

Fishery Management Report No. 05-41

Annual Management Report 2004 Bristol Bay Area

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code	AAC	fork length	FL
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mid-eye-to-fork	MEF
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	mid-eye-to-tail-fork	METF
hectare	ha	at	@	standard length	SL
kilogram	kg	compass directions:		total length	TL
kilometer	km	east	E		
liter	L	north	N	Mathematics, statistics	
meter	m	south	S	<i>all standard mathematical signs, symbols and abbreviations</i>	
milliliter	mL	west	W	alternate hypothesis	H _A
millimeter	mm	copyright	©	base of natural logarithm	<i>e</i>
		corporate suffixes:		catch per unit effort	CPUE
Weights and measures (English)		Company	Co.	coefficient of variation	CV
cubic feet per second	ft ³ /s	Corporation	Corp.	common test statistics	(F, t, χ^2 , etc.)
foot	ft	Incorporated	Inc.	confidence interval	CI
gallon	gal	Limited	Ltd.	correlation coefficient (multiple)	R
inch	in	District of Columbia	D.C.	correlation coefficient (simple)	r
mile	mi	et alii (and others)	et al.	covariance	cov
nautical mile	nmi	et cetera (and so forth)	etc.	degree (angular)	°
ounce	oz	exempli gratia	e.g.	degrees of freedom	df
pound	lb	(for example)		expected value	<i>E</i>
quart	qt	Federal Information Code	FIC	greater than	>
yard	yd	id est (that is)	i.e.	greater than or equal to	≥
		latitude or longitude	lat. or long.	harvest per unit effort	HPUE
Time and temperature		monetary symbols		less than	<
day	d	(U.S.)	\$, ¢	less than or equal to	≤
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	logarithm (natural)	ln
degrees Fahrenheit	°F	registered trademark	®	logarithm (base 10)	log
degrees kelvin	K	trademark	™	logarithm (specify base)	log ₂ , etc.
hour	h	United States (adjective)	U.S.	minute (angular)	'
minute	min	United States of America (noun)	USA	not significant	NS
second	s	U.S.C.	United States Code	null hypothesis	H ₀
		U.S. state	use two-letter abbreviations (e.g., AK, WA)	percent	%
Physics and chemistry				probability	P
all atomic symbols				probability of a type I error (rejection of the null hypothesis when true)	α
alternating current	AC			probability of a type II error (acceptance of the null hypothesis when false)	β
ampere	A			second (angular)	"
calorie	cal			standard deviation	SD
direct current	DC			standard error	SE
hertz	Hz			variance	
horsepower	hp			population	Var
hydrogen ion activity (negative log of)	pH			sample	var
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

FISHERY MANAGEMENT REPORT NO. 05-41

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June 2005

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TABLE OF CONTENTS

	Page
LIST OF TABLES.....	iii
LIST OF FIGURES.....	iv
LIST OF APPENDICES.....	iv
ABSTRACT.....	1
INTRODUCTION.....	1
Management Area Description.....	1
Overview of the Bristol Bay Salmon Fisheries.....	2
2004 COMMERCIAL SALMON FISHERY.....	2
Run Strength Indicators.....	2
Preseason Forecasts.....	2
South Unimak/Shumagin Island Fishery.....	3
Port Moller Test Fishery.....	4
Economics and Market Production.....	4
Run and Harvest Performance by Species.....	4
Sockeye Salmon.....	4
Chinook Salmon.....	4
Chum Salmon.....	4
Pink Salmon.....	5
Coho Salmon.....	5
Season Summary by District.....	5
General District.....	5
Naknek/Kvichak District.....	6
Egegik District.....	10
Ugashik District.....	13
Nushagak District.....	15
Togiak District.....	20
2004 SUBSISTENCE SALMON FISHERY.....	23
Regulations.....	23
Inseason Management.....	24
Permit System.....	25
Harvest.....	26
2004 BRISTOL BAY HERRING FISHERY.....	28
Stock Assessment.....	29
Sac Roe Herring Fishery Overview.....	30
Fishing and Industry Participation.....	30
Gear Specifications.....	30
Harvest and Management Performance.....	31
Spawn-on-Kelp Fishery Overview.....	33
2004 Season Summary.....	34
Biomass Estimation.....	34
Age Composition.....	35

TABLE OF CONTENTS (Continued)

	Page
Fishery Overview.....	35
Purse Seine.....	36
Gillnet.....	38
Spawn on Kelp.....	39
EXPLOITATION.....	39
EXVESSEL VALUE.....	39
ACKNOWLEDGEMENTS.....	40
REFERENCES CITED.....	40
TABLES.....	41
APPENDIX A. SALMON.....	88
APPENDIX B. HERRING.....	123

LIST OF TABLES

Table	Page
1. Comparison of inshore sockeye salmon forecast versus actual run, escapement goals versus actual escapements, and projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 2004.	42
2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2004.....	43
3. Inshore run of sockeye salmon by age class, river system and district, in thousands of fish, Bristol Bay, 2004.....	44
4. Inshore commercial catch and escapement of sockeye salmon, in numbers of fish, Bristol Bay, 2004.....	45
5. Summary of sockeye salmon test fishing indices in the Naknek/Kvichak District, by index area and date, Bristol Bay, 2004.....	46
6. Summary of sockeye salmon test fishing indices in the Ugashik District, by index area and date, Bristol Bay, 2004.....	46
7. Summary of sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 2004.....	47
8. Commercial fishing emergency orders, by district and stat area, Bristol Bay, 2004.....	48
9. Daily district registration of drift gillnet permit holders by district, Bristol Bay, 2004.....	54
10. Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2004.....	55
11. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2004.....	57
12. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2004.....	58
13. Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2004.....	59
14. Commercial sockeye salmon fishing time and setnet harvest numbers by date and statistical area, Nushagak District, Bristol Bay, 2004.....	61
15. Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2004.....	63
16. Commercial salmon catch by date and species, in numbers of fish, Togiak Section, Bristol Bay, 2004.....	65
17. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 2004.....	66
18. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 2004.....	66
19. Commercial salmon catch by date and species, in numbers of fish, Osviak Section, Bristol Bay, 2004.....	66
20. Commercial salmon catch by district and species, in number of fish, Bristol Bay, 2004.....	67
21. Commercial sockeye salmon catch by date and sub-district, in numbers of fish, General District, Bristol Bay, 2004.....	68
22. Daily sockeye salmon escapement tower counts by river system, eastside Bristol Bay, 2004.....	69
23. Daily sockeye salmon escapement tower counts by river system, westside Bristol Bay, 2004.....	71
24. Final daily and cumulative escapement estimates by species, Nushagak River sonar project, Bristol Bay, 2004.....	73
25. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2004.....	76
26. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Egegik River, Bristol Bay, 2004.....	77
27. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Ugashik River, Bristol Bay, 2004.....	78
28. Commercial salmon processors and buyers operating in Bristol Bay, 2004.....	79
29. Mean round weight, price per pound, and total exvessel value of the commercial salmon catch, Bristol Bay, 2004.....	80
30. Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2004.....	81
31. Daily observed estimates (tons) of herring by index area, Togiak District, 2004.....	82
32. Emergency order (EO) commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2004.....	83
33. Commercial herring harvest (tons) by fishing section, gear type, and date Togiak District, Bristol Bay, 2004.....	85
34. Herring total run and commercial catch by year class, Togiak District, 2004.....	87
35. Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2004.....	87

LIST OF FIGURES

Figure	Page
1. Bristol Bay area commercial fisheries salmon management districts.	1
2. Togiak Herring District, Bristol Bay.	28
3. Spawn-on-kelp management areas (K-1 through K11), Togiak District, Bristol Bay.	34

LIST OF APPENDICES

Appendix	Page
A1. Escapement goals and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 1984–2004.	89
A2. Salmon entry permit registration by gear and residency, Bristol Bay, 1984–2004.	91
A3. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.	92
A4. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.	93
A5. Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.	94
A6. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.	95
A7. Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.	96
A8. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.	97
A9. Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1984–2004.	98
A10. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1984–2004.	99
A11. Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District by river system, in numbers of fish, Bristol Bay, 1984–2004.	100
A12. Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1984–2004.	101
A13. Inshore commercial catch and escapement of sockeye salmon in the Egegik District by river system, 1984–2004.	102
A14. Inshore commercial catch and escapement of sockeye salmon in the Ugashik District, by river system, 1984–2004.	103
A15. Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1984–2004.	104
A16. Inshore sockeye salmon total run by river system, in thousands of fish, Nushagak District, 1984–2004. ...	105
A17. Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1984–2004.	106
A18. Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1984–2004.	107
A19. Chinook salmon harvest, escapement and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1984–2004.	108
A20. Chinook salmon harvest, escapement and total runs in the Togiak District, in numbers of fish, Bristol Bay, 1984–2004.	109
A21. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1984–2004.	110
A22. Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1964–2004, even years only.	111
A23. Coho salmon harvest, escapement and total runs in the Nushagak Drainage, in numbers of fish, Bristol Bay, 1984–2004.	112
A24. Coho salmon harvest by fishery, escapement and total runs for the Togiak River, in numbers of fish, Bristol Bay, 1984–2004.	113
A25. Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1984–2004.	114
A26. Average price paid in dollars per pound for salmon, by species, Bristol Bay, 1984–2004.	115
A27. Estimated exvessel value of the commercial salmon catch by species paid to fishermen, in thousands of dollars, Bristol Bay, 1984–2004. Derived from price per pound times commercial catch.	116
A28. South Unimak and Shumigan Island preseason sockeye allocation, actual sockeye and chum harvest in thousands of fish, Alaska Peninsula, 1984–2004.	117
A29. Subsistence salmon harvest, by district and species, Bristol Bay, 1984–2004.	118

LIST OF APPENDICES (Continued)

Appendix	Page
A30. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1984–04.....	121
A31. Subsistence salmon harvest by community, Nushagak District, Bristol Bay, 1984–2004.	122
B1. Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1984–2004.	124
B2. Exploitation of Togiak herring stock, 1984–2004.	125
B3. Age composition of inshore herring, Togiak District, 1984–2004.	126
B4. Herring spawn-on-kelp industry participation, fishing effort, area and harvest, Togiak District, 1984–2004.....	127
B5. Aerial survey estimates of herring biomass and spawn deposition, Togiak District, 1984–2004.	128
B6. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1984–2004.	129
B7. Guideline and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984–2004.....	130

ABSTRACT

The 2004 Bristol Bay Management Report is the forty-third consecutive annual volume reporting on management activities of the Division of Commercial Fisheries staff in Bristol Bay. The report emphasizes a descriptive account of the information, decisions, and rationale used to manage the Bristol Bay commercial salmon and herring fisheries, and outlines basic management objectives and procedures. We have included all information deemed necessary to fully explain the rationale behind management decisions formulated in 2004. All narrative and data tabulations in this volume are combined in two sections, salmon followed by herring, to aid in the use of this document as a reference source. The extensive set of tables has been updated to record previously unlisted data for easy reference. Fisheries data in this report supersedes information in previous reports. Corrections or comments should be directed to the Dillingham office. Attention: Editor. Charlotte Westing, Togiak Area Management Biologist, P.O. Box 230, Dillingham, AK 99576.

Key Words: Bristol Bay Management, commercial fisheries, herring, sockeye salmon, Chinook salmon, chum salmon, coho salmon, pink salmon, Naknek, Kvichak, Egegik, Ugashik, Wood, Nushagak, Igushik, Togiak.

INTRODUCTION

MANAGEMENT AREA DESCRIPTION

The Bristol Bay management area includes all coastal waters and inland waters east of a line from Cape Newenham to Cape Menshikof (Figure 1). The area includes eight major river systems: Naknek, Kvichak, Egegik, Ugashik, Wood, Nushagak, Igushik, and Togiak. Collectively, these rivers are home to the largest commercial sockeye salmon fishery in the world. Sockeye salmon are by far the most abundant salmon species that return to Bristol Bay each year, but Chinook, chum, coho, and (in even-years) pink salmon returns are important to the fisheries as well. The Bristol Bay area is divided into five management districts (Naknek-Kvichak, Egegik, Ugashik, Nushagak, and Togiak) that correspond to the major river drainages. The management objective for each river is to achieve desired escapement goals for the major salmon species while harvesting all fish in excess of the escapement requirement through orderly fisheries. In addition, regulatory management plans have been adopted for individual species in certain districts.

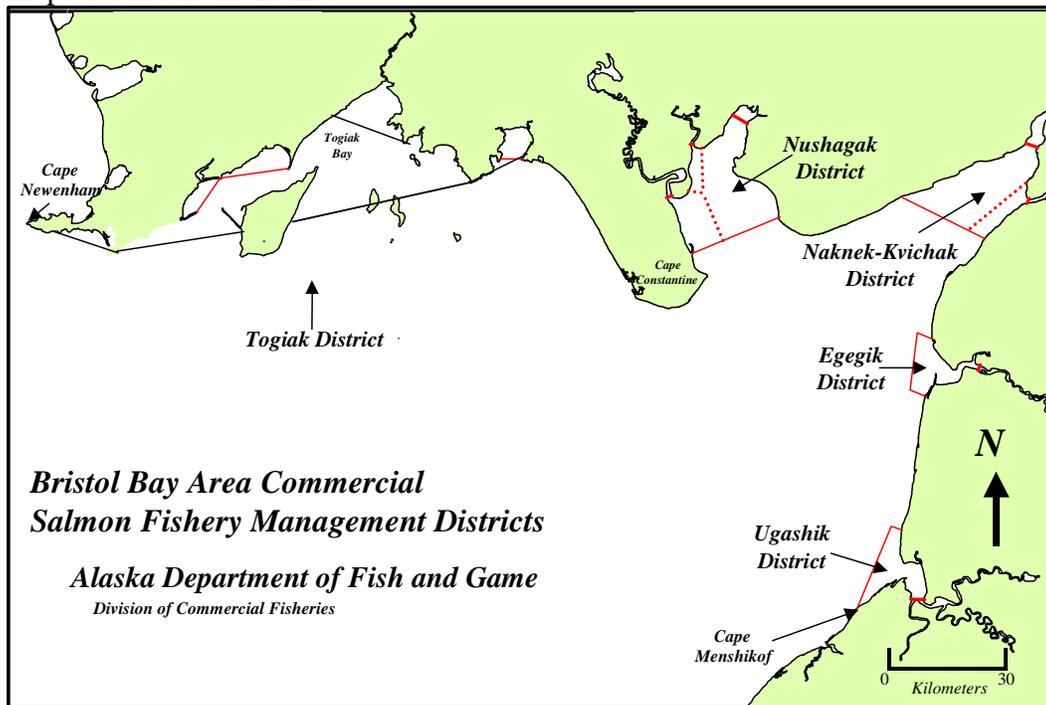


Figure 1.—Bristol Bay area commercial fisheries salmon management districts.

OVERVIEW OF THE BRISTOL BAY SALMON FISHERIES

The five species of pacific salmon found in Bristol Bay are the focus of major commercial, subsistence, and sport fisheries. Annual commercial catches (1984–2003) average nearly 24 million sockeye salmon, 69,000 Chinook, 971,000 chum, 133,000 coho, and 593,000 (even-years only) pink salmon (Appendices A3–A7). Since 1984, the value of the commercial salmon harvest in Bristol Bay has averaged \$121 million, with sockeye salmon being the most valuable, worth an average \$118 million (Appendix A27). Subsistence catches average approximately 154,000 salmon and comprised primarily of sockeye salmon (Appendix A29). Sport fisheries harvest all species of salmon, with most effort directed toward Chinook and coho stocks. Approximately 40,000 salmon are harvested annually by sportfishermen in Bristol Bay.

Management of the commercial fishery in Bristol Bay is focused on discrete stocks with harvests directed at terminal areas around the mouths of major river systems. Each stock is managed to achieve a spawning escapement goal based on maximum sustained yield. Escapement goals are achieved by regulating fishing time and area by emergency order and/or adjusting weekly fishing schedules. Legal gear for the commercial salmon fishery includes both drift (150 fathoms) and set (50 fathoms) gillnets. However, the Board of Fish passed a regulation in 2003 allowing for two permit holders to concurrently fish from the same vessel and jointly operate up to 200 fathoms of drift gillnet gear. This regulation does not apply in special harvest areas. Drift gillnet permits are the most numerous at 1,860 in Bristol Bay (Area T), of those 1,426 fished in 2004. There are a total of 989 setnet permits in Bristol Bay, of those 761 made deliveries in 2004 (Appendix A2).

2004 COMMERCIAL SALMON FISHERY

RUN STRENGTH INDICATORS

Fishery managers in Bristol Bay have several early indicators of sockeye run size, including: the preseason forecast, the False Pass fishery, the Port Moller test boat, the district test program, and the early performance of the commercial fishery. Evaluated individually, each of these pieces of information may not give a correct assessment of run size. Collectively, they form patterns such as missing year classes, discrepancies with the forecast, or differences in run timing that can be important to the successful management of the commercial fishery.

PRESEASON FORECASTS

Total inshore sockeye salmon production for Bristol Bay in 2004 was forecasted to be slightly more than 46.6 million (Table 1). The bay sockeye harvest was predicted to reach approximately 34.7 million fish. Runs were expected to exceed spawning escapement goals for all river systems in Bristol Bay.

The forecast for the sockeye salmon run to Bristol Bay in 2004 is the sum of individual predictions for nine river systems (Kvichak, Alagnak, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak-Mulchatna, and Togiak) and four age classes (ages 1.2, 1.3, 2.2, and 2.3, plus ages 0.3 and 1.4 for Nushagak) (Table 2). Adult escapement and return data from brood years 1973–2000 were used in the analyses.

Predictions for each age class returning to a river system were calculated from models based on the relationship between adult returns and spawners or siblings from previous years. Also, models based on the relationship between returns and smolt were examined for Ugashik River.

Tested models included simple linear regression, multiple regression, and 5-year averages. In addition, univariate and multivariate time series analysis models were examined. The models chosen were those with statistically significant parameters having the greatest past reliability (accuracy and precision) based on mean absolute deviation, mean absolute percent error, and mean percent error between forecasts and actual returns for the years 2001 through 2003.

SOUTH UNIMAK/SHUMAGIN ISLAND FISHERY

These fisheries were managed under a guideline harvest (quota) specified in 5 AAC 09.365, the South Unimak/Shumagin Islands June Fishery Management Plan initially adopted in 1974 by the Alaska Board of Fisheries. The original intent of the Alaska Board of Fisheries was to prevent overharvest of sockeye runs bound for individual river systems in Bristol Bay. In 2001 the Board of Fisheries reviewed the management plan and concluded that because the fishery was based on the interception of stocks bound for Bristol Bay and the Arctic-Yukon-Kuskokwim region, it should be restricted to window periods of fishing time. These window periods were as follows: from June 10 to June 24 such that: “commercial fishing periods may occur only from 6:00 a.m. to 10:00 p.m. and may not be open for more than (A) three days in any seven-day period. (B) 16-hours per day; (C) 48-hours in any seven-day period; (D) two consecutive 16-hour fishing periods in any seven-day period.” The Board removed the previous regulations that were based on a chum cap and a percentage of the Bristol Bay preseason sockeye salmon forecast.

The management plan was again brought before the Board for review in January 2003. At that time, the Board restructured the management plan. 5AAC. 09.365, the South Unimak/Shumagin Island June Fishery Management Plan states: (a) “The South Unimak and Shumagin Islands June fishery harvest both sockeye and chum salmon in a mixed stock fishery during the month of June. The sockeye salmon are predominantly Bristol Bay and Alaska Peninsula origin. The chum salmon are bound for a number of areas, including Japan, Russia, the Arctic-Yukon-Kuskokwim, Bristol Bay, the Alaska Peninsula, and south central Alaska. These salmon stocks have historically been harvested along the south Alaska Peninsula during the month of June. This management plan is intended to be consistent with the Policy for the Management of Sustainable Salmon Fisheries (5AAC 39.222) and the Policy for the Mixed Stock Salmon Fisheries (5AAC 39.220)”. The Board removed references to interception of Bristol Bay and Arctic-Yukon-Kuskokwim stocks and liberalized the fishing schedule: (d) Beginning June 7, the commissioner may open, by emergency order, commercial fishing periods for purse seine, drift gillnet, and set gillnet gear in the South Unimak and Shumagin Islands fisheries as follows: (1) commercial fishing periods will begin at 6:00 a.m. and run 88 hours, until 10:00 p.m. three days later; commercial fishing will be closed for 32 hours and reopen at 6:00 a.m. two days later (2) notwithstanding (1) of this subsection, the final commercial fishing period will end at 10:00 p.m. on June 29.

Preliminary catch information for 2004 indicates that the Shumagin Island fishery landed 816,000 sockeye, and the South Unimak fishery landed 532,000 sockeye (Appendix A28). The South Unimak sockeye catch was 65% of the 10-year average and the chum catch was 62% of the 10-year average. However, in the Shumagin Island fishery sockeye catch was 2.4 times higher than the 10-year average and the chum catch was 2.5 times higher than the 10-year average. Therefore, the overall sockeye catch was 17% higher than the 10-year average and the chum catch was 39% higher than the 10-year average.

PORT MOLLER TEST FISHERY

From 1967–1985 the Department of Fish and Game operated a test fish program out of the community of Port Moller. A large vessel fished specific coordinates on transect lines perpendicular to the migration path of sockeye salmon returning to Bristol Bay. Collected data was used to estimate strength, timing, age, and size composition of the run. Although the forecasting performance of the project was often inaccurate, the project was very popular with salmon processors because it gave an additional indication of run size, which influenced production capacity and the price paid to fishermen. The project did not operate in 1986, but through voluntary funding from the industry and support from the Department of Fish and Game and the Fisheries Research Institute (FRI), the Port Moller test fish project operated from 1987 through 2003. In 2004, the FRI contribution to the project was replaced by the Bristol Bay Science and Research Institute (BBSRI) performed the bulk of the daily inseason analysis.

ECONOMICS AND MARKET PRODUCTION

In 2004, the exvessel value of the commercial salmon inshore harvest was estimated at \$70.2 million. The 1994 to 2003 average exvessel value of Bristol Bay commercial salmon fisheries is about \$120.9 million (Appendix A27).

During the 2004 season, 8 companies canned, 29 companies froze and 3 companies cured salmon in Bristol Bay. In addition, 15 companies exported fresh fish by air (Table 28). A total of 35 processors/buyers reported catches from Bristol Bay in 2004.

RUN AND HARVEST PERFORMANCE BY SPECIES

The combined commercial salmon harvest in Bristol Bay totaled 25.5 million fish in 2004. This was just below the 20-year average of 25.1 million salmon (Appendix A8) for Bristol Bay.

Sockeye Salmon

The 2004 inshore sockeye run of 41.7 million fish was slightly below the preseason forecast of 46.6 million (Table 1). Actual runs were below forecast in all but the Branch, Wood, and Nushagak Rivers.

Sockeye salmon dominated the inshore commercial harvest, and totaled 24.6 million fish (Tables 1 and 4). Sockeye escapement goals were met or exceeded in all systems where spawning requirements have been defined with the exception of the Kvichak and Igushik Rivers. The most spectacular return in 2004 was the Alagnak River where nearly 5.4 million sockeye passed the tower, shattering the previous records set in 1960 and 2003 with escapements of 1.24 million sockeye and 3.7 million sockeye respectively.

Chinook Salmon

Chinook salmon harvests in 2004 were below the recent 20-year averages in all districts except the Nushagak where the harvest of over 93,000 salmon was nearly double the 20 year average (Appendix A4). The 2004 bay-wide commercial harvest of 106,000 Chinook was well above the 20-year average of 69,000.

Chum Salmon

In 2004, the inshore commercial harvest of 730,000 chum salmon, just below the 10-year average of 674,000 but well below the 20-year average of 971,000 (Appendix A5). Chum salmon catches were below average in all districts but the Nushagak District.

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. The 2004 fishing season resulted in the incidental harvest of 52,000 pink salmon (Appendix A6). The harvest was far less than the 20-year average of 593,000 but was slightly higher than the 10-year average of 42,000 salmon.

Coho Salmon

The 2004 bay-wide commercial harvest of coho salmon totaled 73,000, which was just below the 10-year average of 74,000 (Appendix A7). Effort for coho salmon was low, resulting in a small harvest. However, all indications suggest an average to above average return in 2004 for all districts.

SEASON SUMMARY BY DISTRICT

General District

The 2004 projected harvest of 35 million fish led to the creation, by the Board of Fisheries, of a general district. The general district was created, similar to the general districts of 1970 and 1980, with the intent of allowing the fleet to fish the salmon run earlier essentially lessening the compression of the run and increasing seasonal processing capacity. Processors felt that reduced run compression would allow for fish to be processed more carefully, thus, increasing their value.

The General District Management Plan, adopted by the Board, opened an area from the tip of Cape Constantine to the latitude of Cape Menshikof within the state's 3-mile jurisdictional limit. The General District is defined as all waters of the Bristol Bay Area north and east of a line from a point on Cape Constantine at 58° 26.14' N. lat., 158° 45.91' W. long. to a point at 58° 27.22' N. lat., 158° 36.21' W. long., to a point at 58° 32.30' N. lat., 158° 13.26' W. long., then following the territorial sea boundary line around Etolin Point and continuing along the territorial sea boundary line to the latitude of Cape Menshikof at 57° 28.34' N. lat., except those waters within, and those waters draining into, the regular districts described in 5 AAC 06.200. Drift gillnets with mesh size of 5 ½" or less and 150 fathoms in length were allowed. A vessel with two permit holders legal to fish in the General District on board was allowed to fish 200 fathoms of drift gear as specified in 5 AAC 06.385. The General District could potentially be opened by emergency order from June 7 through June 25 for the harvest of up to 10% of the preseason forecast for the Bristol Bay Area.

On Monday, June 7 at 9:00 a.m., the first period in the General District began. This period ended on Friday, June 11 at 9:00 p.m. with a weekly harvest of only 16,300 sockeye (See Table 21). Effort in the district was low with 119 deliveries.

The second week of fishing in the General District began on June 14 at 9:00 a.m., ended on June 18 at 11:00 p.m. and resulted in the harvest of 631,000 sockeye. Cumulative catch by June 18 was 647,000 sockeye. Effort in the district also increased for this second week with 2,000 deliveries.

After the second week of fishing in the General District, information on Kvichak sockeye salmon run strength, including age composition information from the South Unimak/Shumagin Islands June fishery and the Port Moller test fishery in conjunction with genetic samples taken from the Port Moller test fishery was available. The Age 2.2 component was the predominant age class in most sampling, and was believed to show some early support for the forecasted run strengths to

most rivers. Early run timing was also indicated in most systems, which could potentially expose more of the Kvichak sockeye salmon stock to harvest in the General District than with normal run timing. With Kvichak sockeye salmon being a stock of management concern, the decision was made to reduce the weekly fishing schedule in the General District.

The General District opened 9:00 a.m., Monday, June 21 and closed 9:00 p.m., Tuesday, June 22. Catch for this two-day period was 1,022,500 sockeye. Effort in the General District also increased dramatically during this two-day period with 1,681 deliveries.

Total catch for the General District was 1,669,800 sockeye, 4,600 Chinook salmon, and 30,000 chum salmon. Approximately 46% of the total sockeye catch in the General District was taken in the Central Sub-district. It is important to note that the proportion of Kvichak sockeye in the General District is unknown. The General District's focus on mixed stocks has posed a challenge for apportioning catch among districts and could make future data sleuthing inaccurate. Because of these challenges, the General District catch is reported in an individual table (Table 21) but is not included in the totals for the terminal fishing districts, which represent inshore return only.

Naknek/Kvichak District

The 2004 forecast for the Naknek/Kvichak District projected a total run of 22.3 million sockeye, 7.9 million for escapement and 14.4-million to harvest (Table 1). The forecast by river system was 13.23 million to the Kvichak River, 4.4 million expected to return to the Alagnak River and 4.66 million for the Naknek River. The escapement goals for these river systems are: minimum 6.0 million for the Kvichak River, 185,000 for the Alagnak River and a range of 800,000 to 1.4 million for the Naknek River. The actual total inshore return for 2004 was slightly less than 18.0 million sockeye salmon, nearly 20% below the preseason forecast. The commercial catch of just over 4.7-million sockeye occurred almost entirely in the Naknek Section and Naknek River Special Harvest Area (NRSHA). The contribution of catch from the Kvichak and Alagnak Rivers was minimal due to the steps taken at the beginning of the season. No forecasts are made for Chinook, chum, or coho salmon in the Naknek/Kvichak District. The commercial harvest of Chinook salmon has remained relatively insignificant in recent years. This is a result of the current mesh size restrictions that have been implemented since the early 1990s and how the NRSHA is managed. Mesh restrictions are set by "Emergency Order" (E.O.) each year and prohibit gillnets with mesh size larger than 5.5 inches until July 21 (Table 8). The NRSHA is managed by pulsing commercial periods through part of the flood and ebb tide.

During the December BOF meeting in Anchorage, several regulation changes were adopted concerning the Naknek/Kvichak District. The Kvichak sockeye salmon stock was elevated from a "stock of yield concern" to a "stock of management concern", due to the recent chronic inability to meet escapement goals. With this action came the stipulation that if the Kvichak River run is forecasted to be less than 30% above the minimum biological escapement goal (BEG), fishing will begin in the special harvest areas of Naknek, Egegik and Ugashik Rivers (5 AAC 06.360 (h)). In addition to stock status, the BOF also changed the allocation plan for the Naknek/Kvichak District; when fishing in the NRSHA, the allocation of fish will be split 84 percent drift 16 percent set gillnet (5 AAC 06.360 (c)).

As described above, the 2004 total run forecast for the Kvichak River was twice the minimum escapement goal of 6.0 million sockeye salmon for the pre-peak year. With a projected return to the Kvichak that would exceed escapement goal needs, the department would take a more aggressive approach than in the past several years. The department would however; monitor the

Kvichak River escapement closely to assure the 2004 escapement goal would be met. As described in the overview section, the BOF created the General District (GD) for the 2004 season, due to the large Bristol Bay forecast. The Kvichak River has been over-forecasted seven of the last nine years. With the additional fishing pressure outside the Naknek/Kvichak District and the Kvichak failing since 1999, a somewhat cautious approach was needed early in the season. The Naknek Section was open to both drift and set gillnet gear beginning 9:00 a.m. Tuesday, June 1 and the Kvichak Section was open to set gillnet gear only beginning 9:00 a.m. Tuesday, June 1.

Early run strength indicators, prior to catch information in Bristol Bay, come from the South Peninsula commercial and the Port Moller test fishery; both begin around June 10. The Port Moller test fishery program projects run entry to Bristol Bay and the age composition of the run; this is then compared to the preseason forecast. In 2004, the South Peninsula fishery fished the same schedule as in 2003, based on the changes at the BOF in 2001 with 16-hour periods and 36-hour period breaks between the fishing periods. There was little age composition information collected from the commercial harvest. Catch information from the South Peninsula fishery provided no information for local Bristol Bay systems. However, the early scale information collected from the Port Moller test fishery indicated the 2-ocean component in the samples was the dominant age class. This was very early in the project and no conclusive evidence on run size was possible through June 23.

The escapement monitoring projects, i.e., towers for the Naknek, Kvichak, and Alagnak Rivers were operational by June 25. The Naknek tower was operational at 12:00 midnight, June 19, the Kvichak tower at 12:00 midnight, June 23 and the Alagnak River 12:00 midnight, June 25 (Table 22). Throughout the course of the season, escapements into all systems were on track to finish as or better than expected. With the GD open, most drift boats were outside of the district; catch information through June 23 for Naknek/Kvichak District was predominately set net effort. With set gillnet gear the dominant gear type in the district, escapements were at a rate above the projected for the Naknek and Alagnak while the Kvichak was within the one day spread. The district remained on the 4-day a week schedule through 9:00 a.m. June 23.

In recent years, district test fishing began earlier in June due to the restricted fishing in the Naknek/Kvichak District. This season with the Kvichak forecast allowing for a greater than 30% exploitation rate and the GD opening, the district was open for the most part, with limited opportunity in the Kvichak Section. The first day of test fishing occurred on June 26. What transpired prior to June 26 were two short fishing periods on June 24 and June 25 for 8 hours in the Naknek Section only for drift and nine hours for set nets in both sections. As stated earlier, little catch information was available due to the limited fishing inside the district. The GD fishing provided no information on relative abundance due to the limited historical perspective of how the run was developing, hopefully these two periods would shed some light on early run strength. The escapement through June 23 in the Naknek River was 103,000 (Table 22) sockeye the projected for the same time period was 61,000. In the Kvichak, with only two days of counting, 1,100 sockeye had passed the tower and the inriver estimate was 30,000. The catch from the June 24 period was only 83,500 sockeye and for the June 25 period was only 43,600.

The district test boat fished the Naknek Section the morning of June 26. Fishing was marginal, no sockeye were caught near the Naknek River entrance or at Ships Anchorage. Most of the fish harvested were near the Johnson Hill line. No sets indicated a large volume of fish in the area (Table 5). The catch rates from Kvichak inriver test were decreasing from the 50,000–inriver

estimate seen on June 24 to only 10,000 on June 26 (Table 25). The total escapement through June 26 on the Kvichak River was 24,000 sockeye, 120,000 for Naknek River and 8,300 Alagnak River. The expected count, based on historical curves, would be 49,000 for the Kvichak and 72,000 for the Naknek River. This is only the fourth year a tower has been on the Alagnak since 1976 so no projected curves have been developed. The district test boat fished in the Naknek Section on the a.m. tide on June 27; indices improved over the day before but were not outstanding. The district had been closed for the past five tides. Escapement into the Naknek River was more than two days ahead of the historic curve yet the Kvichak remained below the curve slightly. With surplus escapement in the Naknek River and escapement slightly behind schedule in the Kvichak River, a short four-hour period was allowed in the Naknek Section only beginning at 8:30 p.m. Sunday, June 27. The harvest from the four-hour period was 151,500 sockeye.

Following the short period on June 27, Naknek River escapement continued to increase with 145,000 on June 28 and 122,600 on June 29. The Kvichak River escapement saw only meager improvement, 5,000 on June 28 and 28,000 on June 29. However, inriver test for the Kvichak River observed a substantial change in movement on June 28 with an estimated 115,000 sockeye. On June 29, it increased to 400,000 sockeye and by June 30 the estimated inriver estimate jumped 1.2 million sockeye. The Naknek Section only opened for two short periods June 29 to both set and drift gillnet gear. Later that day, the second period was extended to set gillnet gear an additional 25 hours, and remained open until the evening of July 4. The Kvichak District opened to set gillnet fishing only at 9:00 a.m. June 30 for 7.5 hours and again the morning of July 1 where it was then extended daily until July 4. The drift gillnet fleet fished a portion of each tide from the morning of June 29 until the morning of July 6.

The cumulative escapement for the Naknek River through July 3 was slightly more than 715,000 sockeye; the projected escapement through July 3 was 420,000, four days a head of schedule. The Kvichak however, was not as far ahead of schedule; the cumulative escapement through midnight July 3 was nearly 1.1 million. The projected escapement for that date was 950,000 sockeye. The gap between the actual and expected was narrowing. The harvest allocation through July 3 was 76% drift 13% Naknek set and 11% Kvichak set. With the set gillnet fleet ahead in allocation, the next two periods were drift gillnet gear only in the Naknek Section. The Kvichak Section remained closed.

The test boat explored the Kvichak Section on the morning tide of July 3 finding indices ranging from 8 to 541 for an average index of 170. A total of eight drifts harvested 700 sockeye. These indices were made near peak run timing and to date, no drift gillnet fishing in the Kvichak Section had occurred. If the run was as forecast, it was expected that more evidence would have been seen in the district. Based on this, the industry was notified that if the Kvichak escapement did not improve significantly, the NRSHA would open as early as 4:30 p.m. Tuesday, July 6.

The cumulative escapement for the Naknek River through July 4 was nearly 785,000 sockeye; the projected cumulative escapement through July 4 was 530,000, still four days a head of schedule. The daily escapement past the Kvichak tower on July 4 was 230,000 sockeye, considerably less than the 390,000 sockeye needed. The actual cumulative escapement of 1.3 million sockeye was tracking the historical curve of 1.3 million. However, this alignment occurred with no drift gillnet fishing in the Kvichak Section and only marginal fishing with set gillnet gear. Therefore, one would expect a wider spread between the actual and the anticipated curves when considering total run information. To keep on track with the historical curve, the

escapement for the next two days would need to be 900,000 sockeye. The inriver estimate from the test fishery at Levelock projected only 200,000 sockeye inriver. Therefore, escapement was falling further behind and there was an increased likelihood of being more than one day behind the cumulative escapement goal curve. The Naknek/Kvichak District closed at 9:30 p.m. Tuesday, July 6.

To protect the quality of escapement for sockeye and other salmon species when the NRSHA is open, the BOF opted for an optimal escapement goal (OEG) of 800,000 to 2.0 million sockeye for the Naknek River. This would enable the department to pulse (multiple short periods) the fishery. The short periods would allow escapement of salmon without encountering fishing gear and minimize fishing during the low tides. To accomplish this, the drift gillnet fleet began fishing near the 15-foot flood stage and ended at or near the 15-foot ebb stage of the tide. For the set gillnet fleet, the fishery was centered on the 10-foot tides during both the flood and ebb. When runs to the Naknek were at a magnitude of 4 to 6 million, the upper OEG would come into effect. However, when runs to the Naknek are less than 3 million, escapements can be held to less than 1.4 million sockeye and yet continue with the pulse style fishery.

As discussed earlier, the BOF changed the way fish would be distributed in the NRSHA. Prior to 2004, the gear groups fished separately and alternated the periods. During the winter BOF meeting, the BOF applied the allocation percentages to the NRSHA so the harvest is to be divided 84 /16 with drift gear getting the 84%. The allocation as of July 4 was 75% drift 25 % set gillnet. To distribute the fish to the gear groups the drift fleet fished the four tides. The set gillnet users fished the evening tide on Thursday July 8 and again on July 10. While in the NRSHA, set gillnet users fished seven tides, the drift gillnet fleet fished 18 tides. The sockeye harvest for drift gillnet gear was 900,000 sockeye, set gillnet gear caught 122,000. The allocation percentage in the NRSHA was 88% drift, and for the season including GD harvest and Naknek/Kvichak District was 81% drift harvest.

The NRSHA remained open until the morning of July 19 when the Naknek Section of the Naknek Kvichak District opened to both drift and set gillnet gear on the fall schedule of 9:00 a.m. Monday to 9:00 a.m. Friday until September 30. With little effort and few sockeye in the catch, the entire Naknek/Kvichak District opened on August 2 to commercial fishing on the fall schedule. There were 68 deliveries between August 2 and September 30 with the last reported delivery on September 3. The sockeye harvest during that time period was only 470.

The sockeye return to the Alagnak River was record-breaking in 2004, far exceeding the 2003 record of 3.7 million with a total of 5,396,592 sockeye. Aerial surveys of the spawning systems were conducted weekly in 2004 from July 18 to September 14. An estimated 2.9 million sockeye were observed from the air over that time period. The department will continue a counting program on the Alagnak to monitor the effects of these large escapements.

The sockeye salmon harvest totaled just over 4.7 million (Appendix A3). The reported commercial harvest of 1,274 Chinook was below of the recent 10-year average harvest of 2,534 (Appendix A4). The chum salmon harvest totaled 28,895 fish, less then the 10-year average of 107,000 (Appendix A5). There was a reported commercial harvest of only 2,138 coho salmon in the Naknek/Kvichak District (Appendix A7). Subsistence harvests may be found in Table 30.

Egegik District

The 2004 sockeye salmon run to the Egegik District of 11.5 million fish was the largest run recorded since 1996, and it was approximately 5% below the forecast of 12.1 million sockeye. Sockeye salmon runs to the Egegik District during the past four comparable cycle years, dating back to 1984, have ranged from 6.4 to 12.7 million fish with an average of 9.7 million. The 2004 run was 19% above the average for the recent cycle years (Appendix A13). The harvest of 10.2 million sockeye salmon was the seventh largest commercial harvest in the 110 year history of the fishery. An escapement of approximately 1.3 million fish was achieved, which was slightly over the mid-range of the Biological Escapement Goal (BEG) of 800,000 to 1.4 million (Table 1).

The Alaska Department of Fish and Game (ADF&G) forecasted a Bristol Bay run of 46.6 million sockeye salmon in 2004, and a harvest of approximately 34.7 million. The projected Egegik District harvest of 11 million sockeye was 32% of the predicted Bay's harvest (Table 1). With a third of the Bay's predicted harvest, there was a fair amount of interest in fishing the Egegik District this season, and by June 17 most of the drift gillnet effort, 440 vessels, had registered to fish in Egegik. Bay-wide, there were approximately 900 vessels registered to fish on June 17. This early show of effort was due to the creation of the general fishing district outside and between the Bay's terminal fishing districts from June 7 until June 22.

Commercial salmon fishing was opened in the Egegik District on June 1, but no landings occurred until June 7 (Table 11). Through June 16, the total catch of approximately 96,000 was well above the 20-year average of 16,000. In fact, it was the highest cumulative catch on record through this date. The fishery was allowed to close as scheduled at 9:00 a.m. on June 16, but was reopened for 8-hour periods on June 17 and 18. It did not make sense to allow commercial fishing in a General District just outside the terminal Egegik District and not allow some fishing time inside the terminal district.

Daily inriver test fishing, which provides estimates of sockeye salmon passage into the lower portions of Egegik River, began on June 14 at the usual sites just upstream of Wolverine Creek (Table 26). The Egegik River counting towers began operation on June 17 (Table 22), and provided daily estimates of sockeye salmon passage into Becharof Lake. Initial inriver test fishing catches were fair and results through June 18 indicated that approximately 70,000 sockeye salmon were in the river and above the commercial fishing district (Table 26). The tower count was 31,000 through June 18 and two to three days ahead of the expected level.

The June 17 and 18 catch totaled over 100,000 sockeye salmon and was one of the better harvests for these dates. The catch per delivery (CPD) was better inside the Egegik District than it was in the General District just outside of it. The tower escapement count continued to increase and totaled 41,000 sockeye salmon through June 19, and was still two to three days ahead of the expected level. Another brief commercial fishing period was allowed on June 20.

For the 8-hour fishing period on June 20, the catch was approximately 225,000 sockeye salmon. This was the fifth largest catch and the third best CPD on record for this date. Egegik District fishing continued with 8-hour daily fishing periods through June 25.

The June 21 to June 25 daily harvests ranged from 162,000 to over 435,000 sockeye salmon while the escapement count increased to 150,000. With the set gillnet harvest allocation at about 10%, the next fishing period, an 8-hour period on June 26, was for set gillnet fishers only.

The June 26 catch was approximately 85,000 and averaged about 330 fish per delivery. This was the highest CPD for this date and an indication of a strong push of fish into the district. Indeed, the inriver test fishing results shot up to their highest daily index for the season and one day later the cumulative tower count doubled to 325,000 sockeye salmon. Fishing periods for both tides were scheduled on June 27.

The catch of approximately 895,000 sockeye salmon was the third largest harvest on record for this date and brought the cumulative harvest to about 2.5 million or the fifth largest catch for this date. Inriver test fishing had another good day on June 27 and results indicated an estimate of 180,000 additional fish up the river. Fishing on June 28 was also scheduled for two tides, and resulted in a harvest of over 700,000 sockeye salmon. The daily tower count was over 200,000 on June 28, bringing the cumulative escapement up to 525,000. This level of escapement was two days ahead of the expected level with early run timing or seven days ahead with normal run timing. Inriver test fishing results dropped off on June 28 and stayed low for the next six days. Commercial fishing was cut back to one tide per day for drift gillnet fishers, but some extra time was scheduled for set gillnet fishers to make up some ground on their harvest allocation. From June 29 to July 4, daily catches were fairly steady and averaged 676,000 sockeye salmon and ranged from 633,000 to 765,000. The cumulative harvest was now approximately 7.2 million, however; the tower escapement slowed down to a cumulative count of 718,000 on July 4. A longer closure was needed to allow more fish up the Egegik River, and the Egegik District was closed on July 5.

Meanwhile, the struggling Kvichak River escapement prompted the closure of the district and the opening of the Naknek River Special Harvest Area (NRSHA). The opening of the NRSHA triggers the reduction of the Egegik District to the Egegik Special Harvest Area (ERSHA). Inriver test results improved on July 5 and a brief fishing period in the ERSHA was scheduled for July 6.

The July 6 fishing period resulted in a harvest of about 430,000 sockeye salmon of which 139,000 were harvested by set gillnet fishers. This was the second largest single day harvest in Egegik set gillnet history and was indicative of a substantial Egegik run. Set gillnet harvests averaged over 100,000 for the next three days and peaked with a catch of 166,000 on July 8. The 2004 Egegik set gillnet fishery has four of the top five largest single day catches in its history. From July 6 through July 9 the total harvest averaged 470,000 sockeye salmon per day and ranged from 393,000 to 607,000 bringing the cumulative catch up to approximately 9.1 million. Sockeye escapement went to 1.2 million fish by July 10.

Sockeye salmon landings in the district continued until the end of July (Table 11), reaching a seasonal cumulative total catch of approximately 10.2 million fish. The counting towers ceased operation on July 15 and the final escapement count totaled 1.3 million sockeye salmon. This was approximately 18% over the midrange of the BEG range. The escapement sex ratio was approximately 45% males to 55% females.

The age composition of the 2004 Egegik District sockeye run was as follows:

Age Group	Catch	Escapement	Total
1.2	13.2%	13.3%	13.2%
2.2	75.1%	79.9%	75.6%
1.3	5.3%	2.1%	4.9%
2.3	5.8%	2.6%	5.4%
Other	0.6%	2.1%	0.9%
Totals	100%	100%	100%

Most of the sockeye salmon run (88.9%) were 2-ocean fish age 1.2 and 2.2 fish and came from the 2000 and 1999 escapements of 1.11 million and 1.7 million, respectively. Commercial fishers harvested approximately 89% of the Egegik inshore sockeye run, which is slightly above the recent 20-year average of 83%. Peak harvest dates were June 27, and July 1, when 895,000 and 766,000 sockeye salmon were landed on those dates. Peak tower counts occurred June 27–29, and July 8–9, when over 100,000 sockeye salmon were counted on each of those dates. The peak catch rate for drift gillnet fishers was 131,300 sockeye salmon per hour on July 4, and for set gillnet fishers it was 17,000 sockeye salmon per hour on July 6. During the emergency order period from June 16 to July 17, a total of 243.5 hours were fished by drift gillnet fishers, or 33% of the 744 available hours. For set gillnet fishers, 382 hours or 51% of the available time was fished. This compares to 158 hours for drift gillnet fishers and 120 hours for set gillnet fishers last season. By the end of the emergency order period set and drift gillnet fishers had exactly their harvest allocations of 14% and 86%, respectively. Peak drift gillnet effort was 573 vessels on July 1 (Table 9). Approximately 50 vessels left the district before the ERSHA was placed into effect on July 6.

The commercial harvest of other salmon species in the Egegik District was approximately 77,000 fish, or approximately 1% of the total harvest. The Chinook harvest was approximately 1,600 fish, very close to the 1984 to 2003 (20-year) average of approximately 1,600 (Appendix A4). The district chum harvest of approximately 72,400 fish was 20% below the recent 20-year average of 90,800 (Appendix A5). No pink salmon harvest was reported. The coho salmon harvest of approximately 2,900 fish was 92% below the recent 20-year average of 35,000 (Appendix A7). Lack of interest in purchasing Egegik District coho salmon was the main reason for such a low harvest.

Aerial surveys were conducted in the Egegik and King Salmon River systems to provide escapement indices for Chinook, chum, and coho salmon. The resulting counts were 1,513 Chinook, 1,740 chum, and 41,400 coho salmon. Chinook escapement indices ranged from below to above average in the streams surveyed. The Chinook salmon index count was 41% above the 20-year average while the chum salmon count was 73% below average. The Chinook salmon count was the third largest count recorded in the last ten years and the chum count was the fifth largest in ten years. The coho salmon index represents an aerial count from several tributary streams of Becharof Lake and it was almost nine times the 1997 to 2003 average count of 4,630.

In summary, the 2004 sockeye salmon season at Egegik was a very productive one. The run was approximately 7% below forecast. The catch of 10.2 million was the seventh largest on record and the largest harvest since 1996. It was 24% above the twenty year average of 8.2 million sockeye salmon. Like the last four years, this year's run timing was early and it was

approximately four days ahead of normal run timing. There were 16 processors that purchased fish in the Egegik District this season. Bay-wide processing capacity became an issue in early July, and for a few days most of the commercial fishers had some sort of catch limit placed on them. Harvest for Egegik set gillnet fishers was actually suspended for a tide or two.

Ugashik District

The 2004 inshore sockeye salmon run to the Ugashik District was approximately 3.9 million fish, or 5% less than the forecast of 4.1 million (Table 1). The Ugashik District run was the largest run in eight years. The commercial sockeye salmon catch of approximately 3.1 million fish was also the largest harvest in eight years. The sockeye salmon escapement to the Ugashik River was approximately 776,000 fish, or 9% under the middle of the BEG range of 500,000 to 1.2 million. Comparable inshore returns over the last four cycles, dating back to 1984, have ranged from 3.9 million to 5.4 million fish with an average of 4.5 million, making the 2004 run of 3.9 million 13% below the average for the last four cycle years. (Appendix A14).

Even though there was a 4-day weekly fishing schedule established from June 1 through June 23, initial landings didn't occurred in the district until June 14 (Table 12) when only a few sockeye and Chinook salmon were landed. The harvest through June 23 was minimal with only 14,400 sockeye salmon harvested. This compares to the 20-year (1984–2003) average cumulative harvest, through June 23, of 65,200. The cumulative catch through June 23 was one fifth of what might have been expected, especially with the earlier run timing observed in Bristol Bay stocks for the last four years.

The preseason forecast for the Ugashik District suggested a harvest of 3.2 million sockeye salmon, which would have been the largest harvest in eight years. Accordingly, commercial fishers were advised that fishing time after June 23 would depend on inriver test fishing results, fishery performance, and tower escapement levels. With this advisory, 23 drift vessels registered for Ugashik on June 24 (Table 9).

Inriver test fishing, which operates about three miles upstream of Ugashik Village, started on June 22 and provided a daily estimate of sockeye salmon passage into the lower part of the Ugashik River. The counting tower project, operating about 24 miles upstream of Ugashik Village, started counting on June 26 or seven days earlier than usual. After the first six days, inriver test fishing results estimated approximately 20,000 fish up the Ugashik River which, when counted at the tower, would place escapement ahead of schedule. The first tower count on June 26 was a partial day's count and totaled approximately 1,500 fish (Table 22). With a small fleet and anticipated escapement ahead of expected levels, brief fishing periods were scheduled from June 24 to June 26.

The total harvest of approximately 63,000 was recorded over these three days bringing the cumulative harvest to approximately 78,000 which was slightly below the 20-year average of 80,000. Inriver test fishing results were falling off and indicated few fish moving up the Ugashik River. The fishery was rested for two days and then another brief fishing period, 4 hours for drift gillnet fishers and 8 hours for set gillnet fishers, was scheduled on June 29 to check the abundance of fish within the Ugashik District.

The June 29 catch was only about 15,000 sockeye salmon for 43 drift gillnet deliveries and 19 set gillnet deliveries, However the small fleet size enable brief fishing periods to be used over the next few days and a set gillnet only period on July 3 to assess run strength within the Ugashik

District. Inriver test fishing was still slow and after fishing a 3-hour drift gillnet period and 6-hour set gillnet period on July 4, the fishery was closed and district test fishing was scheduled. District test fishing results are listed in Table 6. On July 5, there was a good indication of fish between Pilot Point and the inner district marker at Muddy Point, but few fish were observed in the river above the district. This picture changed considerably on July 6 when indices average over 1,000 points above the district (Table 6). A 9-hour fishing period was scheduled for July 7.

The July 7 opening harvested approximately 97,000 sockeye salmon. The catch per drift gillnet delivery was over 2,200 sockeye salmon and was the highest on record for this date. Inriver test fishing also picked up on July 7 and averaged 2,400 index points (Table 27). Inriver test fishing continued to show a good number of fish moving up the river over the next seven days and fishing periods were scheduled accordingly. The Ugashik tower count was improving as well and went from 45,000 on July 8 to 619,000 on July 14. From July 8 through July 14 the daily commercial harvest ranged from 170,000 to 681,000 sockeye salmon and averaged approximately 342,000 fish per day. The cumulative harvest totaled approximately 2.8 million, or 86% of the preseason forecast.

Fishing periods were scheduled through 9:00 a.m. July 17 when the fishery reverted to the fall fishing schedule of 9:00 a.m. Mondays to 9:00 a.m. Fridays. By July 17 the cumulative catch was approximately 3 million sockeye salmon, while the escapement tower count reached 659,000 fish.

Sockeye landings continued through July and into August with the final catch totaling approximately 3.1 million. The final Ugashik River sockeye escapement count was 776,000 fish when the project ended on July 24. Additionally, about 39,000 sockeye were counted during aerial surveys of the Dog Salmon and King Salmon rivers (Appendix A14).

By the end of emergency order period, setnetters had caught approximately 12% of the sockeye harvest and drift gillnet fishers took 88%. This breakdown is a 2% discrepancy from the allocation. To achieve the established allocations, approximately 53,000 fish in the set gillnet catch should have gone to the drift gillnet harvest. Between June 23 and July 17, setnetters fished a total of 214 hours, or 62 hours more fishing time they had last year, while drift gillnetters fished a total of 151 hours, or 14 hours less fishing time than they had last year.

The peak escapement counts at the counting towers occurred July 9 through July 13 when over 73,000 sockeye salmon were counted on each of those days. The 2004 escapement appeared to be more like the typical Ugashik escapement pattern with most of the escapement occurring over a few days. The escapement sex ratio was approximately 53% males to 47% females.

The age composition of the 2004 Ugashik District sockeye salmon run was as follows:

Age Group	Catch	Escapement	Total
1.2	40.4%	47.6%	41.9%
2.2	35.9%	28.5%	34.4%
1.3	17.6%	19.3%	18.0%
2.3	5.8%	4.0%	5.4%
Other	0.3%	0.6%	0.3%
Totals	100%	100%	100%

The commercial harvest of other salmon species totaled approximately 70,000 fish or 2% of the district's total harvest. The harvest of 868 Chinook salmon was 59% below the 20-year

(1984-2003) average of 2,133 (Appendix A4). Ugashik Chinook salmon escapement indices were above average in the Dog Salmon and Ugashik Rivers, but below average in the King Salmon River. The Ugashik index count of 5,092 Chinook salmon was 9% above the 1984 to 2003 average of 4,670. The chum salmon harvest of approximately 64,000 fish was 11% below the average (Appendix A5). The chum salmon escapement index count of 33,500 was 10% above the 1984 to 2003 average count of 30,550. The coho salmon harvest of approximately 4,700 fish was well below the 20-year average of 22,000, but there was very little commercial effort for Ugashik coho salmon again this year (Appendix A7). The coho salmon escapement index count of 5,280 for the Upper and Lower Ugashik Lakes was slightly above the 1996 to 2003 average count of 5,035, but it was the second highest index count recorded for the lakes during this time. The timing of this survey was good with most coho salmon still schooled up below creek mouths. Pink salmon harvest in the Ugashik District was 120 fish this season (Appendix A6).

The Ugashik District fishery harvested approximately 79% of the sockeye return to the district, which is slightly above the 20-year (1984–2003) average removal rate of 69%. Peak catch per hour occurred on July 10 for drift gillnet fishers, when approximately 580,000 sockeye salmon were landed in 12 hours, or 48,300 fish per hour. For set gillnet fishers, their peak catch occurred on July 7 when approximately 49,000 sockeye salmon were landed in 9 hours, or 5,500 fish per hour. Peak catch per landing occurred on July 7 for drift gillnet fishers and on July 9 for set gillnet fishers when approximately 2,200 and 477 sockeye salmon, respectively, were taken per delivery.

A total of 15 buyers operated in the district during the season (Table 28), or three more than last year. Nearly all of the catch was tendered to other districts for processing. For a few days in early July, there were some delivery limits placed on Ugashik commercial fishers by some of the processors, and one processor quit buying fish from set gillnet fishers at Ugashik Village on July 10 because of the poor condition of the fish.

Nushagak District

The 2004 Nushagak District total inshore sockeye salmon run was approximately 8.2 million fish, 9% over the preseason forecast of 7.3 million fish (Table 1). Commercial sockeye harvest, in the Nushagak District, reached 6.1 million, 13% above the preseason projected harvest of 5.4 million sockeye. Total sockeye escapement in the district's three major river systems was 2.15 million or 14% over the combined mid-range escapement goal of 1.88 million. However, escapement into the Igushik River failed to reach the 150,000 lower end of the escapement goal range for the second time in three years.

In December 2003, the Alaska Board of Fisheries convened in Anchorage to consider proposed regulatory changes for the Bristol Bay salmon and Togiak herring fisheries. Changes for the Nushagak District included an expanded area for harvesting Chinook salmon during directed Chinook openings, a mechanism for shutting down either gear type if the harvest of sockeye in a directed Chinook opening exceeded a 2:1 sockeye to Chinook ratio, as well as new regulations about towing and fishing while grounded.

Peak Chinook salmon production in the early 1980's resulted in record commercial harvests and growth of the sport fishery. Declining run sizes and the question of how to share the burden of conservation among users precipitated the development of a management plan for Nushagak Chinook salmon. Since the plan was adopted in 1992, the Nushagak-Mulchatna Chinook Salmon

Management Plan (NMCSMP) has governed management of the Nushagak Chinook salmon fisheries (5 AAC 06.361). The plan was amended in 1995, 1997, and 2003.

The purpose of this management plan is to ensure an adequate spawning escapement of Chinook salmon into the Nushagak River system. The plan directs the department to manage the commercial fishery for an inriver goal of 75,000 Chinook salmon past the sonar site at Portage Creek. The inriver goal provides: (1) a biological escapement goal of 65,000 spawners, (2) a reasonable opportunity for inriver subsistence harvest and (3) a guideline sport harvest of 5,000 fish. The plan addresses poor run scenarios by specifying management actions to be taken in commercial, sport, and subsistence fisheries, depending on the severity of the conservation concern. Management decisions are heavily dependent upon the estimates of inriver Chinook salmon escapement provided by sonar counters located at Portage Creek on the lower Nushagak River.

Trends in age composition of Chinook spawning escapements in 1995 and 1996 raised concerns about the quality of Chinook escapements in the Nushagak River. The proportion of large (age-5 through age-7) fish was less than desired, and the age composition of the escapement during the first half of the run differed substantially from the escapement during the second half of the run. In the early portion of the run, male Chinook salmon of the younger age classes comprised the majority of the escapement, while the older age classes became prevalent in the latter portion of the escapement. Differences in age composition between escapement and total run, and between early- and late-season escapement, result from size-selective harvests. To address this concern, the department adopted a strategy of allowing unfished pulses of Chinook into the Nushagak River before opening a commercial period. Allowing untargeted fish into the river was intended to lessen the effects of selectivity in the commercial fishery while allowing fish with a natural age distribution to enter the river. In November 1997, additional language, directing the department to allow pulses of Chinook salmon into the Nushagak River that were not exposed to commercial fishing gear, was added to the NMCSMP.

The department adjusts commercial fishing time and area to harvest Chinook salmon surplus to the inriver goal. Management decisions are based on the preseason forecast and inseason indicators of run strength, including commercial harvest performance, subsistence harvest rates and inriver passage rates by the sonar. During the last two years, managers have used directed Chinook openings early in June to harvest fish when a surplus appears to be available. Because these openings occur usually during the first third of the run, it allows for the harvest of more parts of the return at a lower level but also has the potential for complicating management if the second half of the return is significantly weaker than the first half. When a surplus is forecasted, early commercial openings provide for more time between openings allowing unfished pulses of fish to move through the district, better quality of fish in the harvest, and harvest spread over a larger portion of the return.

The 2004 Nushagak District Chinook salmon forecast was 145,000 fish. With an inriver goal of 75,000 fish, and average sport and subsistence harvest of 6,000 fish below the counting station, 64,000 Chinook would theoretically be available for commercial harvest. In 2003, a new strategy was adopted to address concerns about incidental Nushagak sockeye catch in directed Chinook openings. This strategy focused on having directed Chinook openings as early and as often as escapement and the management plan would allow. For both 2003 and 2004, there were two directed Chinook openings but the early return of sockeye forced managers to switch to sockeye management by June 20. In 2004, the unexpected abundance of Chinook allowed managers to

relax mesh restrictions and let permit holders target Chinook or sockeye for the remainder of the season.

The sonar station at Portage Creek was operational on June 8. The daily Chinook counts started off above expectations and continued to be high for the first seven days of counts. Based on this escapement, the first commercial opening was announced for June 14. This directed Chinook opening was for five hours and resulted in a harvest of approximately 7,500 Chinook from 56 deliveries (Table 13). Chinook escapement past the sonar counter was slow for the next two days but based on the high catch per unit effort and some subsistence information, another directed Chinook opening was announced for June 17. The second opening was for four hours and resulted in a harvest of approximately 14,000 Chinook and 5,000 sockeye from 149 deliveries.

Although the harvest of 15,000 Chinook in one four hour period was higher than expected, the escapement past the sonar counters continued at a steady pace on the 17th and 18th of June before virtually doubling on June 19th when the daily escapement exceeded 20,000 Chinook. The escapement of sockeye also began to increase. On the morning of June 20, the fleet was advised they were on short notice and that the earliest possible opening was June 21 at 3:30 a.m. Chinook escapement continued to be strong during the day of the 20th, and an opening was announced for 3:30 a.m. on June 21. Since sockeye escapement had also increased, the focus now was on sockeye management, but no mesh restriction was imposed for any further opening in 2004.

Chinook escapement and harvest continued at a surprisingly steady pace; the peak escapement was on June 19 when 20,395 Chinook were counted and there were two other days when escapement exceeded 10,000 Chinook. The total Chinook escapement for 2004 was 116,400; the total commercial harvest was 93,414. Although subsistence and sport harvest numbers are not yet available, it is safe to assume that the total Chinook run to the Nushagak District exceeded 215,000 fish and was 48% above the preseason forecast.

From 1986 to 1998, the Nushagak District sockeye fishery was managed to achieve a biological escapement goal range of 340,000 to 760,000 spawners in the Nushagak River and a range of between 700,000 to 1.2 million spawners in the Wood River. The Alaska Board of Fisheries modified the Wood River Special Harvest Area Management Plan in March of 1999 to include language that directed the department to manage the Nushagak River for an OEG of no less than 235,000 sockeye when the ratio of Wood River to Nushagak River sockeye was projected to be greater than 3:1. This OEG was adopted by the Board of Fisheries for the 1999 and 2000 seasons to give “economic relief” to the Nushagak District permit holders by allowing a higher exploitation rate on the stronger Wood River sockeye stock in the district. The plan was modified again in January 2001 to allow for a “variable” escapement goal for the Nushagak River and for a change in the Wood River escapement goal range to .7 to 1.5 million with a mid-range goal of 1.1 million. This mandated that managers use the 340,000 minimum goal when the preseason forecast for the Nushagak River was greater than 1 million sockeye and use the 235,000 OEG minimum when the preseason forecast was less than 1 million sockeye. The department was required to reevaluate the Nushagak return during the first week of July and adjust the escapement goal accordingly if the projection changed from the preseason forecast. The 2004 preseason forecast for the Nushagak River was 1.8 million sockeye, therefore, the Nushagak River would be managed for the BEG range of 340,000 – 760,000 spawners at least until the run was reassessed in early July.

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 7.3 million fish (Table 1), which was 24% higher than the 20-year average actual run of 5.9 million sockeye (Appendix A15). Strength of the forecasted Wood River run (4.5 million) was 30% above the 1984–2003 average actual return, while the Nushagak River sockeye run (1.8 million) was expected to be 20% greater than the 20-year average actual return. The forecasted return to Igushik River (1.08 million) was virtually the same as the 1984–2003 average return of 1.06 million (Appendix A16).

There are no tools available to manage Nushagak and Wood River stocks independently in the commercial district because run timing and migratory routes overlap considerably. The Wood River Special Harvest Area Management Plan was adopted in 1996 as a means to conserve coho salmon in the district while continuing to harvest surplus sockeye salmon in the Wood River. The regulatory framework of the WRSMA plan was used by the department in an emergency regulation during the 1997 season for sockeye management due to a large disparity in run strengths between Wood and Nushagak River sockeye salmon stocks. The Board then formally modified the plan in November 1997 to provide a stock specific management tool to target Wood River sockeye salmon. The plan allows managers to open the Wood River Special Harvest Area for the conservation of Nushagak River sockeye salmon. The Nushagak River sockeye escapement peaks slightly earlier than escapement in Wood River. If stock proportions in the escapement represent stock abundance in the district and harvests are not stock selective, delaying the sockeye openings should help to conserve the Nushagak stocks. However, without an additional stock-specific means to exploit Wood River sockeye, surplus Wood River sockeye cannot be harvested without sacrificing the Nushagak River escapement goal particularly when the Wood River run is on the order of three (or greater) times as large as the Nushagak River run.

For at least the last sockeye life cycle, Wood River runs have been more than three times larger than Nushagak River runs due to high production in the Wood River system and decreased production in the Nushagak River system. Throughout these years, the department has attempted, relatively unsuccessfully, to keep sockeye escapement in the Wood River from exceeding the upper end of the escapement goal range, while simultaneously attempting to achieve at least the lower end of the BEG range in the Nushagak River. A ratio of 2.5:1 (Wood River to Nushagak River sockeye) was forecast for 2004. To conserve Nushagak stocks, the department plan was to limit commercial fishing time early in the sockeye run. In accordance with the “variable” escapement goal for the Nushagak River and based on the preseason forecast, the department was managing for the BEG range of 340,000 – 760,000 sockeye in the Nushagak River while attempting to keep the Wood River sockeye escapement below 1.5 million, the recently adopted upper end of its BEG range.

The sonar project for the Nushagak River was operational on June 8, and the counting project on the Wood River was in operation on June 17. On June 19, there was an apparent push of fish beginning past the Wood River counting towers. In response to this increase in escapement the drift fleet was placed on short notice and the set net fleet was given a 6-hour opening on June 20. A second set net only opening was announced for the early morning of June 21 and a 4-hour drift opening was also announced. The idea was to have a short drift opening to see if fish were building up in the district. The apparent push of fish from June 19 and June 20 quickly diminished and the harvest from the drift and set net openings was not indicative of a large buildup of fish in the district.

Based on constraints in the management plan there are only two times a day that a set net fishery can start. One of these times occurs during the 13-hour period between the last announcement time at 8:00 p.m. and the next announcement at 9:00 a.m. the following morning. The status of escapements and fish movement in general can change quite rapidly in 13 hours, especially early in the season. In 2004, managers used set net only openings in the morning as a tool to get information on fish movement but also to be ready to respond to such movement. This gave managers a window of time in the morning to gather information on catch and escapement from the previous day and maximum flexibility to respond to any developments in fish movement that occurred overnight, with a set net extension and or a drift opening if necessary. Set net only openings on June 22 and June 23 harvested relatively few fish but escapement increased a bit on the June 23 so a drift opening was announced for June 24. With the strong forecast, the prospect of limits later in the season, and information from genetics samples in the Port Moller test fishery indicating a strong return to the Wood and Nushagak Rivers, managers were more aggressive than escapement would otherwise have warranted.

Between June 25 and June 29, set net fishing was extended in 25-hour blocks and drift fishing was allowed everyday for 3–6 hours. The daily escapement past the Wood River towers on June 29 was 101,000 sockeye bringing the cumulative total to 354,000. It appeared the salmon were now arriving in large numbers and managers began fishing the drift fleet two periods a day for 5 to 10 hours at a time; the set net fleet was extended until further notice. At this point, managers were trying to control escapement and distribute fish throughout the district so the set net fleet would have harvest opportunity. This was done by giving the set net fleet more fishing time than the drift fleet and by fishing with the drift fleet mostly on the ebb.

Fishing continued on this schedule until the end of the allocation period on July 17. The only exception to the schedule was when several processors announced they would be placing their fleets on limits. This prompted managers to extend the drift opening in progress for 18 hours with the intent of maximizing fishing opportunity for the fleet while they were on limits. After one 18-hour extension, managers returned to the two openings per day schedule until July 17. On July 17, both drift and set gillnets were extended until further notice and fishing did not officially close until September 30. Fishing effort did slow considerably in August and was sporadic until the last delivery in early September.

Set gillnet only fishing in the Igushik section began on June 16 and was opened until further notice. With a forecast of over a million fish for the Igushik River, and the set net fleet limited by processor requirements to deliver fish offshore, it was expected that the set net fleet would not be able to harvest all of the fish surplus to escapement needs in the Igushik River. Managers decided to use the set net fleet as a test fishery and anticipated putting the drift fleet in the Igushik section as indicated by increased set net harvest and escapement. Unfortunately, the escapement never warranted a drift opening in the Igushik section and by early July, the set net opening was changed from “open until further notice” status to 6-hour openings from July 5–7 to complete closure on July 8. The failure of the Igushik return is confusing and a cause for concern. The Igushik River escapement has failed to reach the mid-range for three consecutive years and has failed to reach the lower end of the escapement goal range in two of the last three years.

The final harvest percentages in the Nushagak District were 84% drift, 15% Nushagak Section set, and 1% Igushik Section set (Appendix A9). The sockeye salmon escapement into the Igushik River was 109,000, less than half of the mid-range goal of 225,000. The Nushagak sockeye salmon escapement was 490,000 or 89% of the mid-range goal of 550,000. The Wood River

sockeye salmon escapement was 1.54 million, 40% more than the mid-range goal of 1.1 million. The total sockeye salmon harvest in the Nushagak District was 6.1 million.

The Nushagak Coho Salmon Management Plan (5 AAC 06.368) established spawning and inriver escapement goals and provides guidance to the department in managing sport, subsistence, and commercial fisheries that harvest coho salmon. The plan directs the department to manage the commercial fishery in the Nushagak District to achieve an inriver run goal of 100,000 coho salmon in the Nushagak River. The inriver run goal provides for a biological escapement goal of 90,000 spawners and 10,000 additional fish for upriver sport and subsistence harvests. Based on parent year escapement of approximately 210,000 spawners in 2000 and recent production trends, the 2004 coho return was expected to be strong. The coho plan directs the department to close “the directed coho salmon commercial fishery” by July 23 when the total inriver run in the Nushagak River is projected to be less than 100,000 but at least 60,000 coho. In 2004 the sonar project on the Nushagak River ceased operation on August 17. The count never fell significantly behind the 100,000 fish escapement curve and commercial fishing remained open continuously. Effort in the commercial fishery was limited and sporadic. The coho escapement past the sonar station was 152,613, well above the 100,000 goal. Final reported commercial harvest of coho salmon was approximately 50,000 fish (Table 13, Appendix A23).

Togiak District

The 2004 inshore sockeye run of 593,334 fish was the thirteenth largest run returning to the Togiak District in the last 20 years (Appendix A17) and represented 61% of the preseason forecast. District sockeye harvest was 438,643 salmon, the tenth largest since 1984. Escapement into Togiak Lake was 129,462, within the range (100,000–200,000) of the Biological Escapement Goal (BEG).

The Togiak District is managed differently than other districts in Bristol Bay. This district uses a fixed fishing schedule of three days per week in the Kulukak Section, four days per week in Togiak River Section, and five days per week in the Osviak, Matogak and Cape Peirce Sections. The Togiak District Salmon Management Plan (TDSMP) adopted by the Alaska Board of Fisheries in January 1996 added 36 hours to the weekly schedule for the Togiak River Section between July 1 and July 16. This schedule is adjusted by emergency order, as necessary, to achieve desired escapement objectives. In addition, the TDSMP restricts the transfer into the Togiak District by prohibiting permit holders that fished in any other district from fishing in the Togiak District until July 24. Conversely, it prohibits permit holders that have fished in the Togiak District from fishing in any other Bristol Bay district until July 24.

The 2004 inshore run to the Togiak River was forecasted at 812,000 sockeye salmon (Table 1), of which 81% were projected to be 3-ocean fish, the remaining 19% were predicted to be 2-ocean fish (Table 2). With a midpoint escapement goal of 150,000 sockeye for Togiak Lake, approximately 662,000 sockeye would potentially be available for harvest in the Togiak River Section. A harvest of this size would have been 150% of the 20-year average. Smaller sockeye runs to other drainages in the district (primarily the Kulukak River) occur, but these are not included in the preseason forecast because age composition and escapement data are not complete. Unofficially, a contribution of 58,000 sockeye to the district harvest was projected from drainages other than the Togiak River.

As for Chinook salmon in the Togiak District, no formal forecast is issued. Recently, Chinook run strengths district-wide have declined from a high of almost 62,000 in 1983, to a low of less

than 18,000 in 2002 (Appendix A20). Chinook escapements in the Togiak River drainage fell short of the regulatory escapement goal (10,000) from 1986 through 1992. The Chinook escapement goal was reached from 1993 to 1995 with extensive commercial fishing closures and mesh size restrictions. In 1996, with only minor reductions in the weekly fishing schedule, Chinook escapement again fell short of the goal. The Chinook escapement goal in the Togiak River has been achieved regularly since that time. Reducing the weekly schedule to 48 hours per week in late June seems to provide a good balance between commercial fishing time and closures that allow Chinook escapement to be achieved.

Management strategy for Chinook salmon the last seven years has been to reduce the weekly fishing schedule in sections of the Togiak District during the last two weeks of June. The Kulukak Section was reduced to 48 hours of fishing time and was aimed at decreasing the exploitation of Chinook salmon. In the Togiak River Section, the regularly scheduled periods were reduced by 24 hours. The western sections, Cape Peirce, Osviak, and Matogak, remained open for the regularly scheduled periods.

Commercial fishing opened in the district with a regular weekly schedule on June 1. However, the first landings of the 2004 season were made on June 14 (Table 15). For that week, 282 Chinook salmon were caught. The following week was the first of the season to which the reduced schedule was applied. The commercial harvest and effort for this week was below average with 2,154 Chinook salmon, but represented the strongest mean daily catch of the season. The largest daily catch occurred on June 22, when 1,237 Chinook were harvested.

The fishery reopened on June 28 and was reduced with a split schedule. The season's cumulative catch after the last delivery on Wednesday, June 30 was 4,293 Chinook salmon. Although this is lower than average, it is the largest catch for this time period in the last five years. The close of fishing on the 30th of June marked the end of active management for Chinook salmon. Fishing reopened Friday, July 2 with the focus on sockeye salmon management.

The total Chinook harvest for the Togiak River Section was 7,707 fish (Table 16), with an additional 1,642 caught in the remainder of the Togiak District (Table 17, 18, 19). The total number of Chinook salmon caught in the Togiak District was 7% higher than the 10-year average. Escapement for the Togiak River and tributaries was above the aerial survey goal of 10,000 sockeye with a survey count of 12,324. An estimated 1,188 Chinook migrated into the Kulukak River and an additional 2,478 fish were estimated in the Quigmy, Osviak, Matogak, Slug, Negukthlik and Ungalikthluk Rivers. Commercial exploitation of the Togiak River stock was 63%; the district-wide commercial exploitation rate was 37%. Figures are not yet available for sport or subsistence harvests so the preliminary exploitation rates do not include those numbers. District-wide escapement was 15,990, 15% higher than the 20-year average (Appendix A20.) Total run size was 25,919, which is 101% of the 10-year average and 88% of the 20-year average.

Commercial fishing for sockeye opened with the regularly scheduled fishing periods on June 1. Fishing effort remained below average during the following week. The first deliveries of the season occurred on June 14.

As mentioned above, the last two weekly fishing periods in June for the Togiak River and Kulukak sections were reduced for Chinook conservation. After July 1, regularly scheduled fishing periods in the Kulukak Section were reduced to 48 hours for conservation of Kulukak River sockeye. This reduction has become common practice in recent years due to a shift in

effort to the Kulukak Section and conservation concerns for the Kulukak River sockeye stock. By the end of June, the District sockeye harvest was 22,000 fish, which was average but about half of the expected level.

Operation of the Togiak counting towers began on July 3. Commercial fishing reopened on the July 5 as scheduled. The Kulukak Section remained on a reduced schedule for the conservation of Kulukak river sockeye salmon. Permit holders were advised to listen early in a week for potential changes in the fishing schedule for the Togiak Section. Although both catch and escapement were behind the expected levels, the escapement was building normally. Additionally, the escapement was only off by one day, which could be accounted for by run timing. Therefore, the Togiak fleet fished the normal schedule closing on July 10. By July 10, the cumulative escapement past the towers was over 15,800 sockeye (Table 23). The total harvest by the July 10 was 122,000 with the majority caught in the preceding week. There was some fishing effort in the Osviak and Matogak sections during two weeks of July. A total of 420 sockeye salmon, were reported (Tables 18 and 19).

As with the previous week, when fishing commenced on Monday July 12, the Kulukak Section was reduced to 48 hours and the Togiak Section was on “stand-by”. By the afternoon of July 14, escapement past the towers on the Togiak River was over 22,290 sockeye and catch was reported to be nearly 200,000. On July 16 the fishing schedule changes, by regulation, to close at 9 a.m. Friday for the remainder of the season unless otherwise adjusted. Therefore, the Togiak River Section closed on Friday, July 16.

For the week of July 19, the Kulukak Section was reduced to 48 hours and the Togiak Section was once again on “stand-by”. On July 21, there was a pulse of escapement past the counting towers with a daily total of almost 11,000 fish. This brought the total escapement to over 53,000 sockeye. Catch in the district was strong with over 300,000 fish. Although catch and escapement were behind schedule, the escapement was on track to fall within the range of the BEG. Therefore, the district closed as scheduled Friday, July 23. The last deliveries from the Kulukak Section were made July 21 because it was the last day of tender service in the area. The season total for the Kulukak Section was 80,204 sockeye (Table 17).

The Togiak District opened to all permit holders on July 24; however, the district was not open to fishing until Monday, July 26. Although there seemed to be a lot of interest in fishing there, deliveries did not increase. There are no requirements for registration after July 24 so increased effort is difficult to assess.

Fishing reopened on July 26 in all sections however, the Togiak Section was once again placed on “stand-by”. By Wednesday, July 28, the escapement past the Togiak counting tower was over 89,190. Escapement remained on track to finish well within the range of the BEG. Total catch in the district was over 390,000 sockeye. The fishing schedule in all sections closed as scheduled.

The district opened for fishing Monday, August 2 following the same strategy as the previous weeks. By Wednesday, August 4, the cumulative escapement was over 117,000 sockeye, within the range of the BEG. Total catch for the district was over 420,000 sockeye. The Togiak River Section closed as scheduled Friday, August 6. The counting towers ceased operations August 7 after counting a season total of 129,462 sockeye.

On Monday, August 9, the district opened on the fall schedule that would dictate the remainder of the season. All but one processor had withdrawn from buying by this time and the focus of the

fishery was on coho salmon. The 2004 sockeye harvest in the Togiak District was 438,700, 66% of the expected amount available for harvest.

This year's directed coho fishery was the first since 1998. Parent year escapement in 2000 was based on incomplete aerial survey data. Final operations reports from processors indicated that there were 15,467 coho salmon caught by the last day of fishing, September 7 (Table 15). Due to poor survey conditions and flight availability problems, the Togiak District was not surveyed to assess coho escapement in 2004.

The 2004 sockeye harvest in the Togiak District was 438,700, the tenth highest in the past 20 years (Appendix A3); the total sockeye salmon run also ranked 13th among the last 20 years (Appendix A18). Commercial Chinook harvest was 98% of the 10-year average, while harvest of chum and coho were 66% and 73% respectively of the 10-year averages (Appendices 20, 21, 24). Although aerial surveys to assess escapement on most of the Togiak River could not be performed due to weather, 25,219 sockeye were observed in addition to the 129,462 sockeye that were counted at the towers below Togiak Lake. Therefore, total escapement in the Togiak District was 154,681 which is sufficient escapement. No sockeye surveys were conducted for the Kulukak River. Aerial spawning ground surveys for Chinook salmon exceeded the Togiak River drainage goal of 10,000 with a count of 12,324. No Coho salmon escapement surveys were conducted in 2004 due to weather.

2004 SUBSISTENCE SALMON FISHERY

In spite of numerous social, economic, and technological changes, Bristol Bay residents continue to depend on salmon and other fish species as an important source of food. Residents have relied on fish to provide nourishment and sustenance for thousands of years. Subsistence harvests still provide important nutritional, economic, social, and cultural benefits to most Bristol Bay households. All five species of salmon are utilized for subsistence purposes in Bristol Bay, but the most popular are sockeye, Chinook, and coho. Many residents continue to preserve large quantities of fish through traditional methods such as drying and smoking, and fish are also frozen, canned, salted, pickled, fermented, and eaten fresh.

REGULATIONS

Permits are required to harvest salmon for subsistence purposes in Bristol Bay. Since 1990, under state regulations, all Alaska State residents have been eligible to participate in subsistence salmon fishing in all Bristol Bay drainages (but see below). In 2004, with two exceptions, only gillnets were recognized as legal subsistence gear. In the Togiak District, spear fishing was also allowed. In 1998, the Board of Fisheries adopted new regulations for the taking of "redfish" (spawned sockeye salmon) in portions of the Naknek District. Gillnets, spears, and dipnets may be used along a 100 yard length of the west shore of Naknek Lake near the outlet to the Naknek River from August 20 through September 30; at Johnny's Lake from August 15 through September 25; and at the mouth of the Brooks River from October 1 through November 15. In the Bristol Bay Area in 2004, gillnet lengths were limited to 10 fathoms in the Naknek, Egegik, and Ugashik rivers, Dillingham beaches, and within the Nushagak commercial district during emergency openings. Up to 25 fathoms could be used in the remaining areas, except that nets were limited to 5 fathoms in the special "redfish" harvest areas in the Naknek District.

In Dillingham and the Naknek, Egegik, and Ugashik rivers, subsistence fishing was limited to several fishing periods per week during the peak of the sockeye run. All commercial districts

were open for subsistence fishing during commercial openings. In addition, all commercial districts were open for subsistence fishing in May and September, from Monday to Friday. In recent years, declining Chinook and coho stocks resulted in longer commercial closures and some residents had an increasingly difficult time obtaining fish for home use. The Nushagak commercial district, starting in 1988, has been opened for subsistence fishing by emergency order during extended commercial closures.

On May 21, 2001, Deborah Liggett, the superintendent of Lake Clark National Park and Preserve, announced that the National Park Service (NPS) was prohibiting subsistence fishing with nets in the park and preserve, including all of Lake Clark, except by federally qualified local rural residents. This prohibition was a new enforcement action of a NPS regulation and applied to anyone who was not a permanent resident of Iliamna, Lime Village, Newhalen, Nondalton, Pedro Bay, or Port Alsworth, or who did not have a Section 13.44 subsistence use permit issued by the park superintendent.

The Alaska Department of Fish and Game has continues to issue Bristol Bay subsistence salmon permits to any Alaska resident who requests one. However, the department informs permit applicants that unless they live in one of the above-named communities or have a 13.44 permit, they need to take this NPS closure into account when they subsistence fish in waters of the park and preserve. The department also informs permittees that waters outside of national park and preserve boundaries remain open for subsistence salmon fishing to all permit holders.

INSEASON MANAGEMENT

Due to extended closures to the commercial fishery in the Nushagak commercial fishing district, an emergency order opened the Nushagak commercial fishing district to subsistence salmon harvesting on 12:01 a.m. June 1, 2004. The commercial district was closed by emergency order to subsistence salmon fishing, except during commercial openings, effective 11:00 p.m. June 13. The commercial district was reopened to subsistence fishing effective 8:00 p.m. June 14. The Igushik Section was closed, except during open commercial fishing periods, by emergency order effective 11 p.m. June 15. The Nushagak Section was closed, except during commercial openings, 11 p.m. June 16, and reopened until further notice on June 17 at 8:00 p.m. The Nushagak Section was again closed to subsistence fishing, except during commercial openings, at 8:00 a.m. June 20. Commercial openings occurred everyday from June 20 until the end of September; therefore, no further emergency subsistence fishing openings were necessary.

Due to an extended closure to the commercial salmon fishery in the Togiak District, the commercial fishing district was opened to subsistence fishing by emergency order from 3:00 p.m. June 25 until 9:00 p.m. June 27, 2004. Subsistence fishing opportunities were available in correspondence with commercial fishing openings in the district for the remainder of the season.

An emergency order opened the Naknek River to subsistence fishing for three 24-hour periods per week, from 9 a.m. Saturdays until 9 a.m. Sundays, from 9 a.m. Tuesdays to 9 a.m. Wednesdays, and from 9 a.m. Thursdays until 9 a.m. Fridays, effective 9 a.m. Thursday, July 1, 2004. An additional 24-hour period was justified because the minimum escapement goal of 800,000 sockeye was nearly assured. An emergency order opened the Naknek/Kvichak commercial fishing district to subsistence fishing for a 48-hour period from 3:00 p.m. Tuesday July 6 until 3:00 Thursday July 8. This was to allow subsistence fishing opportunity when the Naknek/Kvichak District was closed to commercial fishing and commercial fishing was occurring in the Naknek River Special Harvest Area (NRSWA). Additional emergency orders

extended this opening to 6:00 p.m. Sunday, July 18. No further commercial fishing occurred in the NRSHA after that date.

In the Egegik District, an additional subsistence fishing period was opened by emergency order when the commercial fishery was closed, from 10 a.m. Friday June 11 until 7:00 a.m. Monday June 14. The department had been informed that some Egegik residents were having difficulty obtaining subsistence fishing locations within the district when the commercial fishery was open. The emergency order provided subsistence fishing time during a commercial closure. Additional subsistence openings in the Egegik District were established by emergency orders from 11:00 a.m. Wednesday, June 16 until 7:00 a.m. Thursday June 17; from 11:30 a.m. June 17 to 7:30 p.m. June 17; from 12:00 noon June 18 to 8:00 p.m. June 18; from 8:30 a.m. Saturday June 19 until 11:30 p.m. June 19; and from 9:30 a.m. to 11:30 p.m. on Thursday June 24.

There were no emergency orders issued for the Ugashik District in 2004.

PERMIT SYSTEM

A permit system was gradually introduced throughout the Bristol Bay region in the late 1960s to document the harvest of salmon for subsistence. Much of the increase in the number of permits issued during these years reflects: 1) a greater compliance with the permitting and reporting requirements, 2) an increased level of effort expended by the department in making permits available (including a local system of vendors), contacting individuals, and reminding them to return the harvest forms, and 3) a growing regional population. Most fishermen are obtaining permits and reporting their catches, and overall permit returns have averaged between 85% and 90%. However, fish removed for home use from commercial catches are not included in most reported subsistence harvest totals. Also, fish caught later in the season, such as coho and spawning salmon are probably not documented as consistently as Chinook and sockeye.

In 2004, a total of 1,100 permits were issued for the Bristol Bay Management Area, and of these, 940 (85.5%) were returned to the Department with harvest data (Table 30). The largest number of permits were issued for the Nushagak (511 permits) and Naknek/Kvichak (481 permits) districts. For the Nushagak District slightly more permits were issued in 2004 than the long-term 20-year average (490), due in part to permits being available to all state residents since 1990. Compared to the previous five years and the recent 10-year average, however, the number of permits issued was down for the Nushagak District (recent ten-year average of 528 permits). Fewer permits were issued in the Naknek/Kvichak district in 2002 (471), 2003 (489), and 2004 (481) than in any year since 1990, likely reflecting the National Park Service prohibition against non-drainage residents' subsistence fishing in the waters of Lake Clark National Park. About the same number of permits were issued for the Egegik District in 2004 (46) compared to the average for the past 10 years (48), while the number issued in the Ugashik District (21) was lower than the recent ten-year average (26). The number of permits issued for the Togiak District in 2004 was 46, similar to recent averages (49 permits on average for 1994–2003) (Appendix A30). However, the number of permits issued in Togiak was lower in 2004 than either 2001 or 2003 (92 permits were issued in both years) when permit data for the Togiak District were supplemented by post-season household surveys conducted by the Division of Subsistence. These surveys were not conducted for 2004 due to lack of funds. Of all Bristol Bay Area subsistence permits issued in 2004, 932 (84.7%) were issued to residents of Bristol Bay communities, and 168 (15.3%) were issued to other Alaska residents.

HARVEST

The estimated total Bristol Bay subsistence salmon harvest in 2004 was 126,865 fish (Table 30). This number was down slightly from the estimate of 131,667 salmon for 2003 but was higher than the 109,587 salmon estimated for 2002. The 2004 harvest was 6.2% below the recent 10-year average of 134,766 salmon and about 21.7% below the recent 20-year average of 154,454 salmon.

The area-wide Chinook harvest of 18,012 salmon in 2004 was down from the record harvest of 21,231 Chinook estimated for 2003, but was higher than any other estimate since 1997 and exceeded both the recent 10-year average (16,026 Chinook) and 20-year average (14,934 Chinook). The area-wide harvest of 93,819 sockeye salmon was down slightly from the 2003 estimate of 95,690 but higher than the 2002 estimate of 81,088 sockeye (which was the lowest estimated harvest since 1973). The 2004 sockeye harvest was 11.6% below the recent 10-year average of 104,699 sockeyes. Compared to recent 10-year averages, subsistence harvests of pink salmon were up in 2004 (returns of pink salmon to Bristol Bay are higher in even-numbered years than in odd-numbered years). The estimated harvest of chum salmon in 2004 (5,141 salmon) was above the recent 10 year average (4,832 salmon) but the coho harvest of 6,667 salmon was slightly lower than the 10-year average (7,586 salmon) (Appendix A29).

In 2004, the Bristol Bay subsistence salmon harvest was composed of 74.0% sockeye, 14.2% Chinook, 4.1% chum, 2.5% pink, and 5.3% coho salmon. Of the entire Bristol Bay Area subsistence salmon harvest in 2004, residents of Bristol Bay communities harvested 118,936 salmon (93.8%), and other Alaska residents harvested 7,929 salmon (6.2%).

In 2004 as over the last several decades, most of the Bristol Bay Area subsistence harvest was taken in the Naknek/Kvichak (58.6%) and the Nushagak (34.0%) districts. The Naknek/Kvichak total harvest of 74,300 salmon was up from 2003, when the harvest was 63,934 salmon. However, the 2004 subsistence salmon harvest in this district was 3.9% below the recent 10-year average of 77,219 fish and 18.6% below the recent 20-year average of 88,130 salmon (Appendix A29).

In 2004, Kvichak drainage residents, and other permit holders fishing in the Kvichak drainage portion of the Naknek/Kvichak District, harvested an estimated 53,225 sockeye salmon, compared to a recent 10-year average of 48,607 sockeyes and a 20-year average of 62,157 sockeyes. The 2004 subsistence harvest of sockeye salmon in the Kvichak drainage was up notably from 2000 through 2003 but was still below historic levels (the 10-year average harvest from 1984 through 1993 was 75,706 sockeyes). Of Kvichak drainage communities, estimated sockeye harvests were substantially lower at Levelock, Igiugig, and Nondalton compared to recent 10-year averages, and somewhat lower at Port Alsworth (Appendix A30). The number of permits issued to households with Port Alsworth addresses was 25 in 2004 (and 22 in 2002 and 23 in 2003), down from 30 in 2001 and 37 in 2000. This may be the result of seasonal Port Alsworth residents not obtaining permits because of the NPS prohibition against subsistence fishing in Lake Clark by non-local residents (see above). Sockeye salmon harvests by Port Alsworth subsistence permit holders in 2004 totaled 2,455 fish, compared to a recent 10-year average of 2,627 sockeyes, although the 2004 harvest was the highest since 2000. The number of permits issued to households with non-Kvichak drainage addresses was 25 in 2004 (and 24 in 2003), compared to 33 in 2002, 37 in 2001, and 48 in 2000, and the sockeye salmon harvest by these permittees fell to 1,631 (and 1,591 fish in 2003) compared to a recent 10-year average of

2,758 sockeye salmon (Appendix A30). The NPS closure is likely at least partly responsible for this change as well.

In the Nushagak District, the total estimated subsistence harvest in 2004 was 43,154 salmon, the third lowest total on record (the total salmon harvest estimate was 38,500 in 1972 and 40,600 in 1966), and the lowest over the last 20 years. It was down substantially from the 2003 estimate of 55,076 fish. The recent 10-year average is 47,968 salmon. The Nushagak Chinook harvest in 2003 of 15,610 exceeded the recent 10-year average of 13,396 Chinook, but was down from the 2003 estimate of 18,686 Chinook, the highest estimate on record. The sockeye harvest in the Nushagak District of 17,491 in 2004 was, by far, the lowest estimate for the district since at least 1964 (the previous low was 22,777 sockeyes in 2002) (Appendix A29). In 2004, subsistence salmon harvests in most Nushagak District communities were lower compared to recent 20-year averages. The 2004 subsistence salmon harvests in the three Nushagak River villages of Ekwok, New Stuyahok, and Koliganek were all down substantially from 2003 (Appendix A31).

The estimated total subsistence salmon harvest for the Togiak District in 2004 of 3,584 fish was lower than both the recent 10-year average (4,400) and the 20-year average (5,260), and was the lowest estimated subsistence salmon harvest for this district since 1997. This likely reflects at least in part the absence of post-season household surveys in Togiak and Twin Hills for 2004, which had increased participation in the harvest assessment program in 2001 and 2003. The estimated subsistence harvest in the Ugashik District in 2004 was 1,116, much lower than the 10-year average of 2,032, and the lowest estimate since 1985. In the Egegik District, the estimated subsistence salmon harvest of 4,711 was the second highest since 1984 and was much higher than the recent ten-year average of 3,133 salmon. The Egegik District had a record-high subsistence harvest of coho salmon in 2004, at 1,423 fish (compared to a recent 10-year average of 590 coho) (Appendix A29).

2004 BRISTOL BAY HERRING FISHERY

This report reviews stock assessment activities, provides an overview of the Togiak District herring fishery from 1978 to 2003 and summarizes the 2004 season.

The Bristol Bay area includes all waters south of a line, extending west from Cape Newenham, east of the International Date Line in the Bering Sea and north of a line extending west from Cape Menshikof. The Bristol Bay area is divided into three herring fishing districts. The Bay District; including all waters east of the longitude of Cape Constantine, the Togiak District; including all waters between the longitude of Cape Newenham and the longitude of Cape Constantine, and the General District; including all waters west of the longitude of Cape Newenham. Togiak District spans approximately 192 km (Figure 2). Togiak village lies at the center of the district, 108 km west of Dillingham.

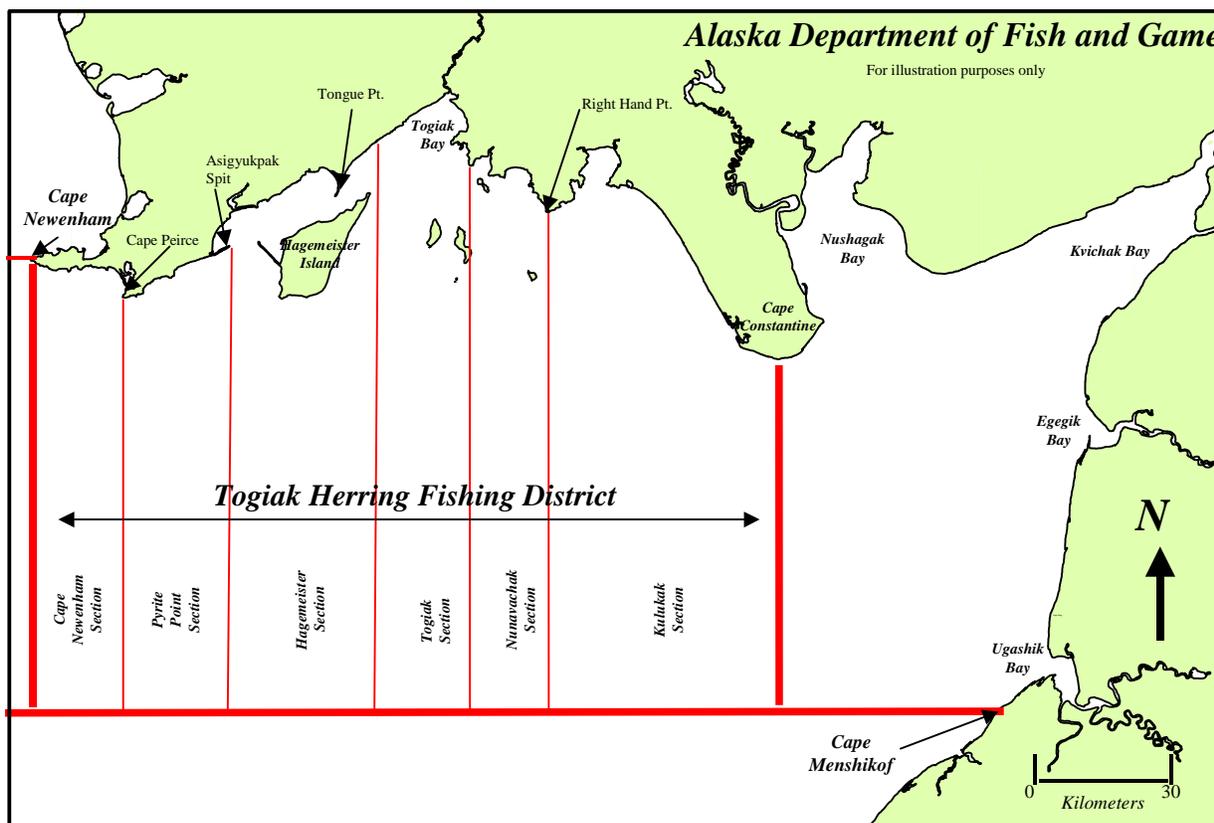


Figure 2.—Togiak Herring District, Bristol Bay.

Pacific herring (*Clupea pallasii*) have been documented throughout Bristol Bay, but the major concentration returns to the Togiak area each spring to spawn and is the focus of herring sac roe and spawn-on-kelp fisheries. In the Togiak District, herring are commercially harvested for sac roe using gillnets and purse seines while herring spawn on rockweed kelp (*Fucus spp.*) is harvested by hand.

The herring sac roe fishery began in the Togiak District in 1967, followed by the first fishery for spawn on kelp in 1968. Effort and harvest levels remained low for the first 10 years of the fishery. Increased interest, favorable market conditions, and additional incentives provided by

the Fishery Conservation and Management Act of 1976 (the 200 mile limit) resulted in a rapid expansion of the Togiak herring fishery in 1977.

The Togiak herring fishery is the largest in Alaska. From 1984 to 2003, sac roe harvests averaged approximately 20,000 tons, worth an average of \$7.7 million annually. Spawn-on-kelp harvests, which have occurred in only 5 of the last 10 years, have averaged 307,000 lbs., worth about \$284,000 to permit holders (Appendices B2 and B3). In 2004, sac roe harvests brought \$2.5 million to permit holders, the third highest value since 2000. No spawn-on-kelp fishery occurred in 2004.

STOCK ASSESSMENT

Since 1978, the department has conducted aerial surveys throughout the herring spawning migration to estimate abundance, timing and distribution of Pacific herring in the Togiak District. Surveys are conducted regularly from mid-April through May each year. Once herring are observed, surveys are conducted daily, weather permitting, until commercial fishing is completed.

Aerial survey techniques used in Togiak have remained largely unchanged since 1978 and are described in Lebida and Whitmore (1985). Herring school surface area is estimated through a handheld tube with a measured grid and a known focal length from a known altitude. Standard conversion factors of 1.52 tons (water depths of 16 ft or less), 2.58 tons (water depths between 16 and 26 ft), and 2.83 tons (water depths greater than 26 ft) per 538 ft² of surface area are applied to herring school surface areas to estimate the total biomass observed during each flight.

Volunteer test fisheries, originally implemented by the department to estimate roe quality, provide samples for age, size, and sex composition analysis. Samples are also collected from commercial harvest for age composition and size analysis. After the season, results are sometimes used to revise biomass estimates.

The status of the Togiak herring population is considered to be relatively stable. Annual biomass estimates range from 83,000 tons in 1991 to 193,800 tons estimated in 1993 (Appendix B5). Abundance was estimated to be high in the late 1970's, declined in mid 1980's and remained relatively low and stable through 1991. Biomass levels from 1992 to 1994 increased to levels between 150,000 and 200,000 tons and estimates since 1995 range from 121,000 to 146,000 tons estimated after the 2003 season.

From 1984 to 2004, herring were generally first observed in the district in early May, but were observed entering near shore areas as early as April 19 and as late as June 3. Biomass typically increases rapidly and peaks within 1 to 7 days of the first observation. In recent years, it has been difficult to get good surveys during the peak of the harvest; in 2002, the peak survey occurred after the fishery was completed. The herring run appears to be more protracted with lower peak biomass estimates but more herring around for a longer period of time. Except for three years, spawn was first observed any time within 3 days of the first herring observation. Spawning trends differ slightly from those observed for biomass, spawning in all but 2 years accelerated rapidly, peaked from 1 to 4 days after the first occurrence of spawn, spawning continued for a month generally but in less intense spot spawns. Small "spot" spawns have been observed as late as June 14.

Herring ages 2 through 20 have been observed in the Togiak District but herring generally recruit into the fishery at age 5. Herring abundance is related to year class survival. Two major

recruitment events have occurred since the State began monitoring the biomass in 1978. The 1977 and 1978 year classes recruited into the fishery in 1982 and 1983 and comprised a substantial component of the biomass until the early 1990's. Other lesser recruitment events have occurred since that time with the most recent being in 1993 appearing as age-10 herring in the 2004 season.

SAC ROE HERRING FISHERY OVERVIEW

Fishing and Industry Participation

Unlike most herring fisheries in Alaska, the Togiak sac roe fishery is not a limited entry fishery. Gillnets, purse seines and hand purse seines are legal gear. Since fishing effort is not limited, effort levels can vary substantially each year. Herring market conditions are one of the leading factors influencing effort in a given year, but other factors also influence fleet size. Since the majority of herring permit holders in Togiak participate in other fisheries like Bristol Bay salmon, the health of the salmon market and markets for other fish indirectly affect effort in the herring fishery. Herring prices paid to permit holders the prior year and run timing also affect effort. In the last four years processors have developed cooperative fleets for the purse seine fishery. Processors in conjunction with the coop members exclude entrants into the fishery. This is beginning to happen in the gillnet fleet as well.

Fishing effort in the sac roe fishery increased through the late 1980's, decreased early in the 1990's, then increased again to a peak in 1996 and has declined since 1997 (Appendix B1). Gillnet effort increased to 300 vessels in 1989, declined to a low of 75 vessels in 1993, and then peaked in 1996 with 461 vessels and has since declined to a low in 2004 of 54. Purse seine effort increased steadily from 1978 through 1989, when 310 vessels were observed. From 1990 to 1997, the purse seine fleet has fluctuated between 200 and 300 vessels, and has declined to less than 100 vessels since 1998. In 2004, the total number of purse seines was 31, an all-time low.

Reduction in fleet size has led to the development of cooperative seine fisheries that focus on fish with high quality roe rather than on quantity. Reduced fleet size has led to changes in the way the fishery is managed; because fishing is less aggressive, managers can allow 12 hour openings leading to increased selectivity and smaller sets.

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. From 1987 through 1997, 16 to 22 companies have purchased herring or spawn-on-kelp in Togiak. Over the past 6 years, industry participation has steadily declined to a low in 2004 of 6 companies. Processing capacity on the grounds has also declined from a high of 4,850 tons per day in 1996 to a low in 2003 of 1,920 tons per day.

Gear Specifications

The Alaska Board of Fisheries has reduced gear to limit harvesting capacity and control problems with waste. Prior to 1989, gillnet length was restricted to 150 fathoms. Each permit holder was restricted to the use of one legal limit of gear, but up to 300 fathoms could be operated from a fishing vessel. Under these gear allowances, lost and abandoned nets accounted for substantial amounts of waste during some years. In 1989, the Board reduced the legal compliment of gillnet gear to a maximum of 100 fathoms in length per permit holder, restricted the operation from one vessel to 100 fathoms, and granted the department the authority to reduce length to 50 fathoms inseason. The Board transposed this regulation in 1992 when it restricted herring gillnet length to 50 fathoms but granted the department the ability to allow up to 100

fathoms of gear by emergency order. This change enabled the department to maintain an orderly fishery, helping ensure roe quality and minimizing potential waste. Gillnet depth remains unrestricted.

In October of 1989, the Board reduced purse seines to 100 fathoms in length and 16 fathoms in depth. In 1995, the Board further restricted purse seine depth to 625 meshes, of which 600 could be no larger than one and one-half inches. Depth was reduced in 1995 to control harvesting capacity. Adjustments in allowable gear have appeared to control waste and preserve order in the fishery without a substantial reduction in harvesting capacity.

Harvest and Management Performance

The commercial sac roe and spawn-on-kelp harvests in the Togiak District have been regulated by emergency order since 1981. From 1981 through 1987, informal policies directed the department to ensure that minimum threshold biomass levels were observed before opening the herring fishery, and to manage the fishery so that exploitation did not exceed 20%. In 1988, the Board incorporated the threshold and exploitation rate policies into the Bering Sea Herring Fishery Management Plan (5 AAC 27.060) for Togiak and other Bering Sea fisheries. Herring biomass in Togiak has been estimated at levels well above threshold requirements since 1981.

The average annual exploitation rate for the last 20 years slightly exceeded 20% but for the last 10 years has been 18.8% (Appendix B2). Annual exploitation ranged from 32% to 13.5% and hasn't exceeded 20% since 1998. Although the sac roe, spawn-on-kelp and Dutch Harbor food and bait fisheries take Togiak herring, only the sac roe harvests were used in calculating exploitation rates from 1981 to 1983. Estimates of herring biomass equivalent to spawn-on-kelp harvests and harvests in the Dutch Harbor fishery were not included when calculating exploitation rates until 1984 and 1988.

Herring purse seine and gillnet sac roe harvests are managed for allocation guidelines set forth in the Bristol Bay Herring Management Plan (BBHMP) (5 AAC 27.865). This plan states that, before opening the sac roe fishery, 1,500 short tons must be set aside for the spawn-on-kelp fishery, and 7% of the remaining available harvest is allocated to the Dutch Harbor food and bait fishery. After the spawn-on-kelp and the Dutch Harbor harvests are subtracted, the remaining harvestable surplus is allocated to the Togiak sac roe fishery: 30% of the harvestable surplus to the gillnet fleet, and 70% to the purse seine fleet. From 1988 through 2000, these percentages were set at 25% gillnet, 75% purse seine. The Board modified these allocation percentages to the current ratio in 2001. To achieve gillnet and purse seine ratios, the Department adjusts fishing time and area for each gear type.

The management plan was modified again slightly by the Board of Fish in December 2003. The Board allowed for the inseason allocation management to be uncoupled after each gear type had harvested 80% of its allocation. The other change allowed up to 50% of the spawn-on-kelp allocation to be reallocated to the sac roe fishery if it was not harvested in a spawn-on-kelp fishery.

The Board of Fisheries and the industry have directed the Department to give product quality and fishery value an equal priority with exploitation objectives. Management Guidelines for Commercial Herring Sac Roe Fisheries (5 AAC 27.059) state the department may manage sac roe fisheries to enhance product value by opening areas in which sampling has demonstrated high herring roe content and large herring size, and to minimize harvest of recruit size herring.

The BBHMP also states that the primary objective in the sac roe fishery is to prosecute an orderly, manageable fishery while striving for the highest level of product quality and a minimum of waste. Given these regulations and comments from industry, the department considers maximizing quality and value primary objectives in the Togiak fishery.

The department has used volunteer test fishing as a means to maximize roe harvest quality since 1982. Test fishing procedures developed and became more organized and systematic from 1982 to 1989. By 1990, the department had established standard test fishing areas and sample sizes, coordinated test fishing start times between areas, coordinated and assisted in transporting samples to roe technicians and established criteria required for opening an area. Since then, the department has opened to commercial fishing only areas that have documented high quality roe.

Development of test fishing procedure sped the availability of results, reduced time required between test fishing and opening an area to commercial fishing, and helped ensure high roe quality in harvests. Average mature roe percentage increased from a 10-year average of 9.45% (1984–1993) to 10.04% (1994–2003). However, average mature roe for the last three years declined to 9.96%. There is some indication the recent downturn in roe percentage of purse seine caught herring is due to increased post-season scrutiny. The inseason roe percentages have been much higher, but final percentages have been much lower.

As an indirect result of test fishing procedures, gillnet harvest area was gradually reduced in the late 1980's and early 1990's due to lack of successful test fishing or poor quality results in some areas of the district. From 1994 through 1997, gillnet fishing was opened almost exclusively in the area between Right Hand Point and Kulukak Bay. This reduction in area heightened competition among the gillnet fleet, especially during 1996 and 1997, when fishing effort was high. Since 1997, attempts have been made by management staff to spread gillnet harvest out to include areas west of Right Hand Point. However, it has proven difficult to dislodge the gillnet fleet from the protected anchorage of Metervik Bay not only to participate in test fisheries but even to fish in a commercial gillnet period.

Although average mature roe for gillnets has increased from 8.57% (1984–1993) to 11.4% (1994–2003), purse seine average mature roe has decreased from 9.69% (1984–1993) to 9.5% (1994–2003). Gillnet-caught herring quality rose sharply in 1993 and has remained high since 1993. Although some of this difference may be attributed to management efforts, most is due to an apparent shift to larger gillnet mesh sizes. Prior to 1993, gillnets with mesh sizes smaller than three inches (stretched) were common. Gillnets with 3-inch mesh and larger have since become standard gear. This shift to large-mesh gillnets appears to have increased the percentage of female herring caught by herring gillnets from 46.3% (1984–1993) to 58.5% (1994–2003).

In 1992, over 20,000 tons of herring were harvested by purse seines in one 20-minute period. This magnitude of harvest from a single opening, combined with a limited processing capacity, resulted in holding times up to seven days, and large-scale deterioration of flesh and roe quality. The poor product quality resulting from the 1992 harvest and increasing market demands for high quality roe, compelled the department to recognize quality problems associated with extended holding times of 3 days or longer. Limiting individual harvests not to exceed 3 days of processing capabilities became a management objective after 1992.

From 1992 until 2000 the department limited harvests by carefully controlling the open area and duration of each purse seine opening. Since 2000, the fishery has become much more self-regulating in that processors have smaller fleets and are much more restrictive about how long

they will hold herring before processing. The reduced processing capacity makes it impossible for the whole quota to be processed in less than ten days.

Although controlling harvest used to be the major concern for managers, the last 3 years have been quite different from the derby style openings of the early 1990's. The seine fleet is now divided into processor controlled cooperative fleets that harvest just enough herring to keep the processing lines full from day to day. This has allowed managers to open large areas of the district for up to 14 hours at a time without the concern of having more fish harvested than processing capacity can handle in a short time. This is true for most of the fishery, but as the quota is approached managers do have to guard against a large grab.

The cooperative seine fleets allow the participants to maximize the value of the fishery by reducing operating costs and allowing processors to control harvest, enforce a maximum set size and be highly selective in the fish they choose to harvest. This has led to higher inseason estimates of roe quality; postseason estimates have not necessarily increased however.

SPAWN-ON-KELP FISHERY OVERVIEW

Similar to the sac roe fishery, the spawn-on-kelp harvest in the Togiak District has been regulated by emergency order since 1981. Since 1984, the spawn-on-kelp fishery was managed under guidelines provided in the Togiak District Herring Spawn on Kelp Management Plan (5 AAC 27.834). The plan essentially provides for an allocation of 350,000 lbs. of product, equivalent to 1,500 tons of herring, to this fishery. The plan also directs the department to 1) rotate harvest areas (Figure 3) on a 2 to 3 year basis; 2) ensure product quality; and 3) include the herring equivalent to the spawn-on-kelp harvest when calculating exploitation.

Fishing effort in the spawn-on-kelp fishery increased steadily since its inception, and peaked at 532 participants in 1991 (Appendix B4). The fishery became limited to interim use and permanent permit holders in 1990. Following the 1991 season, the Board limited the role of non-permit holders in the spawn-on-kelp fishery to assisting with transporting kelp after the period closure. By 1993, most permits issued for this fishery became permanent, stabilizing the number of permits at approximately 300.

From 1984 to 2004, the fishery was opened for all years except 1985, 1997, 1998, 2000, 2001 and 2004. Actual harvests exceeded the 350,000 lb. guideline harvest level by more than 10% in six years and fell short by more than 10% in four (Appendix B7). For the other years in which a fishery occurred, actual harvests were within 10% of the guideline. The 2 to 3 year rotation schedule for kelp harvest areas was adhered to in all years except 1987. In 1987, area K 9 was opened after harvest in area K 10 fell short of the harvest guideline. The western half of area K 9 was opened the previous year.

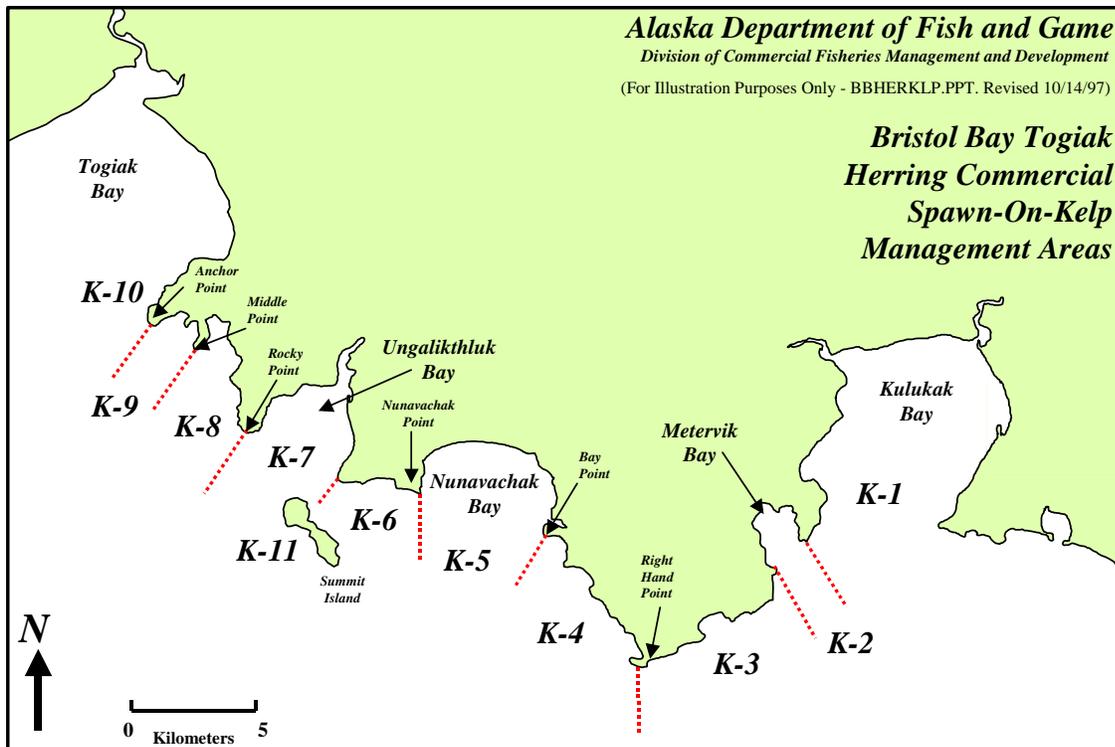


Figure 3.—Spawn-on-kelp management areas (K-1 through K11), Togiak District, Bristol Bay.

To ensure product quality the department, industry representatives and permit holders collect spawn-on-kelp samples to display at a public meeting each season, usually after the peak of herring spawning has occurred. Management decisions are based on comments from industry and users regarding sample quality.

2004 SEASON SUMMARY

Biomass Estimation

Aerial surveys of the Togiak District began April 15, 2004. Herring were first documented in the district on the afternoon of April 22, when approximately 10 tons of herring were observed on the east side of Tongue Point. On April 23 approximately 25 small schools of herring were observed between Togiak Reef and Tongue Point and along the east side of Hagemeister Island. Surveys on April 24 and 25 documented a steady increase in herring biomass. The April 25 survey resulted in a biomass estimate of 20,000 tons of herring with large concentrations in Togiak and Kulukak Bays.

The peak biomass survey was 34,000 tons of herring on May 3. A second end-to-end survey two days later only documented 10,000 tons of herring. Poor weather conditions hampered most of the survey efforts throughout the season and drastically reduced the post-season surveys. Wind and heavy surf limited the duration spawn was visible. Whether herring spawned less, spawned deeper, or spawn was just mixed in turbid water is unclear, but 36 linear miles of spawn were observed this season, much less than the recent 10 year average of 54 miles.

Age Composition

Approximately 6,400 herring were sampled for age, size, and sex information from April 29 to May 9, 2004. Samples were collected from the commercial purse seine fishery, commercial gillnet fishery, and test purse seine sets. Length frequency analysis, based on the last three years of age at length information, was used to differentiate between age classes.

A sample of 4,026 herring was collected from the commercial purse seine fishery. Age 4 herring comprised less than 1% of the sample, age 5–6 herring comprised 15% of the sample, age 7–8 comprised 42% of the sample and age 9+ fish comprised 43% of the sample. Samples collected from the commercial purse seine fishery averaged 359g. Sex composition was 49.13% male and 50.87% female.

A total of 1,163 herring were sampled from the commercial gillnet fishery. Age 5–6 herring comprised 1% of the sample, age 7–8 comprised 19% of the sample and age 9+ herring comprised 80% of the sample. Samples collected from the commercial gillnet fishery averaged 425g. Sex composition was divided 48.5% male and 51.5% female.

A sample of 1,211 herring was collected from the purse seine test fishery. Age 4 herring comprised less than 1% of the sample, age 5–6 herring comprised 14% of the sample, age 7–8 comprised 49% of the sample and age 9+ fish comprised 36% of the sample. Samples collected from test purse seine sets averaged 351g. The sex ratio was 48.55% male and 51.45% female.

As the season progressed, age composition of herring shifted from age 9+ to age 7 and 8. In the Hagemeister and Nunavachak Sections, age composition of herring harvested in the commercial purse seine fishery exhibited a substantial shift from older to younger fish on May 2. During the final commercial purse seine openings on May 8 and 9, age 7–8 fish were the predominant age classes.

Fishery Overview

For the 2004 season, management staff again planned to allow long-duration seine openings over a large area of the district and to let the processors limit harvest for their individual fleets based on processing capacity. Input from the fleet and industry indicated that this would slow the “race for fish” and allow for improved quality and value.

During the winter of 2003–2004, climatic conditions were marginally warmer than usual; there was a moderate amount of snowfall in southwestern Alaska and the ground still had significant amounts of snow on it at the time of the first herring survey on April 15. The Bering Sea ice pack had receded north of Cape Newenham by mid-March, and there were large areas of 4° C. water in the Bering Sea. A cold snap from the end of March to early April cooled water temperatures and created some ice in the near shore waters. By mid-April, the temperature had increased again and there was no ice observed during the first herring survey. These factors indicated there could be an early arrival of herring in the Togiak District, but managers were unsure how early the arrival might be. To predict spawning timing for Togiak herring the department used a temperature model based on April mean air temperatures from Cape Newenham. The model projected the first spawn of one mile or greater would occur on April 27.

Department staff polled processing companies pre-season to assess processing capacity for the 2004 season and to inquire about additional concerns or issues. The poll indicated that one less company would be participating in the 2004 Togiak herring fishery but processing capacity was

estimated to be 2,220 tons per day, an increase of more than 200 tons from 2003. Although there were no major concerns pre-season, department staff held a teleconference on April 1 to discuss the upcoming season with processing companies and permit holders. The greatest concern expressed by stakeholders regarded what would happen if the gillnet fleet was unable to keep up with the seine fleet in harvesting their allocation. During the pre-season teleconference and in other individual conversations companies and permit holders were informed that the department was bound by the allocation plan as described in the Togiak Herring Management Plan.

Company registration for processors intending to buy herring and/or spawn-on-kelp product in the Togiak District began on April 15 by fax. All six companies registered by fax this year and only one company had any difficulties. All six companies that registered for the sac roe fishery planned to buy both seine and gillnet fish. Given the large harvestable surplus available, (25,226 tons) the daily processing capacity, of 2,200 tons was a factor in trying to maintain product quality while enabling the fishery to harvest the quota for each gear group.

Purse Seine

Test fishing with gillnets and purse seines began on the afternoon of April 27; none of the testfish samples indicated the presence of marketable quality roe. Test fishing continued until April 29, when the purse seine test fishery yielded samples with commercial quality roe content. Department staff were not able to document the threshold biomass of 35,000 tons via aerial survey, however, threshold biomass was stipulated to be based on the previously documented biomass (20,000 tons on April 25), poor survey conditions that limited visibility, and the number of days that herring were known to be present on the grounds. Commercial openings were therefore warranted.

The first purse seine opening was a 6-hour opening on April 29 in the area from Right Hand Point to Asigyukpak (Oosik) Spit with the exception of Togiak Bay. The period resulted in 30 deliveries and a harvest of 2,322 tons of herring with an average mature roe percentage of 9.9%. The second seine opening was announced for 4:00 p.m. on April 30. Early in the season, it seemed reasonable to continue with seine openings while the gillnet fleet caught up on their harvest percentage. The second seine opening resulted in a harvest of 963 tons of herring from 20 deliveries with an average mature roe content of 10.6%.

Over the past several years, the seine fishery has turned into a relatively self-regulating fishery. Processing companies manage their cooperative fleets such that they harvest enough fish to keep the processing lines running at full capacity after the daily gillnet harvest has been accounted for. For 2004, the processing capacity was estimated at 2,200 tons per day, so daily harvest was expected to correlate closely with the daily processing capacity.

After the first two openings, fishing progressed in an orderly fashion and the seine fleet was given 10–12 hour periods each day for the next 5 days. This allowed the fleet to harvest fish throughout the day and find quality fish without necessarily setting on every school to test it. This also allowed processors to reduce holding time by waiting until late in the day to have fish harvested, adjust the amount they needed to buy based on gillnet harvest, be selective about the quality of herring bought and reduce the size of sets bought to improve quality.

The four seine openings from May 1 until May 4 went well; the seine fleet harvested fish at a rate that did not overwhelm processing capacity and the gillnet fleet was steadily gaining ground on balancing the harvest percentages. The May 5 opening was another 12 hour period and as

reports came in from the gillnet grounds of low harvest rates, processors decided to maximize purchases of seine caught fish. The total seine harvest for this period was 2,904 tons, bringing the season harvest to 12,731 tons, 72% of the preseason quota.

Based on the allocation plan, and the gillnet fleet having difficulty catching fish, there was no purse seine opening announced for May 6. Gillnet fishing continued to be poor despite continuous fishing. On May 7, area and regional staff conferred with headquarters staff and the decision was made to allow some additional purse seine fishing time while mature, high quality herring were available to the fleet.

At 1:00 p.m. it was announced that there would be a purse seine opening that evening. We asked for test fish information to determine the area with the best quality fish. A long opening was not justified due to the available tendering capacity, and it was thought that the fleet would attempt to harvest as much herring as possible, which could easily exceed 3,000 tons. Department staff surveyed the area being considered for an opening and estimated 1,500 to 2,000 tons of herring were present. In conversations with two separate spotter pilots, additional estimates of up to 3,000 tons were heard for the same area.

In a 6:30 p.m. announcement, the general area being considered was reduced to avoid fishing in the shallow areas behind Tongue Point and Oosik Spit because of the extremely low evening tide (-3.5), which would expose eelgrass beds to potential damage from seine gear. The final area and period duration were to be announced at 7:45 after staff conducted an additional survey beginning at 6:45 p.m. Unfortunately, the weather had deteriorated since our original survey at 3:30 p.m. and flying conditions were extremely poor. Due to these conditions, the opening was announced for the entire area under consideration from Osviak Point to the 161° West Longitude line and duration was set at 30 minutes. This period resulted in a harvest of 93 tons from 6 deliveries and 10.7% mature roe. One radio comment theorized that the fish had been present until shortly before the opening, but all the boats jockeying for position and driving over the schools dispersed them and drove them into deeper water.

On Saturday, May 8, our strategy was to harvest enough fish to maximize daily processing capacity. We started with a 30-minute opening at 2:00 p.m. between Tongue Point and Cape Peirce. Weather conditions still appeared to be hampering fishing effort, but it was also apparent that there was not many herring in the area. Additionally, there were several sets made on spawned out fish that were released; a total of 11 released sets were reported but anecdotal information indicated this was only a fraction of the actual number. Only one delivery was made for a harvest of 9 tons.

A second opening was announced on May 8 at 5:30 p.m. with both time and area increased. This was a one-hour opening from Cape Newenham to Togiak Reef, the entire western half of the Togiak District. This opening resulted in a harvest of 184 tons of herring from 10 deliveries with 6 additional released sets reported. The difficulties the fleet was having harvesting herring, as well as the number of sets being released because of spawned out fish, was indicative of the end of the herring run.

The third opening on May 8 was a two-hour opening that included the entire western half of the district as well as from Rocky Point to Anchor Point in the eastern portion of the district. Although the period harvest was better with 723 tons from 17 deliveries, there were still 6 sets reportedly released mainly due to the presence of spawned out fish. Fish from the eastern portion

of the district and between Togiak Reef and Tongue Point were heavily mixed with spawn outs and almost all fish harvested were from the area around Oosik Spit.

On Sunday, May 9, we announced the final opening for the 2004 Togiak purse seine fishery. The announcement was for a five-hour period from Tongue Point to Cape Newenham. This period resulted in a harvest of 41 tons from 3 deliveries.

The decision to close the fishery was based on the large number of spawned out fish that were wrapped and released, the lack of new fish entering the district, the length of time fish had been on the grounds and the lack of spawn that had been documented. Managers felt that based on the pre-season forecast, the run was not as strong as expected, and it was time to stop stressing fish that had spawned and were trying to recover.

Gillnet

Gillnet test fishing began April 27, collecting information on roe quality in the area between Metervik Bay and Right Hand Point. The test fishery samples obtained averaged 6.4% mature roe. On April 28, no gillnet test fish samples were obtained due to poor weather. Deteriorating weather conditions continued to hamper test fish efforts on April 29, and only one sample was reported late in the evening. The sample had 10.9% mature roe, but the volume of fish was small and the weather was expected to be poor again the next day. Finally on April 30, samples of commercial quality were harvested in the Nunavachak Bay area. Additional samples were obtained from Rocky Bay, but were only 7.5% mature roe.

The first gillnet opening was a 12-hour period that began at noon on May 30. The harvest was 798 tons from 93 deliveries with an average mature roe content of 10.3%. Although the area from Egg Island, in Kulukak Bay, to the east side of Ungalikthluk Bay was open, most of the harvest occurred in Nunavachak Bay and along Gravel Beach. The weather was too rough for effective fishing east of Right Hand Point. This was the first time in eight years that the gillnet fleet moved west of Right Hand Point.

The gillnet fleet continued to fish west of Right Hand Point for the second opening, a 13 hour period. Severe weather again hampered fishing and the harvest was much smaller than the previous period with only 330 tons in 13 hours of fishing. Weather conditions improved on May 2 and allowed the gillnet fleet to fish in the more traditional area along the Kulukak Bluffs. The third opening resulted in a harvest of 1,275 tons in 14 hours of fishing. The large harvest from period three helped equalize the imbalance between actual harvest percentages and allocation percentages.

On May 3, there was another 14-hour period and the good fishing continued. The harvest of 924 tons continued to close the gap between the actual harvest percentage and the allocated percentage of 30%. The harvest percentage was 28.4% after all fishing was completed on May 3 and 44% of the gillnet quota had been harvested. Staff anticipated that another similar period or two would have the harvest balanced at 70/30 with close to 70% of the quota harvested.

Gillnet period 5 began at 6:00 a.m. on May 4 in the same area as the previous opening. The weather was good; however fishing for period 5 was poor. The period resulted in a harvest of only 186 tons. This combined with a large seine harvest dropped the gillnet harvest percentage to 26%. Reports from the grounds indicated that fishing improved toward the end of the period. Period 6 began at 7:00 a.m. on May 5 and was extended repeatedly until 8:00 a.m. on May 7. The harvest through 8:00 p.m. on May 6 was 648 tons and an additional 563 tons were harvested

between 8:00 p.m. May 6 and 8:00 a.m. May 7. Reports from the grounds indicated that harvest rates improved dramatically during nighttime hours. The next period was from 12:00 noon May 7, until 8:00 a.m. May 8 and 343 tons of herring were harvested.

Reports from the grounds were mixed, but there seemed to be only a few schools of herring in the Kulukak area and indications that spawned out fish were present. At least one company reported only bait quality fish were being harvested. The harvest rate continued to drop. Gillnet period 9, a 16-hour period, resulted in a harvest of 88 tons of herring. Although roe quality improved slightly to 10.21%, up from 10%, it was still less than what was expected for the gillnet fleet.

On the morning of May 9 the decision was made to close the 2004 Togiak herring fishery based on the lack of new fish showing up in the district, the poor quality of fish being harvested and the indications that permit holders were switching to smaller mesh gear. The last opening was a 6-hour period from 9:00 a.m. until 3:00 p.m. on Sunday, May 9. The period resulted in a harvest of 17 tons from 16 deliveries. The total gillnet harvest for 2004 was 5,172 tons harvested over 10 days in 162 hours of fishing. The average mature roe content was 10.3%. There were 757 deliveries reported and the peak vessel count was 54.

Spawn on Kelp

No companies registered to buy herring spawn-on-kelp in 2004, therefore there were no openings and no commercial harvest.

EXPLOITATION

The 2004 herring fisheries were managed for a maximum exploitation rate of 20% of the preseason forecast. Combining the sac roe harvest (18,953 tons with an average weight of 391 grams and an average roe percentage of 10.4%), and test fish harvest (617 tons) resulted in an exploitation of 19,570 tons. The Dutch Harbor food and bait fishery has not occurred at this time. If the Dutch Harbor fishery harvest were equal to the quota of 1,899 tons, then the total harvest for 2004 would be 21,469. Based on the preseason forecasted biomass of 143,124 tons, the 2004 exploitation would be calculated at approximately 15.00%.

EXVESSEL VALUE

The projected exvessel value of the 2004 Togiak herring fishery is approximately \$2.1 million. This is based on grounds price estimate of \$138 per ton and does not include any post-season adjustments. A value of \$2.5 million is higher than the 2002 value but only 57% of the five-year average of \$3.7 million.

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TABLES

Table 1.—Comparison of inshore sockeye salmon forecast versus actual run, escapement goals versus actual escapements, and projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 2004.

District and River System ^a	Inshore Run			Escapement		Inshore Catch		
	Forecast	Actual	Percent Deviation ^b	Range	Actual	Projected Harvest	Actual	Percent Deviation ^b
NAKNEK-KVICHAK DISTRICT								
Kvichak River	13,231	7,332	0.80	2,000–10,000	5,500	6,616	1,832	2.61
Branch River	4,402	6,510	–0.32	170–200	5,397	4,217	1,113	2.79
Naknek River	4,664	3,721	0.25	800–1,400	1,939	3,564	1,782	1.00
Total	22,297	17,563	0.27	6,970–11,600	12,836	14,397	4,727	2.05
EGEGIK DISTRICT								
EGEGIK DISTRICT	12,095	11,488	0.05	800–1,400	1,290	10,995	10,198	0.08
UGASHIK DISTRICT								
UGASHIK DISTRICT	4,085	3,943	0.04	500–1,200	815	3,235	3,128	0.03
NUSHAGAK DISTRICT								
Wood River	4,445	5,376	–0.17	700–1,500	1,543	3,345	3,832	–0.13
Igushik River	1,081	564	0.92	150–300	110	856	454	0.89
Nushagak-Mulchatna	1,791	2,293	–0.22	340–760	492	1,241	1,801	–0.31
Total	7,317	8,233	–0.11	1,190–2,560	2,145	5,442	6,088	–0.11
TOGIAC DISTRICT								
TOGIAC DISTRICT	812	493	0.65	100–200	136	662	357	0.85
TOTAL BRISTOL BAY	46,606	41,720	0.12	9,560–16,960	17,222	34,731	24,498	0.42

^a The Bristol Bay inshore forecast does not include several minor river systems, including the Snake River drainage in Nushagak District, and the Kulukak, Osviak, Matogak and Slug River system in Togiak District. Catches, escapements, and total runs for these smaller systems are not included in this table so that forecast efficacy may be gauged. Totals may not equal column sums due to rounding and do not include General District information.

^b Percent deviation = (forecast - actual)/actual.

Table 2.—Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2004.

District and River System	2-Ocean			3-Ocean			Other	
	1.2 (2000)	2.2 (1999)	Total	1.3 (1999)	2.3 (1998)	Total		Total
NAKNEK-KVICHAK DISTRICT								
Kvichak River	388	11,997	12,385	813	33	846	-	13,231
Branch River	2,590	1,134	3,724	607	71	678	-	4,402
Naknek River	723	747	1,470	2,002	1,192	3,194	-	4,664
Total	3,701	13,878	17,579	3,422	1,296	4,718	-	22,297
EGEGIK DISTRICT								
EGEGIK DISTRICT	550	10,011	10,561	627	907	1,534	-	12,095
UGASHIK DISTRICT								
UGASHIK DISTRICT	693	2,041	2,734	758	593	1,351	-	4,085
NUSHAGAK DISTRICT								
Wood River	2,277	281	2,558	1,810	77	1,887	-	4,445
Igushik River	198	98	296	753	32	785	-	1,081
Nushagak River	165	10	175	1,372	62	1,434	182	1,791
Total	2,640	389	3,029	3,935	171	4,106	182	7,317
TOGIAK DISTRICT								
TOGIAK DISTRICT	137	18	155	619	38	657		812
TOTAL BRISTOL BAY^a								
Number	7,721	26,337	34,058	9,361	3,005	12,366	182	46,606
Percent	17	57	73	20	6	27	0	100

^a Sockeye salmon of several minor age classes are expected to contribute an additional 1–2% to the total return.

Table 3.—Inshore run of sockeye salmon by age class, river system and district, in thousands of fish, Bristol Bay, 2004.

District and River System ^a	1.2	2.2	2-Ocean	1.3	2.3	3-Ocean	1.4	Total	
NAKNEK-KVICHAK DISTRICT									
Kvichak River									
Number	1,668	5,378	7,046	213	52	265	5	7,332	
Percent	22.7	73.3	96.1	2.9	0.7	3.6	0.1	99.7	
Branch River									
Number	4,149	844	4,993	1,299	188	1,487	11	6,510	
Percent	63.7	13.0	76.7	20.0	2.9	22.8	0.2	99.5	
Naknek River									
Number	1,131	675	1,806	1,253	646	1,899	10	3,721	
Percent	30.4	18.1	48.5	33.7	17.4	51.0	0.3	99.6	
Total	Number	6,948	6,897	13,845	2,765	886	3,651	26	17,563
Percent	39.6	39.3	78.8	15.7	5.0	20.8	0.1	99.8	
EGEGIK DISTRICT									
Number	1,521	8,690	10,211	568	619	1,187	1	11,488	
Percent	13.2	75.6	88.9	4.9	5.4	10.3	0.0	99.2	
UGASHIK DISTRICT									
Number	1,653	1,355	3,008	709	213	922	3	3,943	
Percent	41.9	34.4	76.3	18.0	5.4	23.4	0.1	99.7	
NUSHAGAK DISTRICT									
Wood River									
Number	3,086	384	3,470	1,804	91	1,895	5	5,376	
Percent	57.4	7.1	64.5	33.6	1.7	35.2	0.1	99.8	
Igushik River									
Number	99	65	164	357	35	392	7	564	
Percent	17.6	11.5	29.1	63.3	6.2	69.5	1.2	98.6	
Nush-Mulchatna River									
Number	222	23	245	1,687	77	1,764	180	2,293	
Percent	9.7	1.0	10.7	73.6	3.4	76.9	7.8	87.6	
Total	Number	3,407	472	3,879	3,848	203	4,051	192	8,233
Percent	41.4	5.7	47.1	46.7	2.5	49.2	2.3	96.3	
TOGIAK DISTRICT^b									
Number	85	28	113	281	89	370	5	493	
Percent	17.2	5.7	22.9	57.0	18.1	75.1	1.0	98.0	
TOTAL BRISTOL BAY^c									
Number	13,614	17,442	31,056	8,171	2,010	10,181	227	41,720	
Percent	32.6	41.8	74.4	19.6	4.8	24.4	0.5	98.8	

^a The inshore run data does not include the South Peninsula or General District catch of Bristol Bay sockeye or immature high seas by-catch.

^b Does not include rivers other than Togiak River.

^c Totals include minor age classes not listed in this table however, minor rivers and creeks are not included.

^d Totals may not equal column sums due to rounding.

Table 4.—Inshore commercial catch and escapement of sockeye salmon, in numbers of fish, Bristol Bay, 2004.

District and River System	Catch	Escapement	Total Run
NAKNEK-KVICHAK DISTRICT			
Kvichak River	1,832,101	5,500,134	7,332,235
Alagnak River	1,113,282	5,396,592	6,509,874
Naknek River	1,781,804	1,939,374	3,721,178
Total	4,727,187	12,836,100	17,563,287
EGEGIK DISTRICT			
	10,198,236	1,290,144	11,488,380
UGASHIK DISTRICT			
	3,127,549	815,104 ^a	3,942,653
NUSHAGAK DISTRICT			
Wood River	3,832,231	1,543,342	5,375,573
Igushik River	454,392	109,650	564,042
Nushagak-Mulchatna	1,801,153	491,698	2,292,851
Total	6,087,776	2,144,690	8,232,466
TOGIK DISTRICT			
Togiak Lake		129,462	129,462
Togiak River/Tributaries	357,354	6,175	363,529
Kulukak System	80,204		80,204
Other Systems ^b	1,095	19,044	20,139
Total	438,653	154,681	593,334
TOTAL BRISTOL BAY	24,579,401	17,240,719	41,820,120

^a Includes Ugashik River Tower and aerial survey estimates from King Salmon and Dog Salmon rivers.

^b "Other Systems" escapement includes Negukthlik, Ungalikthluk, Osviak, Matogak, Quigmy, and Slug Rivers.

Table 5.— Summary of sockeye salmon test fishing indices in the Naknek/Kvichak District, by index area and date, Bristol Bay, 2004.

Date	Naknek R. Mouth ^{la}	Pederson Point ^a	Cutbank & Graveyard ^a	Half Moon Bay ^a	Middle Naknek ^a	Johnston Hill ^a	Division Buoy ^a	Ships Anchorage ^a
6/26	0				614	54	428	0
6/27	195				391	490	316	
6/28	180				412	428	263	228
6/29								818
7/01								611
7/03				223				181
7/12	349	305	263	8		96	140	262
7/14	128	218	574					34

^a All indices expressed in numbers of fish/100 fathoms/hour to the nearest index point.

Table 6.— Summary of sockeye salmon test fishing indices in the Ugashik District, by index area and date, Bristol Bay, 2004.

Index Area ^a	July 5	July 6
Cape Grieg (Nearshore)		
Four Miles North of Smoky Point (Nearshore)		
Two Miles North of Smoky Point (Outer line)		
Smoky Point Bar North Side (Inshore)		
Smoky Point Entrance		
Three Miles South of South Spit (Nearshore)		
1.5 miles south of South Spit		
South Spit (Mid Channel)		
Dago Creek Mouth	147	
Pilot Point	248	1,843
Between Pilot Point and Muddy Point	1,548	
South Spit		
Inner South Channel		
Below inner district boundary line west side		
Below inner district boundary line east side	387	1,176
Above inner district boundary line east side		
Between Dog Salmon and King Salmon Rivers	58	1,263 ^b
Mouth of Dog Salmon River	47	1,172 ^b

^a All indices expressed in number of fish/100 fathom hours to the nearest full index point.

^b Average of two or more drifts.

Table 7.—Summary of sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 2004.

Date	Hanson Point ^a	Across Hanson Pt. ^a	Tule Point ^a	Picnic Point ^a	Grassy Island ^a	Nushagak Point ^a	Pile Driver ^a	Coffee Point ^a	Kanakanak Bluff ^a
6/18	0	0		0	0				
	0	0							
6/19	5,217	1,875	1,680	0	762		1,985		3,923
	3,904	486							
6/20	1,024	1,524	590	0	0		594		197
	912	968							
6/20	0	549	3,669	1,208	0				360
	787	1,292							
6/21	373	186	2,281	0	0				
	943	0							
6/21	183	734	1,132	0	0				
	734	2,049							
6/22	1,125	0	186	0	180				
	189	529							
6/23	3,596	2,286			9,500				
	6,269	779							
6/24	1,250	2,276	1,895	0	0				
	1,895	2,281							
6/24	1,143	3,333	5,454	377	0				
	1,342	2,109							
6/25	1,791	1,313	2,338	0	0			0	
	4,762	2,348						0	
6/26	0	2,557	390	0	0	0			
	0	1,486							
6/27	0	571	0	0	0				
	380	923							
6/28	189	372	188	0	381				
	545	0							
6/29			2,509						

^a All indices expressed in number of fish/100 fathoms-hours to the nearest full index point. Indices listed first for each station were recorded using 5 1/8 inch mesh gear, second with 4 3/4 inch gear.

Table 8.—Commercial fishing emergency orders, by district and stat area, Bristol Bay, 2004.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time	
General District							
Drift Net							
DLG.02	June 07	9:00 a.m.	to	June 11	11:00 p.m.	110 hours	b
DLG.02	June 14	9:00 a.m.	to	June 18	11:00 p.m.	110 hours	b
DLG.14	June 21	9:00 a.m.	to	June 22	9:00 p.m.	36 hours	b
Naknek/Kvichak District							
Drift Net							
AKN.81	August 2	9:00 a.m.	to	Sept. 30	9:00 a.m.	weekly schedule	b,d
Set Net							
AKN.03	June 01	9:00 a.m.	to	July 23	9:00 a.m.	weekly schedule	b,d
AKN.14	June 24	5:00 a.m.	to	June 24	2:00 p.m.	9.0-hours	
AKN.18	June 25	5:30 a.m.	to	June 25	2:30 p.m.	9.0-hours	
AKN.19	June 26	5:30 a.m.	to	June 26	2:30 p.m.	9.0-hours	
AKN.20	June 27	5:30 a.m.	to	June 27	2:30 p.m.	9.0-hours	
AKN.21	June 28	5:30 a.m.	to	June 28	2:30 p.m.	9.0-hours	
AKN.36	July 01	5:30 p.m.	to	July 02	6:00 p.m.	24.5-hours	
AKN.37	July 02	6:30 p.m.	to	July 03	7:30 p.m.	25.0-hours	
AKN.40	July 03	7:30 p.m.	to	July 04	8:00 p.m.	24.5-hours	
AKN.80	July 19	9:00 a.m.	to	Sept. 30	9:00 a.m.	weekly schedule	d
Naknek Section							
Drift Net							
AKN.03	June 01	9:00 a.m.	to	July 23	9:00 a.m.	weekly schedule	b,d
AKN.14	June 24	6:00 a.m.	to	June 24	2:00 p.m.	8.0-hours	
AKN.18	June 25	6:30 a.m.	to	June 25	2:30 p.m.	8.0-hours	
AKN.23	June 27	8:30 p.m.	to	June 28	12:30 a.m.	4.0-hours	
AKN.26	June 29	8:00 a.m.	to	June 29	1:00 p.m.	5.0-hours	
AKN.27	June 29	10:30 p.m.	to	June 30	3:30 a.m.	5.0-hours	
AKN.27	June 30	9:00 a.m.	to	June 30	4:30 p.m.	7.5-hours	
AKN.29	June 30	11:00 p.m.	to	July 01	7:00 a.m.	8.0-hours	
AKN.29	July 01	10:00 a.m.	to	July 01	5:30 p.m.	7.5-hours	
AKN.36	July 02	12:30 a.m.	to	July 02	9:30 a.m.	9.0-hours	
AKN.36	July 02	11:30 a.m.	to	July 02	6:30 p.m.	7.0-hours	
AKN.37	July 03	1:00 a.m.	to	July 03	10:00 a.m.	9.0-hours	
AKN.37	July 03	12:30 p.m.	to	July 03	7:30 p.m.	7.0-hours	
AKN.40	July 04	2:00 a.m.	to	July 04	10:30 a.m.	8.5-hours	
AKN.40	July 04	1:30 p.m.	to	July 04	8:00 p.m.	6.5-hours	
AKN.43	July 05	3:00 a.m.	to	July 05	10:00 a.m.	7.0-hours	
AKN.43	July 05	3:00 p.m.	to	July 05	9:00 p.m.	6.0-hours	
AKN.44	July 06	4:00 a.m.	to	July 06	9:30 a.m.	5.5-hours	
AKN.80	July 19	9:00 a.m.	to	Sept.	9:30 a.m.		d
Set Net							
AKN.23	June 27	8:30 p.m.	to	June 28	12:30 a.m.	4.0-hours	
AKN.26	June 29	8:00 a.m.	to	June 29	1:00 p.m.	5.0-hours	
AKN.27	June 29	10:30 p.m.	to	June 30	4:30 p.m.	18.0-hours	
AKN.29	June 30	4:30 p.m.	to	July 01	5:30 p.m.	25.0-hours	

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Table 8.–Page 2 of 6.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
Naknek River Special Harvest District						
Drift Net						
AKN.44	July 6	4:30 p.m.	to	July 6	10:00 p.m.	5.5-hours
AKN.45	July 6	10:00 p.m.	to	July 6	11:30 p.m.	1.5-hours
AKN.45	July 7	5:00 a.m.	to	July 7	1:00 p.m.	8.0-hours
AKN.45	July 7	5:30 p.m.	to	July 8	1:00 a.m.	7.5-hours
AKN.51	July 8	5:00 a.m.	to	July 8	2:00 p.m.	9.0-hours
AKN.54	July 9	6:00 a.m.	to	July 9	2:30 p.m.	8.5-hours
AKN.54	July 9	7:00 p.m.	to	July 10	3:30 a.m.	8.5-hours
AKN.58	July 10	8:00 p.m.	to	July 11	4:30 a.m.	8.5-hours
AKN.58	July 11	8:00 a.m.	to	July 11	4:00 p.m.	8.0-hours
AKN.65	July 12	8:00 a.m.	to	July 12	4:00 p.m.	8.0-hours
AKN.67	July 13	9:00 a.m.	to	July 13	4:30 p.m.	7.5-hours
AKN.67	July 13	11:00 p.m.	to	July 14	7:00 a.m.	8.0-hours
AKN.71	July 14	10:00 a.m.	to	July 14	5:30 p.m.	7.5-hours
AKN.75	July 15	10:30 a.m.	to	July 15	7:00 p.m.	7.5-hours
AKN.75	July 16	12:30 a.m.	to	July 16	9:00 a.m.	8.5-hours
AKN.78	July 17	1:00 a.m.	to	July 17	9:30 a.m.	8.5-hours
AKN.78	July 17	12:30 p.m.	to	July 17	8:00 p.m.	7.5-hours
AKN.80	July 18	1:00 p.m.	to	July 18	9:00 p.m.	8.0-hours
AKN.80	July 19	2:00 a.m.	to	July 19	8:00 a.m.	6.0-hours
Naknek River Special Harvest Area						
Set Net						
AKN.51	July 8	6:00 p.m.	to	July 9	2:00 a.m.	8.0-hours
AKN.54	July 10	6:30 a.m.	to	July 10	3:30 p.m.	9.0-hours
AKN.58	July 11	9:00 p.m.	to	July 12	6:00 a.m.	9.0-hours
AKN.65	July 12	9:30 p.m.	to	July 13	6:30 a.m.	9.0-hours
AKN.71	July 14	11:30 p.m.	to	July 15	8:30 a.m.	9.0-hours
AKN.75	July 16	11:30 a.m.	to	July 16	7:30 p.m.	8.0-hours
AKN.78	July 18	1:30 a.m.	to	July 18	11:30 a.m.	9.5-hours
Egegik District						
Drift Net						
AKN.01	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^c
AKN.08	June 17	11:30 a.m.	to	June 17	7:30 p.m.	8.0-hours
AKN.08	June 18	12:00 p.m.	to	June 18	8:00 p.m.	8.0-hours
AKN.10	June 20	1:30 p.m.	to	June 20	9:30 p.m.	8.0-hours
AKN.11	June 21	2:30 p.m.	to	June 21	10:30 p.m.	8.0-hours
AKN.12	June 22	3:00 p.m.	to	June 22	11:00 p.m.	8.0-hours
Egegik District						
Drift Net						
AKN.13	June 23	4:00 p.m.	to	June 24	12:00 a.m.	8.0-hours
AKN.17	June 25	4:15 a.m.	to	June 25	12:15 p.m.	8.0-hours
AKN.21	June 27	6:00 a.m.	to	June 27	2:00 p.m.	8.0-hours
AKN.22	June 27	7:00 p.m.	to	June 27	11:30 p.m.	4.5-hours
AKN.22	June 28	6:30 a.m.	to	June 28	2:30 p.m.	8.0-hours

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Table 8.–Page 3 of 6.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
AKN.24	June 28	8:00 p.m.	to	June 28	11:30 p.m.	3.5-hours
AKN.24	June 29	7:30 a.m.	to	June 29	3:30 p.m.	8.0-hours
AKN.28	June 30	8:30 a.m.	to	June 30	4:30 p.m.	8.0-hours
AKN.30	July 01	9:30 a.m.	to	July 01	5:30 p.m.	8.0-hours
AKN.34	July 02	10:30 a.m.	to	July 02	6:30 p.m.	8.0-hours
AKN.38	July 03	11:30 a.m.	to	July 03	7:30 p.m.	8.0-hours
AKN.41	July 04	2:30 p.m.	to	July 04	6:30 p.m.	4.0-hours
Set Net						
AKN.01	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^c
AKN.08	June 17	11:30 a.m.	to	June 17	7:30 p.m.	8.0-hours
AKN.08	June 18	12:00 p.m.	to	June 18	8:00 p.m.	8.0-hours
AKN.10	June 20	1:30 p.m.	to	June 20	9:30 p.m.	8.0-hours
AKN.11	June 21	2:30 p.m.	to	June 21	10:30 p.m.	8.0-hours
AKN.12	June 22	3:00 p.m.	to	June 22	11:00 p.m.	8.0-hours
AKN.13	June 23	4:00 p.m.	to	June 24	12:00 a.m.	8.0-hours
AKN.17	June 25	4:15 a.m.	to	June 25	12:15 p.m.	8.0-hours
AKN.19	June 26	5:00 a.m.	to	June 26	1:00 p.m.	8.0-hours
AKN.21	June 27	6:00 a.m.	to	June 27	2:00 p.m.	8.0-hours
AKN.22	June 27	7:00 p.m.	to	June 28	2:30 p.m.	19.5-hours
AKN.24	June 28	8:00 p.m.	to	June 29	3:30 p.m.	19.5-hours
AKN.28	June 30	8:30 a.m.	to	June 30	4:30 p.m.	8.0-hours
AKN.30	June 30	4:30 p.m.	to	July 01	5:30 p.m.	25.0-hours
AKN.34	July 02	10:30 a.m.	to	July 02	6:30 p.m.	8.0-hours
AKN.38	July 03	11:30 a.m.	to	July 03	7:30 p.m.	8.0-hours
AKN.41	July 04	1:00 p.m.	to	July 04	9:00 p.m.	8.0-hours
Egegik Special Harvest Area						
Drift Net						
AKN.45	July 06	4:30 p.m.	to	July 06	11:00 p.m.	6.5-hours
AKN.47	July 07	4:30 p.m.	to	July 07	11:30 p.m.	7.0-hours
AKN.52	July 08	5:00 p.m.	to	July 08	10:00 p.m.	5.0-hours
AKN.52	July 09	5:00 a.m.	to	July 09	10:00 a.m.	5.0-hours
AKN.56	July 09	6:30 p.m.	to	July 09	11:30 p.m.	5.0-hours
AKN.56	July 10	6:30 a.m.	to	July 10	11:30 a.m.	5.0-hours
AKN.60	July 10	6:30 p.m.	to	July 10	11:30 p.m.	5.0-hours
AKN.60	July 11	6:30 a.m.	to	July 11	1:30 p.m.	7.0-hours
AKN.63	July 12	7:00 a.m.	to	July 12	1:00 p.m.	6.0-hours
Egegik Special Harvest Area						
Drift Net						
AKN.63	July 12	8:00 p.m.	to	July 13	12:00 a.m.	4.0-hours
AKN.69	July 13	9:00 p.m.	to	July 14	1:00 a.m.	4.0-hours
AKN.69	July 14	8:30 a.m.	to	July 14	3:00 p.m.	6.5-hours
AKN.73	July 15	10:00 a.m.	to	July 17	9:00 a.m.	47-hours
Set Net						
AKN.45	July 06	3:00 p.m.	to	July 06	11:00 p.m.	8.0-hours
AKN.47	July 07	3:30 p.m.	to	July 08	12:00 p.m.	20.5-hours
AKN.52	July 08	12:00 p.m.	to	July 09	10:00 a.m.	10-hours
AKN.56	July 09	6:00 p.m.	to	July 10	1:30 p.m.	18.5-hours

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Table 8.–Page 4 of 6.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
AKN.60	July 10	1:30 p.m.	to	July 11	2:30 p.m.	25.0-hours
AKN.63	July 12	7:00 a.m.	to	July 13	4:00 p.m.	33.0-hours
AKN.69	July 13	9:00 p.m.	to	July 14	4:30 p.m.	19.5-hours
AKN.73	July 15	10:00 a.m.	to	July 17	9:00 a.m.	47-hours
Ugashik District						
Drift Net						
AKN.02	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^d
AKN.16	June 24	3:30 p.m.	to	June 24	11:30 p.m.	8.0-hours
AKN.20	June 26	4:30 a.m.	to	June 26	12:30 p.m.	8.0-hours
AKN.25	June 29	7:00 a.m.	to	June 29	11:00 a.m.	4.0-hours
AKN.31	July 01	9:00 a.m.	to	July 01	1:00 p.m.	4.0-hours
AKN.35	July 02	10:00 a.m.	to	July 02	6:00 p.m.	8.0-hours
AKN.42	July 04	3:00 p.m.	to	July 04	6:00 p.m.	6.0-hours
AKN.48	July 07	2:30 p.m.	to	July 07	11:30 p.m.	9.0-hours
AKN.53	July 08	4:30 p.m.	to	July 08	10:30 p.m.	6.0-hours
AKN.57	July 09	4:30 p.m.	to	July 09	11:30 p.m.	7.0-hours
AKN.57	July 10	7:30 a.m.	to	July 10	1:30 p.m.	6.0-hours
AKN.61	July 10	6:00 p.m.	to	July 11	12:00 a.m.	6.0-hours
AKN.61	July 11	8:30 a.m.	to	July 11	3:30 p.m.	7.0-hours
AKN.64	July 11	8:00 p.m.	to	July 12	12:00 a.m.	4.0-hours
AKN.64	July 12	6:30 a.m.	to	July 12	2:30 p.m.	8.0-hours
AKN.66	July 13	7:30 a.m.	to	July 13	5:30 p.m.	10.0-hours
AKN.70	July 14	8:30 a.m.	to	July 14	8:30 p.m.	12.0-hours
AKN.74	July 15	9:30 a.m.	to	July 15	7:30 p.m.	10.0-hours
AKN.77	July 16	10:00 a.m.	to	July 17	9:00 a.m.	23.0-hours
Ugashik District						
Set Net						
AKN.02	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^d
AKN.16	June 24	3:30 p.m.	to	June 25	4:30 a.m.	13.0-hours
AKN.20	June 26	4:30 a.m.	to	June 26	12:30 p.m.	8.0-hours
AKN.25	June 29	7:00 a.m.	to	June 29	3:00 p.m.	8.0-hours
Ugashik District						
Set Net						
AKN.31	July 01	9:00 a.m.	to	July 01	5:00 p.m.	8.0-hours
AKN.35	July 02	10:00 a.m.	to	July 02	8:00 p.m.	10.0-hours
AKN.39	July 03	11:00 a.m.	to	July 03	7:00 p.m.	8.0-hours
AKN.42	July 04	12:00 p.m.	to	July 04	6:00 p.m.	6.0-hours
AKN.48	July 07	2:30 p.m.	to	July 07	11:30 p.m.	9.0-hours
AKN.53	July 08	3:30 p.m.	to	July 09	4:30 a.m.	13.0-hours
AKN.57	July 09	4:30 p.m.	to	July 10	2:30 p.m.	22.0-hours
AKN.61	July 10	2:30 p.m.	to	July 11	5:30 p.m.	27.0-hours
AKN.64	July 11	5:30 p.m.	to	July 12	6:30 p.m.	25.0-hours
AKN.66	July 13	7:30 a.m.	to	July 13	5:30 p.m.	10.0-hours
AKN.70	July 14	8:30 a.m.	to	July 14	8:30 p.m.	12.0-hours
AKN.74	July 15	9:30 a.m.	to	July 15	7:30 p.m.	10.0-hours
AKN.46	July 08	4:30 a.m.	to	July 08	4:30 p.m.	12.0-hours
AKN.49	July 09	5:30 a.m.	to	July 09	5:30 p.m.	12.0-hours
AKN.52	July 10	6:30 a.m.	to	July 10	10:30 p.m.	16.0-hours

-continued-

Table 8.–Page 5 of 6.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time	
AKN.55	July 11	7:30 a.m.	to	July 11	7:30 p.m.	12.0-hours	
AKN.58	July 12	8:30 a.m.	to	July 12	8:30 p.m.	12.0-hours	
AKN.61	July 13	9:30 a.m.	to	July 13	7:30 p.m.	10.0-hours	
AKN.64	July 14	10:30 a.m.	to	July 14	8:30 p.m.	10.0-hours	
AKN.67	July 15	11:30 a.m.	to	July 15	9:30 p.m.	10.0-hours	
AKN.70	July 16	5:30 a.m.	to	July 16	10:30 p.m.	17.0-hours	
Nushagak District							
Nushagak Section							
Drift Net							
DLG.04	June 14	10:30 a.m.	to	June 14	3:30 p.m.	5.0-hours	f
DLG.09	June 17	1:00 p.m.	to	June 17	5:00 p.m.	4.0-hours	f
DLG.15	June 21	7:00 a.m.	to	June 21	11:00 a.m.	4.0-hours	
DLG.19	June 24	9:00 a.m.	to	June 24	3:00 p.m.	6.0-hours	
DLG.24	June 25	10:00 p.m.	to	June 26	4:00 a.m.	6.0-hours	
DLG.26	June 27	6:00 a.m.	to	June 27	2:00 p.m.	8.0-hours	
DLG.28	June 28	12:00 p.m.	to	June 28	5:00 p.m.	5.0-hours	
DLG.30	June 29	2:00 p.m.	to	June 29	5:00 p.m.	3.0-hours	
DLG.31	June 30	2:00 a.m.	to	June 30	8:00 a.m.	6.0-hours	
DLG.32	June 30	3:00 p.m.	to	June 30	8:00 p.m.	5.0-hours	
DLG.33	July 1	6:00 a.m.	to	July 1	11:00 a.m.	5.0-hours	
DLG.34	July 1	3:00 p.m.	to	July 1	11:00 p.m.	8.0-hours	
DLG.35	July 2	5:00 a.m.	to	July 2	12:00 p.m.	7.0-hours	
DLG.36	July 2	6:00 p.m.	to	July 3	12:00 p.m.	18.0-hours	
DLG.37	July 3	4:00 p.m.	to	July 4	2:00 a.m.	10.0-hours	
DLG.37	July 4	6:00 a.m.	to	July 4	4:00 p.m.	10.0-hours	
Nushagak Section							
Drift Net							
DLG.39	July 4	8:00 p.m.	to	July 5	6:00 a.m.	10.0-hours	
DLG.39	July 5	10:00 a.m.	to	July 5	8:00 p.m.	10.0-hours	
DLG.40	July 6	8:00 a.m.	to	July 6	2:00 p.m.	6.0-hours	
DLG.41	July 6	8:00 p.m.	to	July 7	2:00 a.m.	6.0-hours	
DLG.41	July 7	9:00 a.m.	to	July 7	5:00 p.m.	8.0-hours	
DLG.43	July 7	9:00 p.m.	to	July 8	7:00 a.m.	10.0-hours	
DLG.43	July 8	12:00 p.m.	to	July 8	10:00 p.m.	10.0-hours	
DLG.44	July 9	3:00 a.m.	to	July 9	1:00 p.m.	10.0-hours	
DLG.44	July 9	6:00 p.m.	to	July 10	2:00 a.m.	8.0-hours	
DLG.45	July 10	10:00 a.m.	to	July 10	8:00 p.m.	10.0-hours	
DLG.46	July 11	1:00 a.m.	to	July 11	9:00 a.m.	8.0-hours	
DLG.46	July 11	1:00 p.m.	to	July 11	11:00 p.m.	10.0-hours	
DLG.47	July 12	5:00 a.m.	to	July 12	5:00 p.m.	12.0-hours	
DLG.48	July 12	11:00 p.m.	to	July 13	8:00 a.m.	9.0-hours	
DLG.48	July 13	12:00 p.m.	to	July 13	8:00 p.m.	8.0-hours	
DLG.49	July 14	2:00 a.m.	to	July 14	10:00 a.m.	8.0-hours	
DLG.49	July 14	3:00 p.m.	to	July 14	11:00 p.m.	8.0-hours	
DLG.50	July 15	5:00 a.m.	to	July 15	1:00 p.m.	8.0-hours	
DLG.50	July 15	6:00 p.m.	to	July 16	2:00 a.m.	8.0-hours	
DLG.52	July 16	7:00 a.m.	to	July 16	7:00 p.m.	12.0-hours	
DLG.53	July 17	3:00 a.m.					i

-continued-

Table 8.—Page 6 of 6.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time	
Set Net							
DLG.04	June 14	10:30 a.m.	to	June 14	3:30 p.m.	5.0-hours	f
DLG.09	June 17	1:00 p.m.	to	June 17	5:00 p.m.	4.0-hours	f
DLG.13	June 20	3:00 p.m.	to	June 20	9:00 p.m.	6.0-hours	
DLG.15	June 21	3:30 a.m.	to	June 21	11:30 a.m.	8.0-hours	
DLG.16	June 22	4:00 a.m.	to	June 22	12:00 p.m.	8.0-hours	
DLG.17	June 23	4:30 a.m.	to	June 23	12:30 p.m.	8.0-hours	
DLG.18	June 24	5:00 a.m.	to	June 24	1:00 p.m.	8.0-hours	
DLG.19	June 24	1:00 p.m.	to	June 25	6:00 a.m.	17.0-hours	e
DLG.20	June 25	6:00 a.m.	to	June 25	2:00 p.m.	8.0-hours	e
DLG.21	June 25	2:00 p.m.	to	June 26	3:00 p.m.	25.0-hours	e
DLG.25	June 26	3:00 p.m.	to	June 27	4:00 p.m.	25.0-hours	e
DLG.27	June 27	4:00 p.m.	to	June 28	5:00 p.m.	25.0-hours	e
DLG.29	June 28	5:00 p.m.	to	June 29	6:00 p.m.	25.0-hours	e
DLG.30	June 29	6:00 p.m.	to	June 30	7:00 p.m.	25.0-hours	e
DLG.32	June 30	7:00 p.m.	to	July 1	8:00 p.m.	25.0-hours	e
DLG.34	July 1	8:00 p.m.					i
Igushik Section							
Drift Net							
DLG.04	June 14	10:30 a.m.	to	June 14	3:30 p.m.	5.0-hours	f
DLG.09	June 17	1:00 p.m.	to	June 17	5:00 p.m.	4.0-hours	f
Set Net							
DLG.04	June 14	10:30 a.m.	to	June 14	3:30 p.m.	5.0-hours	b
DLG.07	June 16	12:00 p.m.					i
DLG.39				July 4	4:00 p.m.		h
DLG.39	July 5	3:30 p.m.	to	July 5	9:30 p.m.	6.0-hours	
DLG.40	July 6	4:30 p.m.	to	July 6	10:30 p.m.	6.0-hours	
DLG.41	July 7	5:30 p.m.	to	July 7	11:30 p.m.	6.0-hours	j
Togiak District							
Drift and Set Net							
DLG.11	June 21	9:00 a.m.	to	June 23	9:00 a.m.	48.0-hours	g, b
DLG.11	June 21	9:00 a.m.	to	June 24	9:00 a.m.	72.0-hours	g, b
DLG.22	June 28	9:00 a.m.	to	June 30	9:00 a.m.	48.0-hours	g, b
DLG.22	June 28	9:00 a.m.	to	June 30	9:00 a.m.	48.0-hours	g, b
DLG.22	July 2	9:00 a.m.	to	July 3	9:00 p.m.	36.0-hours	g, b
DLG.38	July 5	9:00 a.m.	to	July 7	9:00 a.m.	48.0-hours	g, b
DLG.42	July 12	9:00 a.m.	to	July 14	9:00 a.m.	48.0-hours	g, b
DLG.51	July 19	9:00 a.m.	to	July 21	9:00 a.m.	48.0-hours	g
DLG.54	July 26	9:00 a.m.	to	July 28	9:00 a.m.	48.0-hours	g
DLG.55	August 2	9:00 a.m.	to	August 4	9:00 a.m.	48.0-hours	g
DLG.56	August 9	9:00 a.m.	to	August 11	9:00 a.m.	48.0-hours	g

^a Prefix code on emergency orders indicate where announcement originated. ("AKN" for King Salmon field office and "DLG" for Dillingham field office.)

^b Gillnet mesh size is restricted to 5 and 1/2 inches or less.

^c Weekly schedule: 9:00 a.m. Monday to 9:00 a.m. Wednesday and 9:00 a.m. Thursday to 9:00 a.m. Friday.

^d Weekly schedule: 9:00 a.m. Monday until 9:00 a.m. Friday.

^e Extends current fishing period.

^f Gillnet mesh size is restricted to 7 and 1/2 inches or larger.

^g Reduced the weekly fishing schedule in sections of the Togiak District.

^h Supersedes previous emergency order.

ⁱ Opens commercial fishing until further notice.

^j Closes commercial fishing until further notice.

Table 9.—Daily district registration of drift gillnet permit holders by district, Bristol Bay, 2004.

Date	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
6/20	187	472	27	211	33	930
6/21	250	533	26	304	33	1,146
6/22	269	553	27	337	38	1,224
6/23	271	559	25	349	43	1,247
6/24	297	553	23	360	45	1,278
6/25	307	554	28	374	49	1,312
6/26	312	558	35	384	50	1,339
6/27	318	560	37	374	49	1,338
6/28	343	564	47	384	50	1,388
6/29	348	571	49	387	54	1,409
6/30	349	573	46	387	54	1,409
7/01	352	573	46	389	55	1,415
7/02	352	571	48	390	56	1,417
7/03	354	566	48	391	56	1,415
7/04	366	552	49	391	57	1,415
7/05	368	536	50	391	58	1,403
7/06	387	493	50	395	59	1,384
7/07	377	449	65	394	61	1,346
7/08	361	414	78	399	62	1,314
7/09	349	388	146	377	62	1,322
7/10	345	361	196	370	62	1,334
7/11	336	336	264	349	62	1,347
7/12	337	324	325	346	64	1,396
7/13	346	315	349	343	70	1,423
7/14	354	305	344	339	73	1,415
7/15	377	300	328	342	75	1,422
7/16	403	290	314	336	75	1,418
7/17	415	300	331	345	75	1,466
Average	337	469	121	362	56	1,345

Table 10.—Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2004.

Date	Hours fished		Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set	Drift	Set						
6/11 ^a	9	^b 9								
6/14	15	^b 15	6	18	1,057	3	73	0	0	1,133
6/15	24	^b 24	14	35	1,680	36	97	0	0	1,813
6/16	24	^b 24	9	40	1,610	2	97	1	0	1,710
6/17	24	^b 24	20	48	3,176	14	124	0	1	3,315
6/18	9	^b 9	16	20	1,299	3	37	0	0	1,339
6/19 ^d		^b	1		3,162					
6/21	15	^b 15	40	156	25,013	47	205	0	0	25,265
6/22	24	^b 24	63	232	54,324	72	453	0	0	54,849
6/23 ^d	9	^b 9	107	84	59,785	24	406	0	0	60,215
6/24 ^d	8	^b 9	224	134	83,511	17	490	0	0	84,018
6/25 ^d	8	^b 9	143	87	43,623	14	345	0	0	43,982
6/26 ^d			1		21,113					
6/27 ^d	4/4	^b 4/4	^b 289	147	151,489	6	686	0	0	152,181
6/29	5	^b 5	^b 294	162	78,136	15	443	0	0	78,594
6/30 ^d	5/7.5	^b 24/7.5	590	466	312,510	106	1,728	1	0	314,345
7/01 ^d	8/7.5	^b 24	572	497	466,926	76	1,359	0	0	468,361
7/02 ^d	9/7	^b 24	554	545	439,218	124	1,260	0	0	440,602
7/03 ^d	9/7	^b 24	539	502	452,823	32	1,600	0	0	454,455
7/04 ^d	8.5/6.5	^b 20	570	521	615,215	94	1,990	2	0	617,301
7/05 ^d	7/6	^b	609		648,360	7	2,232	0	0	650,599
7/06 ^d	5.5/7	^{b,c}	603		224,968	18	960	0	0	225,946
7/07 ^d	8/7.5	^c	469		154,674	14	1,289	0	0	155,977
7/08 ^d	9	^c 8	^c 296	167	157,719	20	1,183	0	0	158,922
7/09 ^d	8.5/9	^c	397	85	86,384	25	641	0	0	87,050
7/10 ^d	9	^c 9	^c 117	180	69,482	2	497	1	0	69,982
7/11	8	^c	466	14	220,660	15	2,004	2	0	222,681
7/12	8	^c 9	^c 216	184	74,584	13	775	3	0	75,375
7/13	8	^c 9	^c 205	148	93,401	21	1,163	0	0	94,585
7/14	8/7.5	^c	332		50,265	46	703	0	0	51,014
7/15	8.5	^c 9	^c 134	108	18,751	26	467	0	0	19,244
7/16	8.5	^c 8	^c 70	78	15,588	29	371	2	0	15,588
7/17	8/8.5	^c	105		13,942	37	355	0	0	14,334
7/18	8	^c 10	^c 46	26	7,736	17	232	0	0	7,985
7/19	6/15	^{b,c} 15	^b 113	39	25,782	35	946	18	0	26,781

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Table 10. Page 2 of 2.

Date	Hours fished		Deliveries					Total		
	Drift	Set	Drift	Set	Sockeye	Chinook	Chum		Pink	Coho
7/20	24	^b 24	^b 70	73	22,436	61	816	39	1	23,353
7/21	24	^b 24	^b 52	74	15,541	63	664	65	2	16,335
7/22	24	^b 24	^b 34	50	8,581	33	386	53	3	9,056
7/23	9	^b 9	^b 7	13	2,031	23	89	23	0	2,166
7/26	15	^b 15	^b 4	2	71	16	210	53	13	363
7/27	24	^b 24	^b 4	25	48	35	952	10	35	1,080
7/28	24	^b 24	^b 1	7	0	1	106	0	4	111
7/29	24	^b 24	^b 1	4	5	6	140	0	37	188
7/30	9	^b 9	^b 2							
8/02	15	15	2	5	132	8	86	763	47	1,036
8/03	24	24	3	3	6	2	33	68	57	166
8/04	24	24	1	1						
8/05	24	24	2							
8/06	9	9	1	2						
8/09	15	15		1						
8/10	24	24	3	2	44	2	20	1,337	239	1,642
8/11	24	24	2	6	31	6	27	748	139	951
8/12	24	24	5	4	40	2	17	2,132	241	2,432
8/13	9	9		1						
8/16	15	15	1							
8/17	24	24	1	4	0	2	18	0	303	323
8/18	24	24	1	7	11	1	7	302	222	543
8/19	24	24	1	4	2	1	14	319	269	605
8/24	24	24		2						
8/25	24	24		1						
9/01	24	24	1							
9/02	24	24	1							
9/03	9	9	1							
Total					4,727,187	1,274	28,895	7,710	2,138	4,767,204

^a Less than four permit holders fished, harvest confidential.

^b Fishery was confined to the Naknek Section only.

^c Fishery was confined to the Naknek River Special Harvest Area.

^d District test fish and cost recovery.

Table 11.—Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2004.

Date	Hours fished ^a	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/07	^b 15								
6/08	^b 24								
6/09	^b 9								
6/10	15	3	8	1,948	2	133	0	0	2,083
6/11	9	1	4	1,228	2	43	0	0	1,273
6/14	15	71	91	41,568	7	2,337	0	0	43,912
6/15	24	73	115	42,225	28	1,974	0	0	44,227
6/16	9	18	32	9,203	17	382	0	0	9,602
6/17	8	76	84	39,427	19	797	0	0	40,243
6/18	8	165	88	62,902	86	1,044	0	0	64,032
6/20	^c 8	433	132	238,193	96	2,922	0	0	241,211
6/21	8	234	145	209,046	85	1,665	0	0	210,796
6/22	^c 8	281	112	162,559	63	1,531	0	0	164,153
6/23	^c 8	551	123	245,214	74	2,513	0	0	247,801
6/25	^c 8	491	109	435,989	79	2,738	0	0	438,806
6/26	^c 0/8	0	240	85,232	25	116	0	0	85,373
6/27	^c 12.5/13	887	301	894,973	190	4,676	0	0	899,839
6/28	^c 11.5/18.5	1,008	295	720,118	169	4,092	0	0	724,379
6/29	^c 8/15.5	654	205	633,660	100	3,406	0	0	637,166
6/30	^c 8/15.5	536	215	712,484	76	4,120	0	0	716,680
7/1	^c 8/17.5	526	349	765,921	110	2,913	0	0	768,944
7/2	8	543	138	662,822	48	3,838	0	0	666,708
7/3	^c 8	556	178	636,143	54	3,855	0	0	640,052
7/4	^c 4/8	499	212	645,881	48	4,203	0	0	650,132
7/5	^c	9	0	6,174	0	0	0	0	6,174
7/6	^c 6.5/8	397	255	432,260	20	1,772	0	0	434,052
7/7	^c 7/8.5	344	233	447,981	7	1,870	0	0	449,858
7/8	^c 5/24	403	346	606,665	40	2,396	0	0	609,101
7/9	^c 10/19	599	345	392,770	12	2,284	0	0	395,066
7/10	^c 10/24	591	240	340,944	27	2,244	0	0	343,215
7/11	^c 7/24	316	168	199,500	11	1,810	0	0	201,321
7/12	^c 10/24	394	184	173,670	17	2,160	0	0	175,847
7/13	^c 9/19	267	210	112,510	6	1,852	0	0	114,368
7/14	8/16.5	283	162	103,285	10	2,272	0	0	105,567
7/15	14	125	89	42,235	8	1,238	0	0	43,481
7/16	24	124	83	37,054	7	1,452	0	0	38,513
7/17	9	15	25	8,334	0	304	0	0	8,638
7/19	15	34	13	15,375	9	573	0	0	15,957
7/20	24	37	15	14,251	2	591	0	0	14,844
7/21	24	25	15	9,558	0	183	0	0	9,741
7/22	24	17	10	4,795	2	98	0	0	4,895
7/23	9	3	1	1,121	0	37	0	0	1,158
7/26	15	4	2	428	0	4	0	1	433
7/27	24	6	5	1,094	0	0	0	0	1,094
7/28	24	2	2	404	0	0	0	0	404
7/29	24	3	3	749	0	0	0	0	749
8/31	^b 24								
9/3	^b 24								
9/9	^b 24								
Total		11,600	5,589	10,198,236	1,556	72,437	0	2,863	10,275,092

^a For hours fished: first number is drift, second number is set gillnet, one number both gear groups equal time.

^b Less than four permits, records are confidential.

^c Test fish and cost recovery fish included.

Table 12.—Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2004.

Date	Hours fished ^a	Deliveries			Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set							
6/14	15	7	0	443	29	0	0	0	472	
6/18	^b 9									
6/21	^c 15	1	4	3,033	15	24	0	0	3,072	
6/22	24	4	4	3,796	3	60	0	0	3,859	
6/23	9	15	0	7,139	1	77	0	0	7,217	
6/24	^c 8/8.5	18	10	37,259	21	199	0	0	37,479	
6/25	^b 0/4.5									
6/26	8	38	11	25,859	24	546	0	0	26,429	
6/29	4/8	43	19	14,892	42	255	0	0	15,189	
7/1	4/8	42	31	24,110	34	444	0	0	24,588	
7/2	^c 8/12	43	35	66,494	45	1,477	0	0	68,016	
7/3	8	0	35	7,268	38	52	0	0	7,358	
7/4	3/6	44	41	84,795	27	1,466	0	0	86,288	
7/5	^c	1	0	545	0	0	0	0	545	
7/6	^c	1	0	1,998	0	0	0	0	1,998	
7/7	^c 9	35	95	96,879	13	821	0	0	97,713	
7/8	^c 6/8.5	98	130	268,442	19	3,061	0	0	271,522	
7/9	^c 7/12	109	101	237,201	27	2,247	0	0	239,475	
7/10	^c 12/24	384	154	681,136	98	6,957	0	0	688,191	
7/11	^c 11/24	532	129	526,396	44	6,676	0	0	533,116	
7/12	^c 8/18.5	366	71	313,813	58	7,208	4	0	321,083	
7/13	^c 10	291	44	199,057	46	6,383	0	0	205,486	
7/14	^c 12	261	41	169,518	73	5,939	0	0	175,530	
7/15	10	227	33	110,843	52	4,701	0	0	115,596	
7/16	14	116	25	60,784	34	2,327	0	0	63,145	
7/17	9	79	5	36,761	6	1,406	0	0	38,173	
7/19	15	71	23	45,892	41	3,042	0	0	48,975	
7/20	24	76	31	45,219	33	3,393	0	2	48,647	
7/21	24	43	21	22,128	17	2,351	116	0	24,612	
7/22	24	46	15	21,231	18	1,751	0	0	23,000	
7/23	9	16	4	7,869	6	580	0	0	8,455	
7/26	^b 15									
7/27	24	4	1	1,347	1	126	0	0	1,474	
7/28	24	7	1	2,807	0	422	0	0	3,229	
7/29	24	4	1	1,195	0	0	0	0	1,195	
7/30	^{bd} 9								4,909	
Total		3,023	1,142	3,127,549	868	64,019	120	4,744	3,197,300	

^a For hours fished: first number is drift, second number is set gillnet, one number both gear groups equal time.

^b Less than four permits, records are confidential.

^c Test fish and cost recovery fish included.

^d Weekly fishing schedule was in effect 7/30 to 9/30, last salmon landed was on 9/9.

Table 13.—Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2004.

Date	Hours fished ^a		Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Nushagak	Igushik	Drift	Set						
6/14	5 / 5	0 / 0 ^c	57	9	576	7,494	619	0	0	8689
6/16	0 / 0 ^b	0 / 12 ^d								
6/17	4 / 4	0 / 24	96	49	5,408	13,739	759	0	0	19906
6/18	0 / 0 ^b	0 / 24 ^d								
6/19	0 / 0 ^b	0 / 24	0	25	4,236	48	0	0	0	4284
6/20	0 / 6	0 / 24	1	159	22,710	168	683	4	0	23565
6/21	4 / 8	0 / 24	145	117	55,477	2,158	16,995	2	0	74632
6/22	0 / 8	0 / 24	27	124	18,696	606	2,155	3	0	21460
6/23	0 / 8	0 / 24	4	169	22,279	1,198	729	4	0	24210
6/24	6 / 19	0 / 24	317	299	150,052	4,647	40,593	11	0	195303
6/25	0 / 24	0 / 24	4	193	11,097	316	993	20	0	12426
6/26	2 / 24	0 / 24	292	123	71,560	6,763	19,119	12	0	97454
6/27	12 / 24	0 / 24	343	125	319,476	3,124	51,150	29	0	373779
6/28	5 / 24	0 / 24	365	304	330,341	11,825	43,086	27	1	385280
6/29	3 / 24	0 / 24	326	383	243,785	6,789	25,119	34	0	275727
6/30	11 / 24	0 / 24	684	483	450,374	8,037	30,751	27	1	489190
7/1	13 / 24	0 / 24	621	218	311,887	4,323	28,602	8	0	344820
7/2	13 / 24	0 / 24	554	215	291,147	2,751	18,409	7	0	312314
7/3	20 / 24	0 / 24	568	322	502,464	3,329	26,389	30	0	532212
7/4	16 / 24	0 / 16	552	352	570,788	2,652	34,965	19	0	608424
7/5	16 / 24	0 / 6	598	234	618,959	2,640	27,533	20	0	649152
7/6	10 / 24	0 / 6	440	387	368,722	958	11,002	28	1	380711
7/7	13 / 24	0 / 6	545	251	307,435	1,280	17,216	37	0	325968
7/8	17 / 24	0 / 0 ^c	557	239	292,480	1,690	16,852	54	0	311076
7/9	16 / 24	0 / 0 ^c	393	185	134,134	1,146	10,443	43	1	145767
7/10	12 / 24	0 / 0 ^c	311	154	99,971	1,566	6,471	82	0	108090
7/11	18 / 24	0 / 0 ^c	238	205	259,648	1,170	15,177	95	1	276091
7/12	13 / 24	0 / 0 ^c	281	298	410,508	1,338	12,877	113	15	424851
7/13	16 / 24	0 / 0 ^c	200	69	90,953	684	3,706	61	5	95409
7/14	16 / 24	0 / 0 ^c	161	97	41,309	251	2,058	248	10	43876
7/15	14 / 24	0 / 0 ^c	74	81	16,064	101	1,174	195	19	17553
7/16	14 / 24	0 / 0 ^c	52	37	28,700	147	2,472	124	217	31660
7/17	21 / 24	0 / 0 ^c	10	34	10,069	25	490	185	63	10832
7/18	24 / 24	0 / 0 ^c	15	45	4,810	32	183	422	18	5465
7/19	24 / 24	0 / 0 ^c	14	41	6,425	35	438	1,396	29	8323
7/20	24 / 24	0 / 0 ^c	11	36	5,270	33	293	2,065	79	7740
7/21	24 / 24	0 / 0 ^c	8	34	3,451	40	231	2,126	200	6048
7/22	24 / 24	0 / 0 ^c	5	35	2,777	25	144	3,031	79	6056
7/23	24 / 24	0 / 0 ^c	2	28	1,813	23	177	2,806	186	5005
7/24	24 / 24	0 / 0 ^c	1	7	690	16	155	1,310	391	2562
7/28	24 / 24	0 / 0 ^{cd}								
7/29	24 / 24	0 / 0 ^{cd}								
7/31	24 / 24	0 / 0 ^c	4	1	14	3	5	1,966	30	2018

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Table 13. Page 2 of 2.

Date	Hours fished ^a		Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Nushagak	Igushik	Drift	Set						
8/1	24 /24	0 / 0 ^c	8	5	98	11	3	5,817	377	6306
8/2	24 /24	0 / 0 ^{cd}								
8/3	24 /24	0 / 0 ^{cd}								
8/4	24 /24	0 / 0 ^c	6	2	55	12	12	765	909	1753
8/5	24 /24	0 / 0 ^c	11	2	24	15	7	441	1,470	1957
8/6	24 /24	0 / 0 ^c	10	3	25	2	2	9	3,530	3568
8/7	24 /24	0 / 0 ^c	10	7	15	15	0	901	4,089	5020
8/8	24 /24	0 / 0 ^c	11	5	19	11	2	170	2,432	2634
8/9	24 /24	0 / 0 ^c	16	5	6	10	2	143	4,235	4396
8/10	24 /24	0 / 0 ^c	24	8	17	13	3	361	3,861	4255
8/11	24 /24	0 / 0 ^c	16	5	4	30	0	215	5,349	5598
8/12	24 /24	0 / 0 ^c	21	5	0	3	0	37	12,830	12870
8/13	24 /24	0 / 0 ^c	8	2	0	0	1	2	2,701	2704
8/14	24 /24	0 / 0 ^c	15	0	0	0	0	0	3,972	3972
8/15	24 /24	0 / 0 ^c	4	2	16	1	0	0	227	244
8/16	24 /24	0 / 0 ^{cd}								
8/17	24 /24	0 / 0 ^{cd}								
Total	958 / 1258	0 / 454	9,043	6,225	6,087,776	93,414	470,248	25,886	47,750	6,725,074

^a For hours fished: first number is drift, second number is set gillnet.

^b The Nushagak Section closed.

^c The Igushik Section closed.

^d Less than four permits, records are confidential.

Table 14.—Commercial sockeye salmon fishing time and setnet harvest numbers by date and statistical area, Nushagak District, Bristol Bay, 2004.

Date	Harvest						Total
	Combine Flats	Queen Slough	Coffee Point	Clark's Point	Ekuk Beach	Igushik Beach	
6/14	0	0	53	0	132	0	185
6/16	0	0	0	0	0	189	189
6/17	1,730	428	14	76	321	1,748	4,317
6/18	0	0	0	0	0	719	719
6/19	0	0	0	0	0	4,236	4,236
6/20	12,110	3,681	264	1,243	1,284	3,418	22,000
6/21	1,287	530	69	304	1,399	3,149	6,738
6/22	3,180	569	25	276	579	5,351	9,980
6/23	9,488	767	1,909	964	1,589	6,472	21,189
6/24	23,500	1,276	2,008	676	1,838	5,124	34,422
6/25	4,073	60	578	395	2,442	1,040	8,588
6/26	397	0	96	102	1,857	981	3,433
6/27	96	0	35	158	1,393	1,269	2,951
6/28	22,153	1,019	4,853	3,728	9,214	2,304	43,271
6/29	19,400	2,232	3,174	8,405	17,835	5,671	56,717
6/30	46,411	7,169	6,772	16,588	34,828	14,348	126,116
7/1	13,564	677	1,022	6,174	67	4,529	26,033
7/2	10,263	1,145	2,055	4,708	629	4,289	23,089
7/3	7,167	2,697	5,182	4,053	18,843	7,407	45,349
7/4	14,897	3,513	4,380	5,254	24,987	5,537	58,568
7/5	22,072	6,832	5,848	8,703	59	6,418	49,932
7/6	68,064	12,430	6,905	14,113	22,194	2,576	126,282
7/7	16,831	2,548	2,333	4,934	15,670	2,508	44,824
7/8	10,526	667	1,602	1,846	15,342	0	29,983
7/9	5,907	1,537	586	4,998	15,308	0	28,336
7/10	9,034	524	1,307	5,120	12,346	0	28,331
7/11	7,024	523	482	4,071	28,809	0	40,909
7/12	61,879	3,265	1,880	11,474	39,788	0	118,286
7/13	6,508	2,309	2,131	7,694	41	0	18,683
7/14	7,242	2,484	4,140	4,601	2,589	0	21,056
7/15	2,495	1,014	629	1,542	4,124	0	9,804
7/16	4,622	844	228	994	1,788	0	8,476
7/17	2497	0	814	1,755	1,115	0	6,181
7/18	878	0	371	359	1,638	0	3,246
7/19	42	0	397	579	3,653	0	4,671
7/20	0	0	738	353	3,551	0	4,642
7/21	274	0	134	366	1,975	0	2,749
7/22	168	0	137	227	1,642	0	2,174
7/23	140	0	0	172	1,271	0	1,583
7/24	0	0	0	0	690	0	690
7/31	0	0	0	4	0	0	4
8/1	0	0	0	11	22	0	33
8/3	0	0	0	2	0	0	2
8/4	0	0	0	53	0	0	53
8/5	0	0	0	22	0	0	22
8/6	0	0	0	16	4	0	20

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Table 14. Page 2 of 2.

Date	Harvest						Total
	Combine Flats	Queen Slough	Coffee Point	Clark's Point	Ekuk Beach	Igushik Beach	
8/7	0	0	0	14	0	0	14
8/8	0	0	0	19	0	0	19
8/9	0	0	0	6	0	0	6
8/10	0	0	0	17	0	0	17
8/11	0	0	0	4	0	0	4
8/15	0	0	0	16	0	0	16
Total	415,919	60,740	63,151	127,189	292,856	89,283	1,048,932

Table 15.—Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2004.

Date ^a	Sockeye	Chinook	Chum	Pink	Coho	Total
6/14	47	8	5	0	0	60
6/15	267	41	57	0	0	365
6/16	213	55	46	0	0	314
6/17	354	110	71	0	0	535
6/18	163	68	25	0	0	256
6/21	2,948	505	836	1	0	4,290
6/22	5,043	1,237	1,520	3	0	7,803
6/23	3,296	393	973	0	0	4,662
6/24	964	19	87	0	0	1,070
6/28	10,324	838	4,419	22	0	15,603
6/29	11,086	756	3,857	5	0	15,704
6/30	6,103	263	1,701	0	0	8,067
7/1	176	5	139	0	0	320
7/2	7,847	438	2,514	1	0	10,800
7/3	8,953	385	2,519	0	0	11,857
7/5	17,571	390	4,123	4	0	22,088
7/6	27,307	498	6,245	11	0	34,061
7/7	23,712	493	5,399	11	0	29,615
7/8	16,304	175	1,295	4	0	17,778
7/9	19,168	262	2,286	38	0	21,754
7/10	12,805	137	1,633	19	0	14,594
7/12	25,630	322	5,489	49	0	31,490
7/13	28,948	347	6,759	71	0	36,125
7/14	25,418	288	5,167	69	0	30,942
7/15	18,676	212	3,253	76	0	22,217
7/16	8,953	122	2,333	31	0	11,439
7/19	17,908	82	2,659	156	1	20,806
7/20	24,448	190	5,312	274	0	30,224
7/21	20,476	204	4,544	322	1	25,547
7/22	21,839	147	3,403	551	0	25,940
7/23	8,565	67	1,060	236	1	9,929
7/24	198	1	91	0	0	290
7/26	11,506	53	3,518	887	2	15,966
7/27	11,899	46	2,799	1,754	5	16,503
7/28	9,951	47	2,742	1,588	5	14,333
7/29	9,491	65	1,495	1,776	3	12,830
7/30	3,776	14	420	1,294	1	5,505
7/31	72	1	28	0	0	101
8/2	3,864	18	894	1,784	23	6,583
8/3	5,070	24	1,370	3,032	62	9,558
8/4	3,290	14	500	1,970	40	5,814
8/5	2,319	4	261	1,635	63	4,282

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Table 15. Page 2 of 2.

Date ^a	sockeye	Chinook	Chum	Pink	Coho	Total
8/6	787	4	98	648	34	1,571
8/19	165	0	23	0	786	974
8/20	108	1	20	0	887	1,016
8/23	10	0	1	0	126	137
8/24	231	0	18	0	1,992	2,241
8/25	110	0	8	0	981	1,099
8/30	51	0	2	0	2,414	2,467
8/31	86	0	2	0	3,129	3,217
9/2	61	0	6	0	2,239	2,306
9/3	70	0	5	0	1,832	1,907
9/6	0	0	0	0	80	80
9/7	26	0	0	0	760	786
Total	438,653	9,349	94,030	18,322	15,467	575,821

^a See Table 8 for inseason adjustments to the regular weekly fishing schedule.

Table 16.—Commercial salmon catch by date and species, in numbers of fish, Togiak Section, Bristol Bay, 2004.

Date	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/14 ^a								
6/15	4	3	267	41	57	0	0	365
6/16	5	2	213	55	46	0	0	314
6/17	5	3	354	110	71	0	0	535
6/18	3	1	163	68	25	0	0	256
6/21	17	23	1,439	318	432	0	0	2,189
6/22	35	25	2,269	887	824	3	0	3,983
6/23	22	24	2,238	250	642	0	0	3,130
6/24	4	11	964	19	87	0	0	1,070
6/28	41	50	7,063	616	2,365	6	0	10,050
6/29	51	55	5,716	523	1,988	5	0	8,232
6/30	14	6	1,850	149	551	0	0	2,550
7/2	51	55	7,847	438	2,514	1	0	10,800
7/3	69	67	8,953	385	2,519	0	0	11,857
7/5	48	61	9,400	290	2,137	0	0	11,827
7/6	68	89	12,544	395	2,325	1	0	15,265
7/7	85	84	15,327	451	4,634	3	0	20,415
7/8	41	92	16,304	175	1,295	4	0	17,778
7/9	53	99	18,924	256	2,210	38	0	21,428
7/10	31	61	12,805	137	1,633	19	0	14,594
7/12	69	92	17,852	274	4,210	36	0	22,372
7/13	76	104	18,820	321	5,464	71	0	24,676
7/14	90	102	22,059	281	4,847	69	0	27,256
7/15	85	91	18,676	212	3,253	76	0	22,217
7/16	48	30	8,953	122	2,333	31	0	11,439
7/19	55	71	15,248	65	2,126	149	1	17,589
7/20	85	109	19,298	167	4,739	274	0	24,478
7/21	84	104	18,891	193	4,404	314	1	23,803
7/22	74	106	21,839	147	3,403	551	0	25,940
7/23	22	44	8,206	64	992	236	1	9,499
7/26	64	69	11,506	53	3,518	887	2	15,966
7/27	66	83	11,853	46	2,793	1,754	5	16,451
7/28	49	69	9,951	47	2,742	1,588	5	14,333
7/29	47	45	9,491	65	1,495	1,776	3	12,830
7/30	17	14	3,776	14	420	1,294	1	5,505
8/2	28	34	3,864	18	894	1,784	23	6,583
8/3	37	46	5,070	24	1,370	3,032	62	9,558
8/4	27	35	3,290	14	500	1,970	40	5,814
8/5	20	27	2,319	4	261	1,635	63	4,282
8/6	7	6	787	4	98	648	34	1,571
8/19	6	2	165	0	23	0	786	974
8/20	6	2	108	1	20	0	887	1,016
8/23 ^a								
8/24	11	4	231	0	18	0	1,992	2,241
8/25	7	3	110	0	8	0	981	1,099
8/30	7	9	51	0	2	0	2,414	2,467
8/31	11	12	86	0	2	0	3,129	3,217
9/2	12	7	61	0	6	0	2,239	2,306
9/3	8	9	70	0	5	0	1,832	1,907
9/6 ^a								
9/7	7	1	26	0	0	0	760	786
	1,778	2,141	357,354	7,707	76,307	18,255	15,467	475,090

^a Less than three permits, records are confidential.

Table 17.—Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 2004.

Date ^a	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/21	2	12	1,509	187	404	1	0	2,101
6/22	2	15	2,774	350	696	0	0	3,820
6/23	0	6	1,058	143	331	0	0	1,532
6/28	12	30	3,261	222	2,054	16	0	5,553
6/29	16	42	5,370	233	1,869	0	0	7,472
6/30	12	13	4,253	114	1,150	0	0	5,517
7/5	20	52	8,171	100	1,986	4	0	10,261
7/6	31	56	14,763	103	3,920	10	0	18,796
7/7	14	23	8,385	42	765	8	0	9,200
7/12	11	41	7,778	48	1,279	13	0	9,118
7/13	16	45	10,128	26	1,295	0	0	11,449
7/14	3	22	3,359	7	320	0	0	3,686
7/19	4	25	2,660	17	533	7	0	3,217
7/20	7	32	5,150	23	573	0	0	5,746
7/21	5	14	1,585	11	140	8	0	1,744
Total	155	428	80,204	1,626	17,315	67	0	99,212

^a Kulukak Section is open three days per week. See Table 8 for inseason adjustments to the weekly fishing schedule.

Table 18.—Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 2004.

Date ^a	Sockeye	Chinook	Chum	Pink	Coho	Total
7/9	244	6	76	0	0	326
7/23	359	3	68	0	0	430
7/24	198	1	91	0	0	290
7/27	46	0	6	0	0	52
7/31	72	1	28	0	0	101
Total	919	11	269	0	0	1,199

^a Matogak and Osviak Sections open five days per week. See Table 8 for inseason adjustments to the weekly fishing schedule.

Table 19.—Commercial salmon catch by date and species, in numbers of fish, Osviak Section, Bristol Bay, 2004.

Date	Sockeye	Chinook	Chum	Pink	Coho	Total
7/1	176	5	139	0	0	320
Total	176	5	139	0	0	320

Table 20.—Commercial salmon catch by district and species, in number of fish, Bristol Bay, 2004.

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT						
Kvichak River	1,832,101					
Branch River	1,113,282					
Naknek River	1,781,804					
Total	4,727,187	1,274	28,895	7,710	2,138	4,767,204
EGEGIK DISTRICT	10,198,236	1,556	72,437	0	2,863	10,275,092
UGASHIK DISTRICT	3,127,549	868	64,019	120	4,744	3,197,300
NUSHAGAK DISTRICT						
Wood River	3,832,231					
Igushik River	454,392					
Nushagak-Mulchatna	1,801,153					
Total	6,087,776	93,414	470,248	25,886	47,750	6,725,074
TOGIAK DISTRICT						
Togiak Section	357,354	7,707	76,307	18,255	15,467	475,090
Kulukak Section	80,204	1,626	17,315	67	0	99,212
Matogak Section	919	11	269	0	0	1,199
Osviak Section	176	5	139	0	0	320
Total	438,653	9,349	94,030	18,322	15,467	575,821
TOTAL BRISTOL BAY	24,579,401	106,461	729,629	52,038	72,962	25,540,491

Table 21.—Commercial sockeye salmon catch by date and sub-district, in numbers of fish, General District, Bristol Bay, 2004.

Date	Sub-district								Totals	
	Outer		Northern		Central		Southern		Daily	Cumulative
	Deliveries		Deliveries		Deliveries		Deliveries			
6/7	0	0	0	0	2	183	2	16	199	199
6/8	0	0	1	6	6	432	8	250	688	887
6/9	0	0	1	135	4	743	13	1,138	2,016	2,903
6/10	4	246	3	206	7	812	18	2,578	3,842	6,745
6/11	0	0	3	155	30	6,972	17	2,407	9,534	16,279
6/14	4	249	21	1,727	56	16,787	59	15,131	33,894	50,173
6/15	24	2,256	28	3,155	168	49,159	120	34,811	89,381	139,554
6/16	23	4,991	46	7,044	291	85,710	156	43,018	140,763	280,317
6/17	22	5,470	66	13,494	316	121,586	138	48,770	189,320	469,637
6/18	37	8,965	78	18,858	258	103,705	94	46,088	177,616	647,253
6/21	148	79,414	229	103,257	200	157,752	74	59,388	399,811	1,047,064
6/22	259	95,667	329	177,603	297	220,535	145	128,925	622,730	1,669,794
Total	521	197,258	805	325,640	1,635	764,376	844	382,520		1,669,794

Table 22.— Daily sockeye salmon escapement tower counts by river system, eastside Bristol Bay, 2004.

Date	Kvichak River		Naknek River		Alagnak River		Egegik River		Ugashik River	
	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
6/17							14,718	14,718		
6/18							16,728	31,446		
6/19			7,368	7,368			9,132	40,578		
6/20			4,710	12,078			28,968	69,546		
6/21			7,776	19,854			55,188	124,734		
6/22			8,964	28,818			15,600	140,334		
6/23	390	390	22,344	51,162			3,150	143,484		
6/24	714	1,104	52,224	103,386			3,084	146,568		
6/25	3,570	4,674	8,904	112,290	7,302	7,302	1,962	148,530		
6/26	19,290	23,964	6,300	118,590	1,026	8,328	30,156	178,686	1,506	1,506
6/27	23,364	47,328	57,648	176,238	804	9,132	146,256	324,942	822	2,328
6/28	4,992	52,320	145,290	321,528	3,984	13,116	200,346	525,288	600	2,928
6/29	28,038	80,358	122,622	444,150	89,778	102,894	119,562	644,850	198	3,126
6/30	270,870	351,228	83,766	527,916	103,806	206,700	34,458	679,308	450	3,576
7/01	410,034	761,262	65,610	593,526	76,830	283,530	17,784	697,092	480	4,056
7/02	216,042	977,304	62,274	655,800	38,514	322,044	7,710	704,802	234	4,290
7/03	107,070	1,084,374	62,520	718,320	66,960	389,004	3,270	708,072	258	4,548
7/04	230,514	1,314,888	65,634	783,954	87,852	476,856	9,798	717,870	474	5,022
7/05	315,216	1,630,104	116,964	900,918	58,572	535,428	10,560	728,430	264	5,286
7/06	175,680	1,805,784	362,418	1,263,336	356,262	891,690	93,960	822,390	720	6,006
7/07	350,016	2,155,800	87,060	1,350,396	742,620	1,634,310	88,296	910,686	2,964	8,970
7/08	598,722	2,754,522	31,674	1,382,070	482,172	2,116,482	134,364	1,045,050	35,970	44,940
7/09	543,888	3,298,410	78,972	1,461,042	104,934	2,221,416	139,614	1,184,664	120,090	165,030
7/10	393,456	3,691,866	38,382	1,499,424	226,368	2,447,784	32,130	1,216,794	155,706	320,736

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Table 22. Page 2 of 2.

Date	Kvichak River		Naknek River		Alagnak River		Egegik River		Ugashik River	
	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
7/11	291,966	3,983,832	131,394	1,630,818	257,268	2,705,052	11,730	1,228,524	88,740	409,476
7/12	227,874	4,211,706	98,826	1,729,644	705,588	3,410,640	46,578	1,275,102	93,018	502,494
7/13	432,930	4,644,636	59,622	1,789,266	450,450	3,861,090	5,856	1,280,958	73,638	576,132
7/14	349,326	4,993,962	53,958	1,843,224	595,950	4,457,040	4,104	1,285,062	43,140	619,272
7/15	208,080	5,202,042	17,736	1,860,960	390,114	4,847,154	5,082	1,290,144	19,956	639,228
7/16	129,144	5,331,186	16,308	1,877,268	75,618	4,922,772			13,422	652,650
7/17	41,892	5,373,078	49,860	1,927,128	211,182	5,133,954			6,264	658,914
7/18	59,766	5,432,844	12,246	1,939,374	69,972	5,203,926			11,550	670,464
7/19	26,460	5,459,304			23,976	5,227,902			16,944	687,408
7/20	15,252	5,474,556			26,850	5,254,752			23,622	711,030
7/21	10,080	5,484,636			54,972	5,309,724			38,502	749,532
7/22	15,498	5,500,134			86,868	5,396,592			9,096	758,628
7/23									10,056	768,684
7/24									7,680	776,364

Table 23.—Daily sockeye salmon escapement tower counts by river system, westside Bristol Bay, 2004.

Date	Wood River		Igushik River		Nuyakuk River		Togiak River	
	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
6/17	3,756	3,756						
6/18	2,100	5,856						
6/19	38,094	43,950						
6/20	23,538	67,488						
6/21	8,730	76,218	594	594				
6/22	3,240	79,458	918	1,512				
6/23	71,934	151,392	264	1,776				
6/24	30,414	181,806	2,538	4,314				
6/25	40,518	222,324	1,998	6,312				
6/26	22,392	244,716	1,728	8,040	384	384		
6/27	5,724	250,440	768	8,808	2,532	2,916		
6/28	2,316	252,756	144	8,952	3,408	6,324		
6/29	101,682	354,438	90	9,042	4,548	10,872		
6/30	128,256	482,694	108	9,150	4,056	14,928		
7/01	98,574	581,268	84	9,234	3,612	18,540		
7/02	39,474	620,742	1,068	10,302	1,926	20,466		
7/03	31,518	652,260	4,116	14,418	1,500	21,966	840	840
7/04	65,700	717,960	1,374	15,792	5,262	27,228	912	1,752
7/05	88,020	805,980	720	16,512	9756 ^a	36,984	1,230	2,982
7/06	111,948	917,928	804	17,316	6,000	42,984	1,908	4,890
7/07	133,680	1,051,608	2,568	19,884	5,202	48,186	1,800	6,690
7/08	87,606	1,139,214	2,874	22,758	3,426	51,612	3,534	10,224
7/09	77,472	1,216,686	2,394	25,152	5,124	56,736	2,808	13,032
7/10	51,636	1,268,322	1,554	26,706	4,860	61,596	2,802	15,834
7/11	30,180	1,298,502	996	27,702	5,844	67,440	1,548	17,382
7/12	30,666	1,329,168	3,036	30,738	4,830	72,270	2,418	19,800
7/13	52,728	1,381,896	5,622	36,360	1,968	74,238	1,350	21,150
7/14	82,116	1,464,012	9,930	46,290	1,116	75,354	2,094	23,244
7/15	42,144	1,506,156	13,740	60,030	972	76,326	4,260	27,504
7/16	19,242	1,525,398	11,010	71,040	816	77,142	2,010	29,514
7/17	17,944	1,543,342	12,264	83,304	264 ^a	77,406	1,674	31,188
7/18			11,880	95,184			2,580	33,768
7/19			5,940	101,124			2,388	36,156
7/20			3,750	104,874			6,054	42,210
7/21			3,006	107,880			10,962	53,172
7/22			1,770	109,650			10,758	63,930
7/23							3,438	67,368
7/24							2,358	69,726
7/25							2,970	72,696
7/26							4,164	76,860
7/27							8,802	85,662
7/28							7,476	93,138
7/29							7,086	100,224
7/30							7,692	107,916

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Table 23. Page 2 of 2.

Date	Wood River		Igushik River		Nuyakuk River		Togiak River	
	Daily	Cumulative	Daily	Cumulative	Daily	Date	Daily	Cumulative
7/31							2,844	110,760
8/01							2,256	113,016
8/02							1,962	114,978
8/03							1,794	116,772
8/04							4,938	121,710
8/05							3,552	125,262
8/06							2,676	127,938
8/07							1,524	129,462

^a denotes a partial count

Table 24.– Final daily and cumulative escapement estimates by species, Nushagak River sonar project, Bristol Bay, 2004.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/8	0	0	660	660	0	0	0	0	0	0	660	660
6/9	0	0	1,119	1,779	0	0	0	0	0	0	1,119	1,779
6/10	0	0	1,266	3,045	0	0	0	0	0	0	1,266	3,045
6/11	0	0	1,066	4,111	0	0	0	0	0	0	1,066	4,111
6/12	1,186	1,186	3,024	7,135	1,099	1,099	0	0	0	0	5,309	9,420
6/13	821	2,008	4,863	11,998	2,110	3,209	0	0	0	0	7,794	17,214
6/14	145	2,152	2,494	14,492	450	3,659	0	0	0	0	3,089	20,303
6/15	195	2,347	881	15,373	1,011	4,670	0	0	0	0	2,087	22,390
6/16	403	2,750	958	16,331	1,633	6,303	0	0	0	0	2,993	25,383
6/17	2,499	5,249	2,543	18,874	10,674	16,976	0	0	0	0	15,716	41,099
6/18	4,120	9,369	3,516	22,389	5,334	22,311	0	0	0	0	12,970	54,069
6/19	9,550	18,919	20,395	42,784	24,978	47,289	0	0	0	0	54,923	108,992
6/20	29,527	48,445	10,629	53,414	46,225	93,514	0	0	0	0	86,381	195,373
6/21	17,754	66,199	3,004	56,418	16,835	110,349	0	0	0	0	37,593	232,966
6/22	6,146	72,345	2,127	58,544	14,700	125,050	0	0	0	0	22,973	255,939
6/23	8,452	80,796	5,192	63,736	15,504	140,554	0	0	0	0	29,147	285,086
6/24	36,530	117,326	11,428	75,164	16,626	157,179	0	0	0	0	64,584	349,670
6/25	29,831	147,158	2,208	77,373	6,699	163,879	0	0	0	0	38,739	388,409
6/26	14,901	162,059	1,304	78,677	4,997	168,875	0	0	0	0	21,202	409,611
6/27	12,704	174,763	2,536	81,212	12,510	181,386	0	0	0	0	27,750	437,361
6/28	7,114	181,877	724	81,936	6,655	188,040	0	0	0	0	14,493	451,854
6/29	25,240	207,117	1,734	83,670	2,109	190,150	0	0	0	0	29,083	480,937
6/30	37,925	245,042	3,653	87,323	14,556	204,706	0	0	0	0	56,135	537,072
7/1	45,691	290,733	4,584	91,908	12,777	217,483	0	0	0	0	63,052	600,124
7/2	18,282	309,015	2,778	94,685	4,025	221,509	0	0	0	0	25,085	625,209
7/3	9,060	318,075	1,820	96,505	599	222,107	0	0	0	0	11,479	636,688
7/4	12,969	331,045	1,164	97,670	3,344	225,452	0	0	0	0	17,478	654,166
7/5	25,240	356,285	2,824	100,493	2,954	228,406	0	0	0	0	31,018	685,184

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Table 24. Page 2 of 3.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/6	23,859	380,144	1,978	102,471	8,132	236,538	0	0	0	0	33,969	719,153
7/7	37,406	417,550	3,839	106,310	5,364	241,902	0	0	0	0	46,609	765,762
7/8	21,749	439,299	1,359	107,669	4,080	245,982	0	0	0	0	27,189	792,951
7/9	5,448	444,747	639	108,308	2,901	248,883	0	0	0	0	8,987	801,938
7/10	4,788	449,535	240	108,548	547	249,430	0	0	0	0	5,575	807,513
7/11	3,247	452,782	515	109,063	253	249,683	0	0	0	0	4,015	811,528
7/12	1,273	454,054	557	109,620	317	250,000	0	0	0	0	2,147	813,675
7/13	3,575	457,629	312	109,932	512	250,513	0	0	0	0	4,399	818,074
7/14	8,385	466,014	506	110,438	2,385	252,898	0	0	0	0	11,276	829,350
7/15	4,643	470,657	602	111,040	2,195	255,093	0	0	0	0	7,440	836,790
7/16	2,923	473,580	162	111,202	625	255,717	0	0	0	0	3,709	840,499
7/17	3,074	476,654	159	111,361	2,757	258,474	0	0	265	265	6,255	846,754
7/18	1,124	477,778	160	111,521	1,956	260,430	0	0	166	431	3,406	850,160
7/19	729	478,507	243	111,764	754	261,184	0	0	108	539	1,834	851,994
7/20	1,218	479,725	183	111,947	507	261,691	0	0	102	641	2,010	854,004
7/21	998	480,723	592	112,539	153	261,844	0	0	97	738	1,841	855,845
7/22	1,183	481,907	412	112,951	153	261,998	0	0	176	914	1,924	857,769
7/23	1,430	483,337	179	113,130	104	262,102	0	0	630	1,544	2,344	860,113
7/24	1,188	484,525	284	113,414	2,824	264,926	22	22	579	2,123	4,898	865,011
7/25	0	484,525	57	113,471	3,547	268,473	4,480	4,502	4,382	6,505	12,466	877,477
7/26	0	484,525	0	113,471	2,253	270,726	1,472	5,974	13,926	20,432	17,651	895,128
7/27	0	484,525	174	113,646	262	270,987	10,125	16,098	2,294	22,726	12,855	907,983
7/28	879	485,405	26	113,671	1,902	272,890	4,882	20,980	5,479	28,206	13,169	921,152
7/29	809	486,214	659	114,330	1,904	274,794	13,715	34,696	1,890	30,096	18,977	940,129
7/30	0	486,214	1,809	116,139	0	274,794	30,787	65,483	888	30,984	33,485	973,614
7/31	78	486,292	0	116,139	78	274,872	33,406	98,889	2,291	33,275	35,853	1,009,467

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Table 24. Page 3 of 3.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
8/1	3,036	489,328	0	116,139	740	275,611	54,583	153,472	1,756	35,031	60,115	1,069,582
8/2	1,391	490,720	8	116,147	3,264	278,876	36,260	189,732	661	35,692	41,584	1,111,166
8/3	0	490,720	8	116,155	78	278,954	51,117	240,849	1,727	37,419	52,930	1,164,096
8/4	0	490,720	5	116,159	84	279,038	25,888	266,737	1,366	38,784	27,343	1,191,439
8/5	32	490,751	6	116,165	1,624	280,663	23,074	289,811	1,503	40,287	26,239	1,217,678
8/6	91	490,842	0	116,165	8	280,671	22,282	312,093	935	41,222	23,315	1,240,993
8/7	0	490,842	198	116,364	2,970	283,641	68,645	380,738	6,071	47,293	77,885	1,318,878
8/8	856	491,698	0	116,364	14	283,655	44,805	425,543	7,214	54,507	52,888	1,371,766
8/9	0	491,698	14	116,378	150	283,805	33,096	458,639	3,618	58,125	36,879	1,408,645
8/10	0	491,698	23	116,400	0	283,805	25,346	483,985	7,597	65,722	32,965	1,441,610
8/11	0	491,698	0	116,400	0	283,805	24,546	508,530	10,368	76,090	34,914	1,476,524
8/12	0	491,698	0	116,400	0	283,805	25,191	533,721	1,066	77,156	26,256	1,502,780
8/13	0	491,698	0	116,400	0	283,805	12,306	546,027	23,140	100,296	35,446	1,538,226
8/14	0	491,698	0	116,400	0	283,805	614	546,640	39,240	139,536	39,854	1,578,080
8/15	0	491,698	0	116,400	0	283,805	6,077	552,717	8,537	148,073	14,614	1,592,694
8/16	0	491,698	0	116,400	0	283,805	3,348	556,065	4,540	152,613	7,888	1,600,582

Table 25.—Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2004.

Date	Tower Count		Aerial Survey		River Test Fishing			Estimated River Fish ^b
	Daily	Cum.	Total	Fish per Index Pt. ^a	Index Points		Cumulative Escapement	
					Daily	Cum.		
6/20				85	48	48	4,080	
6/21				85	46	94	7,990	
6/22				85	0	94	7,990	
6/23	390	390		85	312	406	34,510	
6/24	714	1,104		85	178	584	49,640	50,000
6/25	3,570	4,674		50	42	626	31,300	27,000
6/26	19,290	23,964		50	14	640	32,000	10,000
6/27	23,364	47,328		75	45	685	51,375	8,000
6/28	4,992	52,320		76	1,492	2,177	165,452	115,000
6/29	28,038	80,358		76	2,951	5,128	389,728	400,000
6/30	270,870	351,228		150	5,136	10,264	1,539,600	1,200,000
7/01	410,034	761,262		142	2,563	12,827	1,821,434	1,000,000
7/02	216,042	977,304		76	2,000 ^c	14,827	1,126,852	500,000
7/03	107,070	1,084,374		76	4,654	19,481	1,480,556	500,000
7/04	230,514	1,314,888		54	4,065	23,546	1,271,484	200,000
7/05	315,216	1,630,104		69	9,657	33,203	2,291,007	700,000
7/06	175,680	1,805,784		65	13,160	46,363	3,013,595	1,200,000
7/07	350,016	2,155,800		63	8,376	54,739	3,448,557	900,000
7/08	598,722	2,754,522		54	3,561	58,300	3,148,200	400,000
7/09	543,888	3,298,410		64	6,071	64,371	4,119,744	800,000
7/10	393,456	3,691,866		61	3,762	68,133	4,156,113	500,000
7/11	291,966	3,983,832		62	10,037	78,170	4,846,540	800,000
7/12	227,874	4,211,706		62	5,370	83,540	5,179,480	900,000
7/13	432,930	4,644,636		60	5,025	88,565	5,313,900	600,000
7/14	349,326	4,993,962		58	5,185	93,750	5,437,500	400,000
7/15	208,080	5,202,042		58	757	94,507	5,481,406	250,000
7/16	129,144	5,331,186		58	2,232	96,739	5,610,862	130,000
7/17	41,892	5,373,078						
7/18	59,766	5,432,844						
7/19	26,460	5,459,304						
7/20	15,252	5,474,556						
7/21	10,080	5,484,636						
7/22	15,498	5,500,134						

^a The pre-season FPI of 85 was based on the season ending FPI in 1999. 2004 had a similar run projection of an inshore return and age composition as that which occurred in 1999. The pre-season FPI of 85 was used through June 24. Thereafter, FPI's were based on lag-time relationships.

^b Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on aerial surveys, catchability, etc.

^c The daily index originally calculated as 6,818 was believed to be high and downgraded to 2,000 on July 5.

Table 26.—Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Egegik River, Bristol Bay, 2004.

Date	Tower Count		Aerial Survey		River Test Fishing			
	Daily	Cum.	Total	Fish per Index Pt ^a	Index Points		Estimated Cumulative Escapement	Estimated River Fish ^b
					Daily	Cum.		
6/12			1,600					
6/14				81	119	119	9,639	
6/15				81	34	153	12,393	
6/16				81	160	313	25,353	25,000
6/17	14,718	14,718	9,550	81	406	719	58,239	45,000
6/18	16,728	31,446		81	147	866	70,146	40,000
6/19	9,132	40,578		81	60	926	75,006	35,000
6/20	28,968	69,546	14,400	89	875	1,801	160,289	90,000
6/21	55,188	124,734		100	194	1,995	199,500	75,000
6/22	15,600	140,334		92	184	2,179	200,468	60,000
6/23	3,150	143,484		77	55	2,234	172,018	30,000
6/24	3,084	146,568		66	58	2,292	151,272	4,000
6/25	1,962	148,530		65	32	2,324	151,060	2,000
6/26	30,156	178,686		73	3,015	5,339	389,747	210,000
6/27	146,256	324,942		65	2,473	7,812	507,780	180,000
6/28	200,346	525,288		67	286	8,098	542,566	20,000
6/29	119,562	644,850		82	207	8,305	681,010	60,000
6/30	34,458	679,308		82	461	8,766	718,812	40,000
7/01	17,784	697,092		82	367	9,133	748,906	50,000
7/02	7,710	704,802		78	120	9,253	721,734	15,000
7/03	3,270	708,072		77	249	9,502	731,654	15,000
7/04	9,798	717,870		77	111	9,613	740,201	15,000
7/05	10,560	728,430		76	1,111	10,724	815,024	90,000
7/06	93,960	822,390	17,500	80	1,554	12,278	982,240	140,000
7/07	88,296	910,686		78	1,032	13,310	1,038,180	120,000
7/08	134,364	1,045,050		81	359	13,669	1,107,189	80,000
7/09	139,614	1,184,664		88	325	13,994	1,231,472	50,000
7/10	32,130	1,216,794		88	310	14,304	1,258,752	35,000
7/11	11,730	1,228,524		86	376	14,680	1,262,480	30,000
7/12	46,578	1,275,102		87	213	14,893	1,295,691	20,000
7/13	5,856	1,280,958		86	144	15,037	1,293,182	10,000
7/14	4,104	1,285,062						
7/15	5,082	1,290,144						
7/19			5,900					

^a A six-year mean FPI of 81, based on season ending FPI's of large inshore runs with a high 2 ocean age component, was used through June 19. Thereafter, FPI's were based on lag-time relationships.

^b Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on aerial surveys, catchability, etc.

Table 27.—Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Ugashik River, Bristol Bay, 2004.

Date	Tower Count		Aerial Survey		River Test Fishing			
	Daily	Cum.	Total	Fish per Index Pt. ^a	Index Points		Estimated Cumulative Escapement	Estimated RiverFish ^b
					Daily	Cum.		
6/22				65	252	252	16,380	
6/23				65	90	342	22,230	22,000
6/24				65	126	468	30,420	30,000
6/25				65	39	507	32,955	30,000
6/26	1,506	1,506	315	65	48	555	36,075	25,000
6/27	822	2,328		65	36	591	38,415	20,000
6/28	600	2,928	0	65	30	621	40,365	15,000
6/29	198	3,126		65	33	654	42,510	10,000
6/30	450	3,576		65	35	689	44,785	10,000
7/01	480	4,056		65	19	708	46,020	5,000
7/02	234	4,290		65	14	722	46,930	1,000
7/03	258	4,548		65	29	751	48,815	1,000
7/04	474	5,022		65	29	780	50,700	1,000
7/05	264	5,286		65	87	867	56,355	1,000
7/06	720	6,006	17,500	65	173	1,040	67,600	10,000
7/07	2,964	8,970		65	2,395	3,435	223,275	160,000
7/08	35,970	44,940		52	3,135	6,570	341,640	280,000
7/09	120,090	165,030	36,000	51	4,634	11,204	571,404	400,000
7/10	155,706	320,736		45	2,699	13,903	625,635	300,000
7/11	88,740	409,476	1,000	34	2,624	16,527	561,918	150,000
7/12	93,018	502,494		33	1,869	18,396	607,068	100,000
7/13	73,638	576,132		33	1,603	19,999	659,967	70,000
7/14	43,140	619,272		31	1,174	21,173	656,363	35,000
7/15	19,956	639,228		31	540	21,713	673,103	15,000
7/16	13,422	652,650						
7/17	6,264	658,914						
7/18	11,550	670,464						
7/19	16,944	687,408	1,000					
7/20	23,622	711,030						
7/21	38,502	749,532						
7/22	9,096	758,628						
7/23	10,056	768,684						
7/24	7,680	776,364						

^a A two-year mean FPI of 65 was used through July 7. This value was based on season ending FPI's of recent year inshore runs (1999 and 2002) that contained a high 2 ocean age component. Thereafter, FPI's were based on lag-time relationships.

^b Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on aerial surveys, catchability, etc.

Table 28.—Commercial salmon processors and buyers operating in Bristol Bay, 2004.

	Name of Operator/Buyer ^a	Base of Operations	District ^b	Method ^c	Export
1	Alaska Family Seafoods	Dillingham, AK	N	EF,F	AIR
2	Alaska General Seafoods	Kenmore, WA	GD,K,E,U	C,EF,F	AIR
3	Aleutian Maid Processors, LLC	Egegik, AK	E	F	SEA,AIR
4	Alpine Cove, LLC	Kodiak, AK	E,N,U	F	SEA
5	Alyce C. Todd	Montello, WI	N,U	F	SEA,AIR
6	Anthony Wood	King Salmon, AK	K	F	SEA
7	Banacon Inc.	Dillingham, AK	N	EF	AIR
8	Barbara J.Hill	Naknek, AK	K	EF	N/A
9	Baywatch Seafoods, LLC	Woodinville, WA	K,E,U,N,T	EF,F	SEA,AIR
10	Coffee Point Seafoods of WA, LLC	S. Seattle, WA	E	F	SEA
11	CSP Seafoods	Wasilla, AK	T	^d	^d
12	Dancing Salmon Company, LLC	Dillingham, AK	N	F,S	AIR
13	Diamond Lodge	King Salmon, AK	K	EF,F,S	AIR
14	Fisherman's Express, LLC	Anchorage, AK	N	F	AIR
15	Friedman Family Fisheries, Inc.	Baltimore, MD	N	F	SEA,AIR
16	Great Ruby Fish Company	Anchorage, AK	K	EF,F	AIR
17	Icicle Seafoods, Inc.	Seattle, WA	GD,K,E,U,N	C,F	SEA
18	Interior Alaska Fish Processors, Inc.	Fairbanks, AK	N	EF	AIR
19	Kim J. Hubert	Eagle River, AK	T	EF	N/A
20	Lady Marion Seafoods	Anchorage, AK	GD,E	EF,F	AIR
21	Libby Bro. Wild Alaskan Harvest	Anchorage, AK	N	EF,F	AIR
22	Leader Creek Fisheries, LLC	Seattle, WA	GD,K,E,U,N	EF,F	SEA,AIR
23	NorQuest Seafoods, Inc.	Seattle, WA	GD,K,E,U,N	F	SEA
24	Ocean Beauty Seafoods, Inc.	Seattle, WA	GD,K,E,U,N	C,EF,F	SEA,AIR
25	Pacman Fisheries/Bristol Gold, LLC	Naknek, AK	K	S,F	AIR
26	Pederson Point	Seattle, WA	K,E,U	F	SEA
27	Peter Pan Seafoods, Inc.	Seattle, WA	GD,K,E,U,N	C,EF,F	SEA,AIR
28	Snopac Products, Inc.	Seattle, WA	GD,K,E,U	F	SEA
29	Togiak Fisheries	Seattle, WA	T	F	SEA
30	Trident Seafoods	Seattle, WA	GD,K,E,U,N	C,F	SEA,AIR
31	Ugashik Wild Salmon	Ugashik, AK	U	C,EF	AIR
32	Westwind Seafoods, LLC	Seattle, WA	N,T	F	SEA
33	Wild Alaskan Seafood Co., LLC	Spokane, WA	N	F	SEA
34	Woodbine Alaska Fish Company	Rio Vista, CA	E,U,T	C,F	AIR
35	Yard Arm Knot Fisheries, LLC	Seattle, WA	GD,K,E,U	C,F	SEA

Canning=8; Freezing= 29; Fresh=15; Curing=3; Air Export=21; Sea Export=19

^a Indicates operators with a processing facility in a district or operators from other areas buying fish and/or providing support service for fishers in districts away from the facility.

^b GD=General District; K=Naknek-Kvichak; E=Egegik; U=Ugashik; N=Nushagak; T=Togiak.

^c Type of processing: C=canned; EF=export fresh; F=frozen; S=cured.

^d Registered but did not operate.

Table 29.—Mean round weight, price per pound, and total exvessel value of the commercial salmon catch, Bristol Bay, 2004.

Species	Total Catch (lbs.)	Mean Weight ^a (lbs.)	Mean Price (\$/lb.)	Exvessel Value (\$)
Sockeye	148,394,331	5.77	0.50	74,197,166
Chinook	1,707,696	15.35	0.38	648,924
Chum	4,932,731	6.57	0.09	443,946
Pink	212,527	4.07	0.05	10,626
Coho	473,380	6.84	0.34	160,949
Total	155,720,665			75,461,611

^aWeighted Average

Table 30.—Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2004.

Area and River System	Permits	Estimated Number of Salmon Harvested ^a					
	Issued ^b	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT	481	71,110	1,075	469	1,080	566	74,300
Naknek River	277	17,488	949	419	1,033	493	20,381
Kvichak River/Iliamna Lake:	206	53,225	99	10	43	39	53,416
Alagnak (Branch) River	2	91	0	3	0	0	94
Igiugig	2	773	2	0	0	0	775
Iliamna (community)	3	43	0	0	0	0	43
Iliamna Lake	41	10,060	0	0	0	0	10,060
Kijik	2	135	0	0	0	0	135
Kokhanok	24	11,533	16	6	43	12	11,610
Kvichak River	10	650	0	0	0	0	650
Lake Clark: General	26	2,917	0	0	0	0	2,917
Levelock	3	1,000	81	1	0	27	1,108
Newhalen River	37	12,062	0	0	0	0	12,062
Nondalton Village	14	2,910	0	0	0	0	2,910
Pedro Bay	23	4,712	0	0	0	0	4,712
Pile Bay	1	183	0	0	0	0	183
Port Alsworth	9	733	0	0	0	0	733
Six Mile Lake	27	5,424	0	0	0	0	5,424
Naknek-Kvichak Unspecified	6	397	27	40	4	35	503
EGEGIK DISTRICT	46	2,618	169	410	91	1,423	4,711
UGASHIK DISTRICT	21	804	64	9	4	234	1,116
NUSHAGAK DISTRICT	511	17,491	15,610	3,869	1,944	4,240	43,154
Wood River	120	4,094	2,449	562	148	648	7,901
Lower Nushagak River	32	692	1,418	213	123	291	2,738
Upper Nushagak River	87	2,938	4,423	1,793	398	865	10,416
Dillingham Beaches	236	6,875	6,413	1,173	1,087	1,815	17,363
Nushagak Bay Commercial	45	913	440	65	174	323	1,915
Igushik/Snake River	27	1,919	314	41	12	266	2,552
Nushagak, Site Unspecified	3	60	153	23	2	32	270
TOGIAK DISTRICT	46	1,795	1,094	383	108	204	3,584
TOTAL BRISTOL BAY	1,100	93,819	18,012	5,141	3,225	6,667	126,865

^a Harvests are extrapolated for all permits issued, based on those returned and on the area fished as recorded on the permit. Due to rounding, the sum of columns and rows may not equal the estimated total. Of 1,100 permits issued for the management area, 940 were returned (85.5%).

^b Sum of sites may exceed district totals, and sum of districts may exceed area total, because permittees may use more than one site.

Table 31.– Daily observed estimates (tons) of herring by index area, Togiak District, 2004.

Date	Start Time	Survey Rating ^a	Miles of Spawn	Estimated Biomass by Index Area ^b													Daily Total	
				NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYR	CPN	HAG	WAL		
4/15	08:30	4.1																
4/18	16:30	3.7																
4/21	11:30	3.3																
4/22	12:00	2.5									11	3					13	
4/23	10:15	2.7									26				8		34	
4/24	02:15	1.3		687	3,132	268	300		1,969	358					1,144		9,142	
4/25	14:10	1.5		6,958	6,016	523	55	12	1,119	2,693	10				3,109		20,494	
4/28	14:40	3.5	5.7	8	1,657	13	441	797	1,920	1,920	119	4,180	229		248		11,532	
4/29 ^c	05:00	5.0	3.0															
4/30 ^c	12:00	4.0	10.3															
5/02	10:50	3.7	0.7	9	460	420	868	624									2,381	
5/03	12:00	2.7	2.9	3,908	7,210	2,064	703	4,285	9,413	1,303	3,158	1,514	859	173	18		34,607	
5/05	12:00	2.9	7.1	76	550		1,210	90	3,557	1,983	583	1,168	150	88	437		9,891	
5/07	14:00	3.5	4.0								1,360	346	42				1,749	
5/20	16:40	3.8	2.5	422	130	32	587				3						1,173	
5/26	10:45	3.7	0.2			149		6									154	
Total linear miles of spawn			36.4														Peak biomass estimate ^d	34,607

^a Average survey rating for all sections surveyed: 1= Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Unsatisfactory

^b Index areas: NUS - Nushagak Peninsula; KUK - Kulukak; MET - Metervik; NUK - Nunavachak; UGL - Ungalikthluk/Togiak; TOG - Togiak; TNG - Tongue Pt; MTG - Matogak; HAG - Hagemeister; OSK - Osviak; PYT - Pyrite Point; CPN - Cape Newenham.

^c Vessel count and spawn survey only.

^d The 2004 Togiak District Pacific herring total run biomass could not be estimated from aerial survey information because of poor survey conditions.

Table 32.— Emergency order (EO) commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2004.

EO #	Area ^a		Date and Time				Duration
Herring Sac Roe Gillnet							
DLG-02	East Ungalikthluk to Egg Island		4/30	12:00 p.m.	to 4/30	6:00 p.m.	6 hrs.
DLG-04	East Ungalikthluk to Egg Island	extension	4/30	6:00 p.m.	to 5/1	12:00 a.m.	6 hrs.
DLG-06	East Ungalikthluk to Egg Island		5/1	11:00 a.m.	to 5/1	5:00 p.m.	6 hrs.
DLG-07	East Ungalikthluk to Egg Island	extension	5/1	5:00 p.m.	to 5/2	12:00 a.m.	7 hrs.
DLG-08	East Ungalikthluk to Egg Island		5/2	6:00 a.m.	to 5/2	12:00 p.m.	6 hrs.
DLG-10	Right Hand Pt. to Egg Island	extension	5/2	12:00 p.m.	to 5/2	8:00 p.m.	8 hrs.
DLG-12	Right Hand Pt. to Egg Island		5/3	9:00 a.m.	to 5/3	3:00 p.m.	6 hrs.
DLG-13	Right Hand Pt. to Egg Island	extension	5/3	3:00 p.m.	to 5/3	7:00 p.m.	4 hrs.
DLG-14	Right Hand Pt. to Egg Island	extension	5/3	7:00 p.m.	to 5/3	11:00 p.m.	4 hrs.
DLG-16	Right Hand Pt. to Egg Island		5/4	7:00 a.m.	to 5/4	1:00 p.m.	6 hrs.
DLG-17	Right Hand Pt. to Egg Island	extension	5/4	1:00 p.m.	to 5/4	8:00 p.m.	7 hrs.
DLG-18	Right Hand Pt. to Egg Island	extension	5/4	8:00 p.m.	to 5/5	12:00 a.m.	4 hrs.
DLG-20	Right Hand Pt. to Egg Island		5/5	7:00 a.m.	to 5/5	1:00 p.m.	6 hrs.
DLG-21	Right Hand Pt. to Egg Island	extension	5/5	1:00 p.m.	to 5/5	8:00 p.m.	7 hrs.
DLG-22	Right Hand Pt. to Egg Island	extension	5/5	8:00 p.m.	to 5/6	9:00 a.m.	13 hrs.
DLG-23	Right Hand Pt. to Egg Island	extension	5/6	9:00 a.m.	to 5/6	8:00 p.m.	11 hrs.
DLG-24	Right Hand Pt. to Egg Island	extension	5/6	8:00 p.m.	to 5/7	8:00 a.m.	12 hrs.
DLG-25	Right Hand Pt. to Egg Island		5/7	12:00 p.m.	to 5/7	8:00 p.m.	8 hrs.
DLG-26	Right Hand Pt. to Egg Island	extension	5/7	8:00 p.m.	to 5/8	8:00 a.m.	12 hrs.
DLG-27	Right Hand Pt. to Egg Island	extension	5/8	8:00 a.m.	to 5/8	2:00 p.m.	6 hrs.
DLG-30	Right Hand Pt. to Egg Island	extension	5/8	2:00 p.m.	to 5/8	8:00 p.m.	6 hrs.
DLG-32	Right Hand Pt. to Egg Island	extension	5/8	8:00 p.m.	to 5/9	12:00 a.m.	4 hrs.
DLG-33	Right Hand Pt. to Egg Island		5/9	9:00 a.m.	to 5/9	3:00 p.m.	6 hrs.
Herring Sac Roe Purse Seine							
DLG-01	Oosik to Togiak Reef, Right Hand Pt. (RHP) to Anchor Pt.		4/29	4:00 p.m.	to 4/29	10:00 p.m.	6 hrs.
DLG-03	Oosik to Togiak Reef, Rocky Pt. to Anchor Pt.		4/30	4:00 p.m.	to 4/30	10:00 p.m.	6 hrs.
DLG-05	Cape Newenham to Togiak Reef, Rocky Point to Anchor Pt.		5/1	11:00 a.m.	to 5/1	10:00 p.m.	11 hrs.
DLG-09	Cape Newenham to Togiak Reef, RHP to Anchor Pt.		5/2	12:00 p.m.	to 5/2	10:00 p.m.	10 hrs.
DLG-11	Cape Newenham to Togiak Reef, RHP to Anchor Pt.		5/3	8:00 a.m.	to 5/3	8:00 p.m.	12 hrs.
DLG-15	Cape Newenham to Togiak Reef, RHP to Anchor Pt.		5/4	8:00 a.m.	to 5/4	8:00 p.m.	12 hrs.
DLG-19	Cape Newenham to Togiak Reef		5/5	8:00 a.m.	to 5/5	8:00 p.m.	12 hrs.
DLG-28	161 degrees to Osviak Point		5/7	8:30 p.m.	to 5/7	9:00 p.m.	30 min.
DLG-29	Cape Peirce to Tongue Pt.		5/8	2:00 p.m.	to 5/8	2:30 p.m.	30 min.
DLG-31	Cape Newenham to Togiak Reef		5/8	5:30 p.m.	to 5/8	6:30 p.m.	1 hrs.

-continued-

Table 32. Page 2 of 2.

EO #	Area ^a		Date and Time			Duration
DLG-34	Cape Newenham to Togiak Reef, Rocky Pt. to Anchor Pt.	5/8	9:30 p.m.	to	5/8 11:30 p.m.	2 hrs.
DLG-35	Cape Newenham to Tongue Pt.	5/9	10:00 a.m.	to	5/9 3:00 p.m.	5 hrs.
Herring Spawn on Kelp ^b						

^a Area descriptions are approximate. Precise boundaries are described in Emergency Orders.

^b There was no market for spawn on kelp therefore, a fishery did not occur.

Table 33.— Commercial herring harvest (tons) by fishing section, gear type, and date Togiak District, Bristol Bay, 2004.

Date	Duration	Periods	Kulukak		Nunavachak		Togiak		Hagemeister		Pyrite Point		Cape Newenham		Total	Roe %
			Tons	Roe %	Tons	Roe %	Tons	Roe %	Tons	Roe %	Tons	Roe %	Tons	Roe %		
Purse Seine																
29-Apr	6:00	1	0	0.0	302.6	9.3 ^a	2,160.6	8.7 ^a	0.0	0.0	0	0.0	0	0.0	2,463	8.8
30-Apr	6:00	2	0	0.0	0	0.0	667.7	9.3	161.6	10.1	0	0.0	0	0.0	829	9.5
1-May	11:00	3	0	0.0	0	0.0	257.3	9.4	1,022.0	9.6	113.0	10.2	0	0.0	1,392	9.6
2-May	10:00	4	0	0.0	142.1	9.0	46.9	10.5	1,756.9	9.0	262.1	10.5	0	0.0	2,208	9.2
3-May	12:00	5	0	0.0	52.9	8.3	0	0.0	992.4	9.4 ^b	205.9	9.3	0	0.0	1,251	9.3
4-May	12:00	6	0	0.0	259.9	7.8	0	0.0	1,587.5	9.7	28.2	12.2	0	0.0	1,876	9.5
5-May	12:00	7	0	0.0	0	0.0	171.6	11.7	1,775.1	9.6	432.0	10.7	0	0.0	2,379	10.0
6-May			0	0.0	0	0.0	0	0.0	205.2	9.6 ^a	0	0.0	0	0.0	205	9.6
7-May	0:30	8	0	0.0	0	0.0	0	0.0	120.3	9.2 ^c	0	0.0	0	0.0	120	9.2
8-May	0:30	9	0	0.0	31.9	9.9 ^a	0	0.0	9.6	10.2	0	0.0	0	0.0	41	10.0
8-May	1:00	10	0	0.0	0	0.0	0	0.0	173.3	10.6	135.0	10.5	0	0.0	308	10.6
8-May	2:00	11	0	0.0	0	0.0	0	0.0	547.5	10.6	41.1	10.9	0	0.0	589	10.6
9-May	5:00	12	0	0.0	0	0.0	0	0.0	30.7	9.5	0	0.0	0	0.0	31	9.5
10-May			0	0.0	0	0.0	0	0.0	195.2	10.8 ^a	0	0.0	0	0.0	195	10.8
Subtotal	78:00:00		0.0	0.0	789.4	8.7 ^a	3,304.1	9.1 ^a	8,577.3	9.6 ^{a,b,c}	12,17.3	10.4	0	0.0	13,888	9.5
Gillnet																
30-Apr	12:00	1	17.5	12.8	775.1	10.5	0	0.0	0	0.0	0	0.0	0	0.0	793	10.6
1-May	13:00	2	0.0	0	276.1	10.4	0	0.0	0	0.0	0	0.0	0	0.0	276	10.4
2-May	14:00	3	1,257.3	10.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,257	10.4
3-May	14:00	4	920.6	10.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	921	10.7
4-May	18:00	5	188.2	10.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	188	10.5
5,6-May	37:00	6	681.7	10.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	682	10.2
6,7-May	12:00	7	506.8	9.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	507	9.9
7,8-May	20:00	8	249.8	10.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	250	10.3
8-May	16:00	9	92.8	10.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	93	10.4
9-May	6:00	10	14.4	10.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	14	10.9
Subtotal	162:00:00		3,929.1	10.4	1,051.2	10.5	0	0.0	0	0.0	0	0.0	0	0.0	4,980	10.4

-continued-

Table 33. Page 2 of 2.

Date	Duration	Periods	Kulukak		Nunavachak		Togiak		Hagemeister		Pyrite Point		Cape Newenham		Total	Total Roe%
			Tons	Roe %	Tons	Roe %	Tons	Roe %	Tons	Roe %	Tons	Roe %	Tons	Roe %		
Combined																
29-Apr			0.0	0.0	302.7	9.4 ^a	2,160.6	8.7 ^a	0.0	0.0	0	0.0	0	0.0	2,463	8.8
30-Apr			17.5	12.8	775.1	10.5	667.7	9.3	161.6	10.1	0	0.0	0	0.0	1,622	10.0
1-May			0.0	0.0	276.1	10.4	257.3	9.4	918.6	9.6	113.0	10.2	0	0.0	1,565	9.8
2-May			1,257.3	10.4	142.1	9	46.9	10.5	1,860.3	9.0	262.1	10.5	0	0.0	3,569	9.6
3-May			920.6	10.7	52.9	8.3	0.0	0	1,070.5	9.5 ^b	205.9	9.3	0	0.0	2,250	9.9
4-May			188.2	10.5	259.9	7.8	0.0	0	1,405.0	9.7	28.2	12.2	0	0.0	1,881	9.6
5-May			460.3	10.1	0.0	0	171.6	11.7	1,879.4	9.5	432.0	10.7	0	0.0	2,943	9.9
6-May			574.7	10.1	0.0	0	0.0	0	205.2	9.6 ^a	0	0.0	0	0.0	780	10.0
7-May			365.0	10.3	0.0	0	0.0	0	120.3	9.2 ^c	0	0.0	0	0.0	485	10.0
8-May			133.0	10.3	31.9	9.9 ^a	0.0	0	730.4	10.6	0	0.0	0	0.0	895	10.5
9-May			12.5	11	0.0	0	0.0	0	30.7	9.5	176.2	10.6	0	0.0	219	10.5
10-May			0.0	0	0.0	0	0.0	0	195.2	10.8 ^a	0	0.0	0	0.0	195	10.8
Total			3,929.1	10.4	1,840.7	9.7 ^a	3304.1	9.1 ^a	8,577.2	9.6 ^{a,b,c}	1217.4	10.4	0.0	0.0	18,868	9.7

^a Includes test fish harvest which is conducted during closed commercial periods.

^b Includes 60.5 tons documented waste.

^c Includes 42 tons documented waste.

Table 34.—Herring total run and commercial catch by year class, Togiak District, 2004.

Year Class	Age	Total Run		Harvest ^a		Escapement	
		(tons)	%	(tons)	%	(tons)	%
1984	20	0	0.0%	0	0%	0	0.0%
1985	19	0	0.0%	0	0%	0	0.0%
1986	18	0	0.0%	0	0%	0	0.0%
1987	17	286	0.2%	28	0%	258	0.2%
1988	16	1,288	0.9%	82	1%	1,206	0.9%
1989	15	3,469	2.4%	289	2%	3,180	2.4%
1990	14	4,591	3.2%	403	3%	4,188	3.2%
1991	13	4,376	3.1%	380	3%	3,996	3.1%
1992	12	8,902	6.2%	820	6%	8,082	6.2%
1993	11	13,410	9.4%	1,214	9%	12,197	9.4%
1994	10	9,551	6.7%	807	7%	8,743	6.7%
1995	9	5,676	4.0%	543	4%	5,133	4.0%
1996	8	34,354	24.0%	3,408	24%	30,946	24.0%
1997	7	52,719	36.8%	5,402	37%	47,316	36.8%
1998	6	4,165	2.9%	481	3%	3,684	2.9%
1999	5	256	0.2%	23	0%	233	0.2%
2000	4	80	0.1%	7	0%	73	0.1%
2001	3	0	0.0%	0	0%	0	0.0%
2002	2	0	0.0%	0	0%	0	0.0%
Total		143,124 ^b	100%	13,888	100%	129,236 ^b	100%

^a Does not include harvest in the Dutch Harbor food and bait fishery, but does include harvest from test fishery.

^b Total run and escapement estimates not available. Seasons aerial assessment was hampered by poor weather preventing adequate biomass assessment to calculate season's biomass estimate. Preseason forecast was used to estimate Total Run and Escapement.

Table 35.—Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2004.

Operator/Buyer ^a	Base of Operation	Product Purchased		
		Sac Roe		Spawn-on-Kelp
		Gillnet	Purse Seine	
1 Snopac Products Inc.	P/V Snopac	X	X	
2 Y.A.K. Inc.	S/P Red Salmon Cannery	X	X	
3 Trident Seafoods	S/P Naknek, P/V Alaska Packer	X	X	
4 Leader Creek Fisheries	S/P Naknek	X	X	
5 Norquest Seafoods, Inc.	P/V Aleutian Falcon/Pribilof	X	X	
6 Icicle Seafoods	P/V Arctic Star, Bering Star, Discovery Star	X	X	

^a Operators that registered in the Togiak District.

APPENDIX A. SALMON

Appendix A1.—Escapement goals and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 1984–2004.

Year	Kvichak River			Naknek River ^a		
	Range		Actual	Range		Actual
	Lower	Upper		Lower	Upper	
1984	8,000	12,000	10,491	800	1,400	1,242
1985	8,000	12,000	7,211	800	1,400	1,850
1986	4,000	6,000	1,179	800	1,400	1,978
1987	4,000	6,000	6,066	800	1,400	1,062
1988	4,000	6,000	4,065	800	1,400	1,038
1989	6,000	10,000	8,318	800	1,400	1,612
1990	6,000	10,000	6,970	800	1,400	2,093
1991	4,000	8,000	4,223	800	1,400	3,579
1992	4,000	8,000	4,726	800	1,400	1,607
1993	4,000	8,000	4,025	800	1,400	1,536
1994	6,000	10,000	8,338	800	1,400	991
1995	6,000	10,000	10,039	800	1,400	1,111
1996	4,000	6,000	1,451			1,078
1997	4,000	6,000	1,504	800	1,400	1,026
1998	2,000	10,000	2,296	800	1,400	1,202
1999	6,000	10,000	6,197	800	1,400	1,625
2000	6,000	10,000	1,828	800	1,400	1,375
2001	2,000	10,000	1,095	800	2,000	1,830
2002	2,000	10,000	704	800	2,000	1,264
2003	2,000	10,000	1,687	800	2,000	1,831
20-Year Average	4,600	8,900	4,621	800	1,495	1,547
1984–1993 Average	5,200	8,600	5,727	800	1,400	1,760
1994–2003 Average	4,000	9,200	3,514	800	1,600	1,333
2004	2,000	10,000	5,500	800	2,000	1,939
Year	Egegik River			Ugashik River		
	Range		Actual	Range		Actual
	Lower	Upper		Lower	Upper	
1984	800	1,200	1,165	500	900	1,241
1985	800	1,200	1,095	500	900	998
1986	800	1,200	1,151	500	900	1,001
1987	800	1,200	1,273	500	900	669
1988	800	1,200	1,599	500	900	643
1989	800	1,200	1,610	500	900	1,681
1990	800	1,200	2,191	500	900	730
1991	800	1,200	2,787	500	900	2,457
1992	800	1,200	1,945	500	900	2,174
1993	800	1,200	1,517	500	900	1,390
1994	800	1,200	1,897	500	900	1,081
1995	800	1,400	1,282	500	1,200	1,304
1996	800	1,400	1,076	500	1,200	668
1997	800	1,400	1,104	500	1,200	618
1998	800	1,400	1,111	500	1,200	891
1999	800	1,400	1,728	500	1,200	1,652
2000	800	1,400	1,032	500	1,200	620
2001	800	1,400	969	500	1,200	834
2002	800	1,400	1,036	500	1,200	892
2003	800	1,400	1,152	500	1,200	759
20-Year Average	800	1,290	1,436	500	1,035	1,115
1984–1993 Average	800	1,200	1,633	500	900	1,298
1994–2003 Average	800	1,380	1,239	500	1,170	932
2004	800	1,400	1,290	500	1,200	776

Appendix A1. Page 2 of 2.

Year	Wood River			Igushik River		
	Range		Actual	Range		Actual
	Lower	Upper		Lower	Upper	
1984	700	1,200	1,003	150	250	185
1985	700	1,200	939	150	250	212
1986	700	1,200	819	150	250	309
1987	800	1,200	1,337	140	250	169
1988	800	1,200	867	140	250	170
1989	800	1,200	1,186	150	250	462
1990	700	1,200	1,069	150	250	366
1991	700	1,200	1,160	150	250	756
1992	700	1,200	1,286	150	250	305
1993	700	1,200	1,176	150	250	406
1994	700	1,200	1,472	150	250	446
1995	700	1,200	1,475	150	250	473
1996	700	1,200	1,650	150	250	401
1997	700	1,200	1,512	150	250	128
1998	700	1,200	1,756	150	250	216
1999	700	1,200	1,512	150	250	446
2000	700	1,200	1,300	150	250	413
2001	700	1,500	1,459	150	300	410
2002	700	1,500	1,284	150	300	123
2003	700	1,500	1,460	150	300	194
20-Year Average	715	1,245	1,286	149	258	330
1984–1993 Average	730	1,200	1,084	148	250	334
1994–2003 Average	700	1,290	1,488	150	265	325
2004	700	1,500	1,543	150	300	110
Year	Nushagak River ^b			Togiak River		
	Range		Actual	Range		Actual
	Lower ^c	Upper		Lower	Upper	
1984	300	700	473	140	250	95
1985	300	700	429	140	250	137
1986	300	700	822	140	250	168
1987	300	700	163	100	200	250
1988	300	700	483	100	200	277
1989	300	700	513	100	200	84
1990	340	760	680	140	250	142
1991	340	760	493	140	250	255
1992	340	760	695	140	250	199
1993	340	760	715	140	250	177
1994	340	760	509	140	250	155
1995	340	760	281	140	250	186
1996	340	760	504	140	250	157
1997	340	760	373	100	200	132
1998	340	760	459	100	200	154
1999	235	760	393	100	200	156
2000	340	760	404	100	200	312
2001	340	760	804	100	200	297
2002	340	760	316	100	200	162
2003	340	760	581	100	200	232
20-Year Average	323	742	505	120	225	186
1984–1993 Average	316	724	547	128	235	178
1994–2003 Average	330	760	462	112	215	194
2004	340	760	492	100	200	129

^a An Optimal escapement goal of up to 2.0 million sockeye set by the BOF in 2001, when fishing in the Naknek River Special Harvest Area.

^b Actual escapement through 1988 is Nuyakuk River tower count, from 1989–present is based on sonar count at Portage Creek.

^c The "Optimal Escapement Goal" of 235,000 sockeye set by the BOF in 1999.

Appendix A2.—Salmon entry permit registration by gear and residency, Bristol Bay, 1984–2004.

Year ^a	Drift Net ^b						Set Net ^b						Total Drift/Set
	Resident	Non-Resident	Drift Total	Permits Fished	% Fished	Interim Use	Resident	Non-Resident	Set Total	Permits Fished	% Fished	Interim Use	
1984	1,047	771	1,818	1,804	99%	89	743	219	962	869	90%	31	2,687
1985	1,062	772	1,834	1,815	99%	96	741	218	959	872	91%	28	2,706
1986	1,060	778	1,838	1,823	99%	95	739	223	962	869	90%	22	2,707
1987	1,044	793	1,837	1,824	99%	91	736	224	960	899	94%	18	2,736
1988	1,033	806	1,839	1,837	100%	90	731	227	958	922	96%	17	2,761
1989	1,036	831	1,867	1,855	99%	91	785	240	1,025	971	95%	18	2,838
1990	1,039	839	1,878	1,869	100%	93	783	243	1,026	971	95%	15	2,849
1991	1,019	862	1,881	1,873	100%	88	771	253	1,024	950	93%	12	2,831
1992	997	886	1,883	1,879	100%	86	774	251	1,025	968	94%	8	2,851
1993	982	904	1,886	1,875	99%	81	763	259	1,022	965	94%	8	2,851
1994	970	917	1,887	1,865	99%	77	760	259	1,019	939	92%	7	2,826
1995	967	921	1,888	1,882	100%	75	762	257	1,019	967	95%	8	2,855
1996	966	925	1,891	1,884	100%	70	760	257	1,017	941	93%	6	2,832
1997	959	940	1,899	1,875	99%	67	757	262	1,019	921	90%	7	2,820
1998	954	945	1,899	1,858	98%	55	756	259	1,015	901	89%	6	2,800
1999	937	961	1,898	1,847	97%	52	748	266	1,014	925	91%	6	2,823
2000	945	945	1,890	1,823	96%	38	735	277	1,012	921	91%	6	2,811
2001	958	925	1,883	1,566	83%	24	729	281	1,010	834	83%	2	2,717
2002	945	933	1,878	1,183	63%	16	717	289	1,006	680	68%	2	2,558
2003	923	944	1,867	1,389	74%	7	713	288	1,001	714	71%	1	2,581
20 Year Ave.	992	880	1,872	1,781	95%	69	750	253	1,003	900	90%	11	2,772
1984–1993 Ave.	1,032	824	1,856	1,845	99%	90	757	236	992	926	93%	18	2,782
1994–2003 Ave.	952	936	1,888	1,717	91%	48	744	270	1,013	874	86%	5	2,762
2004	912	948	1,860	1,426	77%	3	703	286	989	761	77%	1	2,849

^aLimited Entry went into effect in 1974. Interim-use permits are included in the totals.

^bAllowable gear per license/permit is measured in fathoms, 150 for drift and 50 for set.

Appendix A3.—Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	14,546,710	5,190,413	2,658,376	1,992,681	322,126	24,710,306
1985	8,179,093	7,537,273	6,468,862	1,307,889	209,766	23,702,883
1986	2,892,171	4,852,935	5,002,949	2,719,313	308,688	15,776,056
1987	4,986,002	5,356,669	2,128,652	3,254,720	342,732	16,068,775
1988	3,480,836	6,456,598	1,523,520	1,706,716	822,087	13,989,757
1989	13,809,956	8,901,994	3,146,239	2,788,185	88,932	28,735,306
1990	17,272,224	10,371,762	2,149,009	3,532,543	197,589	33,523,127
1991	10,475,206	6,797,166	2,945,742	5,053,845	549,221	25,821,180
1992	9,395,948	15,646,575	3,320,966	2,789,741	726,446	31,879,676
1993	8,907,876	21,600,858	4,176,900	5,236,557	539,933	40,462,124
1994	16,327,858	10,750,213	4,352,797	3,393,143	400,039	35,224,050
1995	20,279,581	14,425,979	4,509,446	4,445,883	605,328	44,266,217
1996	8,211,983	10,809,115	4,411,055	5,693,523	462,621	29,588,297
1997	589,311	7,517,389	1,402,690	2,506,818	142,569	12,158,777
1998	2,595,439	3,528,845	730,247	2,990,597	190,446	10,035,574
1999	9,452,972	7,388,080	2,256,007	6,175,419	385,411	25,657,889
2000	4,727,061	7,029,397	1,538,790	6,367,208	794,996	20,457,452
2001	5,280,538	2,872,662	480,509	4,734,800	810,096	14,178,605
2002	1,418,938	4,610,374	1,573,234	2,840,031	233,743	10,676,320
2003	3,348,453	2,291,502	1,748,934	6,665,918	706,008	14,760,815
20-Year Ave.	8,308,908	8,196,790	2,826,246	3,809,777	441,939	23,583,659
1984–1993 Ave.	9,394,602	9,271,224	3,352,122	3,038,219	410,752	25,466,919
1994–2003 Ave.	7,223,213	7,122,356	2,300,371	4,581,334	473,126	21,700,400
2004	4,727,187	10,198,236	3,127,549	6,087,776	438,653	24,579,401

Appendix A4.—Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	8,972	4,680	4,767	61,378	22,179	101,976
1985	5,697	4,015	5,840	67,783	37,106	120,441
1986	3,188	1,883	2,982	65,783	19,880	93,716
1987	5,175	2,959	4,065	45,983	17,217	75,399
1988	6,538	3,103	3,444	16,648	15,606	45,339
1989	6,611	2,034	2,112	17,637	11,366	39,760
1990	5,068	1,146	1,840	14,812	11,130	33,996
1991	3,584	510	589	19,718	6,039	30,440
1992	5,724	694	2,146	47,563	12,640	68,767
1993	7,477	1,478	3,075	62,976	10,851	85,857
1994	6,016	1,243	3,685	119,480	10,486	140,910
1995	5,084	760	1,551	79,942	11,981	99,318
1996	4,195	980	588	72,011	8,602	86,376
1997	2,839	2,047	1,084	64,294	6,114	76,378
1998	2,444	760	346	108,486	14,131	126,167
1999	1,295	712	1,638	10,893	11,919	26,457
2000	1,027	1,061	893	12,055	7,858	22,894
2001	904	950	989	11,568	9,937	24,348
2002	969	268	612	39,473	2,801	44,123
2003	567	131	409	42,615	3,231	46,953
20-Year Average	4,169	1,571	2,133	49,055	12,554	69,481
1984–1993 Average	5,803	2,250	3,086	42,028	16,401	69,569
1994–2003 Average	2,534	891	1,180	56,082	8,706	69,392
2004	1,274	1,556	868	93,414	9,349	106,461

Appendix A5.—Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	447,259	178,096	210,611	850,114	336,660	2,022,740
1985	210,107	126,736	131,576	396,740	203,302	1,068,461
1986	262,925	94,666	111,112	488,375	270,057	1,227,135
1987	446,908	145,259	101,074	416,476	419,425	1,529,142
1988	295,571	237,888	94,545	371,196	470,132	1,469,332
1989	310,869	136,185	84,673	523,903	203,178	1,258,808
1990	422,276	123,087	32,013	378,223	102,861	1,058,460
1991	443,189	75,892	60,299	463,780	246,589	1,289,749
1992	167,168	121,472	57,170	398,691	176,123	920,624
1993	43,684	70,628	73,402	505,799	144,869	838,382
1994	219,118	62,961	52,127	328,267	232,559	895,032
1995	236,472	68,325	62,801	390,158	221,126	978,882
1996	124,137	85,151	103,392	324,261	207,094	844,035
1997	8,719	53,139	16,379	185,620	47,459	311,316
1998	82,281	29,405	8,088	208,551	67,595	395,920
1999	259,922	74,890	68,004	170,795	111,677	685,288
2000	68,218	38,857	36,349	114,454	140,175	398,053
2001	16,472	33,579	43,394	526,602	211,701	831,748
2002	19,180	23,516	35,792	276,845	112,987	468,320
2003	34,481	37,116	52,908	740,311	68,154	932,970
20-Year Average	205,948	90,842	71,785	402,958	199,686	971,220
1984–1993 Average	304,996	130,991	95,648	479,330	257,320	1,268,283
1994–2003 Average	106,900	50,694	47,923	326,586	142,053	674,156
2004	28,895	72,437	64,019	470,248	94,030	729,629

Appendix A6.—Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	211,306	5,759	2,387	3,127,153	19,468	3,366,073
1985	39	51	3	48	316	457
1986	106,919	2,749	98	267,117	24,404	401,287
1987	5	0	30	2	20	57
1988	648,569	4,485	218	243,890	58,084	955,246
1989	75	6	29	156	172	438
1990	421,690	11,593	361	54,127	8,746	496,517
1991	102	15	2	69	117	305
1992	214,228	694	525	190,102	93,989	499,538
1993	86	2	2	83	240	413
1994	11,537	145	21	8,562	69,552	89,817
1995	55	1	1	120	294	471
1996	4,590	22	21	2,681	30,308	37,622
1997	39	2	0	50	27	118
1998	11,317	674	247	6,787	6,406	25,431
1999	11	0	3	52	2	68
2000	19,659	32	4	38,309	695	58,699
2001	23	0	0	308	97	428
2002	10	1	1	204	311	527
2003	24	0	0	188	32	244
20-Year Average ^a	164,983	2,615	388	393,893	31,196	593,076
1984–1993 Average ^a	320,542	5,056	718	776,478	40,938	1,143,732
1994–2003 Average ^a	9,423	175	59	11,309	21,454	42,419
2004	7,710	0	120	25,886	18,322	52,038

^a Includes even numbered years only.

Appendix A7.—Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	3,209	66,589	68,451	260,310	176,053	574,612
1985	10,474	32,667	60,815	20,230	38,636	162,822
1986	5,824	33,607	25,770	68,568	48,306	182,075
1987	5,274	30,789	14,785	13,263	1,292	65,403
1988	29,988	48,981	52,355	52,698	18,468	202,490
1989	22,668	49,175	33,942	77,077	56,972	239,834
1990	16,091	43,897	32,906	7,733	2,690	103,317
1991	17,527	47,486	42,622	5,574	4,531	117,740
1992	18,553	47,780	35,794	84,077	5,328	191,532
1993	1,779	41,603	2,387	14,345	12,615	72,729
1994	5,877	48,436	19,250	5,615	96,062	175,240
1995	981	21,772	13,800	4,896	8,917	50,366
1996	3,601	38,156	13,163	11,401	58,978	125,299
1997	718	35,470	7,156	4,110	2,970	50,424
1998	1,587	29,856	13,007	22,703	52,630	119,783
1999	303	11,464	2,289	2,836	2,653	19,545
2000	952	13,166	1,269	112,819	2,758	130,964
2001	3	12,603	976	3,218	284	17,084
2002	0	7,099	464	93	754	8,410
2003	42	40,577	994	583	1,047	43,243
20-Year Average	7,273	35,059	22,110	38,607	29,597	132,646
1984–1993 Average	13,139	44,257	36,983	60,388	36,489	191,255
1993–2002 Average	1,406	25,860	7,237	16,827	22,705	74,036
2004	2,138	2,863	4,744	47,750	15,467	72,962

Appendix A8.—Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1984-2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	15,217,456	5,445,537	2,944,592	6,291,636	876,486	30,775,707
1985	8,405,410	7,700,742	6,667,096	1,792,690	489,126	25,055,064
1986	3,271,027	4,985,840	5,142,911	3,609,156	671,335	17,680,269
1987	5,443,364	5,535,676	2,248,606	3,730,444	780,686	17,738,776
1988	4,461,502	6,751,055	1,674,082	2,391,148	1,384,377	16,662,164
1989	14,150,179	9,089,394	3,266,995	3,406,958	360,620	30,274,146
1990	18,137,349	10,551,485	2,216,129	3,987,438	323,016	35,215,417
1991	10,939,608	6,921,069	3,049,254	5,542,986	806,497	27,259,414
1992	9,801,621	15,817,215	3,416,601	3,510,174	1,014,526	33,560,137
1993	8,960,902	21,714,569	4,255,766	5,819,760	708,508	41,459,505
1994	16,570,406	10,862,998	4,427,880	3,855,157	808,698	36,525,139
1995	20,522,297	14,516,875	4,587,276	4,920,284	847,600	45,394,332
1996	8,322,312	10,900,288	4,530,995	6,111,030	724,023	30,588,648
1997	616,084	7,626,863	1,432,200	2,866,890	200,676	12,742,713
1998	2,693,068	3,589,540	751,962	3,345,717	336,995	10,717,282
1999	9,714,503	7,475,146	2,327,941	6,359,995	511,662	26,389,247
2000	4,816,917	7,082,513	1,577,305	6,644,845	946,482	21,068,062
2001	5,297,940	2,919,794	525,868	5,276,496	1,032,115	15,052,213
2002	1,439,097	4,641,258	1,610,103	3,156,646	350,596	11,197,700
2003	3,383,567	2,369,326	1,803,245	7,449,615	778,472	15,784,225
20-Year Average	8,608,230	8,324,859	2,922,840	4,503,453	697,625	25,057,008
1984–1993 Average	9,878,842	9,451,258	3,488,203	4,008,239	741,518	27,568,060
1994–2003 Average	7,337,619	7,198,460	2,357,478	4,998,668	653,732	22,545,956
2004	4,767,204	10,275,092	3,197,300	6,725,074	575,821	25,540,491

Appendix A9.—Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak			NRSHA ^d		Egegik		Ugashik		Nushagak			WRSHA ^a		Togiak		Total	
	Drift	Setnet Sec.		Drift	Set	Drift	Set	Drift	Set	Drift	Setnet Sec.		Drift	Set	Drift	Set	Drift	Set
		Nak.	Kvi.								Nush.	Igushik						
1984	89	11			92	8	92	8	83	17			77	23	87	13		
1985	87	13			93	7	96	4	65	35			75	25	90	10		
1986	70	30			89	11	94	6	76	24			68	32	90	10		
1987	86	14			91	9	93	7	80	20			66	34	90	10		
1988	86	14			90	10	91	9	75	25			64	36	85	15		
1989	89	11			90	10	87	13	58	42			55	45	87	13		
1990	88	12			91	9	91	9	67	33			67	33	86	14		
1991	89	11			91	9	89	11	76	24			64	36	86	14		
1992	89	11			91	9	90	10	65	35			62	38	87	13		
1993	84	16			93	7	90	10	72	28			54	46	86	14		
1994	90	10			92	8	94	6	68	32			52	48	88	12		
1995	89	11			90	10	95	5	68	32			52	48	87	13		
1996	83	17			90	10	95	5	81	19			52	55	88	12		
1997	73	27			87	13	88	12	70	30			37	63	87	13		
1998	84	8	8		86	14	85	15	72	24	4	76	24	43	57	86	14	
1999	85	8	7		85	15	89	11	70	24	6	78	22	53	47	82	18	
2000	84	11	5		84	16	87	13	77	17	6	68	32	57	43	80	20	
2001	82	16	2	74 ^b	26 ^b	86	14	80	20	77	18	5		66	34	80	20	
2002				64 ^b	36 ^b	85	15	88	12	77	22	1	67	33	62	38	79	21
2003	91	9	0	65 ^b	35 ^b	81	19	89	11	83	15	2		63	37	79	21	
20-Year Ave.	85	14			89	11	90	10	73	26			59	41	86	15		
1984–1993 Ave.	86	14			91	9	91	9	72	28			65	35	87	13		
1994–2003 Ave.	85	13	4	68 ^b	32 ^b	87	13	89	11	74	23	4	72	26	54	47	84	16
2004	79	11	10	88	12	86	14	88	12	84	15	1		55	45	79	21	
Allocation ^c	84	8	8	84	16	86	14	90	10	74	20	6	74	26	n.a.	n.a.	n.a.	n.a.

^a Wood River Special Harvest Area (WRSHA), Nushagak District.

^b Naknek River Special Harvest Area (NRSHA) prior to allocation plan, fishing periods were alternated between gear types.

^c BOF enacted allocation plan in 1998, reviewed in December 2003. Historical data prior to 1998 is based on post-season numbers. Inseason numbers are presented for 1998–present, as they were used to make management decisions regarding allocation.

^d NRSHA allocation plan enacted in December 2003.

Appendix A10.—Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak ^a	Egegik ^b	Ugashik ^c	Nushagak ^d	Togiak ^e	Total
1984	11,948,514	1,165,345	1,270,318	1,814,686	200,778	16,399,641
1985	9,179,014	1,095,204	1,006,407	1,684,760	190,082	13,155,467
1986	3,387,147	1,151,750	1,015,582	2,134,490	271,184	7,960,153
1987	7,281,896	1,273,553	686,894	1,895,961	316,076	11,454,380
1988	5,297,708	1,599,161	654,412	1,524,704	340,712	9,416,697
1989	9,676,244	1,611,566	1,713,281	2,189,501	125,080	15,315,672
1990	9,231,358	2,191,582	749,478	2,144,444	278,202	14,595,064
1991	8,078,885	2,786,925	2,482,001	2,419,488	320,713	16,088,012
1992	6,557,157	1,945,632	2,194,927	2,286,278	266,956	13,250,950
1993	5,908,799	1,517,000	1,413,454	2,296,789	242,475	11,378,517
1994	9,571,245	1,894,977	1,095,068	2,449,616	233,632	15,244,538
1995	11,365,573	1,282,508	1,321,108	2,254,231	240,266	16,463,686
1996	2,835,426	1,075,596	692,167	2,553,995 ^f	212,524	7,369,708
1997	2,747,511	1,104,004	656,641	2,021,529	171,373	6,701,058
1998	3,750,246	1,110,932	924,853	2,441,666	214,626	8,442,323
1999	8,303,878	1,727,772	1,662,042	2,269,861 ^f	231,196	14,194,749
2000	3,654,568	1,032,138	638,420	2,116,842 ^f	390,080	7,832,048
2001	3,194,708	968,872	866,368	2,679,432 ^f	338,616 ^g	9,016,868
2002	2,303,463	1,036,092	905,584	1,722,519 ^f	199,507	6,167,165
2003	5,627,974	1,152,030	758,532	2,241,556 ^f	261,851 ^g	10,041,943
20-Year Average	6,495,066	1,436,132	1,135,377	2,157,117	252,296	11,524,432
1984–1993 Average	7,654,672	1,633,772	1,318,675	2,039,110	255,226	12,901,455
1994–2003 Average	5,335,459	1,238,492	952,078	2,275,125	249,367	10,147,409
2004	12,836,100	1,290,144	815,104	2,144,690 ^f	154,681 ^g	17,240,719

^a Includes counts from Kvichak tower, Branch aerial survey and Naknek tower.

^b Includes Egegik River. May include King Salmon River and Shosky Creek; see table 14 for specific counts.

^c Includes Ugashik River. Also includes Mother Goose River and Dog Salmon River system in 1984–2004.

^d Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna and Snake Rivers.

^e Includes Togiak River, Lake tributaries, Kulukak system and other miscellaneous river systems.

^f Snake River not surveyed.

^g Only partial and late survey of Togiak streams in 2001, 2003, and 2004.

Appendix A11.—Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District by river system, in numbers of fish, Bristol Bay, 1984–2004.

Year	Catch	Escapement			Total	Total Run
		Kvichak ^a	Alagnak ^b	Naknek ^a		
1984	14,546,710	10,490,670	215,370	1,242,474	11,948,514	26,495,224
1985	8,179,093	7,211,046	118,030	1,849,938	9,179,014	17,358,107
1986	2,892,171	1,179,322	230,180	1,977,645	3,387,147	6,279,318
1987	4,986,002	6,065,880	154,210	1,061,806	7,281,896	12,267,898
1988	3,480,836	4,065,216	194,630	1,037,862	5,297,708	8,778,544
1989	13,809,956	8,317,500	196,760	1,161,984	9,676,244	23,486,200
1990	17,272,224	6,970,020	168,760	2,092,578	9,231,358	26,503,582
1991	10,475,206	4,222,788	277,589	3,578,508	8,078,885	18,554,091
1992	9,395,948	4,725,864	224,643	1,606,650	6,557,157	15,953,105
1993	8,907,876	4,025,166	347,975	1,535,658	5,908,799	14,816,675
1994	16,327,858	8,337,840	242,595	990,810	9,571,245	25,899,103
1995	20,279,581	10,038,720	215,713	1,111,140	11,365,573	31,645,154
1996	8,211,983	1,450,578	306,750	1,078,098	2,835,426	11,047,409
1997	589,311	1,503,732	218,115	1,025,664	2,747,511	3,336,822
1998	2,595,439	2,296,074	252,200	1,202,172	3,750,446	6,345,885
1999	9,452,972	6,196,914	481,600	1,625,364	8,303,878	17,756,850
2000	4,727,061	1,827,780	451,300	1,375,488	3,654,568	8,381,629
2001	5,280,538	1,095,348	267,000	1,830,360	3,192,708	8,473,246
2002	1,418,938	703,884	335,661	1,263,918	2,303,463	3,722,401
2003 ^c	3,348,453	1,686,804	2,110,000	1,831,170	5,627,974	8,976,427
20 Year Average	8,308,908	4,774,965	257,846	1,507,796	6,540,607	15,110,592
1984–1993 Average	9,394,602	5,916,478	197,797	1,734,383	7,848,658	17,297,341
1994–2003 Average	7,223,213	3,513,767	488,093	1,333,418	5,335,279	12,558,493
2004 ^c	4,727,187	5,500,134	2,911,600	1,939,374	10,351,108	15,078,295

^a Tower count

^b Aerial survey estimates

^c Tower counts for the Alagnak River in 2003 and 2004 were 3,676,146 and 5,396,592, respectively.

Appendix A12.—Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1984–2004.

Year	Kvichak		Alagnak ^b		Naknek		Total Run ^a
	Number	%	Number	%	Number	%	
1984	23,014	87	555	2	2,926	11	26,495
1985	13,394	77	264	2	3,699	21	17,357
1986	1,966	31	399	6	3,913	62	6,278
1987	9,593	78	297	2	2,378	19	12,268
1988	6,720	77	320	4	1,739	20	8,779
1989	19,774	84	534	2	3,179	14	23,487
1990	17,521	66	555	2	8,427	32	26,503
1991	8,032	43	604	3	9,918	53	18,554
1992	10,445	65	487	3	5,021	31	15,953
1993	9,313	63	817	6	4,687	32	14,817
1994	22,232	86	634	2	3,033	12	25,899
1995	27,431	87	651	2	3,564	11	31,646
1996	3,458	31	706	6	6,860	62	11,024
1997	1,683	50	244	7	1,409	42	3,336
1998	3,412	54	388	6	2,546	40	6,346
1999	12,947	73	1,070	6	3,740	21	17,757
2000	2,862	34	731	9	4,789	57	8,382
2001	1,426	17	409	5	6,639	78	8,474
2002	704	19	336	9	2,671	72	3,711
2003	1,721	19	2,110	24	5,096	57	8,927
20 Year Average	9,882	57	606	5	4,312	37	14,800
1984–1993 Average	11,977	67	483	3	4,589	30	17,049
1994–2003 Average	7,788	47	728	8	4,035	45	12,550
2004	7,332	42	6,510	37	3,721	21	17,563

^a Due to rounding of river system total runs, district total run may not equal the sum of the rows.

^b Total run is based on aerial survey estimate, not tower counts.

Appendix A13.—Inshore commercial catch and escapement of sockeye salmon in the Egegik District by river system, 1984–2004.

Year	Catch	Escapement			Total Run
		Egegik ^a	Shosky Cr. ^b	King Salmon ^b River	
1984	5,190,413	1,165,320		25	6,355,758
1985	7,537,273	1,095,204			8,632,477
1986	4,852,935	1,151,320		430	6,004,685
1987	5,356,669	1,272,978		575	6,630,222
1988	6,456,598	1,599,096	65		8,055,759
1989	8,901,994	1,610,916	50	600	10,513,560
1990	10,371,762	2,191,362		220	12,563,344
1991	6,797,166	2,786,880		45	9,584,091
1992	15,646,575	1,945,332		300	17,592,207
1993	21,600,858	1,516,980	20		23,117,858
1994	10,750,213	1,894,932	15	30	12,645,190
1995	14,425,979	1,281,678		830	15,708,487
1996	10,809,115	1,075,596			11,884,711
1997	7,517,389	1,103,964		40	8,621,393
1998	3,528,845	1,110,882		50	4,639,777
1999	7,388,080	1,727,772		625	9,116,477
2000	7,050,899	1,032,138			8,083,037
2001	2,872,662	968,862	10		3,841,534
2002	4,610,374	1,036,092			5,646,466
2003	2,291,502	1,152,030		90	3,443,622
20-Year Average	8,197,865	1,435,967	32	297	9,634,033
1984–1993 Average	9,271,224	1,633,539	45	314	10,904,996
1994–2003 Average	7,124,506	1,238,395	13	278	8,363,069
2004	10,198,236	1,290,144			11,488,380

^a Tower count.

^b Aerial survey index count.

Appendix A14.—Inshore commercial catch and escapement of sockeye salmon in the Ugashik District, by river system, 1984–2004.

Year	Catch	Ugashik ^a River	Escapement King Salmon ^b River	Dog Salmon ^b River	Total Run
1984	2,658,376	1,241,418	17,100	11,800	3,928,694
1985	6,468,862	998,232	7,400	775	7,475,269
1986	5,002,949	1,001,492	4,310	9,780	6,018,531
1987	2,128,652	668,964	15,855	2,075	2,815,546
1988	1,523,520	642,972	8,360	3,080	2,177,932
1989	3,146,239	1,681,296	25,480	6,505	4,859,520
1990	2,149,009	730,038	11,340	8,100	2,898,487
1991	2,945,742	2,457,306	12,195	12,500	5,427,743
1992	3,320,966	2,173,692	13,425	7,810	5,515,893
1993	4,176,900	1,389,534	22,570	1,350	5,590,354
1994	4,352,797	1,080,858	8,885	5,325	5,447,865
1995	4,509,446	1,304,058	7,650	9,400	5,830,554
1996	4,411,055	667,518	7,230	17,419	5,103,222
1997	1,402,690	618,396	27,645	10,600	2,059,331
1998	730,274	890,508	27,425	6,920	1,655,127
1999	2,256,007	1,651,572	6,350	4,120	3,918,049
2000	1,538,790	620,040	12,900	5,480	2,177,210
2001	480,509	833,628	22,940	9,800	1,346,877
2002	1,573,234	892,104	11,460	2,020	2,478,818
2003	1,748,934	758,532	27,620	4,000	2,539,086
20-Year Average	2,826,248	1,115,108	14,907	6,943	3,963,205
1984–1993 Average	3,352,122	1,298,494	13,804	6,378	4,670,797
1994–2003 Average	2,300,374	931,721	16,011	7,508	3,255,614
2004	3,127,549	776,364	22,850	15,890	3,942,653

^a Tower count.

^b Aerial survey.

Appendix A15.—Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1984–2004.

Year	Catch	Escapement						Total	Total Run
		Wood ^a	Igushik ^a	Nuyakuk ^a	Nush/Mul ^b	Nushagak ^c	Snake ^d		
1984	1,992,681	1,002,792	184,872	472,596	120,586	593,182	33,840	1,814,686	3,807,367
1985	1,307,889	939,000	212,454	429,162	69,300		34,880	1,186,334	2,494,223
1986	2,719,313	818,652	307,728	821,898	168,340		16,780	1,143,160	3,862,473
1987	3,254,720	1,337,172	169,236	163,000	225,034	388,034	1,520	1,895,962	5,150,682
1988	1,706,716	866,778	170,454	319,992	163,208	483,200	4,320	1,524,752	3,231,468
1989	2,788,185	1,186,410	461,610			513,421	28,060	2,189,501	4,977,686
1990	3,532,543	1,069,440	365,802			680,368	28,840	2,144,450	5,676,993
1991	5,053,845	1,159,920	756,126			492,522	10,920	2,419,488	7,473,333
1992	2,789,741	1,286,250	304,920			695,108		2,286,278	5,076,019
1993	5,236,557	1,176,126	405,564			715,099		2,296,789	7,533,346
1994	3,393,143	1,471,890	445,920			509,326	22,480	2,449,616	5,842,759
1995	4,445,883	1,482,162	473,382	69,702	211,605	281,307	17,380	2,254,231	6,700,114
1996	5,693,523	1,649,598	400,746	250,692	252,959	503,651		2,553,995	8,247,518
1997	2,506,818	1,512,396	127,704	272,982	100,053	373,035	8,394	2,021,529	4,528,347
1998	2,990,597	1,755,768	215,904	146,250	312,624	458,874	11,120	2,441,666	5,432,263
1999	6,175,419	1,512,426	445,536	81,006	230,893	311,899		^e 2,269,861	8,445,280
2000	6,367,208	1,300,026	413,316	129,468	274,032	403,500		^e 2,116,842	8,484,050
2001	4,734,800	1,458,732	409,596	184,044	627,060	811,104		^e 2,679,432	7,414,232
2002	2,840,031	1,283,682	123,156	68,928	246,753	315,681		^e 1,722,519	4,562,550
2003	6,665,918	1,459,782	194,088	116,646	463,888	580,534		^e 2,234,404	8,900,322
20-year Ave.	3,809,777	1,286,450	329,406	251,883	247,595	506,103	18,211	2,082,275	5,892,051
1984–1993 Ave.	3,038,219	1,084,254	333,877	441,330	149,294	570,117	19,895	1,890,140	4,928,359
1994–2003 Ave.	4,581,334	1,488,646	324,935	146,635	302,207	454,891	14,844	2,274,410	6,855,744
2004	6,087,776	1,543,342	109,650	77,406	414,292	491,698		^e 2,144,690	8,232,466

^a Tower count.

^b Aerial survey estimates for 1985. Escapement estimates for 1984, 1987–1988, and 1995–2004, were derived from the difference between lower river sonar estimates and Nuyakuk Tower counts. Escapement estimates for 1986 based on the average ratio of Nuyakuk/Nushagak-Mulchatna in years when data was available. In 1987, the counting tower was terminated early due to high water. Tower estimate was expanded using aerial survey data.

^c Total escapements from 1989 on are determined for the entire Nushagak River drainage using Portage Creek sonar estimates.

^d Aerial survey estimate 1984–1991, 1994–1995 and 1997; weir count not surveyed in 1992, 1993 or 1996 due to lack of funding.

^e Snake River escapement is not included this year because staff was unable to conduct aerial surveys.

Appendix A16.—Inshore sockeye salmon total run by river system, in thousands of fish, Nushagak District, 1984–2004.

Year	Wood		Igushik		Nushagak					Snake ^c		Total Run ^b			
	Total Run		Total Run		Nushagak Escapement ^d				Catch	Total Run					
	Number	%	Number	%	Nuyakuk		Nush-Mul		Sonar ^a	Total	Number		%	Number	%
					Number	%	Number	%	Estimate						
1984	1,982	52	435	11	473	80	121	20	594	763	1,357	36	34	1	3,808
1985	1,593	53	460	15	429	86	69	14	498	407	905	30	35	1	2,993
1986	1,772	37	877	18	822	83	168	17	990	1,197	2,187	45	17	0	4,853
1987	2,828	55	617	12	163	42	225	58	388	1,317	1,705	33	2	0	5,152
1988	1,749	54	406	13	320	66	163	34	483	590	1,073	33	4	0	3,232
1989	2,519	51	1,214	24					513	704	1,217	24	28	1	4,978
1990	2,610	46	1,280	23					680	1,077	1,757	31	29	1	5,676
1991	3,303	44	2,424	32					493	1,243	1,736	23	11	0	7,474
1992	2,481	49	794	16					695	1,107	1,802	35			5,077
1993	3,725	49	1,580	21					715	1,513	2,228	30			7,533
1994	2,957	51	1,300	22					509	1,034	1,543	26	42	1	5,842
1995	4,022	60	1,902	28	70	25	212	75	281	475	756	11	20	0	6,700
1996	5,007	61	1,481	18	251	50	253	50	504	1,256	1,760	21			8,248
1997	3,365	74	291	6	273	73	100	27	373	491	864	19	8	0	4,528
1998	3,901	72	571	11	146	32	313	68	459	490	949	17	11	0	5,432
1999	5,930	70	1,563	19	81	26	231	74	312	640	952	11			8,445
2000	5,278	62	1,748	21	129	32	274	68	404	1,054	1,458	17			8,484
2001	3,987	54	1,315	18	184	23	627	77	811	1,301	2,112	28			7,414
2002	3,715	81	207	5	69	22	247	78	316	325	641	14			4,563
2003	5,647	63	1,018	11	117	20	464	80	581	1,655	2,236	25			8,901
20-Year Ave.	3,419	57	1,074	17	252	47	248	53	530	932	1,462	26	20	0	5,967
1984–1993 Ave.	2,456	49	1,009	19	441	71	149	29	605	992	1,597	32	20	0	5,078
1994–2003 Ave.	4,381	65	1,140	16	147	34	302	66	455	872	1,327	19	20	0	6,856
2004	5,375	65%	564	7%	77	16%	414	84%	492	1,801	2,293	28%			8,232

^a Sonar estimates not available for 1985–1986. Value derived from sum of escapement for the entire Nushagak River.

^b Due to rounding, the district total runs may not equal the sum of the rows. District total run is the sum of Wood, Igushik, Nushagak, and Snake total run numbers.

^c Snake River escapement is not included from 1999–2004 year because staff was unable to conduct aerial surveys.

^d Escapement percentages represent the portion of sonar escapement that is accounted for in the Nuyakuk or Nush-Mul.

Appendix A17.—Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1984–2004.

Year	Catch				Escapement						
	Togiak	Kulukak	Os/Mat ^a	Total	Togiak			Kulukak ^c	Other ^f	Total	Total Run
					Lake ^b	River ^c	Tributaries ^d				
1984	213,213	96,709	12,204	322,126	95,448	15,830	39,700	49,800		200,778	522,904
1985	133,263	44,120	32,383	209,766	136,542	3,600	13,340	36,600		190,082	399,848
1986	191,158	100,466	17,064	308,688	168,384	20,000	15,000	42,800	25,000	271,184	579,872
1987	274,613	45,401	22,718	342,732	249,676	10,400	18,200	37,800		316,076	658,808
1988	673,408	143,112	5,567	822,087	276,612	18,800	13,600	31,700		340,712	1,162,799
1989	68,375	14,116	6,441	88,932	84,480	15,200	4,560	20,840		125,080	214,012
1990	168,688	27,311	1,590	197,589	141,977	17,540	29,605	49,600	39,480	278,202	475,791
1991 ^g	522,090	33,425	6,437	549,221	254,683	15,980	7,740	23,940	18,370	320,713	869,934
1992	610,575	108,358	7,513	726,446	199,056	6,060	10,400	26,440	25,000	266,956	993,402
1993	475,799	58,616	5,518	539,933	177,185	4,600	11,330	31,800	17,560	242,475	782,408
1994	321,121	76,781	2,137	400,039	154,752	6,200	13,220	29,740	29,720	233,632	633,671
1995	527,143	76,056	2,129	605,328	185,718	6,520	18,988	14,620	14,420	240,266	845,594
1996	381,539	76,833	1,691	460,063	156,954	18,320	11,900	18,980	6,370	212,524	672,587
1997	91,639	47,979	2,951	142,569	131,682	12,300	8,325	7,950	11,116	171,373	313,942
1998	112,993	75,279	2,155	190,427	153,576	9,780	12,120	12,950	26,200	214,626	405,053
1999	346,749	38,662	0	385,411	155,898	10,800	29,438	12,300	22,760	231,196	616,607
2000	727,384	67,612	0	794,996	311,970	25,200	15,075	22,350	15,485	390,080	1,185,076
2001 ^h	798,426	9,762	1,908	810,096	296,676	6,520	150	17,280	17,990	338,616	1,148,712
2002	214,094	19,112	537	233,743	162,402	4,100	12,075	8,500	12,430	199,507	433,250
2003	650,066	55,081	861	706,008	232,302			8,004	21,545	261,851	967,859
20-Year Average	369,102	60,781	6,674	435,920	184,260	11,748	14,934	26,148	20,136	251,184	687,104
1983–1992 Average	338,516	66,892	11,444	415,580	179,838	13,061	16,607	34,649	26,963	254,939	670,519
1993–2002 Average	399,689	54,669	1,903	456,261	188,681	10,434	13,262	17,647	17,405	247,430	703,690
2004 ^{h,i}	357,354	80,204	1,095	438,653	129,462	6,100	75		19,044	154,681	593,334

^a Catches in the Osviak and Matogak sections were combined.

^b Tower count.

^c Aerial survey estimate.

^d Aerial survey estimate includes Gechiak, Pungokepuk, Kemuk, Nayorurun, and Ongivinuck River systems. Aerial survey estimates prior to 1986 also include Ungalikthluk, Negukthluk, Matogak, Osviak, and other miscellaneous river systems when surveyed.

^e Aerial survey estimate includes Kulukak River and Lake and Tithe Creek ponds.

^f Aerial survey estimate includes Matogak, Osviak, Slug, Negukthluk, and Ungalikthluk and Quigmy Rivers. Prior to 1986 estimates for these systems were included under tributaries when surveyed.

^g Catches are based on weekly processor reports. Fish tickets were not coded by section.

^h Only the Ongivinuck River was surveyed for sockeye escapement in tributaries.

ⁱ Partial Survey

Appendix A18.—Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1984–2004.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1984	26,495,224	6,355,758	3,928,694	3,807,367	522,904	41,109,947
1985	17,358,107	8,632,477	7,475,269	2,992,649	399,848	36,858,350
1986	6,279,318	6,004,685	6,018,531	4,853,803	579,872	23,736,209
1987	12,267,898	6,630,222	2,815,546	5,150,681	658,808	27,523,155
1988	8,778,544	8,055,759	2,177,932	3,231,420	1,162,799	23,406,454
1989	23,486,200	10,513,560	4,859,520	4,977,686	214,012	44,050,978
1990	26,503,582	12,563,344	2,898,487	5,676,987	475,791	48,118,191
1991	18,554,091	9,584,091	5,427,743	7,473,333	869,934	41,909,192
1992	15,953,105	17,592,207	5,515,893	5,076,019	993,402	45,130,626
1993	14,816,675	23,117,858	5,590,354	7,533,346	782,408	51,840,641
1994	25,899,103	12,645,190	5,447,865	5,842,759	633,671	50,468,588
1995	31,645,154	15,708,487	5,830,554	6,700,114	845,594	60,729,903
1996	11,047,409	11,884,711	5,103,222	8,247,518	672,587	36,955,447
1997	3,336,822	8,621,393	2,059,331	4,527,953	313,942	18,859,441
1998	6,345,885	4,639,777	1,655,127	5,432,143	405,053	18,477,985
1999	17,738,850	9,116,477	3,918,049	8,445,280	616,607	39,835,263
2000	8,381,629	8,083,037	2,177,210	8,484,050	1,185,076	28,311,002
2001	8,473,246	3,841,534	1,346,877	7,414,232	1,148,712	22,224,601
2002	3,722,401	5,646,466	2,478,818	4,562,550	433,250	16,843,485
2003	8,976,427	3,443,622	2,539,136	8,900,322	967,859	24,827,366
20-Year Average	14,802,984	9,634,033	3,963,208	5,966,511	694,106	35,060,841
1984–1993 Average	17,049,274	10,904,996	4,670,797	5,077,329	665,978	38,368,374
1994–2003 Average	12,556,693	8,363,069	3,255,619	6,855,692	722,235	31,753,308
2004	17,563,287	11,488,380	3,942,653	8,232,466	593,334	41,820,120

Appendix A19.—Chinook salmon harvest, escapement and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1984–2004.

Year	Harvests by Fishery				Inriver Abundance ^a	Spawning Escapement ^b	Total Run
	Commercial	Sport	Subsistence	Total			
1984	61,378	2,320	9,800	73,498		80,940	154,438
1985	67,783	1,838	7,900	77,521		115,720	193,241
1986	65,783	4,790	12,600	83,173	43,434	33,854	117,027
1987	45,983	4,458	12,200	62,641	84,309	75,891	138,532
1988	16,648	2,817	10,079	29,544	56,905	50,946	80,490
1989	17,637	3,613	8,122	29,372	78,302	72,601	101,973
1990	14,812	3,486	12,407	30,705	63,955	55,931	86,636
1991	19,718	5,551	13,627	38,896	104,351	94,733	133,629
1992	47,563	4,755	13,588	65,906	82,848	74,094	140,000
1993	62,976	5,899	17,709	86,584	97,812	86,706	173,290
1994	119,480	10,626	15,490	145,596	95,954	83,103	228,699
1995	79,943	4,951	13,701	98,595	85,622	77,018	175,613
1996	72,011	5,390	15,941	93,342	52,127	42,228	135,570
1997	64,156	3,497	15,318	82,971		82,000	164,971
1998	117,079	5,827	12,258	135,164	117,495	108,037	243,201
1999	10,893	4,237	10,057	25,187	62,331	54,703	79,890
2000	12,055	6,017	9,470	27,542	56,374	47,674	75,216
2001	11,568	5,899	26,939	44,406	99,155	83,272	127,678
2002	39,473	3,693	11,281	54,447	87,141	79,790	134,237
2003	42,615	5,590	18,686	66,891	80,028	67,403	134,294
20-Year Ave.	49,478	4,763	13,359	67,599	79,303	73,332	140,931
1984–1993 Ave.	42,028	3,953	11,803	57,784	76,490	74,142	131,926
1994–2003 Ave.	56,927	5,573	14,914	77,414	81,803	72,523	149,937
2004	93,414	5,000	20,000	118,414	116,400	103,800	222,214

^a Inriver abundance estimated by sonar below the village of Portage Creek.

^b Spawning escapement estimated from the following: 1984–1985: correlation between index counts and total escapement estimates when aerial surveys were complete (results rounded to the nearest thousand fish). 1997: comprehensive aerial surveys. 1986–1996, 1998–2004: Inriver abundance estimated by sonar minus inriver harvests.

^c Guideline harvest level used as estimate.

Appendix A20.—Chinook salmon harvest, escapement and total runs in the Togiak District, in numbers of fish, Bristol Bay, 1984–2004.

Year	Harvests by Fishery				Spawning Escapement ^a	Total Run
	Commercial	Sport ^d	Subsistence	Total		
1984	22,179	87	600	22,866	26,000	48,866
1985	37,106	224	600	37,930	14,000	51,930
1986	19,880	525	700	21,105	8,000	29,105
1987	17,217	137	700	18,054	11,000	29,054
1988	15,606	0	429	16,035	10,000	26,035
1989	11,366	234	551	12,151	10,540	22,691
1990	11,130	172	480	11,782	9,107	20,889
1991	6,039	284	470	6,793	12,667	19,460
1992	12,640	271	1,361	14,272	10,413	24,685
1993	10,851	225	784	11,860	16,035	27,895
1994	10,486	663	904	12,053	19,353	31,406
1995	11,981	581	448	13,010	16,438	29,448
1996	8,602	790	471	9,863	11,476	21,339
1997	6,114	1,165	667	7,946	11,495	19,441
1998	14,131	763	782	15,676	11,666	27,342
1999	11,919	644	1,244	13,807	12,263	26,070
2000	7,858	470	1,116	9,444	16,897	26,341
2001	9,937	1,006	1,612	12,555	15,185	27,740
2002	2,801	76	703	3,580	14,265	17,845
2003	3,231	706	1,208	5,145	5,668 ^c	10,813
20-Year Average	12,554	451	792	13,796	13,123	26,920
1984–1993 Average	16,401	216	668	17,285	12,776	30,061
1994–2003 Average	8,706	686	916	10,308	13,471	23,779
2004	9,349	580 ^b	1,094	11,023	15,990	27,013

^a Spawning escapement estimated from comprehensive aerial surveys. Estimates for 1984–1988 are rounded to the nearest thousand fish.

^b Estimate.

^c Partial survey

^d Sport fish harvest estimate only includes the Togiak River Section.

Appendix A21.—Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1984–2004.

Year ^a	Nushagak District			Togiak District		
	Catch	Escapement ^b	Total Run	Catch	Escapement ^c	Total Run
1984	850,114	362,000	1,212,114	336,660	204,000	540,660
1985	396,740	288,000	684,740	203,302	212,000	415,302
1986	488,375	168,275	656,650	270,057		270,057
1987	416,476	147,433	563,909	419,425	361,000	780,425
1988	371,196	186,418	557,614	470,132	412,000	882,132
1989	523,903	377,512	901,415	203,178	143,890	347,068
1990	378,223	329,793	708,016	102,861	67,460	170,321
1991	463,780	287,280	751,060	246,589	149,210	395,799
1992	398,691	302,678	701,369	176,123	120,000	296,123
1993	505,799	217,230	723,029	144,869	98,470	243,339
1994	328,267	378,928	707,195	232,559	229,470	462,029
1995	390,158	212,612	602,770	221,126	163,040	384,166
1996	331,414	225,331	556,745	206,226	117,240	323,466
1997	185,620	61,456	247,076	47,459	106,580	154,039
1998	208,551	299,443	507,994	67,408	102,455	169,863
1999	170,795	242,312	413,107	111,677	116,183	227,860
2000	114,454	141,323	255,777	140,175	80,860 ^d	221,035
2001	526,602	564,373	1,090,975	211,701	252,610	464,311
2002	276,845	419,969	696,814	112,987	154,360	267,347
2003	740,311	295,413	1,035,724	68,406	39,090 ^e	107,496
20-Year Average	403,316	275,389	678,705	199,646	164,733	356,142
1984–1993 Average	479,330	266,662	745,992	257,320	196,448	434,123
1994–2003 Average	327,302	284,116	611,418	141,972	136,189	278,161
2004	470,248	283,805	754,053	94,030	103,810	197,840

^a Escapement estimates supersede those previously reported.

^b Escapement based on sonar estimates from the Portage Creek site. Estimates for 1984–1985 are rounded to the nearest thousand fish.

^c Escapement estimates based on aerial surveys. Estimates for 1984–1988 rounded to the nearest thousand fish.

^d No escapement counts were made for the Togiak River.

^e Only a partial count was made for the Togiak River.

Appendix A22.—Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1964–2004, even years only.

Year	Catch	Wood ^a	Igushik ^b	Nuyakuk ^c	Escapement			Total	Total Run
					Nush/Mul ^d	Nushagak ^e	Snake ^f		
1964	1,497,817	1,560	450	883,500	25,000		50	910,560	2,408,377
1966	2,337,066			1,442,424				1,442,424	3,779,490
1968	1,705,150			2,161,116				2,161,116	3,866,266
1970	417,834			152,580				152,580	570,414
1972	67,953			58,536				58,536	126,489
1974	413,613	44,800	7,500	529,216	3,100		900	585,516	999,129
1976	739,590	21,986	5,070	794,478	41,800		100	863,434	1,603,024
1978	4,348,336	205,000	16,210	8,390,184	771,600		3,483	9,386,477	13,734,813
1980	2,202,545	31,150	3,500	2,626,746	123,000		800	2,785,196	4,987,741
1982	1,339,272	36,100	8,430	1,592,096	19,130		900	1,656,656	2,995,928
1984	3,127,153	81,400	6,190	2,760,312	73,050		5,500	2,926,452	6,053,605
1986	267,117					72,189		72,189	339,306
1988	243,890					494,610		494,610	738,500
1990	54,127					801,430		801,430	855,557
1992	190,102					^g			
1994	7,337					191,772		191,772	199,109
1996	2,681					821,312		821,312	823,993
1998	6,808	942				132,402		133,344	140,152
2000	38,309					135,285		135,285	173,594
2002	204					317,659		317,659	317,863
Average	950,345	52,867	6,764	1,944,653	150,954	370,832	1,676	1,362,976	2,353,334
2004	25,886					556,065		581,951	607,837

^a Aerial survey estimate 1974–1984; tower count 1964.

^b Aerial survey estimate 1964–1980; aerial survey estimates and tower count 1976 and 1982–1984.

^c Tower count 1964–1984. Survey estimate below counting tower 1964 and 1982–1984.

^d Aerial survey estimate.

^e Sonar estimate from Portage Creek.

^f Aerial survey estimate 1964, 1974–1976 and 1980–1984, and weir count 1978.

^g No escapement estimate. Sonar project terminated early due to budget constraints.

Appendix A23.—Coho salmon harvest, escapement and total runs in the Nushagak Drainage, in numbers of fish, Bristol Bay, 1984–2004.

Year	Harvests by Fishery				Sport Total	Total Harvest	Inriver Run	Spawning Escapement ^c	Total Run
	Commercial Harvest	Subsistence ^a		Total					
		Lower	Upper						
1984	260,310	5885	1,564	7,449	473	268,232	142,841	140,804	409,036
1985	20,230	4360	1,646	6,006	130	26,366	89,862	88,086	114,452
1986	68,568	6533	2,617	9,150	1,576	79,294	52,722	48,529	127,823
1987	13,263	4149	1,209	5,358	1,007	19,628	24,923	22,707	42,335
1988	52,698	3515	1,112	4,627	557	57,882	134,069	132,400	190,282
1989	77,077	6971	1,159	8,130	2,392	87,599	84,628	81,077	168,676
1990	7,733	4856	766	5,622	438	13,793	141,704	140,500	154,293
1991	5,574	8915	1,275	10,190	874	16,638	42,965	40,816	57,454
1992	84,077	4962	1,534	6,496	752	91,325			91,325
1993	14,345	4463	387	4,850	194	19,389	42,742	42,161	61,550
1994	5,615	4302	406	4,708	1,143	11,466	82,019	80,470	91,936
1995	4,896	3233	478	3,711	725	9,332	46,340	45,137	54,469
1996	11,401	3603	1,080	4,683	3,488	19,572	187,028	182,460	202,032
1997	4,110			3,433	500	8,043	43,369	42869	50,912
1998	22,703	201	254	455	1,368	24,526	104,948	103194	127,720
1999	2,836	3,054	244	3,298	618	6,752	34,853	33,991	40,743
2000	112,819	3,811	768	4,579	2,219	119,617	213,062	210,075	329,692
2001	3,218	4,851	612	5,463	2,357	11,038	75,961	72,992	84,030
2002	93	4,054	511	4,565	1,416	6,074	52,194	50,267	56,341
2003	583	120	1,310	1,430	917	2,930	N/A	N/A	N/A
20-Year Average	38,607	4,307	996	5,210	1,157	44,975	88,679	86,585	129,216
1984–1993 Average	60,388	5,461	1,327	6,788	839	68,015	84,051	81,898	141,722
1994–2003 Average	16,827	3,025	629	3,633	1,475	21,935	93,308	91,273	115,320
2004	47,750			0	1,505 ^d	49,255	152,613	151,108	200,363

^a Subsistence harvest estimated by expanding fishing permit returns; excludes estimates for the communities of Manokotak and Wood River. Estimates for 1984–1986 were based on community where permit was issued: 1987 based on community where permit issued and Nushagak watershed fishing site: 1988–present on community of residence and watershed fishing site.

^b Inriver run estimated by sonar; sonar estimates expanded for years that terminated prior to August 25. Sonar stopped July 21 in 2003.

^c Spawning escapement estimated by sonar minus sport and subsistence harvests upriver of Portage Creek sonar site.

^d Estimate based on five year average. Final numbers not available at this time.

Appendix A24.—Coho salmon harvest by fishery, escapement and total runs for the Togiak River, in numbers of fish, Bristol Bay, 1984–2004.

Year	Harvests by Fishery				Total	Spawning Escapement ^b	Total Run
	Commercial	Subsistence ^a	Sport				
1984	111,631	3,800	1,154		116,585	60,840	177,425
1985	35,765	1,500	0		37,265	33,210	70,475
1986	28,030	500	2,851		31,381	21,400	52,781
1987	1,284	1,600	183		3,067	16,000	19,067
1988	8,744	792	1,238		10,774	25,770	36,544
1989	35,814	976	416		37,206		
1990	2,296	1,111	367		3,774	21,390	25,164
1991	4,262	1,238	87		5,587	25,260	30,847
1992	3,918	1,231	251		5,400	80,100	85,500
1993	12,613	743	330		13,686		
1994	88,522	910	531		89,963		
1995	8,910	703	408		10,021		
1996	58,369	199	1,382		59,950	64,980	124,930
1997	2,976	260	780		4,016	20,625	24,641
1998	52,783	310	1,020		54,113	25,335	79,448
1999	2,653	217	1,109		3,979	3,855 ^d	7,834
2000	2,758	342	840		3,940		
2001	3,218	388	904		4,510		
2002	754	241	1,475		2,470		
2003	961	883	2,086		3,930	6,900 ^d	10,830
20-Year Average	23,313	897	871		25,081	31,205	57,345
1984–1993 Average	24,436	1,349	688		26,473	35,496	62,225
1994–2003 Average	22,190	445	1,054		23,689	24,339	49,537
2004	15,467	204	1,283 ^c		16,954		16,954

^a Subsistence harvest estimated by expanding permit returns; Estimates for 1984–1987 were based on community where permit was issued; 1988–present on community of residence.

^b Expanded estimates from aerial surveys.

^c Estimate.

^d Results of a partial survey.

Appendix A25.—Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1984–2004.

Year	Sockeye	Chinook	Chum	Pink	Coho
1984	5.6	20.5	6.8	3.2	7.5
1985	5.8	17.9	6.8		8.0
1986	6.0	18.8	6.7	3.5	6.7
1987	6.0	20.5	6.5		7.0
1988	6.2	18.7	7.0	3.6	7.8
1989	5.6	19.1	6.3		7.4
1990	5.7	16.9	6.3	3.8	7.5
1991	5.7	15.9	6.4		7.3
1992	5.7	16.8	6.4	3.7	7.0
1993	6.0	17.4	6.5		6.8
1994	5.5	18.0	6.5	3.7	8.2
1995	5.5	19.8	6.3	3.6	6.7
1996	6.3	18.0	7.3	3.5	6.8
1997	6.0	16.4	7.3	3.4	6.3
1998	5.7	17.7	6.4	3.3	8.4
1999	5.3	14.3	6.7	3.2	6.4
2000	6.1	15.7	6.9	3.7	7.6
2001	6.7	17.4	8.2	2.8	7.1
2002	6.1	18.2	7.1	3.8	6.8
2003	6.3	16.0	6.5	4.0	6.9
20-Year Average	5.9	17.7	6.7	3.5	7.2
1984–1993 Average	5.8	18.3	6.6	3.6	7.3
1994–2003 Average	6.0	17.2	6.9	3.5	7.1
2004	5.8	15.4	6.6	4.1	6.8

Appendix A26.—Average price paid in dollars per pound for salmon, by species, Bristol Bay, 1984–2004.

Year	Sockeye ^a	Chinook ^a	Chum ^a	Pink ^a	Coho ^a
1984	0.69	1.03	0.30	0.22	0.71
1985	0.85	1.02	0.31	0.20	0.71
1986	1.42	1.03	0.31	0.15	0.68
1987	1.35	1.24	0.26		0.69
1988	1.93	1.05	0.43	0.34	1.14
1989	1.07	0.80	0.26	0.17	0.67
1990 ^b	1.04	0.91	0.26	0.27	0.74
1991	0.70	0.68	0.22	0.11	0.58
1992	1.04	0.89	0.24	0.12	0.58
1993	0.62	0.76	0.21	0.11	0.52
1994	0.70	0.47	0.22	0.04	0.45
1995	0.75	0.65	0.20	0.11	0.43
1996	0.75	0.50	0.10	0.05	0.30
1997	0.85	0.55	0.10	0.05	0.46
1998	1.10	0.50	0.10	0.10	0.50
1999	0.80	0.50	0.10	0.05	0.30
2000	0.64	0.48	0.09	0.08	0.38
2001	0.40	0.30	0.11	0.07	0.39
2002	0.45	0.30	0.10	0.05	0.30
2003	0.50	0.30	0.09	0.03	0.30
20-Year Average	0.88	0.70	0.20	0.12	0.54
1984–1993 Average	1.07	0.94	0.28	0.19	0.70
1994–2003 Average	0.69	0.46	0.12	0.06	0.38
2004	0.46	0.38	0.09	0.05	0.34

^b Price paid in Nushagak District. Bristol Bay average unavailable.

^a Price does not include all post-season adjustments.

Appendix A27.—Estimated exvessel value of the commercial salmon catch by species paid to fishermen, in thousands of dollars, Bristol Bay, 1984–2004. Derived from price per pound times commercial catch.

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1984	94,681	2,158	4,040	2,414	3,072	106,365
1985	115,402	2,188	2,218		923	120,731
1986	135,689	1,819	2,522	207	826	141,063
1987	130,847	1,912	2,594		314	135,667
1988	168,586	891	4,418	1,171	1,792	176,858
1989	173,963	609	2,029		1,186	177,787
1990	198,897	520	1,752	508	582	202,259
1991	103,750	328	1,807		499	106,384
1992	190,368	1,029	1,359	222	767	193,745
1993	152,034	1,131	989		257	154,411
1994	138,007	1,190	1,043	15	650	140,905
1995	183,262	1,272	1,240		129	185,903
1996	139,208	788	615	7	254	140,872
1997	61,728	689	200		150	62,767
1998	62,948	1,116	294	8	521	64,887
1999	109,495	186	438		38	110,157
2000	80,331	172	236	17	363	81,119
2001	38,250	127	656		48	39,081
2002	29,164	240	330	0	18	29,752
2003	46,917	213	473		89	47,692
20 Year Average	117,676	929	1,463	415 ^a	624	120,920
1984–1993 Average	146,422	1,259	2,373	754 ^a	1,022	151,527
1994–2003 Average	88,931	599	553	9 ^a	226	90,314
2004	68,968	645	425	10	162	70,210

^a Includes even-years only.

Appendix A28.—South Unimak and Shumigan Island preseason sockeye allocation, actual sockeye and chum harvest in thousands of fish, Alaska Peninsula, 1984–2004.

Year	South Unimak ^a			Shumigan Island ^a			Total		
	Sockeye			Sockeye			Sockeye		
	Actual	Quota ^b	Chum	Actual	Quota ^b	Chum	Actual	Quota ^b	Chum
1984	1,131	1,111	228	257	245	109	1,388	1,356	337
1985	1,495	1,380	345	367	305	134	1,862	1,685	479
1986	314	907	252	156	200	99	470	1,107	351
1987	652	635	406	141	140	37	793	775	443
1988	474	1,263	465	282	279	62	756	1,542	527
1989	1,348	1,199	408	397	264	48	1,745	1,463	456
1990	1,091	1,087	455	256	240	64	1,347	1,327	519
1991	1,216	1,573	669	333	347	102	1,549	1,920	771
1992	2,047	1,959	324	410	432	102	2,457	2,391	426
1993	2,365	2,375	382	607	524	150	2,972	2,899	532
1994	1,001	2,938	374	460	648	208	1,461	3,586	582
1995	1,451	2,987	342	653	659	195	2,104	3,646	537
1996	572	2,564	129	446	566	228	1,018	3,130	357
1997	1,179	1,840	196	449	406	126	1,628	2,246	322
1998	975	1,529	195	314	336	50	1,289	1,865	245
1999	1,106	1,024	187	269	226	58	1,375	1,250	245
2000	892	1,650	169	359	363	70	1,251	2,013	239
2001	271		185	130		149	401		334
2002	356		201	235		178	591		379
2003	336		121	117		161	453		282
20-yr Average	1,014	1,648	302	332	364	117	1,346	2,012	418
1984–1993 Average	1,213	1,349	393	321	298	91	1,534	1,647	484
1994–2003 Average	814	2,076	210	343	458	142	1,157	2,534	352
2004	532		131	816		357	1,348		488

^a South Unimak includes statistical area 284 in June and July, while Shumigan Islands includes statistical area 282 in June only.

^b The sockeye quota management system was initiated in 1974, and is based on 8.3 % of the Bristol Bay projected inshore harvest and traditional harvest patterns. This quota system was removed in 2001.

Appendix A29.—Subsistence salmon harvest, by district and species, Bristol Bay, 1984–2004.

Year ^{ab}	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
Naknek-Kvichak District							
1984	382	115,200	900	600	1,300	600	118,600
1985	544	107,543	1,179	540	27	1,103	110,392
1986	412	77,283	1,295	695	2,007	650	81,930
1987	407	86,706	1,289	756	490	1,106	90,347
1988	391	88,145	1,057	588	917	813	91,520
1989	411	87,103	970	693	277	1,927	90,970
1990	466	92,326	985	861	1,032	726	95,930
1991	518	97,101	1,152	1,105	191	1,056	100,605
1992	571	94,304	1,444	2,721	1,601	1,152	101,222
1993	560	101,555	2,080	2,476	762	2,025	108,898
1994	555	87,662	1,843	503	460	1,807	92,275
1995	533	75,644	1,431	1,159	383	1,791	80,407
1996	540	81,305	1,574	816	794	1,482	85,971
1997	533	85,248	2,764	478	422	1,457	90,368
1998	567	83,095	2,433	784	1,063	1,592	88,967
1999	528	85,315	1,567	725	210	856	88,674
2000	562	61,817	894	560	845	937	65,053
2001	506	57,250	869	667	383	740	59,909
2002	471	52,805	837	909	1,137	943	56,632
2003	489	61,443	1,221	259	198	812	63,934
20 Year Average	497	83,943	1,389	895	725 ^c	1,179	88,130
1984–1993 Average	466	94,727	1,235	1,104	860 ^c	1,116	99,041
1994–2003 Average	528	73,158	1,543	686	589 ^c	1,242	77,219
2004	481	71,110	1,075	469	1,080	566	74,300
Egegik District							
1984	24	500		100		300	900
1985	23	582	14	21	1	203	821
1986	41	1,052	69	58	21	319	1,519
1987	49	3,350	87	139	2	284	3,862
1988	52	1,405	97	87	54	333	1,976
1989	50	1,636	50	33	1	414	2,134
1990	61	1,105	53	85	39	331	1,613
1991	70	4,549	82	141	32	430	5,234
1992	80	3,322	124	270	51	729	4,496
1993	69	3,633	128	148	15	905	4,829
1994	59	3,208	166	84	153	857	4,468
1995	60	2,818	86	192	100	690	3,886
1996	44	2,321	99	89	85	579	3,173
1997	34	2,438	101	21	5	740	3,304
1998	36	1,795	44	33	52	389	2,314
1999	42	2,434	106	35	2	806	3,384
2000	31	842	16	11	0	262	1,131
2001	57	2,493	111	105	16	928	3,653
2002	53	1,892	65	34	12	356	2,359
2003	62	3,240	84	32	10	297	3,663
20 Year Average	50	2,231	83	86	34 ^c	508	2,936
1984–1993 Average	52	2,113	78	108	24 ^c	425	2,738
1994–2003 Average	48	2,348	88	64	44 ^c	590	3,133
2004	46	2,618	169	410	91	1,423	4,711

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Appendix A29.–Page 2 of 3.

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
Ugashik District							
1984	8	500				200	700
1985	9	233	17	7		143	400
1986	27	1,080	83	48	21	335	1,567
1987	22	892	104	51	29	272	1,348
1988	23	1,400	84	55	35	330	1,904
1989	22	1,309	32	35	2	214	1,592
1990	37	1,578	51	143	120	280	2,172
1991	38	1,403	121	168	42	614	2,348
1992	37	2,348	106	79	8	397	2,938
1993	39	1,766	86	107	24	495	2,478
1994	31	1,587	126	42	38	579	2,372
1995	20	1,513	56	18	6	290	1,883
1996	26	1,247	50	21	7	298	1,623
1997	28	2,785	169	39	23	311	3,327
1998	27	1,241	59	75	82	485	1,942
1999	25	1,365	35	5	0	271	1,675
2000	31	1,927	51	34	1	467	2,481
2001	24	1,197	61	8	2	357	1,624
2002	23	1,294	51	14	2	460	1,821
2003	23	1,113	31	30	0	392	1,567
20 Year Average	26	1,389	72	52	25 ^c	359	1,888
1984–1993 Average	26	1,251	76	77	35 ^c	328	1,745
1994–2003 Average	26	1,527	69	29	16 ^c	391	2,032
2004	21	804	64	9	4	234	1,116
Nushagak District							
1984	438	43,200	9,800	10,300	6,600	8,100	78,000
1985	406	38,000	7,900	4,000	600	6,100	56,600
1986	424	49,000	12,600	10,000	5,400	9,400	86,400
1987	474	40,900	12,200	6,000	200	6,200	65,500
1988	441	31,086	10,079	8,234	6,316	5,223	60,938
1989	432	34,535	8,122	5,704	407	8,679	57,447
1990	441	33,003	12,407	7,808	3,183	5,919	62,320
1991	528	33,161	13,627	4,688	292	10,784	62,552
1992	476	30,640	13,588	7,076	3,519	7,103	61,926
1993	500	27,114	17,709	3,257	240	5,038	53,358
1994	523	26,501	15,490	5,055	2,042	5,338	54,426
1995	484	22,793	13,701	2,786	188	3,905	43,373
1996	481	22,935	15,941	4,704	1,573	5,217	50,370
1997	538	25,080	15,318	2,056	218	3,433	46,106
1998	562	25,217	12,258	2,487	1,076	5,316	46,355
1999	548	29,387	10,057	2,409	124	3,993	45,969
2000	541	24,451	9,470	3,463	1,662	5,983	45,029
2001	554	26,939	11,760	3,011	378	5,993	48,080
2002	520	22,777	11,281	5,096	1,179	4,565	44,897
2003	527	25,491	18,686	5,064	403	5,432	55,076
20 Year Average	490	30,880	12,279	5,165	1,852 ^c	6,120	56,297
1984–1993 Average	456	36,064	11,803	6,707	2,676 ^c	7,255	64,504
1994–2003 Average	528	25,157	13,396	3,613	884 ^c	4,917	47,968
2004	511	17,491	15,610	3,869	1,944	4,240	43,154

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Appendix A29. –Page 3 of 3.

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
Togiak District							
1984	41	3,600	600	1,700	500	3,800	10,200
1985	51	3,400	600	1,000	100	1,500	6,600
1986	29	2,400	700	800	100	500	4,500
1987	46	3,600	700	1,000		1,600	6,900
1988	29	2,413	429	716	45	792	4,395
1989	40	2,825	551	891	112	976	5,355
1990	37	3,689	480	786	60	1,111	6,126
1991	43	3,517	470	553	27	1,238	5,805
1992	40	3,716	1,361	626	135	1,231	7,069
1993	38	2,139	784	571	8	743	4,245
1994	25	1,777	904	398	77	910	4,066
1995	22	1,318	448	425	0	703	2,894
1996	19	662	471	285	59	199	1,676
1997	31	1,440	667	380	0	260	2,747
1998	42	2,211	782	412	76	310	3,791
1999	76	3,780	1,244	479	84	217	5,804
2000	54	3,013	1,116	569	90	342	5,130
2001	92	4,162	1,612	367	61	388	6,590
2002	36	2,319	703	605	10	241	3,878
2003	92	4,403	1,208	483	451	883	7,428
20 Year Average	44	2,819	791	652	105 ^c	897	5,260
1984–1993 Average	39	3,130	668	864	121 ^c	1,349	6,120
1994–2003 Average	49	2,509	915	440	91 ^c	445	4,400
2004	46	1,795	1,094	383	108	204	3,584
Total Bristol Bay Area							
1984	893	163,000	11,300	12,700	8,400	13,000	208,400
1985	1,033	149,758	9,710	5,568	728	9,049	174,813
1986	933	130,815	14,747	11,601	7,549	11,204	175,916
1987	998	135,493	14,356	7,895	689	9,453	167,886
1988	936	124,449	11,746	9,680	7,367	7,491	160,733
1989	955	127,408	9,725	7,356	799	12,210	157,498
1990	1,042	131,701	13,976	9,683	4,434	8,367	168,161
1991	1,197	139,731	15,452	6,655	584	14,122	176,544
1992	1,204	134,330	16,623	10,772	5,314	10,612	177,651
1993	1,206	136,207	20,787	6,559	1,049	9,206	173,808
1994	1,193	120,735	18,529	6,082	2,770	9,491	157,607
1995	1,119	104,086	15,722	4,580	677	7,378	132,443
1996	1,110	108,470	18,136	5,915	2,518	7,775	142,813
1997	1,166	116,991	19,159	2,974	668	6,201	145,992
1998	1,234	113,560	15,576	3,792	2,349	8,093	143,368
1999	1,219	122,281	13,009	3,653	420	6,143	145,506
2000	1,219	92,050	11,547	4,637	2,599	7,991	118,824
2001	1,226	92,041	14,412	4,158	839	8,406	119,856
2002	1,093	81,088	12,936	6,658	2,341	6,565	109,587
2003	1,182	95,690	21,231	5,868	1,062	7,816	131,667
2004	1,093	81,088	12,936	6,658	2,341	6,565	109,587
20 Year Average	1,108	120,994	14,934	6,839	2,658 ^c	9,029	154,454
1984–1993 Average	1,040	137,289	13,842	8,847	3,691 ^c	10,471	174,141
1994–2003 Average	1,176	104,699	16,026	4,832	1,624 ^c	7,586	134,766
2004	1,100	93,819	18,012	5,141	3,225	6,667	126,865

^a Harvests are extrapolated for all permits issued, based on those returned. Harvests prior to 1985 are rounded to the nearest hundred fish.
^b Permit and harvest estimates prior to 1989 are based on the community where the permit was issued; estimates from 1989 to the present are based on the area fished, as first recorded on the permit.
^c Includes even years only.

Appendix A30.—Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1984–04.

Year ^{ab}	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna-Newhalen ^c	Nondalton	Port Alsworth	Other ^f	Total
1984	8,100	6,300	12,100	24,400	15,900	29,100	4,600		100,500
1985	6,600	3,400	12,900	21,900	22,300	14,900	4,500		86,500
1986	6,400	1,600	6,700	18,300	17,000	6,600	3,300		59,900
1987	5,700	^c	7,300	16,500	27,500	11,800	3,200		72,000
1988	3,500	^c	5,500	14,400	29,800	20,700	3,200	^d	77,100
1989	5,100	1,200	6,700	13,000	24,700	18,500	2,200	^d	71,400
1990	4,700	2,200	6,600	12,400	18,800	27,300	3,200	1,400	76,600
1991	1,029	1,712	9,739	17,184	29,094	4,163	2,755	1,110	66,786
1992	4,374	1,056	6,932	11,477	29,633	13,163	2,954	2,559	72,148
1993	4,699	1,397	6,226	18,810	19,067	17,890	3,254	2,780	74,123
1994	1,467	1,201	8,747	15,771	15,553	15,246	3,074	3,284	64,343
1995	3,756	497	5,359	14,412	20,134	4,188	2,892	3,441	54,679
1996	1,120	2,309	5,219	14,011	14,787	11,856	3,263	2,307	54,872
1997	1,062	2,067	5,501	8,722	19,513	17,194	2,348	3,101	59,508
1998	2,454	1,659	3,511	10,418	16,165	13,136	2,678	3,635	53,656
1999	1,276	1,608	5,005	10,725	14,129	17,864	4,282	2,834	57,723
2000	1,467	1,981	1,815	7,175	6,679	11,953	3,200	2,720	36,990
2001	908	779	2,118	9,447	8,132	7,566	1,958	1,901	32,808
2002	625	2,138	2,687	9,847	9,417	5,508	1,201	1,578	33,001
2003	737	1,081	2,135	9,771	13,824	8,016	1,370	1,591	38,495
20 Year Average	3,254	1,899	6,140	13,933	18,606	13,832	2,971	2,446	62,157
1984–1993 Average		5,020	2,358	8,070	16,837	23,379	16,412	3,316	1,962
1994–2003 Average		1,487	1,532	4,210	11,030	13,833	11,253	2,627	2,639
2004	1,000	1,026	4,803	11,869	21,652	8,789	2,455	1,631	53,225

^a Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates from 1991 are rounded to the nearest hundred fish.

^b Harvest estimates prior to 1990 are based on the community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Kvichak District.

^c No permits issued.

^d No permits issued. Only residents of the Naknek/Kvichak watershed could obtain subsistence permits.

^e Includes Chekok

^f Subsistence harvests by non-Kvichak River watershed residents.

Appendix A31.—Subsistence salmon harvest by community, Nushagak District, Bristol Bay, 1984–2004.

Year ^{ab}	New							Total
	Dillingham ^e	Manokotak	Aleknagik	Ekwok	Stuyahok	Koliganek	Other ^f	
1984	30,500	4,100	2,600	7,200	16,500	17,100		78,000
1985	22,900	3,600	1,600	7,000	14,500	6,800		56,400
1986	31,900	5,500	6,900	7,800	26,400	8,200		86,700
1987	33,500	5,900	3,100	6,400	11,400	4,900		65,200
1988	29,600 ^d	5,500	2,400	6,100	11,700	5,700	^c	61,000
1989	31,800 ^d	5,800	2,000	4,700	9,700	3,800	^c	57,800
1990	28,860 ^d	6,600	2,300	4,900	9,900	8,000	700	61,260
1991	34,399 ^d	5,873	3,043	4,532	8,326	5,438	2,163	63,774
1992	31,702 ^d	4,317	2,184	5,971	11,325	3,708	2,635	61,842
1993	25,315 ^d	3,048	2,593	2,936	12,169	4,180	2,538	52,779
1994	30,145 ^d	3,491	2,289	4,343	8,056	4,513	2,322	55,159
1995	24,998 ^d	2,453	1,468	2,046	6,911	2,983	2,406	43,265
1996	27,161 ^d	3,883	1,733	2,866	8,892	3,319	2,113	49,967
1997	23,255 ^d	3,988	1,989	1,797	6,427	4,179	4,598	46,233
1998	24,072 ^d	4,069	1,112	3,555	5,419	3,166	4,958	46,351
1999	26,502 ^d	3,413	1,532	1,805	4,556	2,772	5,389	45,969
2000	27,931 ^d	3,173	1,111	3,946	3,715	2,792	2,362	45,029
2001	26,435 ^d	3,700	2,129	2,218	7,294	2,209	4,096	48,080
2002	25,004 ^d	3,254	1,517	2,735	6,043	3,098	3,247	44,897
2003	26,955 ^d	4,214	2,044	2,291	10,817	5,721	3,034	55,076
20 Year Average	28,147	4,294	2,282	4,257	10,002	5,129	3,040	56,239
1984–1993 Average	30,048	5,024	2,872	5,754	13,192	6,783	2,009	64,476
1994–2003 Average	26,246 ^d	3,564	1,692	2,760	6,813	3,475	3,453	48,003
2004	23,308	2,052	2,206	1,891	6,714	3,619	3,364	43,154

^a Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates prior to 1991 are rounded to the nearest hundred fish.

^b Harvest estimates prior to 1990 are based on the community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Nushagak District.

^c No permits issued. Only residents of the Nushagak watershed could obtain subsistence permits.

^d Includes permits issued in Clarks Point and Ekuk.

^e Includes the village of Portage Creek and Clarks Point.

^f Subsistence harvests by non-watershed residents.

APPENDIX B. HERRING

Appendix B1.–Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1984–2004.

Year	Companies	Daily Processing Capacity ^a	Fishery Dates	Gillnet					Purse Seine					Total Harvest ^c
				Effort ^b	Duration (hrs.)	Harvest ^c	C.P.U.E.	Roe%	Effort ^b	Duration (hrs.)	Harvest ^c	C.P.U.E.	Roe%	
1984	25		5/18–5/21	300	35.0	4,934	0.5	8.4	196	11.0	14,485	6.7	10.2	19,419
1985	23		5/23–5/25	302	11.0	4,482	1.3	7.4	155	3.0	21,330	45.9	10.0	25,812
1986	23		5/14–5/15	209	10.0	3,448	1.6	8.8	209	1.0	12,828	61.4	9.9	16,276
1987	18		4/27–5/6	148	36.0	2,685	0.5	8.6	111	5.5	12,845	21.0	8.9	15,530
1988	22		5/17	300	4.0	3,695	3.1	8.3	239	0.5	10,472	87.6	10.9	14,167
1989	19		5/9–5/14	320	5.0	2,844	1.8	7.8	310	3.0	9,415	10.1	8.5	12,259
1990	16	3,100	5/8–5/20	277	66.0	3,072	0.2	9.0	221	3.0	9,158	13.8	9.7	12,230
1991	16	3,350	5/10–5/17	170	14.0	3,182	1.3	8.5	200	3.0	11,788	19.6	10.0	14,970
1992	18	3,700	5/20–5/27	274	25.5	5,030	0.7	8.8	301	0.3	20,778	230.1	9.2	25,808
1993	12	2,500	4/27–5/9	75	144.5	3,564	0.3	10.1	140	33.8	14,392	3.0	9.6	17,956
1994	16	3,300	5/11–5/20	146	76.0	7,462	0.7	12.0	240	4.6	22,853	20.7	9.4	30,315
1995	22	4,350	5/7–5/15	250	33.5	6,995	0.8	12.0	254	12.2	19,737	6.4	10.1	26,732
1996	19	4,850	5/3–5/8	461	18.0	6,863	0.8	11.1	268	2.4	18,008	27.8	9.0	24,871
1997	18	4,200	5/2–5/6	336	24.0	5,164	0.6	11.8	231	6.4	18,649	12.6	9.4	23,813
1998	15	2,475	4/29–5/10	152	46.0	5,952	0.9	12.5	123	16.5	16,824	8.3	9.6	22,776
1999	12	2,400	5/18–5/26	171	28.0	4,858	1.0	11.5	96	4.7	15,020	33.3	9.2	19,878
2000	12	2,100	5/6–5/14	227	67.0	5,464	0.4	10.6	90	15.8	14,957	10.6	10.1	20,421
2001	11	2,255	5/6–5/13	96	84.0	6,481	0.8	10.6	64	26.0	15,849	9.5	9.2	22,330
2002	8	1,920	5/3–5/13	82	102.0	5,216	0.6	10.9	37	57.5	11,833	5.6	9.3 ^d	17,049
2003	7	1,920	4/25–5/7	75	142.0	6,505	0.6	10.9	35	110.2	15,158	3.9	8.9 ^d	21,663
1984–2003 Average	17	3,030		219	49	4,895	0.9	10.0	176	16	15,319	31.9	9.6	20,214
1994–2003 Average	14	2,977		200	62	6,096	0.7	11.4	144	26	16,889	13.9	9.5	22,985
2004	6	2,150	4/29–5/9	54	162.0	4,980	1	10.4	31	78	13,888	5.7	9.5	18,868

^a Number of tons per day based on companies registered.

^b Peak aerial survey count.

^c Harvest total does include deadloss and test fish harvest.

^d Values are lower than inseason assessment due to more stringent post-season market scrutiny compared with previous years.

Appendix B2.—Exploitation of Togiak herring stock, 1984–2004.

Year	Biomass		Dutch Harbor Food/Bait	Sac Roe			Total Harvest	Exploitation Rate	
	Estimate ^a (short tons)	S-O-K Herring Equivalent		Gillnet	Purse Seine ^b	Waste ^c			Total
1984	106,422	1,552		4,934	14,485		19,419	20,971	19.7%
1985	114,604	0		4,482	21,330		25,812	25,812	22.5%
1986	86,310	1,446		3,448	12,828		16,276	17,722	20.5%
1987	64,462	1,309		2,685	12,845		15,530	16,839	26.1%
1988	128,959	1,782	2,004	3,695	10,472		14,167	17,953	13.9%
1989	80,100	2,499	3,081	2,844	9,415		12,259	17,839	22.3%
1990	71,879	1,617	820	3,072	9,158		12,230	14,667	20.4%
1991	55,000	1,310	1,325	3,182	11,788		14,970	17,605	32.0%
1992	129,256	1,482	1,949	5,030	20,778		25,808	29,239	22.6%
1993	164,130	1,481	2,790	3,564	14,392		17,956	22,227	13.5%
1994	148,716	1,134	3,349	7,462	22,853		30,315	34,798	23.4%
1995	149,093	996	1,748	6,995	19,737		26,732	29,476	19.8%
1996	135,585	1,899	2,239	6,863	18,008		24,871	29,009	21.4%
1997	125,000	0	1,950	5,164	18,649	350	23,813	25,763	20.6%
1998	121,000	0	1,994	5,952	16,824	400	22,776	24,770	20.5%
1999	156,183	1,605	2,398	4,858	15,020	221	19,878	23,881	15.3%
2000	130,904	0	2,014	5,464	14,957	100	20,421	22,435	17.1%
2001	119,818	0	1,439	6,481	15,849	219	22,330	23,769	19.8%
2002	120,196	260	2,846	5,216	11,833	40	17,049	20,155	16.8%
2003	126,213	55	1,487	6,505	15,158	380	21,663	23,205	18.4%
1984–2003 Average	116,692	1,021	2,090	4,895	15,319	244	20,214	22,907	20.3%
1994–2003 Average	133,271	595	2,146	6,096	16,889	244	22,985	25,726	19.3%
2004	143,124	0	1,258	4,980	13,785	103	18,868	20,126	14.1%

^a Preseason forecast unless peak biomass estimate in season exceeded preseason forecast

^b Includes testfish harvest

^c Estimated waste, also included in purse seine harvest.

Appendix B3.—Age composition of inshore herring, Togiak District, 1984–2004.

Year	Age Composition (%) ^a							Total Run (tons) ^b
	3 ^c	4	5	6	7	8	9+	
1984		2	2	28	42	4	24	114,880
1985		1	1	8	35	42	13	131,400
1986			1	2	15	44	38	94,770
1987				8	10	28	54	88,400
1988		2	5	1	13	5	74	134,717
1989			5	11	4	15	65	98,965
1990	d	d	d	6	11	3	80	88,105
1991		7	1	1	16	18	57	83,329
1992	d	10	20	1	1	15	53	156,955
1993		d	6	23	1	1	67	193,847
1994		d	2	12	28	3	55	185,454
1995		1	4	7	24	30	35	^e
1996		d	3	5	7	21	64	^e
1997	d	7	5	12	11	10	55	144,887
1998		d	4	5	10	11	70	^e
1999	d	d	1	13	9	12	65	157,026
2000	d	d	1	2	17	16	63	^e
2001		5	21	5	4	27	39	146,209
2002		1	25	28	4	5	36	^e
2003		d	3	37	25	4	31	^e
2004		d	d	3.8	43.7	24.6	27.5	^e

^a Age composition in 1984–1992 is weighted by aerial survey data and weight at age.

^b Includes commercial catch, escapement, and documented waste.

^c Includes age 1, 2 and 3 herring.

^d Contribution of age class is less than 0.5%.

^e Age contribution of the commercial purse seine harvest (by weight) was used to represent the total run for the 1995, 1996, 1998, 2000, 2002, 2003 and 2004 fishing seasons. Aerial surveys to determine abundance were hampered by poor weather conditions preventing estimation of total biomass estimate.

Appendix B4.—Herring spawn-on-kelp industry participation, fishing effort, area and harvest, Togiak District, 1984–2004.

Year	Companies	Fishery Dates	Hours	Effort ^a	Area	Total Harvest in pounds	Herring Equivalent (in tons)	Openings	Average roe %
1984	6	5/21–5/24	16.0	330	K 4, K 9	406,586	1,552	3	9.8
1985		no fishery							9.6
1986	6	5/18–5/21	21.0	204	K 7, K 8, K 9	374,142	1,446	4	9.7
1987	5	4/29–5/4	6.6	187	K 9, K 10	307,307	1,309	5	8.8
1988	10	5/20	6.0	259	K 4, K 8	489,320	1,782	1	10.3
1989	11	5/14	4.0	487	K 9	559,780	2,499	1	8.3
1990	7	5/11	3.0	481	K 8	413,844	1,617	1	9.5
1991	7	5/13	2.5	532	K 4	348,357	1,310	1	9.7
1992	5	5/23	3.3	386	K 9	363,600	1,482	2	9.1
1993	2	5/1–5/2	7.0	173	K 8	383,000	1,481	2	9.7
1994	3	5/13–5/14	7.5	204	K 5	308,400	1,134	2	10.0
1995	5	5/11–5/14	14.5	188	K 2, K 3	281,600	996	3	10.6
1996	3	5/9–5/10	12.0	200	K 8, K 9	455,800	1,899	2	9.6
1997		no fishery							
1998		no fishery							
1999	1	5/23	8.0	130	K 9	419,563	1,605	2	9.8
2000		no fishery							
2001		no fishery							
2002	1	5/14	2.0	50	K9	67,793	260	1	9.8
2003	1	5/3–5/4	3.0	35	K-3	^b	^b	1	^b
1994–2003 Average	2		7.8	135		257,840	992	2	9.9
1999–2003 Average	1		4.3	72		167,080	640	1	9.7
2004		no fishery							

^a 1984–1989 and 1992–1996, number of permits fished based on fish tickets. 1990 and 1991, peak aerial survey count.

^b Data confidential under Alaska Statute 16.05.815.

Appendix B5.—Aerial survey estimates of herring biomass and spawn deposition, Togiak District, 1984–2004.

Year ^a	Preseason Forecast ^d	Biomass Estimate	Spawn Estimates	
			Observations	Miles
1984	106,422	114,880	171	61
1985	81,899	131,400	141	43
1986	86,310	94,700	182	67
1987	61,100	88,400	160	76
1988	54,500	134,717	107	61
1989	80,100	98,965	69	53
1990	56,000	88,105	94	66
1991	55,000	83,329	90	70
1992	60,214	156,955	160	97
1993	148,786	193,847	76	53
1994	142,497	185,454	80	72
1995	149,093	149,093	^b 70	59
1996	135,585	135,585	^b 99	73
1997	125,000	144,887	79	59
1998	121,000	121,000	^b 42	33
1999	90,000	156,183	33	56
2000	130,904	130,904	^b 71	46
2001	119,818	119,818	^c 100	57
2002	120,196	120,196	^b 79	32
2003	126,213	126,213	^b 42	95
1984–2003 Average	102,532	128,732	97	61
1994–2003 Average	126,031	138,933	70	58
2004	143,124	143,124	^b 17	36

^a 1993–2004 forecasts based on Age Structured Analysis. Previous years based on age composition, abundance, average growth and mortality rates.

^b Peak biomass estimate could not be determined, therefore, preseason forecast was used.

Appendix B6.—Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1984–2004.

Year	Herring			Total ^a
	Sac Roe ^a	Food/Bait ^a	Spawn-on-Kelp ^a	
1984	7,178	33	203	7,414
1985	13,696	41	^b	13,737
1986	8,648	12	187	8,847
1987	8,614	49	166	8,829
1988	14,103	3	346	14,452
1989	4,983	19	448	5,450
1990	6,494	9	360	6,863
1991	6,173	21	383	6,577
1992	8,818	26	254	9,098
1993	5,218	3	268	5,489
1994	9,090	0	212	9,302
1995	16,713	0	362	17,075
1996	14,395	5	510	14,910
1997	4,306	0	^b	4,306
1998	3,986	0	^b	3,986
1999	6,211	0	315	6,526
2000	4,000	0	^b	4,000
2001	3,090	0	^b	3,090
2002	1,880	0	20	1,900
2003	2,797	0	^c	2,797
1984–2003 Average	7,520	11	288	7,732
1994–2003 Average	6,647	1	284	6,789
2004	2,541	0	^b	2,541

^a Exvessel value (value paid to the fishermen) is derived by multiplying price/ton by the commercial harvest. These estimates do not include any postseason adjustments to fishermen from processors and should therefore be treated as minimum estimates.

^b Fishery not conducted.

^c Data confidential under Alaska Statute 16.05.815.

Appendix B7.—Guideline and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984–2004.

Year	Gillnet Sac Roe			Purse Seine Sac Roe			Spawn-on-Kelp		
	Guideline ^a	Actual	Difference ^c	Guideline ^a	Actual ^b	Difference ^c	Guideline ^a	Actual	Difference ^c
1984							350,000	406,586	16%
1985							350,000	^d	
1986							350,000	374,142	7%
1987							350,000	307,307	-12%
1988	5,647	3,695	-35%	16,943	10,472	-38%	350,000	489,320	40%
1989	3,376	2,844	-16%	10,128	9,415	-7%	350,000	559,780	60%
1990	2,993	3,072	3%	8,980	9,158	2%	350,000	413,844	18%
1991	3,143	3,182	1%	9,429	11,788	25%	350,000	348,357	0%
1992	5,662	5,030	-11%	16,985	20,778	22%	350,000	363,600	4%
1993	6,570	3,564	-46%	19,709	14,392	-27%	350,000	383,000	9%
1994	6,277	7,462	19%	18,832	22,853	21%	350,000	308,400	-12%
1995	6,582	6,995	6%	19,747	19,737	0%	350,000	281,600	-20%
1996	5,956	6,863	15%	17,868	18,008	1%	350,000	455,800	30%
1997	5,464	5,164	-5%	16,391	18,649	14%	350,000	^d	
1998	5,280	5,952	13%	15,840	16,824	6%	350,000	^d	
1999	6,914	4,858	-30%	20,741	15,020	-28%	350,000	419,563	20%
2000	5,738	5,464	-5%	17,215	14,957	-13%	350,000	^d	
2001	6,268	6,481	3%	14,624	15,849	8%	350,000	^d	
2002	6,288	5,216	-17%	14,673	11,833	-19%	350,000	67,793	-81%
2003	6,624	6,505	-2%	15,457	15,158	-2%	350,000	^e	-96%
1989–03 Average	5,542	5,243	-5%	15,775	15,628	0%	350,000	328,693	-6%
1994–2003 Average	6139.1	6,096	-0.002	17138.8	16,889	-0.012	350,000	257,840	-26%
2004	7,568	4,980	-34%	17,658	13,888	-21%	350,000	^d	

^a Harvest guideline derived from inseason biomass estimate when available, or preseason forecast if weather prevents an estimate.

^b Includes deadloss and test fish harvest.

^c Actual minus guideline divided by guideline.

^d No fishery conducted

^e Data confidential under Alaska Statute 16.05.815.