg [a]	432,435	88	2,766	1	24,700	5	27,670	6	487,571
1997-2006 Avg	113,422	92	966	1	4,451	4	3,507	3	122,345

[a] Harvest data prior to 2007 reflect minor adjustments to historical catch database.

[b] 1989 not used in average as the drift fleet did not fish due to the Exxon Valdez oil spill; this had an effect on all other fisheries.

Appendix A6.–Upper Cook Inlet commercial salmon harvest by species, 1966–2007.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1966	8,544	1,852,114	289,837	2,005,745	532,756	4,688,996
1967	7,859	1,380,062	177,729	32,229	296,837	1,894,716
1968	4,536	1,104,896	468,160	2,276,993	1,107,903	4,962,488
1969	12,386	691,815	100,684	32,499	267,686	1,105,070
1970	8,336	732,572	275,205	814,760	750,774	2,581,647
1971	19,765	636,289	100,362	35,590	323,945	1,115,951
1972	16,086	879,811	80,896	628,566	626,414	2,231,773
1973	5,194	670,098	104,420	326,184	667,573	1,773,469
1974	6,596	497,185	200,125	483,730	396,840	1,584,476
1975	4,787	684,751	227,376	336,330	951,588	2,204,832
1976	10,865	1,664,149	208,663	1,256,728	469,180	3,609,585
1977	14,790	2,052,291	192,593	553,855	1,233,436	4,046,965
1978	17,299	2,621,421	219,193	1,688,442	571,779	5,118,134
1979	13,738	924,406	265,164	72,980	649,758	1,926,046
1980	13,798	1,573,588	271,416	1,786,421	387,815	4,033,038
1981	12,240	1,439,262	484,405	127,143	831,977	2,895,027
1982	20,870	3,259,864	792,224	790,644	1,432,940	6,296,542
1983	20,634	5,049,733	516,322	70,327	1,114,858	6,771,874
1984	10,062	2,106,714	449,993	617,452	680,726	3,864,947
1985	24,088	4,060,429	667,213	87,828	772,849	5,612,407
1986	39,254	4,791,562	757,319	1,300,939	1,134,817	8,023,891
1987	39,431	9,465,994	449,421	109,381	348,809	10,413,036
1988	29,069	6,843,833	560,948	471,076	710,615	8,615,541
1989	26,737	5,011,124	339,818	67,441	122,051	5,567,171
1990	16,105	3,604,259	501,643	603,434	351,123	5,076,564
1991	13,542	2,178,331	426,487	14,663	280,223	2,913,246
1992	17,171	9,108,353	468,930	695,861	274,303	10,564,618
1993	18,871	4,755,329	306,882	100,934	122,770	5,304,786
1994	19,954	3,565,586	583,793	523,434	303,177	4,995,944

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Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1995	17,893	2,951,827	446,954	133,575	529,422	4,079,671
1996	14,306	3,888,922	321,668	242,911	156,501	4,624,308
1997	13,292	4,176,738	152,404	70,933	103,036	4,516,403
1998	8,124	1,219,242	160,660	551,260	95,654	2,034,940
1999	14,383	2,680,510	125,908	16,174	174,541	3,011,516
2000	7,350	1,322,482	236,871	146,482	127,069	1,840,254
2001	9,295	1,826,833	113,311	72,559	84,494	2,106,492
2002	12,714	2,773,118	246,281	446,960	237,949	3,717,022
2003	18,490	3,476,159	101,756	48,789	120,767	3,765,961
2004	27,476	4,926,220	311,056	357,939	146,164	5,768,855
2005	28,171	5,238,168	224,657	48,419	69,740	5,609,155
2006	18,029	2,192,730	177,853	404,111	64,033	2,856,756
2007	17,625	3,316,779	177,339	147,020	77,240	3,736,003
1966-2006 Avg	16,150	2,923,872	319,673	498,822	478,656	4,237,173
1997-2006 Avg	15,732	2,983,220	185,076	216,363	122,345	3,522,735

Note: Catch statistics prior to 2006 reflect minor adjustments to harvest database.

Appendix A7.–Approximate exvessel value of Upper Cook Inlet commercial salmon harvest by species, 1960–2007.

Year	Chinook	%	Sockeye	%	Coho	%	Pink	%	Chum	%	Total
1960	$ 140,000	5.0%	$ 1,334,000	47.9%	$ 307,000	11.0%	$ 663,000	23.8%	$ 343,000	12.3%	$ 2,787,000
1961	$ 100,000	4.7%	$ 1,687,000	79.4%	$ 118,000	5.6%	$ 16,000	0.8%	$ 204,000	9.6%	$ 2,125,000
1962	$ 100,000	2.5%	$ 1,683,000	42.3%	$ 342,000	8.6%	$ 1,274,000	32.0%	$ 582,000	14.6%	$ 3,981,000
1963	$ 89,000	4.6%	$ 1,388,000	72.3%	$ 193,000	10.1%	$ 13,000	0.7%	$ 236,000	12.3%	$ 1,919,000
1964	$ 20,000	0.5%	$ 1,430,000	38.9%	$ 451,000	12.3%	$ 1,131,000	30.8%	$ 646,000	17.6%	$ 3,678,000
1965	$ 50,000	2.0%	$ 2,099,000	82.1%	$ 109,000	4.3%	$ 70,000	2.7%	$ 230,000	9.0%	$ 2,558,000
1966	$ 50,000	1.2%	$ 2,727,000	64.4%	$ 295,000	7.0%	$ 823,000	19.4%	$ 338,000	8.0%	$ 4,233,000
1967	$ 49,000	1.9%	$ 2,135,000	82.6%	$ 187,000	7.2%	$ 13,000	0.5%	$ 202,000	7.8%	$ 2,586,000
1968	$ 30,000	0.7%	$ 1,758,000	40.4%	$ 515,000	11.8%	$ 1,209,000	27.8%	$ 843,000	19.4%	$ 4,355,000
1969	$ 70,000	4.0%	$ 1,296,697	73.9%	$ 134,003	7.6%	$ 18,291	1.0%	$ 236,404	13.5%	$ 1,755,394
1970	$ 89,382	3.0%	$ 1,190,303	39.9%	$ 468,179	15.7%	$ 456,354	15.3%	$ 780,622	26.2%	$ 2,984,840
1971	$ 189,504	9.2%	$ 1,250,771	61.0%	$ 137,815	6.7%	$ 18,402	0.9%	$ 454,483	22.2%	$ 2,050,974
1972	$ 224,396	6.3%	$ 1,863,177	52.6%	$ 137,315	3.9%	$ 478,246	13.5%	$ 840,057	23.7%	$ 3,543,192
1973	$ 121,156	2.0%	$ 3,225,847	52.3%	$ 318,950	5.2%	$ 362,658	5.9%	$ 2,135,025	34.6%	$ 6,163,635
1974	$ 209,712	3.2%	$ 3,072,221	46.8%	$ 843,048	12.8%	$ 919,916	14.0%	$ 1,517,637	23.1%	$ 6,562,535
1975	$ 63,990	1.0%	$ 2,628,036	39.2%	$ 838,859	12.5%	$ 419,173	6.3%	$ 2,752,555	41.1%	$ 6,702,612
1976	$ 274,172	2.0%	$ 8,668,095	63.4%	$ 819,006	6.0%	$ 1,874,915	13.7%	$ 2,041,225	14.9%	$ 13,677,413
1977	$ 523,776	2.4%	$ 13,318,720	61.8%	$ 932,540	4.3%	$ 767,273	3.6%	$ 5,995,611	27.8%	$ 21,537,920
1978	$ 661,375	2.0%	$ 26,167,741	80.3%	$ 1,380,312	4.2%	$ 2,154,176	6.6%	$ 2,217,510	6.8%	$ 32,581,114
1979	$ 616,360	4.2%	$ 8,093,280	55.3%	$ 1,640,277	11.2%	$ 82,339	0.6%	$ 4,199,765	28.7%	$ 14,632,021
1980	$ 414,771	3.2%	$ 7,937,699	61.7%	$ 891,098	6.9%	$ 2,114,283	16.4%	$ 1,513,960	11.8%	$ 12,871,810
1981	$ 424,390	2.3%	$ 11,080,411	60.1%	$ 2,623,598	14.2%	$ 170,038	0.9%	$ 4,150,158	22.5%	$ 18,448,596
1982	$ 763,267	2.4%	$ 25,154,115	80.0%	$ 4,080,570	13.0%	$ 553,635	1.8%	$ 886,129	2.8%	$ 31,437,716
1983	$ 590,730	2.0%	$ 24,016,294	81.8%	$ 1,601,976	5.5%	$ 41,338	0.1%	$ 3,109,814	10.6%	$ 29,360,152

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Year	Chinook	%	Sockeye	%	Coho	%	Pink	%	Chum	%	Total
1984	$ 310,899	1.8%	$ 12,450,532	71.8%	$ 2,039,681	11.8%	$ 522,795	3.0%	$ 2,011,253	11.6%	$ 17,335,160
1985	$ 799,318	2.3%	$ 27,497,929	80.0%	$ 3,359,824	9.8%	$ 57,412	0.2%	$ 2,644,995	7.7%	$ 34,359,478
1986	$ 915,189	2.0%	$ 38,683,950	83.3%	$ 2,909,043	6.3%	$ 724,367	1.6%	$ 3,197,973	6.9%	$ 46,430,522
1987	$ 1,609,777	1.6%	$ 95,915,522	94.9%	$ 2,373,254	2.3%	$ 84,439	0.1%	$ 1,116,165	1.1%	$ 101,099,156
1988	$ 1,120,885	0.9%	$ 111,537,736	91.3%	$ 4,738,463	3.9%	$ 650,931	0.5%	$ 4,129,002	3.4%	$ 122,177,017
1989	$ 803,494	1.4%	$ 56,194,753	95.0%	$ 1,674,393	2.8%	$ 86,012	0.1%	$ 415,535	0.7%	$ 59,174,188
1990	$ 436,822	1.1%	$ 35,804,485	88.0%	$ 2,422,214	6.0%	$ 512,591	1.3%	$ 1,495,827	3.7%	$ 40,671,938
1991	$ 348,522	2.3%	$ 12,249,200	80.4%	$ 1,996,049	13.1%	$ 5,478	0.0%	$ 643,400	4.2%	$ 15,242,649
1992	$ 634,466	0.6%	$ 96,026,864	96.0%	$ 2,261,862	2.3%	$ 404,772	0.4%	$ 740,294	0.7%	$ 100,068,258
1993	$ 617,092	2.1%	$ 27,969,409	93.1%	$ 1,081,175	3.6%	$ 36,935	0.1%	$ 322,205	1.1%	$ 30,026,815
1994	$ 642,291	1.9%	$ 29,441,442	85.5%	$ 3,297,865	9.6%	$ 240,545	0.7%	$ 831,121	2.4%	$ 34,453,264
1995	$ 474,475	2.2%	$ 19,168,077	87.1%	$ 1,295,353	5.9%	$ 53,114	0.2%	$ 1,023,926	4.7%	$ 22,014,944
1996	$ 402,980	1.4%	$ 28,238,578	95.0%	$ 800,423	2.7%	$ 44,386	0.1%	$ 225,751	0.8%	$ 29,712,117
1997	$ 365,316	1.1%	$ 31,439,536	97.1%	$ 434,327	1.3%	$ 12,004	0.0%	$ 143,244	0.4%	$ 32,394,427
1998	$ 181,318	2.1%	$ 7,686,993	88.5%	$ 497,050	5.7%	$ 187,759	2.2%	$ 132,025	1.5%	$ 8,685,145
1999	$ 337,482	1.6%	$ 20,095,838	95.5%	$ 329,164	1.6%	$ 5,995	0.0%	$ 265,026	1.3%	$ 21,033,505
2000	$ 183,044	2.2%	$ 7,115,614	87.2%	$ 626,287	7.7%	$ 47,065	0.6%	$ 186,385	2.3%	$ 8,158,395
2001	$ 169,593	2.2%	$ 7,135,690	92.3%	$ 297,387	3.8%	$ 20,312	0.3%	$ 111,028	1.4%	$ 7,734,010
2002	$ 326,051	2.8%	$ 10,682,051	91.7%	$ 329,031	2.8%	$ 84,922	0.7%	$ 224,148	1.9%	$ 11,646,203
2003	$ 358,688	2.9%	$ 11,659,037	95.1%	$ 132,079	1.1%	$ 8,660	0.1%	$ 99,850	0.8%	$ 12,258,314
2004	$ 675,910	3.3%	$ 19,404,381	93.8%	$ 416,193	2.0%	$ 65,861	0.3%	$ 129,794	0.6%	$ 20,692,138
2005	$ 575,082	1.8%	$ 31,316,655	95.7%	$ 720,766	2.2%	$ 13,971	0.04%	$ 101,917	0.3%	$ 32,728,391
2006	$ 617,133	4.4%	$ 12,301,215	88.5%	$ 679,754	4.9%	$ 174,576	1.3%	$ 121,343	0.9%	$ 13,894,021
2007	$ 629,643	2.7%	$ 21,916,852	93.6%	$ 682,747	2.9%	$ 53,029	0.2%	$ 141,097	0.6%	$ 23,423,367

Appendix A8.–Commercial herring harvest by fishery, Upper Cook Inlet, 1973–2007.

	Harvest (Tons)				
Year	Upper Subdistrict	Chinitna Bay	Tuxedni Bay	Kalgin Island	Total
1973	13.8	-	-	not open	13.8
1974	36.7	-	-	not open	36.7
1975	6.2	-	-	not open	6.2
1976	5.8	-	-	not open	5.8
1977	17.3	-	-	not open	17.3
1978	8.3	55.3	-	not open	63.6
1979	67.3	96.2	24.8	not open	188.3
1980	37.4	20	86.5	not open	143.9
1981	86.2	50.5	84.9	not open	221.6
1982	60.2	91.8	50.2	not open	202.2
1983	165.3	49.2	238.2	not open	452.7
1984	117.5	90.6	159	not open	367.1
1985	121.7	47.4	220.5	not open	389.6
1986	178.9	111.1	191.9	not open	481.9
1987	130.5	65.1	152.5	not open	348.1
1988	50.7	23.4	14.1	not open	88.2
1989	55.2	122.3	34.3	not open	211.8
1990	55.4	55.9	16.1	not open	127.4
1991	13.4	15.7	1.6	not open	30.7
1992	24.7	10.4	-	not open	35.1
1993	-	-	-	not open	-
1994	-	-	-	not open	-
1995	-	-	-	not open	-
1996	-	-	-	not open	-
1997	-	-	-	not open	-
1998	19.5	-	-	not open	19.5
1999	10.4	-	-	not open	10.4
2000	14.7	-	-	not open	14.7
2001	9.9	-	-	not open	9.9
2002	16.2	1.9	0	not open	18.1
2003	3.7	0	0	not open	3.7
2004	6.7	0.1	0	not open	6.8
2005	17.1	0.2	0	0	17.3
2006	14.4	0	0	0	14.4
2007	13.4	0	0	0	13.4

Appendix A9.–Commercial harvest of razor clams in Upper Cook Inlet, 1919–2007.

Year	Pounds	Year	Pounds
1919	76,963	1964	0
1920	11,952	1965	0
1921	72,000	1966	0
1922	510,432	1967	0
1923	470,280	1968	0
1924	156,768	1969	0
1925	0	1970	0
1926	0	1971	14,755
1927	25,248	1972	31,360
1928	0	1973	34,415
1929	0	1974	0
1930	0	1975	10,020
1931	No Record	1976	0
1932	93,840	1977	1,762
1933	No Record	1978	45,931
1934	No Record	1979	144,358
1935	No Record	1980	140,420
1936	No Record	1981	441,949
1937	8,328	1982	460,639
1938	No Record	1983	269,618
1939	No Record	1984	261,742
1940	No Record	1985	319,034
1941	0	1986	258,632
1942	0	1987	312,349
1943	0	1988	399,376
1944	0	1989	222,747
1945	15,000	1990	323,602
1946	11,424	1991	201,320
1947	11,976	1992	296,727
1948	2,160	1993	310,481
1949	9,672	1994	355,165
1950	304,073	1995	248,358
1951	112,320	1996	355,448
1952	0	1997	366,532
1953	0	1998	371,877
1954	0	1999	352,910
1955	0	2000	369,397
1956	0	2001	348,917
1957	0	2002	338,938
1958	0	2003	411,403
1959	0	2004	419,697
1960	372,872	2005	371,395
1961	277,830	2006	368,953
1962	195,650	2007	283,085
1963	0		

Appendix A10.–Enumeration goals and counts of sockeye salmon in selected streams of Upper Cook Inlet, 1978–2007.

	Kenai River		Kasilof River		Fish Creek	
Year	Enumeration Goal	Enumeration Estimate [a,f]	Enumeration Goal	Enumeration Estimate [a,f]	Enumeration Goal	Enumeration Estimate[b]
1978	350,000–500,000	398,900	75,000–150,000	116,600	0	3,555
1979	350,000–500,000	285,020	75,000–150,000	152,179	0	68,739
1980	350,000–500,000	464,038	75,000–150,000	184,260	0	62,828
1981	350,000–500,000	407,639	75,000–150,000	256,625	0	50,479
1982	350,000–500,000	619,831	75,000–150,000	180,239	50,000	28,164
1983	350,000–500,000	630,340	75,000–150,000	210,271	50,000	118,797
1984	350,000–500,000	344,571	75,000–150,000	231,685	50,000	192,352
1985	350,000–500,000	502,820	75,000–150,000	505,049	50,000	68,577
1986	350,000–500,000	501,157	75,000–150,000	275,963	50,000	29,800
1987	400,000–700,000	1,596,871	150,000–250,000	249,250	50,000	91,215
1988	400,000–700,000	1,021,469	150,000–250,000	204,000	50,000	71,603
1989	400,000–700,000	1,599,959	150,000–250,000	158,206	50,000	67,224
1990	400,000–700,000	659,520	150,000–250,000	144,289	50,000	50,000
1991	400,000–700,000	647,597	150,000–250,000	238,269	50,000	50,500
1992	400,000–700,000	994,798	150,000–250,000	184,178	50,000	71,385
1993	400,000–700,000	813,617	150,000–250,000	149,939	50,000	117,619
1994	400,000–700,000	1,003,446	150,000–250,000	205,117	50,000	95,107
1995	450,000–700,000	630,447	150,000–250,000	204,935	50,000	115,000
1996	550,000–800,000	797,847	150,000–250,000	249,944	50,000	63,160
1997	550,000–825,000	1,064,818	150,000–250,000	266,025	50,000	54,656
1998	550,000–850,000	767,558	150,000–250,000	273,213	50,000	22,853
1999	750,000–950,000	803,379	150,000–250,000	312,587	50,000	26,667
2000	600,000–850,000	624,578	150,000–250,000	256,053	50,000	19,533
2001	600,000–850,000	650,036	150,000–250,000	307,570	50,000	43,469
2002	750,000–950,000	957,924	150,000–250,000	226,682	20,000–70,000	90,483
2003	750,000–950,000	1,181,309	150,000–250,000	359,633	20,000–70,000	92,298
2004	850,000–1,100,000	1,385,981	150,000–250,000	577,581	20,000–70,000	22,157
2005	850,000–1,100,000	1,376,452	150,000–250,000	348,012	20,000–70,000	14,215
2006	750,000–950,000	1,499,692	150,000–250,000	368,092	20,000–70,000	32,566
2007	750,000–950,000	867,572	150,000–250,000	336,866	20,000–70,000	27,948

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	Yentna River		Crescent River		Packers Creek	
Year	Enumeration Goal	Enumeration Estimate [a,f]	Enumeration Goal	Enumeration Estimate [a,f]	Enumeration Goal	Enumeration Estimate[b,g]
1978	100,000		0	N/C	0	N/C
1979	100,000		50,000	86,654	0	N/C
1980	100,000		50,000	90,863	0	16,477
1981	100,000	139,401	50,000	41,213	0	13,024
1982	100,000	113,847	50,000	58,957	0	15,687
1983	100,000	104,414	50,000	92,122	0	18,403
1984	100,000	149,375	50,000	118,345	0	30,684
1985	100,000	107,124	50,000	128,628	0	36,850
1986	100,000–150,000	92,076	50,000	20,385	0	29,604
1987	100,000–150,000	66,054	50,000–100,000	120,219	0	35,401
1988	100,000–150,000	52,330	50,000–100,000	57,716	15,000–25,000	18,607
1989	100,000–150,000	96,269	50,000–100,000	71,064	15,000–25,000	22,304
1990	100,000–150,000	140,290	50,000–100,000	52,238	15,000–25,000	31,868
1991	100,000–150,000	109,632	50,000–100,000	44,578	15,000–25,000	41,275
1992	100,000–150,000	66,054	50,000–100,000	58,229	15,000–25,000	28,361
1993	100,000–150,000	141,694	50,000–100,000	37,556	15,000–25,000	40,869
1994	100,000–150,000	128,032	50,000–100,000	30,355	15,000–25,000	30,788
1995	100,000–150,000	121,479	50,000–100,000	52,311	15,000–25,000	29,473
1996	100,000–150,000	90,781	50,000–100,000	28,729	15,000–25,000	19,095
1997	100,000–150,000	157,822	50,000–100,000	70,768	15,000–25,000	33,846
1998	100,000–150,000	119,623	50,000–100,000	62,257	15,000–25,000	17,732
1999	100,000–150,000	99,029	25,000–50,000	66,519	15,000–25,000	25,648
2000	100,000–150,000	133,094	25,000–50,000	56,599	15,000–25,000	20,151
2001	100,000–150,000	83,532	25,000–50,000	78,081	15,000–25,000	no count
2002	90,000–160,000	78,591	25,000–50,000	62,833	15,000–25,000	no count
2003	90,000–160,000	180,813	25,000–50,000	122,457	15,000–25,000	no count
2004	90,000–160,000	71,281	25,000–50,000	103,201	15,000–25,000	no count
2005	75,000–180,000	36,921	30,000–70,000	125,623	15,000–25,000	22,000
2006	90,000–160,000	92,896	30,000–70,000	92,533	15,000–25,000	no count
2007	90,000–160,000	79,901	30,000–70,000	79,406	15,000–25,000	46,637

[a] Derived from sonar counters unless otherwise noted.

[b] Weir counts.

[c] Yentna River escapement goal only.

[d] Combined counts from weirs on Bear and Glacier Flat Creeks and surveys of remaining spawning streams; sonar count was 151,856.

[e] Counts through 16 July only.

[f] Enumeration estimates prior to 2007 reflect minor adjustments to the escapement database.

[g] Escapement estimate of all salmon via remote camera; an unknown number of salmon escaped into the lake after the camera was removed.

Appendix A11.–Average price paid for commercially harvested salmon, Upper Cook Inlet, 1969–2007.

Year	Chinook	Sockeye	Coho	Pink	Chum
1969	0.38	0.28	0.19	0.14	0.12
1970	0.40	0.28	0.25	0.14	0.14
1971	0.37	0.30	0.21	0.15	0.15
1972	0.47	0.34	0.27	0.19	0.20
1973	0.62	0.65	0.50	0.30	0.42
1974	0.88	0.91	0.66	0.46	0.53
1975	0.54	0.63	0.54	0.35	0.41
1976	0.92	0.76	0.61	0.37	0.54
1977	1.26	0.86	0.72	0.38	0.61
1978	1.16	1.32	0.99	0.34	0.51
1979	1.63	1.41	0.98	0.34	0.88
1980	1.15	0.85	0.57	0.34	0.53
1981	1.46	1.20	0.83	0.38	0.65
1982	1.27	1.10	0.72	0.18	0.49
1983	0.97	0.74	0.45	0.18	0.36
1984	1.08	1.00	0.64	0.21	0.39
1985	1.20	1.20	0.70	0.20	0.45
1986	0.90	1.40	0.60	0.15	0.38
1987	1.40	1.50	0.80	0.22	0.45
1988	1.30	2.47	1.20	0.37	0.76
1989	1.25	1.70	0.75	0.40	0.47
1990	1.20	1.55	0.75	0.25	0.60
1991	1.20	1.00	0.77	0.12	0.35
1992	1.50	1.60	0.75	0.15	0.40
1993	1.20	1.00	0.60	0.12	0.45
1994	1.00	1.45	0.80	0.12	0.40
1995	1.00	1.15	0.45	0.12	0.27
1996	1.00	1.15	0.40	0.05	0.19
1997	1.00	1.15	0.45	0.05	0.19
1998	1.00	1.15	0.45	0.09	0.19
1999	1.00	1.30	0.45	0.12	0.19
2000	1.10	0.85	0.40	0.09	0.19
2001	1.00	0.65	0.40	0.08	0.19
2002	1.15	0.60	0.20	0.05	0.12
2003	0.95	0.60	0.20	0.05	0.12
2004	1.00	0.65	0.20	0.05	0.12
2005	1.00	0.95	0.50	0.08	0.20
2006	1.75	1.10	0.60	0.10	0.25
2007	1.75	1.05	0.60	0.10	0.25

Note: Price is expressed as dollars per pound. Data source: 1969–1983: Commercial Fisheries Entry Commission; 1984–2006: random fish ticket averages, which do not include bonuses or postseason adjustments.

Appendix A12.–Average weight (in pounds) of commercially harvested salmon, Upper Cook Inlet, 1969–2007.

Year	Chinook	Sockeye	Coho	Pink	Chum
1969	17.1	6.7	7.0	3.9	7.3
1970	26.8	5.8	6.8	4.0	7.2
1971	25.9	6.6	6.5	3.4	9.3
1972	29.7	6.2	6.3	4.0	6.7
1973	37.6	7.4	6.1	3.7	7.6
1974	36.1	6.8	6.4	4.1	7.2
1975	24.8	6.1	6.8	3.6	7.1
1976	27.4	6.9	6.4	4.0	8.1
1977	28.1	7.6	6.7	3.7	8.0
1978	33.0	7.6	6.4	3.8	7.6
1979	27.5	6.2	6.3	3.3	7.3
1980	26.1	5.9	5.8	3.5	7.3
1981	23.8	6.4	6.5	3.5	7.7
1982	28.8	7.0	7.1	3.9	8.2
1983	29.5	6.4	6.9	3.3	7.8
1984	28.6	5.9	7.1	4.0	7.6
1985	27.7	5.6	7.2	3.3	7.6
1986	25.9	5.8	6.4	3.7	7.4
1987	29.0	6.7	6.6	3.5	7.1
1988	29.7	6.6	7.1	3.7	7.7
1989	24.0	6.6	6.6	3.2	7.3
1990	22.6	6.4	6.5	3.4	7.1
1991	21.5	5.6	6.1	3.1	6.6
1992	24.6	6.6	6.4	3.9	6.8
1993	27.5	5.9	5.9	3.1	5.8
1994	31.7	5.7	7.1	3.9	6.9
1995	26.6	5.7	6.4	3.3	7.2
1996	28.3	6.3	6.2	3.7	7.6
1997	27.6	6.6	6.3	3.4	7.3
1998	22.7	5.5	6.9	3.8	7.3
1999	23.9	5.8	5.8	3.1	8.0
2000	22.6	6.3	6.6	3.6	7.7
2001	18.2	6.0	6.6	3.5	6.9
2002	22.3	6.4	6.7	3.8	7.9
2003	20.4	5.6	6.5	3.6	6.9
2004	24.6	6.1	6.7	3.7	7.4
2005	24.6	6.1	6.3	3.3	7.2
2006	19.6	5.1	6.4	4.3	7.6
1969-2006 Avg	26.2	6.3	6.5	3.6	7.4
2007	20.4	6.3	6.4	3.6	7.3

Note: Total poundage divided by numbers of fish from fish ticket totals.

Appendix A13.–Registered units of gillnet fishing effort by gear type in Cook Inlet, 1970–2007.

	DRIFT GILLNET			SET GILLNET			
Year	Resident	Non-Resident	Subtotal	Resident	Non-Resident	Subtotal	Total
1970	537	220	757	707	65	772	1,529
1971	519	191	710	693	38	731	1,441
1972	419	152	571	672	35	707	1,278
1973	516	146	662	632	43	675	1,337
1974	436	149	585	698	54	752	1,337
1975	539	245	784	695	63	758	1,542
1976	410	186	596	675	44	719	1,315
1977	387	188	575	690	43	733	1,308
1978	401	190	591	701	46	747	1,338
1979	410	189	599	705	44	749	1,348
1980	407	190	597	699	48	747	1,344
1981	412	186	598	687	60	747	1,345
1982	413	178	591	695	53	748	1,339
1983	415	172	587	684	61	745	1,332
1984	423	165	588	670	74	744	1,332
1985	418	173	591	669	76	745	1,336
1986	412	176	588	665	78	743	1,331
1987	415	171	586	662	81	743	1,329
1988	421	164	585	660	83	743	1,328
1989	415	170	585	645	98	743	1,328
1990	412	173	585	644	99	743	1,328
1991	412	172	584	642	103	745	1,329
1992	404	179	583	636	109	745	1,328
1993	398	185	583	633	112	745	1,328
1994	395	187	582	628	117	745	1,327
1995	393	189	582	622	123	745	1,327
1996	392	190	582	621	124	745	1,327
1997	392	189	581	621	124	745	1,326
1998	393	186	579	621	124	745	1,324
1999	390	185	575	621	124	745	1,320
2000	394	182	576	621	124	745	1,321
2001	395	179	574	625	119	744	1,318
2002	396	176	572	620	123	743	1,315
2003	400	172	572	617	125	742	1,314
2004	402	169	571	617	122	739	1,310
2005	404	167	571	609	128	737	1,308
2006	401	169	570	614	124	738	1,308
2007	401	170	571	612	126	738	1,309

Source: 1966–1974 ADF&G unpublished reports; 1975–2006 Commercial Fisheries Entry Commission. http://www.cfec.state.ak.us/SPCS/MENUS.HTM.

Appendix A14.–Forecast and projected commercial harvests of salmon by species, Upper Cook Inlet, 1984–2007.

	Sockeye			Coho			Pink			Chum			Chinook		
Year	Forecast[a]	Actual[b,d]	Error	Projected	Actual[c,d]	Error	Projected	Actual[c,d]	Error	Projected	Actual[c,d]	Error	Projected	Actual[c,d]	Error
1984	2,200,000	2,216,553	1%	250,000	442,619	77%	1,700,000	622,510	-63%	350,000	684,124	95%	14,000	8,819	-37%
1985	3,700,000	4,248,506	15%	250,000	667,213	167%	112,500	87,828	-22%	700,000	772,829	10%	17,500	24,086	38%
1986	4,200,000	4,981,255	14%	450,000	756,830	68%	1,250,000	1,299,360	4%	900,000	1,134,173	26%	32,500	39,240	21%
1987	4,800,000	9,859,418	98%	500,000	449,421	-10%	150,000	348,809	-27%	1,000,000	348,809	-65%	30,000	39,431	32%
1988	5,300,000	7,087,976	29%	400,000	560,948	40%	400,000	710,615	17%	800,000	710,615	-11%	35,000	29,069	-17%
1989	2,500,000	5,443,946	100%	400,000	339,818	-15%	100,000	122,051	-33%	800,000	122,051	-85%	30,000	26,737	-11%
1990	4,300,000	3,822,864	-16%	250,000	501,643	101%	600,000	351,123	-41%	400,000	351,123	-12%	25,000	16,105	-36%
1991	3,200,000	2,549,310	-32%	400,000	426,487	7%	90,000	280,223	211%	500,000	280,223	-44%	20,000	13,542	-32%
1992	3,600,000	9,502,392	153%	400,000	468,930	17%	400,000	274,303	-31%	350,000	274,303	-22%	20,000	17,171	-14%
1993	2,500,000	5,042,799	90%	450,000	306,882	-32%	25,000	122,770	391%	350,000	122,770	-65%	15,000	18,871	26%
1994	2,000,000	3,826,508	78%	400,000	583,793	46%	600,000	303,177	-49%	250,000	303,177	21%	15,000	19,954	33%
1995	2,700,000	3,224,087	9%	400,000	446,954	12%	100,000	529,422	429%	250,000	529,422	112%	15,000	17,893	19%
1996	3,300,000	4,312,193	18%	400,000	321,668	-20%	600,000	156,501	-74%	350,000	156,501	-55%	15,000	14,306	-5%
1997	5,300,000	4,565,608	-21%	400,000	152,404	-62%	100,000	103,036	3%	250,000	103,036	-59%	15,000	13,292	-11%
1998	2,500,000	1,626,594	-51%	300,000	160,660	-46%	300,000	95,654	-68%	200,000	95,654	-52%	17,000	8,124	-52%
1999	2,000,000	3,179,342	59%	300,000	125,908	-58%	75,000	174,541	133%	200,000	174,541	-13%	16,000	14,383	-10%
2000	3,000,000	1,786,241	-40%	150,000	236,871	58%	500,000	127,069	-75%	200,000	127,069	-36%	15,000	7,350	-51%
2001	2,700,000	2,312,491	-14%	300,000	113,311	-62%	50,000	84,494	69%	250,000	84,494	-66%	13,000	9,295	-29%
2002	2,200,000	3,369,371	53%	160,000	246,281	54%	170,000	237,949	40%	120,000	237,949	98%	10,000	12,714	27%
2003	2,400,000	4,161,009	73%	170,000	101,756	-40%	80,000	120,767	51%	140,000	120,767	-14%	10,000	18,490	85%
2004	3,700,000	5,601,465	51%	160,000	308,449	93%	380,000	357,283	-6%	150,000	145,073	-3%	10,000	27,448	174%
2005	4,100,000	5,962,408	45%	200,000	224,657	12%	70,000	48,599	-31%	140,000	69,740	-50%	10,000	28,171	182%
2006	2,100,000	2,658,537	27%	200,000	174,507	-13%	350,000	404,094	15%	140,000	63,893	-54%	20,000	16,917	-15%
2007	3,300,000	3,730,654	13%	210,000	174,845	-17%	50,000	144,957	190%	130,000	76,750	-41%	20,000	17,271	-14%
Avg.	3,233,333	4,377,980	31%	312,500	345,536	16%	343,854	296,131	43%	371,667	295,379	-16%	18,333	19,112	13%

[a] Harvest forecasts have typically been prepared using average return per spawner values, parent-year escapements and average marine maturity schedules or time series modeling tempered by available juvenile production data or combinations of these data sets.

[b] Sockeye salmon harvest estimates include, commercial, sport, personal use, and educational fisheries.

[c] Harvest projections are prepared using subjective estimates of parent-year escapements, gross trends in harvest, and expected intensity of fishery.

[d] Actual harvests prior to 2007 reflect minor adjustments to the harvest database.

Appendix A15.–Subsistence and educational fishery salmon harvest, Upper Cook Inlet, 1980–2007.

Fishery	No. Permits	Chinook	Sockeye	Coho	Pink	Chum
Tyonek Subsistence						
1980	67	1,757	235	0	0	0
1981	70	2,002	269	64	32	15
1982	69	1,590	310	113	14	4
1983	75	2,665	187	59	0	6
1984	75	2,200	266	79	3	23
1985	76	1,472	164	91	0	10
1986	65	1,676	203	223	50	46
1987	64	1,610	166	149	10	24
1988	47	1,587	91	253	8	12
1989	49	1,250	85	115	0	1
1990	42	781	66	352	20	12
1991	57	902	26	58	0	0
1992	57	907	75	234	7	19
1993	62	1,370	57	77	19	17
1994	49	770	85	101	0	22
1995	55	1,317	45	153	0	15
1996	49	1,039	68	137	21	7
1997	42	639	101	137	0	8
1998	74	978	163	64	1	2
1999	76	1,230	144	94	32	11
2000	60	1,157	63	87	6	0
2001	84	976	172	49	4	6
2002	102	1,080	209	115	9	4
2003	91	1,183	111	44	7	10
2004	97	1,345	93	130	0	0
2005	81	720	60	104	0	2
2006	81	904	21	36	0	0
2007	?	1,275	327	604	16	11

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Fishery	No. Permits	Chinook	Sockeye	Coho	Pink	Chum
Yentna Subsistence						
1996	17	0	242	46	115	51
1997	24	0	549	83	30	10
1998	21	0	495	113	30	15
1999	18	0	516	48	18	13
2000	19	0	379	92	4	7
2001	16	0	545	50	10	4
2002	25	0	454	133	14	31
2003	19	0	553	67	2	8
2004[a]	21	0	441	146	36	3
2005	18	0	181	42	25	24
2006	22	0	388	178	15	27
2007	21	0	367	66	17	18
Educational Fisheries[a]						
1994	na	57	1,907	948	134	0
1995	na	40	1,498	953	35	0
1996	na	105	2,242	648	211	0
1997	na	236	2,884	290	60	0
1998	na	252	3,266	843	135	0
1999	na	283	2,690	690	28	0
2000	na	220	2,713	835	680	0
2001	na	353	4,510	805	166	0
2002	na	200	3,366	1,122	545	0
2003	na	307	5,171	616	91	0
2004	na	162	4,784	927	440	0
2005	na	163	6,665	161	15	0
2006	na	224	4,996	300	712	0
2007	na	390	5,514	1,128	133	0

[a] Educational fisheries consist of Kenaitze Tribal Council, Ninilchik Traditional Council, Ninilchik Native Descendents (since 1998), Ninilchik Emergency Services (since 2004), Knik Tribal Group (since 1994), Eklutna Village (since 1994), Tyonek Village (1998–2000), Big Lake Cultural Outreach (since 2005), Tim Obrien (2007), and Anchor Pt VFW (2007). See Appendix A16 for individual fishery harvests.

Appendix A16.–Summary of salmon harvested from educational fisheries, 1994–2007.

Year	Fishery	Chinook	Sockeye	Coho	Pink	Chum	Total
1994	Kenaitze	57	1,907	829	134		2,927
	NTC			119			119
	NND						0
	Knik						29
	Eklutna						172
	Total	57	1,907	948	134	0	**3,247**
1995	Kenaitze	40	1,498	868	35		2,441
	NTC			85			85
	NND						0
	Knik	5	21	1	0	1	28
	Eklutna	14	55	37	6	42	154
	Total	59	1,574	991	41	43	**2,708**
1996	Kenaitze	105	2,242	592	211		3,150
	NTC			56			56
	NND						0
	Knik	5	163	45	3	62	278
	Eklutna						0
	Total	110	2,405	693	214	62	**3,484**
1997	Kenaitze	142	2,410	191	5		2,748
	NTC	94	474	99	55		722
	NND						0
	Knik	19	153	34	0	15	221
	Eklutna	7	39	14	16	7	83
	Total	262	3,076	338	76	22	**3,774**
1998	Kenaitze	133	2,621	638	58		3,450
	NTC	67	506	95	57		725
	NND	52	139	110	20		321
	Knik	31	186	153	0	85	455
	Eklutna	32	104	116	6	51	309
	Tyonek	0	11	41	3	1	56
	Total	315	3,556	1,112	141	136	**5,316**

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Year	Fishery	Chinook	Sockeye	Coho	Pink	Chum	Total
1999	Kenaitze	118	1,944	530	5	0	2,597
	NTC	109	442	84	6	0	641
	NND	56	304	76	17	0	453
	Knik	42	177	120	0	55	394
	Eklutna	11	80	25	3	20	139
	Tyonek	0	100	0	0	0	100
	Total	336	2,947	835	31	75	**4,324**
2000	Kenaitze	130	2,088	656	617	0	3,491
	NTC	40	423	82	48	0	593
	NND	50	202	97	15	0	364
	Knik	65	34	63	0	18	180
	Eklutna	17	76	85	21	51	250
	Tyonek	0	97	0	0	0	100
	Total	302	2,823	983	701	69	**4,978**
2001	Kenaitze	204	3,441	572	107	0	4,324
	NTC	75	760	123	42	0	1,000
	NND	74	309	110	17	0	510
	Knik	32	71	34	0	0	137
	Eklutna	58	52	95	56	34	295
	Tyonek	0	0	0	0	0	100
	Total	443	4,633	934	222	34	**6,366**
2002	Kenaitze	70	2,889	921	482	0	4,362
	NTC	65	339	106	52	0	562
	NND	65	138	95	11	0	309
	Knik	55	136	99	5	36	331
	Eklutna	58	220	156	40	76	550
	Tyonek	0	0	0	0	0	100
	Total	313	3,722	1,377	590	112	**6,214**
2003	Kenaitze	151	4,651	439	63		5,304
	NTC	87	426	100	15		628
	NND	69	94	77	13		253
	Knik	34	654	87	3	45	823
	Eklutna	69	160	49	14	21	313
	Tyonek	0	0	0	0	0	100
	Total	410	5,985	752	108	66	**7,421**

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Year	Fishery	Chinook	Sockeye	Coho	Pink	Chum	Total
2004	Kenaitze	10	4,113	765	417		5,305
	NTC	73	395	83	0		551
	NND	78	199	79	14		370
	NES	1	77	0	9		87
	Knik	105	142	207	20	29	503
	Eklutna	50	311	297	4	71	733
	Tyonek	0	0	0	0	0	0
	Total	307	1,124	666	47	100	**7,549**
2005	Kenaitze	100	6,317	490	12	0	6,919
	NTC	70	264	83	0	0	417
	NND	88	84	78	15	0	265
	NES	0	5	0	0	0	5
	Knik	25	200	80	9	16	330
	Eklutna	72	166	242	8	29	517
	Tyonek						0
	Big Lake	61	98	99	56	34	348
	Total	258	6,670	651	27	0	**8,801**
2006	Kenaitze	85	4,380	223	702	0	5,390
	NTC	75	561	35	0	0	671
	NND	64	55	42	10	0	171
	NES	0	0	0	0	0	0
	Knik	24	197	75	12	7	315
	Eklutna	43	59	199	11	7	319
	Tyonek	0	0	0	0	0	0
	Big Lake	8	68	12	1	3	92
	Intertribal	12	135	95	85	21	348
	Total	224	4,996	300	712	0	**7,306**
2007	Kenaitze	25	3,941	543	119		4,628
	NTC	300	1,363	483	2	0	2,148
	NND	65	210	102	12	0	389
	NES	0	0	0	0	0	0
	Knik	19	7	75		16	117
	Eklutna						0
	Tyonek	0	0	0	0	0	0
	Big Lake	17	100	46	14		177
	Intertribal						0
	O'Brien	49	75	103	9	4	240
	Total	390	5,514	1,128	133	0	**7,699**

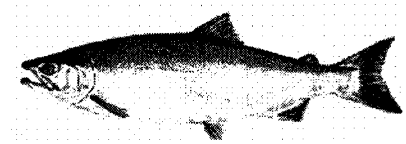
Note: Harvest data include both early and late-run Kenai River Chinook and sockeye salmon.

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

NEWS RELEASE

Denby S. Lloyd, Commissioner
John Hilsinger, Director



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Date Issued: 4/5/2007

UPPER COOK INLET
2007 OUTLOOK FOR COMMERCIAL SALMON FISHING

SOCKEYE SALMON

A run of 4.9 million sockeye salmon is forecasted to return to UCI in 2007 with a harvest by all user groups of 3.3 million sockeye salmon. The forecasted harvest in 2007 is about 1.2 million fish below the 20-year average harvest by all user groups. The sockeye salmon run forecast for the Kenai River is 37% less than the 20-year average run of 3.8 million. Age-1.3 sockeye salmon typically comprise about 65% of the run to the Kenai River. A fry model based upon the abundance of age-0 fry rearing in Kenai and Skilak lakes in 2003 was used to forecast the return of age-1.3 sockeye salmon to the Kenai River. The fry population estimate in 2003 (12.7 million) was 26% less than the 20-year average. The fry model predicted a return of 1.6 million age 1.3-sockeye salmon to the Kenai River, and the sibling model forecast for this age class was the same as the fry model forecast. Age-2.3 sockeye salmon typically comprise about 20% of the run to the Kenai River. A sibling model based upon the return of age-2.2 sockeye salmon in 2006 was used to forecast the return of age-2.3 sockeye salmon to the Kenai River in 2007. The return of age-2.2 sockeye salmon in 2006 was 68% less than the 20-year average return for this age class.

The sockeye salmon run forecast for the Kasilof River is 36% greater than the 20-year average run of 915,000. Age-1.3 sockeye salmon typically comprise about 35% of the run to the Kasilof River. A sibling model based upon the return of age-1.2 sockeye salmon in 2006 was used to forecast the return of age-1.3 sockeye salmon to the Kasilof River in 2007. The return of age-1.2 sockeye salmon in 2006 was more than double the 20-year average return for this age class. Age-1.2 and -2.2 sockeye salmon typically comprise about 53% of the run to the Kasilof River. Smolt models were used to forecast the returns of age-1.2 and -2.2 sockeye salmon to Kasilof River. These fish

-continued-

emigrated from Tustemena Lake as smolts in 2005. The age-1 smolt population estimate in 2005 (10.2 million) was about double the 20-year average, while the age-2 smolt population estimate in 2005 (1.0 million) was about one half of the 20-year average.

The sockeye salmon run forecast for the Susitna River is 12% greater than the 20-year average run of 436,000. Age-1.2 and -1.3 sockeye salmon typically comprise 72% of the run to the Susitna River. A spawner-abundance model was used to forecast the return of age-1.2 sockeye salmon to the Susitna River. The brood-year spawner abundance for this age class was about 38% greater than the 20-year average spawner abundance. A sibling model based upon the return of age-1.2 sockeye salmon in 2006 was used to forecast the return of age-1.3 sockeye salmon to the Susitna River in 2007. The return of age-1.2 sockeye salmon in 2006 was 37% greater than the 20-year average run for this age class. The sockeye salmon run forecast for Fish Creek is 77% less than the 20-year average run of 161,000. Age-1.2 and -1.3 sockeye salmon typically comprise 79% of the run to Fish Creek. Smolt models were used to forecast the returns of age-1.2 and -1.3 sockeye salmon to Fish Creek. These fish emigrated from Big Lake as smolts in 2004 and 2005. The age-1 smolt population estimate in 2004 (231,000) was 53% less than the long-term average, while the age-1 smolt population estimate in 2005 (128,000) was 74% less than the long-term average.

Forecast runs to individual freshwater systems are as follows:

System	Run	Goal
Crescent River	109,000	30,000–70,000
Fish Creek	37,000	20,000–70,000
Kasilof River	1,247,000	150,000–250,000[a]
Kenai River	2,411,000	750,000–950,000[b]
Susitna River	487,000	90,000–160,000[c]
Minor Systems	644,000	N/A

[a] The Kasilof River has an optimum escapement goal (OEG) of 150,000 to 300,000 to facilitate meeting the lower end of the Kenai River goal.

[b] The Kenai River is an abundance-based escapement goal; 750,000 to 950,000 is the appropriate sonar goal for a 2 million to 4 million Kenai River sockeye salmon run.

[c] The escapement goal for the Yentna River is 90,000 to 160,000 sockeye counted by sonar. The Yentna River accounts for approximately 50 percent of the total Susitna River run. In Kenai runs of over 4 million, there is a Yentna River OEG of 75,000 to 180,000 sockeye.

OTHER SPECIES' HARVEST PROJECTIONS

Very little information is available on which to base outlooks for the commercial harvests of the other salmon species. Using recent harvest trends and factoring in the expected intensity of the sockeye-based fishery, the following numbers represent our best estimate of the 2007 harvest:

Pink Salmon	50,000
Chum Salmon	130,000
Coho Salmon	210,000
Chinook Salmon	20,000

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2007 FISHING STRATEGY

Given the relatively robust forecast to all systems in Cook Inlet for 2007, restrictions during regular periods other than those directed by the management plans, are not anticipated. In the drift gillnet fishery, these mandated restrictions include the fishing periods on July 9 and July 12 be restricted to the Kenai and Kasilof Sections and Drift Gillnet Area Number One (Figure 2). In addition, in runs of between 2 and 4 million sockeye salmon to the Kenai River; two regular fishing periods between July 16 and July 31 will be restricted to the Kenai and Kasilof Sections of the Upper Subdistrict and Drift Areas One and Two (Figure 2). The date these two restrictions will occur on is dependant on how accurate the forecast is and how the season develops.

The use of the Kasilof Terminal fishery is very likely again in 2007. Prior to July 8, if Kasilof escapements are at or above desired levels, the terminal area will be used to cover the 48-hour windows each week. After July 8, there are two windows, a 24-hour and a 36-hour window. If escapements in the Kasilof River remain above desired levels, then the terminal area would again be utilized.

The following summary of regulations is for informational purposes only and is not a comprehensive review.

Northern District Set Gillnet

The Northern District king salmon fishery will open on the first Monday on or after May 25. The fishery can not exceed three periods and the area from an ADF&G regulatory marker located 1 mile south of the Theodore River to the Susitna River is open for one period only, on the second regular Monday period, this year that period will be June 4. In addition, fishing periods will now be open from 7:00 a.m. to 7:00 p.m., 12 hours instead of 6 hours.

Central District Fisheries

Big River Fishery

The Big River Sockeye Salmon Management Plan was amended in 2005 to allow fishing in a portion of the Kalgin Island Subdistrict along the western shore from Light Point (60° 29.00' N. lat., 151° 50.50' W. long.) to the Kalgin Island Light on the southern end of the island at 60° 20.80' N. lat., 152° 05.09' W. long.

Upper Subdistrict Set Gillnet Fishery

Kasilof Section Prior to July 8:

- The Kasilof Section opens on the first regular period on or after June 25, unless the department estimates that 50,000 sockeye salmon are in the Kasilof River prior to that date, at which time the commissioner may open the fishery, by Emergency Order (EO); however, the fishery may not open earlier than June 20.
- From the beginning of the fishery through July 7 the department may not allow more than 48 hours of additional fishing time per week (Sun through Sat) and must close the fishery for 48 consecutive hours per week.
- Beginning July 8, or after, the Kenai and East Forelands Sections open, the Kasilof Section will be managed in combination with the Kenai and East Forelands Sections.

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Kenai, Kasilof and East Forelands Sections

- After July 8, or after the Kenai and East Forelands Sections fishing season opens, the following fishing scenarios are possible depending on run strength to the Kenai River:
- If the Kenai assessment shows the run to be **less than 2 million Kenai sockeye salmon,** there will be no more than 24 hours of additional fishing time per week in the Upper Subdistrict and there are no mandatory window closures. If the Kenai and East Forelands Sections are not fished during regular or additional openings, the department may limit regular and additional periods in the Kasilof Section to within ½ mile of shore. If the Kasilof escapement is projected to exceed 300,000, 24-hours of additional fishing time per week is available after July 15 within ½ mile of shore in the Kasilof Section.
- If the Kenai assessment is **between 2 and 4 million Kenai sockeye salmon**, the Department may allow up to 51 hours of additional fishing time per week and will close the Upper Subdistrict for a 36-hour closed period, which will begin between 7:00 p.m. on Thursdays and 7:00 a.m. on Fridays. In addition there will be a second 24-hour closed period per week to be implemented at the Department's discretion. If the Kenai and East Forelands Sections are not fished, the department may limit regular and extra periods in the Kasilof Section to within ½ mile of shore.
- If the Kenai assessment changes to a run of **more than 4 million Kenai sockeye salmon**, the department may allow up to 84 hours of additional fishing time per week and will close the Upper Subdistrict for a 36 hour closed period, which will begin between 7:00 p.m. on Thursdays and 7:00 a.m. on Fridays. There are no other mandatory windows at this run strength. If the Kenai and East Forelands Sections are not fished, the department may limit regular and extra periods in the Kasilof Section to within ½ mile of shore.
- The Upper Subdistrict set gillnet fishery will close no later than August 10 and all restrictions and additional time regulations from July carry over into August.

Central District Drift Gillnet Fishery

The drift fishery opens the third Monday in June or June 19, whichever is later.

From July 9 through July 15,

- Drift gillnet fishing is restricted for two regular fishing periods to the Kenai and Kasilof Sections and Drift Area One described below.
- For runs greater than 2 million sockeye salmon to the Kenai River there may be one additional 12-hour drift gillnet fishing period in the Kenai and Kasilof Sections of the Upper Subdistrict and in Drift Area One.

From July 16 through July 31,

- In runs of less than 2 million sockeye salmon to the Kenai River there will be two regular 12-hour fishing periods restricted to the Kenai and Kasilof Sections of the Upper Subdistrict and Drift Area One;

-continued-

- In runs of between 2 and 4 million sockeye salmon to the Kenai River; there will be two regular 12-hour fishing periods restricted to the Kenai and Kasilof Sections of the Upper Subdistrict and in Drift Areas One and Two;
- In runs of over 4 million sockeye salmon to the Kenai River, there are no mandatory restrictions.

From August 11 until closed by emergency order,

- Drift Areas Three and Four are open for regular periods (Figure 3);
- Chinitna Bay may be opened by emergency order.

Drift Fishing Areas

(1) Drift Area One: includes those waters of the Central District south of Kalgin Island at 60° 20.43' N. lat. (Figure 2);

(2) Drift Area Two: includes those waters of the Central District enclosed by a line from 60° 20.43' N. lat., 151° 54.83' W. long. to a point at 60° 41.08' N. lat., 151° 39.00' W. long. to a point at 60° 41.08' N. lat., 151° 24.00' W. long. to a point at 60° 27.10' N. lat., 151° 25.70' W. long. to a point at 60° 20.43' N. lat., 151° 28.55' W. long. (Figure 2);

(3) Drift Area Three; includes those waters of the Central District within one mile of mean lower low water (zero tide) south of a point on the West Foreland at 60° 42.70' N. lat., 151° 42.30' W. long. (Figure 3);

(4) Drift Area Four; includes those waters of the Central District enclosed by a line from 60° 04.70' N. lat., 152° 34.74' W. long. to the Kalgin Buoy at 60° 04.70' N. lat., 152° 09.90' W. long. to a point at 59° 46.15' N. lat., 152° 18.62' W. long. to a point on the western shore at 59° 46.15' N. lat., 153° 00.20' W. long., not including the waters of the Chinitna Bay Subdistrict (Figure 3).

Other regulatory changes include:

- Up to 50 fathoms of the 150 fathoms of allowable drift gillnet gear per boat may be monofilament mesh; **you must register with ADF&G prior to using monofilament gear.**
- Up to 35 fathoms of set gillnet gear per permit may be monofilament mesh with no more than one net per permit having monofilament mesh; **you must register with ADF&G prior to using monofilament gear.**

SET NET REGISTRATION AND BUOY STICKERS

All Cook Inlet set net fishermen are still required to register prior to fishing for one of three areas of Cook Inlet: 1) the Upper Subdistrict of the Central District; 2) the Northern District; or, 3) all remaining areas of Cook Inlet (Greater Cook Inlet). Once registered for one of these three areas, fishermen may fish only in the area for which they are registered for the remainder of the year. No transfers will be permitted. Set gillnet permit holders fishing in the Northern District

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or the Greater Cook Inlet area can register at Department offices in Soldotna, Homer, or Anchorage beginning in May or by mail. Forms will be available at area offices or on the department's homepage at http://www.cf.adfg.state.ak.us/region2/ucihome.php. Fishermen wishing to register in the Upper Subdistrict must register in the **Soldotna ADF&G office only,** and must purchase buoy stickers at the time of registering.

SEASON OPENING DATES

Season opening dates for the various fisheries around the inlet are as follows:

Big River Fishery: June 1 and continuing through June 24 unless the 1,000 Chinook salmon harvest limit is reached prior to that date. Weekly fishing periods are Mondays, Wednesdays, and Fridays from 7:00 a.m. to 7:00 p.m.

Northern District King Salmon Fishery: May 28. There will be no more than three fishing periods, the remaining two periods are scheduled on June 4 and June 11. In that area from 1 mile south of the Theodore River to the Susitna River, there is only one open period during this fishery, which will occur on June 4 in 2007.

Western Subdistrict Set Net Fishery: June 18

All remaining set gillnet fisheries except the Upper Subdistrict: June 25.

Upper Subdistrict Set Net Fishery: June 25 for the Kasilof Section (that portion south of the Blanchard Line) unless opened earlier by EO (if 50,000 sockeye are in the river before the June 25 opener), but will not open before June 20. The Kenai and East Forelands Sections (that portion north of the Blanchard Line) will open July 9. All sections of the Upper Subdistrict will close for the season on or before August 10.

Drift Gillnet Fishery: June 21

GENERAL INFORMATION

The UCI commercial fisheries information line will again be available by calling 262-9611. The most recent emergency order announcement is always available on the recorded message line and catch, escapement and test fishing information is included whenever possible. All emergency order announcements are also faxed to processors as quickly as possible and posted to the Upper Cook Inlet web page at http://www.cf.adfg.state.ak.us/region2/ucihome.php. For very general information, we invite you to visit the Commercial Fisheries web page on the Internet at http://www.cf.adfg.state.ak.us/.

If, during the summer, fishermen have information or questions concerning the commercial fishery, the Soldotna Commercial Fisheries Division staff can be reached by phone at 262-9368, by fax at 262-4709 or by mail at 43961 Kalifornsky Beach Road, Suite B, Soldotna, 99669.

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Latitude and Longitude are based on the North American Datum of 1983 (NAD 83) which is equilivalent to the World Geodetic System 1984 (WGS 84).

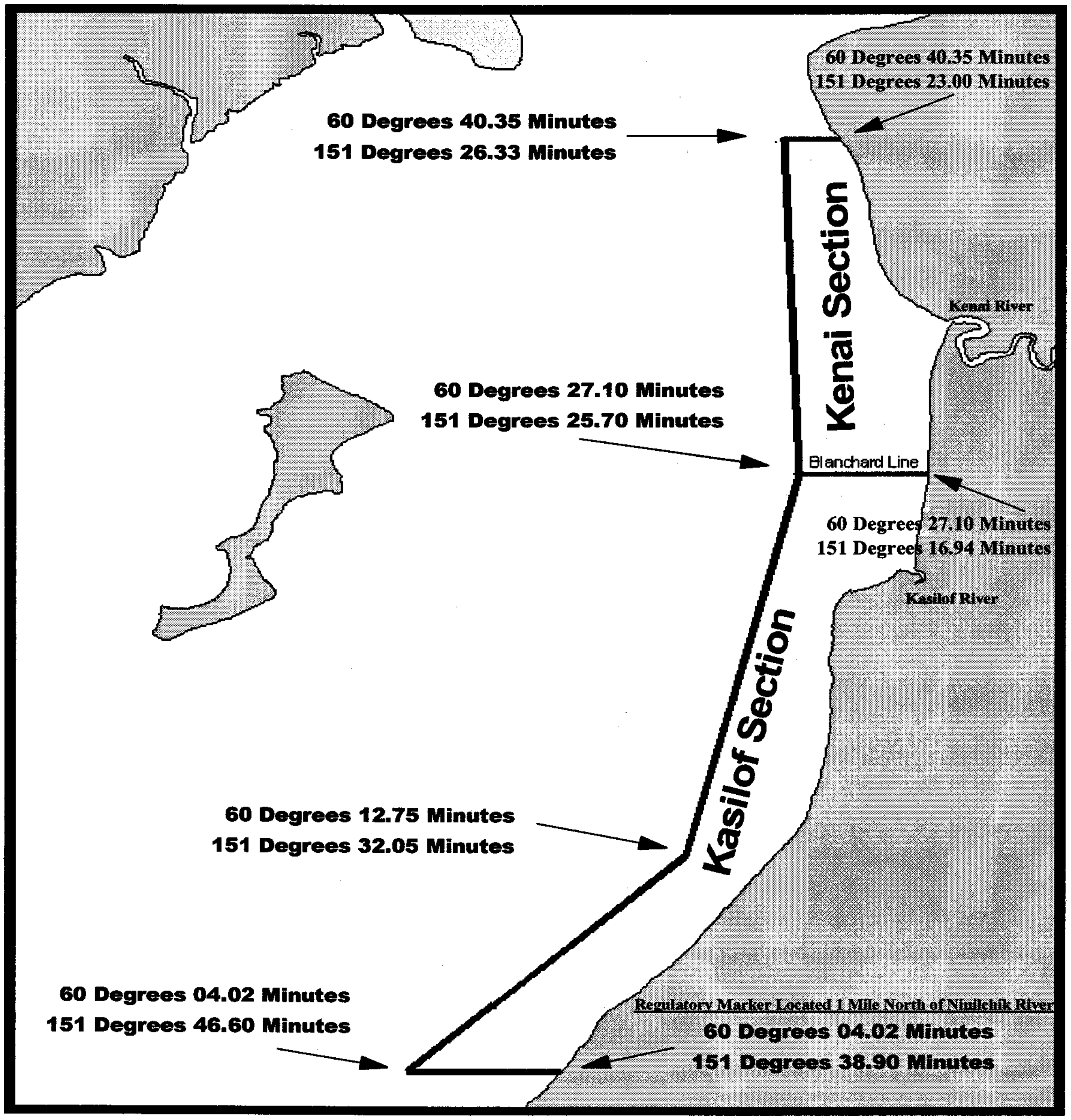

Figure 1. Map of the Kenai and Kasilof Sections with waypoint descriptions.

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Drift Gillnet Area 1 & Area 2 Descriptions

AREA 2 DESCRIPTION	COORDINATES
1. Southwest Corner	60^0 20.43' N. lat., 151^0 54.83' W. long.
2. Northwest Corner	60^0 41.08' N. lat., 151^0 39.00' W. long.
3. Northeast Corner	60^0 41.08' N. lat., 151^0 24.00' W. long.
4. Blanchard Line Corridor Boundary	60^0 27.10' N. lat., 151^0 25.70' W. long.
5. Southeast Corner	60^0 20.43' N. lat., 151^0 28.55' W. long.

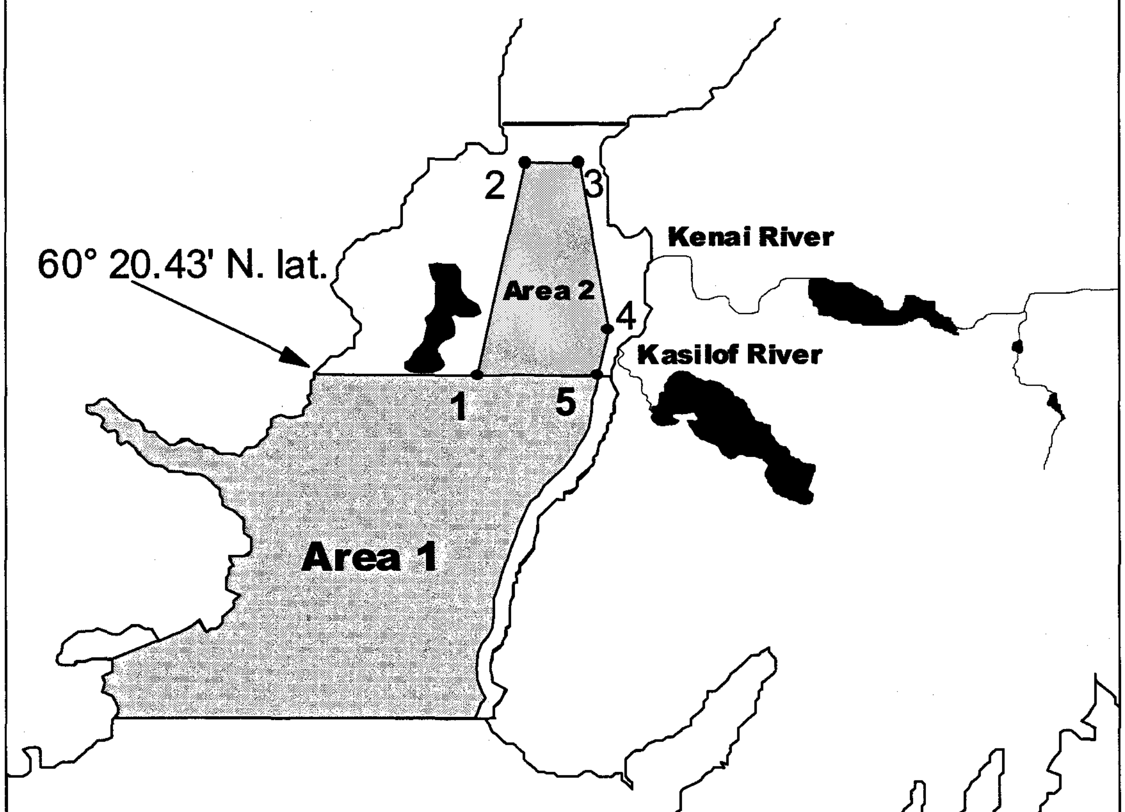

Figure 2. Map of drift gillnet fishing areas one and two.

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Drift Gillnet Area 3 & Area 4 Descriptions

AREA 4 LOCATION	COORDINATES
A. Southwest Corner	59^0 46.15' N. lat., 153^0 00.20' W. long.
B. Northwest Corner	60^0 04.70' N. lat., 152^0 34.74' W. long.
C. Northeast Corner (Kalgin Buoy)	60^0 04.70' N. lat., 152^0 09.90' W. long.
D. Southeast Corner	59^0 46.15' N. lat., 152^0 18.62' W. long.

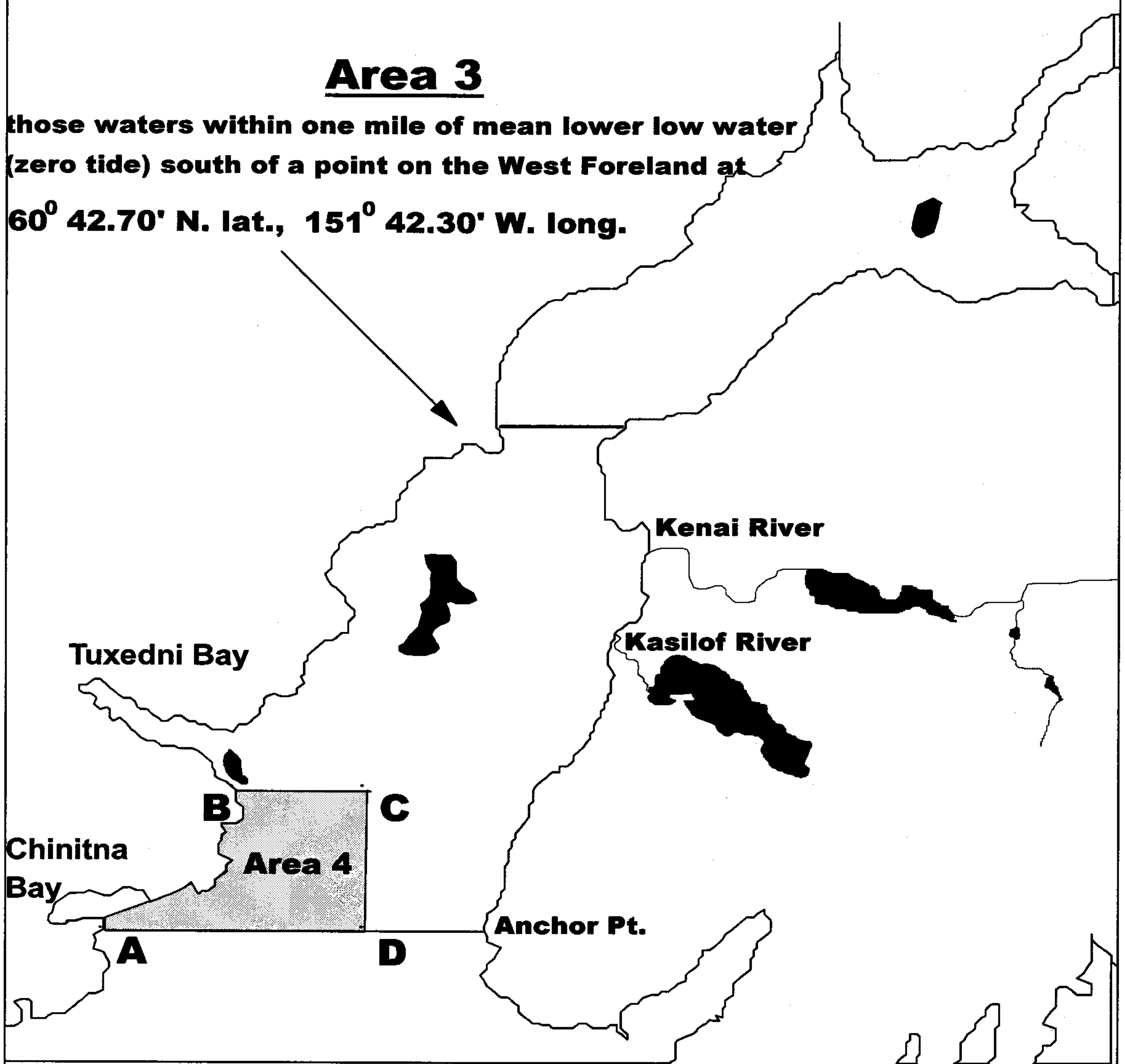

Figure 3. Map of drift gillnet regular period fishing areas beginning August 11

Appendix B2.–2008 Upper Cook Inlet sockeye salmon forecast.

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

Denby S. Lloyd, Commissioner
John Hilsinger, Director

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Date Issued: 12/17/2007

2008 UPPER COOK INLET SOCKEYE SALMON FORECAST

A run of 5.6 million sockeye salmon is forecasted to return to UCI in 2008 with a harvest by all user groups of 3.9 million sockeye salmon. The forecasted harvest in 2008 is about 200,000 fish below the 20-year average harvest by all user groups. The sockeye salmon run forecast for the Kenai River of 3.1 million is 16% less than the 20-year average run of 3.7 million. Age-1.3 sockeye salmon typically comprise about 65% of the run to the Kenai River. A sibling model based upon the return of age-1.2 sockeye salmon in 2007 was used to predict a return of 2.6 million age-1.3 sockeye salmon to the Kenai River in 2008, while the fry model predicted a return of 2.5 million age-1.3 sockeye salmon. Age-2.3 sockeye salmon typically comprise about 20% of the run to the Kenai River. A sibling model based upon the return of age-2.2 sockeye salmon in 2007 was used to forecast the return (286,000) of age-2.3 sockeye salmon to the Kenai River in 2008. The return of age-2.2 sockeye salmon in 2007 was 58% less than the 20-year average return for this age class. The predominant age classes in the 2008 run should be age 1.3 (85%) and age 2.3 (9%).

The sockeye salmon run forecast for the Kasilof River of 1.3 million is 33% greater than the 20-year average run of 968,000 fish. Age-1.3 sockeye salmon typically comprise about 35% of the run to the Kasilof River. A sibling model based upon the return of age-1.2 sockeye salmon in 2007 was used to forecast the return (376,000) of age-1.3 sockeye salmon in 2008. The return of age-1.2 sockeye salmon last year was 57% greater than the 20-year average return for this age class. Age-1.2 sockeye salmon typically comprise about 30% of the run to the Kasilof River. A sibling model based upon an above average return of age-1.1 sockeye salmon in 2007 was used to forecast the return of age-1.2 sockeye salmon to Kasilof River. The sibling model predicted a return of 484,000 age-1.2 sockeye salmon. However, we are less confident in this forecast, because a smolt model predicted a return of only 252,000 age-1.2 sockeye salmon.

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Age-1.2 sockeye salmon migrated as smolts from the Kasilof River in 2006, when their estimated abundance was only 2.6 million, about one-half of the 20-year average. The predominant age classes in the 2008 run should be age 1.2 (38%) and age 1.3 (29%).

The sockeye salmon run forecast for the Susitna River of 344,000 is 24% less than the 20-year average run of 453,000. Age-1.2 and -1.3 sockeye salmon typically comprise 72% of the run to the Susitna River. A spawner-recruit model was used to forecast the return (80,000) of age-1.2 sockeye salmon to the Susitna River. The spawner abundance for this age class was about 37% less than the 20-year average spawner abundance. A sibling model based upon the return of age-1.2 sockeye salmon in 2007 was used to forecast the return (170,000) of age-1.3 sockeye salmon to the Susitna River in 2008. The return of age-1.2 sockeye salmon in 2007 was 44% less than the 20-year average. The predominant age classes in the 2008 run should be age 1.3 (49%) and age 1.2 (23%).

The sockeye salmon run forecast for Fish Creek of 53,000 is 67% less than the 20-year average run of 159,000. Age-1.2 and -1.3 sockeye salmon typically comprise 79% of the run to Fish Creek. Sibling models based upon the abundances of age-1.1 and -1.2 sockeye salmon in 2007 were used to forecast the returns of age-1.2 (36,000) and -1.3 (10,000) sockeye salmon in 2008. The abundances of age-1.1 and -1.2 sockeye salmon returning to Fish Creek in 2007 were 74% less than the 20-year average. The predominant age classes in the 2008 run should be age 1.2 (67%) and age 1.3 (19%).

The sockeye salmon run forecast for Crescent River of 100,000 is 7% less than the 20-year average run of 108,000. Sibling models based upon returns of age-1.2 and -2.2 sockeye salmon in 2007 were used to forecast returns of age-1.3 (48,000) and -2.3 (28,000) sockeye salmon to the Crescent River in 2008. The predominant age classes in the 2008 run should be age 1.3 (48%) and age 2.3 (28%).

Forecast runs to individual freshwater systems are as follows:

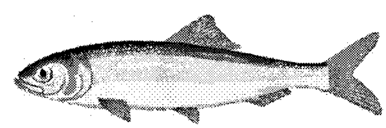
System	Run	Goal Range
Crescent River	100,000	30,000–70,000
Fish Creek	53,000	20,000–70,000
Kasilof River	1,286,000	150,000–250,000
Kenai River	3,064,000	750,000–950,000
Susitna River	344,000	90,000–160,000[a]
Minor Systems	727,000	N/A

[a] The inriver goal listed for Susitna River sockeye salmon is the escapement goal range for Yentna River sockeye salmon. The sonar estimate of sockeye salmon escapement into the Yentna River is typically multiplied by 1.95 to expand the estimate to the entire Susitna River watershed.

For more information contact Mark Willette, Jeff Fox, or Pat Shields at the Soldotna ADF&G office at (907) 262-9368.

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

Denby S. Lloyd, Commissioner
John Hilsinger, Director



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Date Issued: March 20, 2007

2007 UPPER COOK INLET COMMERCIAL SMELT (HOOLIGAN) & HERRING FISHING SEASONS

A commercial fishery for smelt (hooligan) was reopened by the Alaska Board of Fisheries (BOF), beginning with the 2005 season. This fishery occurs in Cook Inlet, in those waters located between the Chuit River and the Little Susitna River (salt water only). The season is open from May 1 to June 30. Legal gear for the fishery is a hand-operated dip net as defined in 5AAC 39.105. The total harvest may not exceed 100 tons of smelt. Any salmon caught must be released immediately and returned to the water unharmed. To participate in this fishery, a miscellaneous finfish permit is required as well as a free commissioner's permit, which can be obtained from the ADF&G office in Soldonta. The commissioner's permit must be obtained prior to applying for the miscellaneous finfish permit.

The Central District Herring Management Plan (5AAC 27.409) was also modified by the BOF at their 2005 Upper Cook Inlet meeting. The areas open to fishing occur in the Central District of Upper Cook Inlet, including the Kalgin Island Subdistrict, Upper Subdistrict, Western Subdistrict, and Chinitna Bay Subdistrict as described in 5AAC 21.200(b)(2), (b)(3), (b)(5), and (b)(6). The legal gillnet mesh size was changed to no smaller than 2.0 inches or no greater than 2.5 inches. The season is open from April 20 to May 31. In the Upper Subdistrict, the guideline harvest range is 0-40 tons and fishing for herring is not allowed any closer than 600 feet of the mean high tide mark on the Kenai Peninsula. In the Chinitna Bay Subdistrict the department is to manage for a guideline harvest of 0–40 tons, in the Western Subdistrict the guideline harvest range is 0–50 tons, and in the Kalgin Island Subdistrict the guideline harvest range is 0–20 tons.

In the Central District, herring may be taken only by gillnet, as defined in 5AAC 27.431, except that in the Chinitna Bay and Kalgin Island Subdistricts, herring may only be taken by set gillnets (5AAC 27.430 (b)). All participants are required to register at the department's Soldotna office **no later than April 10 of this year**. Fishermen are also required to report fishing time and the amount of smelt and herring harvested, whether sold or retained for personal use, to the Soldotna office by 12:00 noon of the next day for each day fished. Fishermen are also reminded that fish tickets are to be filled out and either mailed or dropped off at the Soldotna ADF&G office within 7 days of the time of landing (5 AAC 39.130 (c)). If you intend to sell your catch directly from your fishing site (beach or vessel), you must first obtain a catcher-seller permit from ADF&G.