

Fishery Management Report No. 06-46

**Pillar Creek Hatchery Annual Management Plan,
2006**

by

Steve Schrof

and

Gary Byrne

August 2006

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

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

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

FISHERY MANAGEMENT REPORT NO. 06-46

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August 2006

The Kodiak Regional Aquaculture Association (KRAA) funds the general operation of the Pillar Creek Hatchery and the facility's stocking and evaluation programs. The Alaska Department of Fish and Game, Division of Sport Fish, provides funding for the Chinook and Coho salmon projects. Past funding for the Chinook project was also provided by the Kodiak Sport Fish Association and the Kodiak Association of Charter Boat Operators. The Division of Commercial Fisheries provides material and financial support for the management of returning adult runs enhanced or rehabilitated by hatchery stocking projects.

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This document should be cited as:

Schrof, S. and G. Byrne. 2006. Pillar Creek hatchery annual management plan, 2006. Alaska Department of Fish and Game, Fishery Management Report No. 06-46, Anchorage.

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**PREFACE:
EXECUTIVE SUMMARY, 2006, AND SUMMARY OF ACTIVE
FISH TRANSPORT PERMITS**

PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN
EXECUTIVE SUMMARY, 2006.

New Projects for 2006: No new egg take or stocking locations are planned for 2006.

Cost Recovery Harvests for 2006: NONE

Stocking Location	Broodstock	2006 Projected Enhanced Return	2006 Stocking (brood year 2005)	2006 Stocking (brood year 2004)	2006 Egg Take Goals	2007 Stocking (brood year 2006)	2008 Stocking (brood year 2006)
Sockeye:							
Hidden Lake	Afognak Lake early run	3,665	435,000		690,910	400,000	
Little Waterfall Lake	Afognak Lake early run	6,816 ^a	25,000		345,455	200,000	
Big Waterfall Lake	Afognak Lake early run				172,725	100,000	
Crescent Lake	Afognak Lake early run	474	265,000		690,910	400,000	
Total	Afognak Lake early run	10,955	725,000	0	1,900,000 ^b	1,100,000	0
Hidden Lake	Malina Lake early run						
Little Waterfall Lake	Malina Lake early run		175,000				
Big Waterfall Lake	Malina Lake early run		75,000				
Crescent Lake	Malina Lake early run						
Malina Lake	Malina Lake early run		85,000				
Total	Malina Lake early run	0	335,000	0		0	0
Spiridon Lake	Saltery Lake late run	160,912	3,500,000		5,066,667	3,800,000	
Ruth Lake	Saltery Lake late run		50,000		200,000	150,000	
Jennifer Lake	Saltery Lake late run		50,000		533,333	400,000	
Little Kitoi Lake	Saltery Lake late run		50,000		800,000 ^c	600,000	
Total	Saltery Lake late run	160,912	3,650,000	0	6,600,000	4,950,000	0
Total Sockeye		171,867	4,710,000	0	8,500,000	6,050,000	0

-Continued-

Executive Summary, 2006 (page 2 of 2)

Stocking Location	Broodstock	2006 Projected Enhanced Return	2006 Stocking (brood year 2005)	2006 Stocking (brood year 2004)	2006 Egg take Goals	2007 Stocking (brood year 2006)	2008 Stocking (brood year 2006)
Coho:							
Mayflower Lake	Buskin Lake	850	6,500		7,216	6,500	
Island Lake	Buskin Lake	2,614	22,500	23,000	24,978	22,500	
Dark Lake	Buskin Lake	434	7,500		8,326	7,500	
Mission Lake	Buskin Lake	1,558	12,500		13,876	12,500	
Potato Patch Lake	Buskin Lake	536	9,500		10,546	9,500	
Big (Lily) Lake	Buskin Lake			10,000	11,101		10,000
Southern Lake	Buskin Lake	landlocked	3,500		3,885	3,500	
Margaret Lake	Buskin Lake	landlocked		3,500	3,885		3,500
Abercrombie Lake	Buskin Lake	landlocked		3,500	3,885		3,500
Monashka Creek	Buskin Lake	1,231	0	10,000	11,101	0	10,000
Total Coho	Buskin Lake	7,223	62,000	50,000	98,799	62,000	27,000
Chinook:							
Monashka Creek	Karluk River	1,095	0	29,000		0	
Monashka Creek	Monashka Creek		0		300,000 ^d	0	130,000

^a The projected enhanced run for Big Waterfall and Little Waterfall Lakes is a combined total estimate for the two systems.

^b Afognak Lake sockeye salmon has traditionally been the primary broodstock for early-run stocking projects. Afognak Lake adult runs since 2001 have not been as strong as those of the 1990s, and in 2004, Malina Lake sockeye were utilized as an alternative early-run broodstock. Early run sockeye egg takes were conducted at both Malina and Afognak Lakes in 2005. Afognak Lake is the preferred brood source for the 2006 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2006 brood source if egg take goals cannot be achieved using Afognak Lake brood exclusively.

^c Saltery stock eyed eggs are transferred to Kitoi Bay Hatchery; KBH incubates these eggs, rears resulting juveniles, and juveniles are released into Little Kitoi Lake.

^d The 2006 egg take should result in a release of 130,000 smolts in 2008.

**Pillar Creek Hatchery (PCH) summary of active (in use)
Fish Transport Permits (FTP): (page 1 of 4)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Egg takes, early-run sockeye			
Afognak Lake egg take 99A-0051	7/15/1999	12/31/2008	Allows egg take of 4,100,000 green eggs at Afognak Lake; incubation and rearing at PCH, and release of the resultant fry into Hidden, Big and Little Waterfall, and Crescent Lakes.
Malina Lake egg take 04A-0042	4/1/2004	12/31/2009	Allows egg take of 4,100,000 green eggs at Malina Lake, to be incubated and reared at PCH; progeny to be released into Hidden, Crescent, Big Waterfall and Little Waterfall Lakes.
Little Waterfall Creek 04A-0054	7/15/2004	12/31/2009	Allows egg take of 4,100,000 green eggs at the Little Waterfall Lake, outlet creek, to be incubated and reared at PCH; progeny to be released into Hidden, Crescent, Big Waterfall and Little Waterfall Lakes. This is an alternate early-run brood source.
Laura Lake egg take 99A-0060	7/15/1999	12/31/2008	Allows egg take of 1,500,000 green eggs at Laura Lake, incubation and rearing at PCH, and release of progeny into Laura Lake.
Egg takes, late-run sockeye			
Saltery Lake egg take 97A-0071	8/31/1997	12/31/2008	Allows egg take of 9,800,000 green eggs at Saltery Lake, incubation and rearing at PCH, and release of progeny into Spiridon and Ruth Lakes.
Saltery Lake egg take 97A-0068	9/1/1997	12/31/2008	Allows egg take of 1,200,000 green eggs at Saltery Lake, and transfer, incubation and rearing of up to 300,000 presmolt and 600,000 smolt at Kitoi Bay Hatchery.
Little Kitoi Lake egg take 04A-0041	4/1/2004	12/31/2009	Allows egg take of 9,800,000 green eggs at Little Kitoi Lake, incubation and rearing at PCH, and release of progeny into Spiridon and Ruth Lakes.
Stocking, early-run sockeye			
Afognak Lake 04A-0055	8/1/2004	12/31/2009	Allows the release of up to 300,000 Afognak Lake stock fry, or 150,000 fingerling, or 75,000 presmolt, incubated and reared at PCH, into Afognak Lake.
Hidden Lake 99A-0053	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock fry, incubated and reared at PCH into Hidden Lake.
Hidden Lake 06A-0044	4/14/2006	12/31/2011	Allows the release of up to 500,000 Afognak Lake stock fingerling, incubated and reared at PCH into Hidden Lake.
Hidden Lake 99A-0054	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock presmolt, incubated and reared at PCH into Hidden Lake
Hidden Lake 04A-0035	4/1/2004	12/31/2009	Allows the release of up to 600,000 each Malina Lake stock fry and fingerling, and 500,000 presmolt, incubated and reared at PCH, into Hidden Lake.
Little Waterfall Lake 06A-0042	4/14/2006	12/31/2011	Allows the release of up to 400,000 Afognak Lake stock fry, incubated and reared at PCH into Little Waterfall Lake.

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**Pillar Creek Hatchery summary of active (in use)
Fish Transport Permits (FTPs): (page 2 of 4)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Little Waterfall Lake 06A-0045	4/17/2006	12/31/2011	Allows the release of up to 400,000 Afognak Lake stock fingerling, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 97A-0076	10/1/1997	12/31/2008	Allows the release of up to 200,000 Afognak Lake stock presmolt, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 04A-0038	4/1/2004	12/31/2009	Allows the release of up to 400,000 each Malina Lake stock fry and fingerling, and 350,000 presmolt, incubated and reared at PCH, into Little Waterfall Lake.
Big Waterfall Lake 06A-0046	4/14/2006	12/31/2011	Allows the release of up to 250,000 Afognak Lake stock fry, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 99A-0055	7/15/1999	12/31/2008	Allows the release of up to 250,000 Afognak Lake stock fingerling, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 04A-0032	4/1/2004	12/31/2009	Allows the release of up to 250,000 Afognak Lake stock presmolt, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 04A-0031	4/1/2004	12/31/2009	Allows the release of up to 250,000 each Malina Lake stock fry, fingerling and presmolt, incubated and reared at PCH, into Big Waterfall Lake.
Crescent Lake 06A-0047	4/17/2006	12/31/2011	Allows the release of up to 500,000 Afognak Lake stock fry, incubated and reared at PCH into Crescent Lake.
Crescent Lake 99A-0052	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock fingerling, incubated and reared at PCH into Crescent Lake.
Crescent Lake 04A-0034	4/1/2004	12/31/2009	Allows the release of up to 275,000 Afognak Lake stock presmolt, incubated and reared at PCH, into Crescent Lake.
Crescent Lake 04A-0033	4/1/2004	12/31/2009	Allows the release of up to 500,000 each Malina Lake stock fry and fingerling, and 275,000 presmolt, incubated and reared at PCH, into Crescent Lake.
Malina Lake 06A-0043	4/14/2006	12/31/2011	Allows the release of up to 500,000 Malina Lake stock fry, incubated and reared at PCH, into Malina Lake.
Malina Lake 99A-0056	7/15/1999	12/31/2008	Allows the release of up to 500,000 Malina Lake stock fingerling, incubated and reared at PCH, into Malina Lake.
Malina Lake 97A-0078	7/15/1999	12/31/2008	Allows the release of up to 300,000 Malina Lake stock presmolt, incubated and reared at PCH, into Malina Lake.

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**Pillar Creek Hatchery summary of active (in use)
Fish Transport Permits (FTP): (page 3 of 4)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Laura Lake 99A-0062	7/15/1999	12/31/2008	Allows the release of up to 200,000 Laura Lake stock fingerling, incubated and reared at PCH, into Laura Lake.
Laura Lake 99A-0061	7/15/1999	12/31/2008	Allows the release of up to 200,000 Laura Lake stock presmolt, incubated and reared at PCH, into Laura Lake.
Stocking, late-run sockeye			
Saltery Lake 04A-0056	8/1/2004	12/31/2009	Allows the release of up to 800,000 Saltery Lake stock fry, or 400,000 fingerling, or 200,000 presmolt, incubated and reared at PCH, into Saltery Lake.
Spiridon Lake 99A-0059	7/15/1999	12/31/2008	Allows the release of up to 7,000,000 Saltery Lake stock fingerling, incubated and reared at PCH into Spiridon Lake.
Spiridon Lake 04A-0040	4/4/2004	12/31/2009	Allows the release of up to 7,000,000 Saltery Lake stock fry, and 1,000,000 presmolt, incubated and reared at PCH, into Spiridon Lake.
Little Kitoi Lake 04A-0037	5/1/2004	12/31/2009	Allows the release of up to 100,000 Saltery Lake stock fingerling, and 150,000 presmolt, incubated and reared at PCH, into Ruth Lake.
Ruth Lake 99A-0058	7/15/1999	12/31/2008	Allows the release of up to 300,000 Saltery Lake stock fingerling, incubated and reared at PCH, into Ruth Lake.
Ruth Lake 04A-0039	5/1/2004	12/31/2009	Allows the release of up to 300,000 each Saltery Lake stock fry and presmolt, incubated and reared at PCH, into Ruth Lake.
Jennifer Lake 04A-0036	3/1/2004	12/31/2009	Allows the release of 400,000 and 250,000 Saltery Lake stock fry and presmolt, incubated and reared at PCH, into Jennifer Lake.
Egg takes, coho			
Buskin Lake egg take 04A-0004	1/1/2004	12/31/2013	Allows egg take of 200,000 green eggs at Buskin Lake; incubation and rearing at PCH, and release of the resultant progeny into anadromous and landlocked systems in Chiniak Bay.
Stocking, coho			
Road System Lakes 04A-0006	1/1/2004	12/31/2013	Allows the release of Buskin Lake stock juveniles, incubated and reared at PCH, into Kodiak road system lakes, as follows: 22,500 into Island Lake (plus 27,500 smolt; amendment valid 2006 only) 7,500 into Dark Lake 12,500 into Mission Lake (plus 47,500 smolt; amendment for 2006 only) 9,500 into Potato Patch Lake 6,500 into Mayflower Lake
Southern Lake 04A-0005	1/1/2004	12/31/2013	Allows the release of up to 3,500 Buskin Lake stock juveniles, incubated and reared at PCH, into Southern Lake.
Margaret Lake 04A-0013	1/1/2004	12/31/2013	Allows the release of up to 3,500 Buskin Lake stock juveniles, incubated and reared at PCH, into Margaret Lake.

-Continued-

**Pillar Creek Hatchery summary of active (in use)
Fish Transport Permits (FTPs): (page 4 of 4)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Abercrombie Lake 05A-0003	1/12/2005	12/31/2013	Allows the release of up to 3,500 Buskin Lake stock juveniles, incubated and reared at PCH, into Abercrombie Lake.
Big (Lily) Lake 05A-0004	1/12/2005	12/31/2013	Allows the release of up to 10,000 Buskin Lake stock juveniles, incubated and reared at PCH, into Big (Lily) Lake.
Monashka Creek 04A-0007	1/1/2004	12/31/2008	Allows the release of up to 10,000 Buskin Lake stock smolt, incubated and reared at PCH, into Monashka Creek.
Egg takes, chinook Karluk River egg take 00A-0010	2/6/2000	12/31/2008	Allows egg take of 300,000 green eggs at Karluk River; incubation and rearing at PCH, and release of the resultant presmolt into Monashka Creek.
Dog Salmon egg take 04A-0009	1/1/2004	12/31/2006	Allows egg take of 300,000 green eggs at Dog Salmon; incubation and rearing at PCH, and release of the resultant smolt into Monashka Creek.
Monashka egg take 05A-0050	4/1/2005	9/1/2014	Allows egg take of 300,000 green eggs at Monashka Creek; incubation and rearing at PCH, and release of the resultant smolt into Monashka Creek. Eggtake may occur at Karluk River during transition from Karluk to Monashka broodstock.
Stocking, chinook Monashka Creek			see above
Island Lake 04A-0011	1/1/2004	12/31/2007	Allows the release of up to 150,000 juvenile chinook, incubated and reared at PCH, into Island Lake, IF an emergency occurs at PCH, and rearing salmon can not be held to smolt size.
Abercrombie Lake 04A-0012	1/1/2004	12/31/2007	Allows the release of up to 10,000 juvenile chinook, incubated and reared at PCH, into Abercrombie Lake IF an emergency occurs at PCH, and rearing salmon can not be held to smolt size.

ABSTRACT

Pillar Creek Hatchery (PCH) was constructed in 1990 as a cooperative project between the Alaska Department of Fish and Game (ADF&G) and the Kodiak Regional Aquaculture Association (KRAA). The hatchery is located on the road system north of the city of Kodiak and has a capacity to incubate 20 million salmon eggs and rear up to 16 million juvenile fish. Currently, the hatchery incubates and rears single stocks of Chinook *Oncorhynchus tshawytscha* and coho *O. kisutch* salmon, and two stocks of sockeye salmon *O. nerka*.

A total of 1,060,000 early-run juvenile sockeye salmon (725,000 Afognak Lake broodstock and 335,000 Malina Lake broodstock) will be released in 2006. Prior releases of the Afognak Lake early-run stock are expected to produce 10,955 adult sockeye salmon returning in June 2006. About 1,900,000 early-run sockeye eggs will be collected in 2006 for incubation at PCH. After emergence and rearing at the hatchery, a total of 1,100,000 juveniles will be released in 2007.

Approximately 3,650,000 late-run juvenile sockeye salmon (Saltery Lake broodstock) will be released in 2006. The majority of these fish will be released into Spiridon Lake (3,500,000) with additional releases into Ruth, Jennifer, and Little Kitoi Lakes (50,000 each). Prior releases (Saltery Lake broodstock) are expected to produce 160,912 adult sockeye salmon returning to Spiridon Lake in late June through early August 2006. Approximately 5,066,667 Saltery Lake sockeye salmon eggs will be collected in 2006 for stocking Spiridon (3,800,000), Ruth (150,000), and Jennifer (400,000) Lakes in 2007.

A total of about 112,000 juvenile coho salmon (Buskin Lake broodstock) will be released in 2006. These releases include 50,000 coho presmolt and smolt (brood year 2004) which will be released into four road system lakes and Monashka Creek. An additional 62,000 fingerlings and/or fall presmolt (brood year 2005) will be released into six road system lakes in 2006. Prior releases of this coho salmon stock are expected to produce a return of 7,223 adult coho salmon in late August and September 2006. The Buskin River coho salmon egg take in 2006 will target about 98,800 eggs for the release of about 62,000 juveniles in 2007.

About 29,000 brood year 2004 Karluk River Chinook salmon smolt will be released into Monashka Creek in 2006. About 1,095 adult Chinook salmon are expected to return to Monashka Creek in 2006. Approximately 300,000 Chinook salmon eggs will be collected in 2006, which will result in approximately 130,000 smolt released into Monashka Creek in 2008.

There are no cost recovery projects planned for this facility in 2006; however, an “unplanned cost recovery operational plan” (UCROP) has been prepared by KRAA and will be implemented to prevent straying if, for any reason, sockeye salmon cannot be harvested by common property commercial fisheries at the special harvest areas.

Key words: Pillar Creek Hatchery, Kodiak Regional Aquaculture Association, sockeye salmon, coho salmon, Chinook salmon, eggtake, broodstock, stocking, fry, fingerling, presmolt, smolt, harvest, return

INTRODUCTION

Pillar Creek Hatchery (PCH) is located on the Kodiak road system about seven miles north of the City of Kodiak (Figures 1 and 2). The hatchery was constructed in 1990 as a cooperative project between the Alaska Department of Fish and Game (ADF&G) and the Kodiak Regional Aquaculture Association (KRAA; Honnold and Byrne 2004; Honnold and Clevenger 2003; McCullough and Clevenger 2002). PCH has the capacity to incubate 20 million salmon eggs and rear up to 16 million juveniles to a variety of life stages (fry, fingerlings, presmolt, and smolt). The facility is operated primarily by funds provided by KRAA and, to a lesser extent, through a cooperative agreement with the ADF&G Division of Sport Fish. PCH was designed to produce juvenile sockeye salmon *Oncorhynchus nerka* for: 1) stocking barren-lake systems to enhance adult production, and 2) stocking anadromous lakes to supplement wild sockeye salmon stocks in attempts to rehabilitate diminished runs (KRAA 1998). These stocking projects were developed to improve sockeye salmon harvest opportunities in the Kodiak Management Area (KMA) for commercial seine and gillnet, subsistence, and recreational fishers.

Spiridon Lake was selected as the primary barren-lake sockeye salmon stocking project for PCH and has been stocked annually since 1991 (Figure 1). Malina and Laura Lakes were the initial anadromous lake stocking projects conducted by PCH (Figure 1). The latter stocking projects were initiated in 1992 and 1993, respectively, and were discontinued in the late 1990s after successful rebuilding of both sockeye runs.

Late-run Upper Station sockeye salmon were initially used to stock Spiridon Lake and Little Kitoi Lake near the Kitoi Bay Hatchery (KBH; Figure 1). Little Kitoi Lake releases were intended to develop a brood source for the Spiridon Lake project (Honnold and Aro 2004). Investigations by ADF&G and the U.S. Fish and Wildlife Service (USFWS) indicated that the Sallery Lake stock would be preferred for Spiridon Lake stocking (Figure 1; Honnold 1997; Honnold et al. 1999). The earlier run timing of Sallery Lake sockeye salmon (about three weeks earlier than the late-run Upper Station sockeye stock) was expected to improve returns to Little Kitoi Lake and make broodstock collection easier. Additionally, the earlier run timing was expected to reduce the incidental harvest of Spiridon River pink *O. gorbuscha* and chum *O. keta* salmon stocks during the terminal fishery targeting sockeye salmon returns to Spiridon Lake.

Sallery Lake stock will continue to be the brood source for the Spiridon Lake project in 2006. Little Kitoi Lake has been stocked with Sallery Lake sockeye salmon stock from KBH annually since 1999 and this stocking will continue in 2006 (Schrof and Aro *in prep*). Depending on the magnitude of the adult sockeye run, an egg take may occur at Little Kitoi Lake in 2006 for the first time since the brood source was changed. If the 2006 run is not sufficient to meet a substantial portion of the egg take goals, broodstock from Sallery Lake will again be collected and used for stocking Spiridon, Jennifer, and Ruth Lakes and continuing broodstock development at Little Kitoi Lake (Figure 1).

PCH also provides early-run juvenile sockeye salmon for stocking several barren lakes in the Kodiak area. Hidden, Crescent, Little Waterfall and Big Waterfall Lakes will be stocked with juvenile early-run sockeye salmon in 2006 (Figure 1). Afognak Lake sockeye salmon have traditionally been the primary broodstock for early-run stocking projects. Afognak Lake adult sockeye returns since 2001 have not been as strong as the runs of the 1990s, and in 2004, Malina Lake sockeye were utilized as an alternative early-run broodstock. Early-run sockeye egg takes were conducted at both Malina and Afognak Lakes in 2005, with resultant juveniles to be stocked in 2006. Afognak Lake is the preferred brood source for the 2006 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2006 brood source if eggtake goals cannot be achieved using Afognak Lake brood exclusively.

Lake fertilization (1991-2001) and sockeye salmon stocking (1992-1999) projects were conducted at the Malina Lake system during 1991 to 2001 to restore adult production levels adequate to consistently achieve escapement goals (Schrof and Honnold 2003; Figure 1). Juveniles (Malina Lake broodstock) were released (“backstocked”) into this early-run system, which increased ensuing adult returns. Sockeye salmon escapement goals were achieved from 1999 through 2002 (Wadle 2004). Stocking was planned for the 2000-2002 seasons, but escapement levels were sufficient to forego egg takes. Planning for rehabilitation egg takes was discontinued after 2002 and the stock is now considered to be rehabilitated (McCullough and Clevenger 2002).

A similar restoration project was conducted at Laura Lake, which was also fertilized (1993-2001) and supplemented with sockeye fry (1994-1996 and 1999) of Laura Lake origin (Figure 1). In

1996, 1997, and 1999 through 2002 sockeye salmon eggs were not collected at Laura Lake due to adequate adult escapement. As a result of reaching escapement goals for four consecutive years, both lake fertilization and egg takes were discontinued after 2002 and the stock was considered rehabilitated (McCullough and Clevenger 2002).

Another intent of the hatchery was to produce coho salmon *O. kisutch* juveniles for stocking of lakes along the Kodiak Island road system to enhance recreational sport fishing opportunities (KRAA 1998). Buskin Lake coho salmon were reared to the fry or fingerling life stages at PCH annually from 1992 to 2005 for road system stocking (Figure 2). The availability of additional rearing space for coho salmon in 2003-2005 allowed for the rearing and release of coho salmon presmolt and smolt into road system lakes, and the addition of Monashka Creek as a stocking location. Coho salmon fingerling and smolt stocking is also planned for 2006. Future releases of coho smolt will be dependent upon the number of Chinook salmon reared at PCH, and available rearing space. Buskin Lake coho salmon eggs are also used for several classroom incubation programs in Kodiak area schools.

A Chinook salmon enhancement project was initiated at PCH in 2000 after the sockeye and coho salmon programs were established (McCullough et al. 2000). A permit alteration request (PAR) was approved for the PCH Basic Management Plan in January 2000 (McCullough et al. 2000). The PAR provides for the development of a Chinook salmon enhancement project for the Kodiak road system to increase recreational fishing opportunities. Chinook salmon eggs were collected for the first time from the Karluk River in 2000. These eggs were incubated and reared at PCH and about 60,400 smolt were released into Monashka Creek in the spring of 2002 (Figure 2). This project was continued with egg takes occurring at Karluk River during 2001 to 2004, and the release of smolt from 2003 to 2005. In 2005, the first return of adult Chinook produced by this project allowed for an egg take at Monashka Creek. Currently PCH is rearing 29,000 juvenile Chinook salmon from brood year 2004, which will be released into Monashka Creek in 2006. An additional 110,000 Chinook salmon fry from the 2005 egg take are being reared for release as smolt in 2007. The Chinook salmon project will continue in 2006 with an egg take goal (300,000) designed to produce about 130,000 smolt (current rearing capacity at PCH) for release in 2008. Monashka Creek is the preferred brood source for the 2006 Chinook egg take; Karluk River Chinook may be utilized as a 2006 brood source if egg take goals cannot be achieved using Monashka Creek brood exclusively.

PCH will continue to adhere to all measures for protecting natural salmon stocks including genetics guidelines, policies and guidelines for health and disease control, and the prevention of straying. The latter may require the implementation of “unplanned cost recovery” fisheries in the event enhanced returns of adults cannot be efficiently harvested.

2006 SOCKEYE SALMON RELEASES

Below we describe stock-specific sockeye salmon releases planned for 2006. Juvenile sockeye will be transported from Kodiak to specific lakes by either float-equipped aircraft which will release fish after landing on the lake, or by a wheel-equipped aircraft which will stock aerially.

EARLY-RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK

A total of approximately 725,000 early-run Afognak Lake stock juveniles will be released into three lakes (Hidden, Little Waterfall, and Crescent) in 2006 (Table 1; Figure 1; Appendix A1). About 550,000 fry will be released in May with the remaining 175,000 juveniles reared until

October and released as presmolt. Fry releases will range from about 25,000 (Little Waterfall Lake) to 265,000 (Crescent Lake). One release of 175,000 presmolt will occur (Hidden Lake).

Adult returns from these releases are estimated to total about 40,898 fish (Tables 1 and 3). Approximately 3,784 “jacks” (age 1.1 fish) will return in 2008, with the remaining returns expected in 2009 (12,302 fish), 2010 (20,728 fish), and 2011 (4,084). The run timing of these returns should be similar to Afognak Lake sockeye salmon (brood source) escapement, with runs beginning in late May, peaking about mid June, and substantially declining by early July (Figure 3).

EARLY-RUN SOCKEYE SALMON: MALINA LAKE DONOR STOCK

A total of approximately 335,000 early-run Malina Lake stock will be released into three lakes (Little Waterfall, Big Waterfall, and Malina) in 2006 (Table 2; Figure 1; Appendix A2). About 135,000 fry will be released in May with the remaining 200,000 juveniles reared until October and released as presmolt. Anticipated fry releases are 50,000 into Little Waterfall Lake and 85,000 into Malina Lake; presmolt releases will be approximately 75,000 into Big Waterfall Lake and 125,000 into Little Waterfall Lake.

Adult returns from these releases are estimated to total about 25,241 fish (Tables 2 and 3). Approximately 2,703 “jacks” (age 1.1 fish) will return in 2008, with the remaining returns expected in 2009 (8,218 fish), 2010 (13,317 fish), and 2011 (1,002). The run timing of these returns should be similar to Malina Lake sockeye salmon (brood source) escapement, with runs beginning in late May, peaking about mid June, and substantially declining by early July (Figure 4).

LATE-RUN SOCKEYE SALMON: SALTERY LAKE DONOR STOCK

Spiridon Lake will be stocked with about 3,500,000 juvenile Saltery Lake sockeye salmon in 2006 (Table 4; Figure 1; Appendix A3). Of these, 3,125,000 will be released as fry in June and 375,000 as presmolt in October. Ruth and Jennifer Lakes will each be stocked with 50,000 Saltery Lake fry in June 2006, and Little Kitoi Lake with 50,000 fingerling in July 2006 (Table 4; Figure 1; Appendix A3).

We expect about 187,359 adult salmon to return as a result of the 2006 releases into Spiridon Lake (Tables 3 and 4). A small number of jacks (1,453) will return in 2008 and some older age fish (7,594) will return in 2011. However, the majority of adult returns should occur in 2009 (70,266) and 2010 (108,047). Ruth, Jennifer, and Little Kitoi Lake releases in 2006 are expected to produce 7,051 adults returning primarily in 2009 (2,159) and 2010 (4,437; Tables 3 and 4). The run timing of returns from the stocking of Spiridon, Jennifer, Little Kitoi, and Ruth Lakes should be similar to the escapement timing of Saltery Lake sockeye salmon, with the run beginning in mid June, peaking in early to mid July, and ending in mid to late August (Figure 5).

2006 COHO SALMON RELEASES: BUSKIN LAKE DONOR STOCK

PCH plans to release coho salmon presmolt (Brood Year 2004) into the following lakes in April and May 2006: 3,500 into Margaret (Boy Scout) Lake, 3,500 into Abercrombie (Gertrude) Lake, 23,000 into Island Lake, and 10,000 into Big (Lily) Lake (Table 5; Figure 2; Appendix A4). Another 10,000 smolt will be released into Monashka Creek in June. An additional 62,000 coho salmon fingerlings (Brood Year 2005) are scheduled for releases into Island, Dark, Mission, Potato Patch, Mayflower, and Southern Lakes in July 2006 (Table 6; Figure 2; Appendix A4).

Coho salmon juveniles are transported from PCH in a truck-mounted transport tank to each stocking location with the exception of Southern Lake, to which presmolt are transported by skiff.

A small number of Buskin Lake coho salmon eggs (up to 500 per school) were provided for 2005/2006 educational programs in the Kodiak Island Borough school system. Eggs from the 2005 egg take were incubated in classroom incubators, with resultant fry released by students into one of the several previously mentioned lakes.

Presmolt and smolt releases in 2006 are expected to produce about 4,550 returning adults in 2007 (Tables 3 and 5). About 3,805 adults and 1,000 adults should return in 2008 from the 2006 fingerling and 2007 presmolt releases, respectively (Table 6). Estimates of adult returns will vary if fingerling releases are reduced in 2006 in lieu of smolt releases in 2007. The run timing should be similar to the escapement timing of Buskin Lake coho, with fish beginning to return in mid to late August, peaking in late September, and declining by mid October (Figure 6).

2006 CHINOOK SALMON RELEASES: KARLUK RIVER DONOR STOCK

In April 2006, approximately 29,000 Chinook salmon smolt will be transported in a truck-mounted transport tank from PCH to the stocking location at Monashka Creek (Table 7; Figure 2; Appendix A5). The smolt will be held for imprinting in a raceway adjacent to Monashka Creek until they are released in late May.

Approximately 724 adult Chinook salmon are expected to return from the 2006 release with the majority (366) of the adults returning in 2010 (Table 7). Although run timing was initially expected to be similar to escapement timing of the Karluk River Chinook salmon, which return in late May, peaking in mid June, and declining by early July (Figure 7), Monashka Chinook salmon that returned in 2005 were approximately two weeks later than the Chinook salmon returns to the Karluk River.

BROODSTOCK NUMBERS, ESCAPEMENT GOALS, AND EGG TAKE GUIDELINES

In 2006, we propose collecting the following broodstock for egg takes: 1,900 Afognak Lake early-run sockeye salmon (2,150 sockeye salmon, if Malina Lake is used as an alternate early-run broodstock), 4,900 Saltery Lake late-run sockeye salmon, 52 Buskin Lake coho salmon, and 120 Monashka Creek/Karluk River Chinook salmon (Table 8). Escapement goal ranges for these systems are (Nelson et al. 2005): 20,000-50,000 sockeye salmon at Afognak Lake (1,000-10,000 sockeye salmon at Malina Lake), 15,000-30,000 sockeye salmon at Saltery Lake, 3,200-7,200 coho salmon at Buskin River, and 3,600-7,300 Chinook salmon at Karluk River (Monashka Creek does not have a Chinook salmon escapement goal).

The egg take guidelines established in 2005 (Honnold and Byrne 2005) will be used for 2006:

1. Egg takes will be prohibited when escapements are less than or equal to 50% of the lower bound of the escapement goal range for a given system (Table 8).
2. Broodstock removals will not reduce escapements below 50% of the lower bound of the escapement goal range for a given system (Table 8); broodstock removals will be reduced accordingly if necessary (Appendices B1-B3).

3. Broodstock removals for sockeye salmon egg takes may be contingent upon specific “replacement requirements” to compensate for the adults that were removed from the spawning population.
4. Replacement requirement is defined as the number of juvenile sockeye salmon of the specific stock needed for “backstocking” into each system (Appendices B4-B6).
5. Replacement will be required when escapements are over 50% of the lower bound of the escapement goal range to just under (one fish) the lower bound of the escapement goal range, including broodstock removals, for a given system. For example, the lower bound of the escapement goal range for Afognak Lake is 20,000 sockeye salmon and we propose using 1,900 for broodstock. Thus, $50\% * 20,000 + 1 = 10,001$ and $20,000 - 1 + 1,900 = 21,899$, so replacement backstocking will be required if the escapement is from 10,001 to 21,899 sockeye salmon in 2006. If the escapement is less than or equal to 10,000 fish, the egg take will be prohibited.
6. Backstocking options will be based upon productivity parameters for each sockeye salmon system and are intended to replace potential lost production from adult removals (i.e., the number of juveniles backstocked will produce the approximate number of adults that the spawners would have produced had they not been removed).
7. Guidelines for backstocking, as recommended by ADF&G geneticists, will be adhered to (Appendix C).
8. Specific backstocking options based on proposed broodstock removal in 2006 include 153,000 0.4-g fry or 76,500 3.0-g fingerlings or 38,250 10.0-g presmolt into Afognak Lake (Appendix B4), or 173,000 0.4-g fry or 86,500 3.0-g fingerlings or 43,250 10.0-g presmolt into Malina Lake (Appendix B5) and 611,000 0.4-g fry or 305,500 3.0-g fingerlings or 152,750 10-g presmolt into Sallery Lake (Appendix B6).
9. Backstocking of sockeye salmon presmolt is recommended to lessen lake grazing pressure and to provide for easy identification of returning adults (through unique scale patterns).
10. Replacement will be optional for coho or Karluk River Chinook broodstock removals due to the small numbers of adults needed for egg takes and the anticipation of escapement requirement being met at the Buskin River (coho) and Karluk River (Chinook) systems (L. Schwarz, Alaska Department of Fish and Game, Kodiak, personal communication). If these runs are weak in 2006, replacement for broodstock removal may occur and, if needed, backstocking options will be developed. Monashka Creek, the preferred Chinook salmon brood source, does not have a Chinook salmon escapement goal.

2006 SOCKEYE SALMON EGG TAKES (2007 STOCKING)

Egg-take goals for 2006 and stocking levels for 2007, as described below for each broodstock, are based on the evaluation of the rearing capacity of each lake. This evaluation was based on zooplankton data collected in 2005 and may be adjusted in season as a result of limnological analysis of zooplankton data collected at each lake in 2006. Rearing limitations at PCH (i.e., how many juveniles of each life stage can be successfully cultured) may also result in modifications to stocking levels in 2007.

EARLY-RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK

The 2006 early-run egg take goal is 1,900,000 Afognak Lake sockeye salmon eggs (1,900 adults), which should provide for stocking about 1,100,000 juveniles in 2007 (Table 9; Appendix A1). These fish will be released into Hidden (200,000 fry and 200,000 presmolt), Little Waterfall (50,000 fry and 150,000 presmolt), Big Waterfall (100,000 presmolt), and Crescent (200,000 fry and 200,000 presmolt) Lakes.

The escapement levels at Afognak Lake in 2006 will determine the number of broodstock available for an egg take (Table 8; Appendix B1). Malina Lake sockeye salmon may be used as

an alternative broodstock for the aforementioned stocking projects if escapement levels preclude or do not allow the egg-take goal to be met at Afognak Lake (Table 8; Appendices A1 and A2). The egg-take guidelines previously described will be adhered to regardless of the egg-take location (Table 8; Appendices B1 and B2).

LATE-RUN SOCKEYE SALMON: SALTERY LAKE DONOR STOCK

The 2006 late-run egg-take goal is 5,671,102 (4,900 adults) Saltery Lake sockeye salmon eggs (Table 10; Appendix A3). The 2007 stocking goal is 4,350,000 juveniles, of which 3,800,000 (3,300,000 fry and 500,000 presmolt) will be released into Spiridon Lake, 400,000 (250,000 fry and 150,000 presmolt) into Jennifer Lakes, and 150,000 (50,000 fry and 100,000 presmolt) into Ruth Lake.

The egg take at Saltery Lake will be based upon the level of escapement available for broodstock collection (Table 8; Appendix B3). There are no other “wild” late-run stocks available for alternate egg takes if escapement levels preclude or do not allow the egg-take goal to be met at Saltery Lake. Little Kitoi Lake sockeye salmon returns, as a result of broodstock development at Kitoi Bay Hatchery, may be available for broodstock collection; however, we do not anticipate that egg-take goals can be reached at the level of escapement expected at Little Kitoi Lake in 2006 (Schrof and Aro *in prep*).

2006 COHO SALMON EGG TAKES (2007 STOCKING)

About 98,800 Buskin Lake coho salmon eggs (52 adults) will be collected in 2006, which will provide approximately 62,000 fingerlings for stocking into six road system lakes in 2007 (Table 11; Appendix A4), and, if rearing space is available at PCH, potentially 27,000 spring presmolt and/or smolt will be available for 2008 stocking into Kodiak Road System Lakes.

We do not expect that Buskin River coho salmon escapement levels will preclude or reduce broodstock collection in 2006, due to the small number (52) of broodstock needed to attain egg take goals (Table 8; Appendix A4) and the anticipated magnitude of the 2006 coho salmon escapement (L. Schwarz, Alaska Department of Fish and Game, Kodiak, personal communication). However, alternate broodstocks for coho stocking projects have not been identified and adherence to egg-take guidelines may result in reducing egg take goals or not collecting eggs in 2006. Replacement requirements have not been identified for the Buskin River coho salmon stock, but may be developed in 2006.

2006 CHINOOK SALMON EGG TAKES (2008 STOCKING)

The 2006 Chinook salmon egg take goal is 300,000 Monashka Creek/Karluk River eggs (120 adults), which is expected to provide for stocking of 130,000 smolt into Monashka Creek in 2008 (Table 7; Appendix A5). Monashka Creek is the preferred brood source for the 2006 Chinook egg take, and the 2006 run is expected to be of sufficient strength to meet the above-stated hatchery eggtake goals. However, Karluk River chinook may be utilized as a 2006 brood source if egg-take goals cannot be achieved using Monashka Creek brood exclusively. If the Karluk River Chinook salmon escapement is less than or equal to 1,800 fish, an egg take will not occur there in 2006 (Table 8). The 2006 Monashka Creek Chinook salmon run will include only 1 to 4-ocean age fish, while Karluk River Chinook run will include all age classes (1 to 5-ocean age fish).

The Chinook salmon run to the Karluk River is expected to meet escapement requirements in 2006 (L. Schwarz, Alaska Department of Fish and Game, Kodiak, personal communication) and should allow broodstock goals (120) to be reached (Table 7; Appendix A4). The Dog Salmon River Chinook salmon stock is permitted (FTP 04A-0009) as an alternate broodstock for the Monashka Creek enhancement project. If Chinook salmon runs to both Monashka Creek and the Karluk River are weak, this stock may be used for the 2006 egg take. Replacement requirements have not been identified for Chinook salmon to the Karluk River; egg-take guidelines could restrict or preclude an egg take in 2006 (Table 8).

SOCKEYE SALMON HARVEST AND MANAGEMENT

A total of 171,867 sockeye salmon produced from PCH stocking projects are expected to return in 2006 (Table 12). The majority of these fish (160,912) will be a result of Spiridon Lake stocking. Hidden, Little Waterfall, Big Waterfall, Crescent, Spiridon, and Ruth Lakes are barriered systems without native salmon runs. Salmon may be present in the lake outlet stream from marine waters to the salmon barrier. All sockeye salmon returning to these systems will be available for harvest. Prior to 2005, designated Terminal Harvest Areas (THA) were used to manage the harvest of enhanced sockeye salmon production from PCH (Honnold and Byrne 2004). Special Harvest Areas (SHA) were established by regulation in 2005 to replace the THAs (5 AAC 40.085).

HARVEST OF RETURNS TO HIDDEN LAKE

The Foul Bay (Hidden Lake; Figure 8) harvest strategy is designed to allow for the harvest of sockeye salmon produced from the Hidden Lake enhancement project and to provide for the protection of wild salmon stocks returning to, or passing through, the Northwest Afognak Section of the Afognak District (Figure 9). The run timing of Hidden Lake returns should be similar to the timing of Afognak Lake sockeye salmon (brood source) escapement, with runs beginning in late May, peaking in early June, and declining substantially by early July (Figure 3).

Hidden Lake sockeye salmon runs will be harvested in the Foul Bay SHA, which includes the area of Foul Bay east of 152°47.20' W long. (Figure 8; 5 AAC 40.085(3)). By regulation the only legal gear type for the SHA is seine gear. Because a harvestable surplus of enhanced sockeye salmon is expected in the SHA, continuous fishing periods through the duration of the sockeye run will be allowed by the ADF&G, beginning 1 June (Wadle 2006). The fishery directed at the Hidden Lake sockeye salmon run is not expected to impact pink salmon escapement; the fishery occurs prior to the arrival of most of the pink salmon. There is no escapement requirement for sockeye salmon in Hidden Creek as the lake is inaccessible due to a large barrier falls. The sockeye salmon harvest is expected to occur primarily in the Foul Bay SHA; however, some Hidden Lake sockeye salmon may be harvested in the Northwest Afognak Section (Figure 9).

The ADF&G recognizes that some incidental harvest of wild stocks could occur in the Foul Bay SHA while the fishery is managed to harvest the Hidden Lake sockeye salmon run. The ADF&G may adjust the size of the SHA to minimize the harvest of wild stocks and to target the Hidden Lake sockeye salmon. Age and scale pattern analysis of the commercial harvest have indicated a minimal wild stock bycatch (Schrof et al. 2000; Schrof and Honnold 2003). Therefore, a reduction in the size of the SHA is not expected in 2006 (J. Wadle, Alaska Department of Fish and Game, Kodiak, personal communication).

A weir was installed annually on Hidden Lake Creek during 1995 to 2003 to ensure that the majority of Hidden Lake sockeye salmon were harvested in the common property fishery (Figure 8). Large numbers of sockeye salmon were not observed in front of the weir either before or during the commercial fishery. Based on these observations, the ADF&G did not operate the weir in 2004 or 2005. Fishery evaluation efforts were instead based from the ADF&G vessel, *K-HI-C* anchored in Foul Bay in early June. ADF&G personnel will evaluate the Foul Bay SHA fishery in a similar manner in 2006.

HARVEST OF RETURNS TO CRESCENT LAKE

The purpose of the Crescent Lake stocking project is to provide additional sockeye salmon for harvest in the Settler Cove (Crescent Lake) area without compromising wild stock escapements, primarily Barabara Lake sockeye salmon (Figure 10). The run timing of Crescent Lake returns should be similar to the escapement timing of Afognak Lake sockeye salmon (brood source), with runs beginning in late May, peaking in early June, and declining substantially by early July (Figure 3).

The harvest of Crescent Lake sockeye salmon is expected to occur during fishing periods targeting early-run sockeye, pink, and chum salmon in the Central Section of the Northwest Kodiak District (Figure 9). During 2006 the fishery will open in the Central Section of the Northwest Kodiak District on 1 June for a 57-hour period (Wadle 2006). Additional fishing time is dependent on the run strength of early-run Karluk Lake sockeye salmon (5 AAC 18.362). The Settler Cove SHA, which includes all waters of Settler Cove west of 152°50.80' W long. (Figure 10; 5 AAC 40.085(5)), could open in 2006 if large numbers of sockeye salmon are not harvested during normal commercial fishery openings and are observed in the Settler Cove area. All fish in the SHA will be available for harvest; residents of Port Lions will utilize the inriver escapement for subsistence purposes.

HARVEST OF RETURNS TO LITTLE AND BIG WATERFALL LAKES

The Waterfall Bay harvest strategy allows for the harvest of enhanced sockeye salmon returning to Waterfall Bay and provides safeguards for wild salmon escapements (Figure 11). The run timing of returns to Waterfall Bay should be similar to the escapement timing of Afognak Lake sockeye salmon (brood source), with runs beginning in late May, peaking in early June, and declining substantially by early July (Figure 3).

The sockeye salmon harvest is expected to occur in the Waterfall Bay SHA within the Perenosa Bay Section (Figure 11). The Waterfall Bay SHA includes waters seaward of the stream terminus of Little (251-822) and Big (251-821) Waterfall Creeks to a straight line extending northwesterly from 58°24.15' N lat., 152°28.23' W long. to 58°25.60' N lat., 152°28.23' W long. (5 AAC 40.085(4)). By regulation, the only legal gear type for the Waterfall Bay SHA is seine gear. Since escapement and broodstock are not required, all returning enhanced sockeye salmon will be available for harvest. Because a harvestable surplus of enhanced sockeye salmon is expected in 2006, continuous fishing through the duration of the sockeye run will be allowed beginning 1 June (Wadle 2006).

The ADF&G recognizes that an incidental harvest of wild salmon could occur in the Waterfall Bay SHA while the fishery is managed to harvest enhanced Little and Big Waterfall Lakes sockeye salmon. The ADF&G may adjust the size of the SHA open to commercial fishing to avoid harvesting local wild sockeye salmon stocks (Pauls Bay and Portage Lake sockeye salmon; Figure 11). To date, scale pattern and age analysis of harvest samples have indicated minimal

wild stock harvest (Schrof et al. 2000; Baer and Honnold 2002). A reduction in the size of the Waterfall SHA is not expected in 2006 (J. Wadle, Alaska Department of Fish and Game, Kodiak, personal communication).

Unlike the sockeye salmon returning to Foul Bay, fish returning to Waterfall Bay tend to migrate into the confluence of Little Waterfall Creek. Thus, each year since 1995, a fish barrier has been installed near the terminus of Little Waterfall Creek prior to the start of the terminal fishery. This has ensured that all returning sockeye salmon were harvested (Honnold and Clevenger 2003; Honnold and Byrne 2004). Although there have been concerns that the barrier may cause straying (Honnold et al. 1998), studies have conclusively demonstrated that the barrier net at the Waterfall Bay SHA does not cause adverse straying effects to nearby systems with natural salmon runs (Wadle and Honnold 2000; Baer and Honnold 2002). The ADF&G will continue to allow the use of the barrier net as long as effort to harvest fish remains aggressive as in most prior years. If a fishery does not occur, the net may be removed to allow returning sockeye salmon access to Little Waterfall Creek. It is also possible that the barrier net will not be installed at all in 2006. As recent regulatory changes have allowed for the salmon fishery to open earlier (first opener date changed from June 9 to June 5 in 2003, from June 5 to June 1 in 2005), fishing vessels may be on the grounds early enough to intercept Little Waterfall-bound sockeye before they reach the mouth of the creek, thereby eliminating the necessity for the barrier. ADF&G personnel will monitor the fishery to ensure that this is the case; if returning sockeye are observed schooling at the mouth of Little Waterfall Creek prior to the opening of the fishery, the barrier net will be installed at that time.

A fish barrier will not be used in the terminus of Big Waterfall Creek; all returning adults that are not harvested will have unimpeded access to freshwater downstream of the barrier falls.

HARVEST OF RETURNS TO SPIRIDON LAKE

The Spiridon Lake sockeye salmon management plan, 5 AAC 18.366, is designed to allow for the harvest of enhanced sockeye salmon returning to Spiridon Lake (Wadle 2006; Figure 12) and to provide adequate protection for escapements of wild salmon stocks returning to streams in the area (Spiridon River sockeye, pink, chum, and coho salmon; stream number 254-401). The intent of this stocking project is to provide enhanced sockeye salmon in traditional commercial fishing areas in the Northwest Kodiak District (Figure 9). The sockeye salmon run as a result of Spiridon Lake stocking in 2006 is expected to begin in late June and continue into mid-August (Figure 5).

Harvests of Spiridon Lake sockeye salmon are expected to occur during openings targeting Karluk Lake sockeye and westside pink and chum salmon stocks (Wadle 2006). A SHA, however, is required to provide for an orderly harvest of enhanced sockeye salmon that have migrated past the traditional commercial fishing areas of the Northwest Kodiak District. The Spiridon Bay SHA includes all waters of Telrod Cove north of a line extending from Stream Point at 57° 39.00' N lat., 153° 38.50' W long., to a point at 57° 38.80' N lat., 153° 37.70' W long. (5 AAC 40.085(2); Figure 12). A continuous fishing period will be announced by the ADF&G when enhanced sockeye salmon are documented within the SHA (Wadle 2006). By regulation, the only legal gear type for the Spiridon Bay SHA is seine gear. A series of barrier falls prevents salmon from entering Spiridon Lake, but sockeye salmon returning to Telrod Cove have access to Telrod Creek (Figure 12). Closed water markers ensure that intertidal habitat is not disturbed during fishing operations.

The ADF&G recognizes that some incidental harvest of wild stocks could occur in this area while the fishery is managed to harvest the enhanced Spiridon Lake sockeye salmon. The restricted size of the SHA coupled with the run timing (Saltery Lake sockeye salmon broodstock) of returns to Spiridon Lake, however, are expected to reduce the incidental harvest of wild salmon stocks, specifically those returning to Spiridon River (pink and chum salmon) and Telrod Creek (pink salmon).

The SHA will be monitored by ADF&G personnel beginning in mid June and continuing until early August or when the SHA is closed to fishing.

HARVEST OF RETURNS TO RUTH LAKE

The return of enhanced sockeye salmon to Ruth Lake is expected to be negligible in 2006, as the system was not stocked by PCH from 2001 to 2003. The small number of enhanced sockeye salmon that do return to Ruth Lake will be harvested incidentally in 2006 during pink, chum, and coho salmon fisheries in the Kitoi, Izhut, and Duck Bay Sections of the Afognak District (Figures 1 and 9; Wadle 2006; Schrof and Aro *in prep*). The run timing is expected to be similar to that described for Spiridon Lake runs, since Saltery Lake sockeye salmon were used as broodstock (Figure 5).

HARVEST REPORTING

Spiridon Lake SHA, Foul Bay SHA, Waterfall Bay SHA, and Kitoi Bay Area (Ruth Lake) salmon harvest information will be monitored through daily verbal processor reports and the ADF&G fish ticket database. On-site estimates of harvest and the collection of age and sex composition data from returning sockeye salmon will be collected by field personnel at each of these locations.

Harvest information from the Crescent Lake sockeye salmon run will be monitored through the ADF&G fish ticket database and subsistence permit reports. The harvest contribution from this project will be determined by assigning all sockeye salmon harvested in the Settler Cove SHA as originating from Crescent Lake. The run timing and location of the fishery (SHA) provides for an isolated harvest of returning adults. The subsistence harvest will be assigned through the ADF&G subsistence use reporting system.

ADDITIONAL MEASURES FOR WILDSTOCK PROTECTION

GENETICS POLICY

The ADF&G Genetics Policy is designed to assure that stocking projects do not negatively impact the genetic integrity of wild stocks (McGee 1995). The policy addresses three primary areas: 1) stock transport, 2) protection of wild stocks, and 3) maintenance of genetic variance. This policy, as described in the 1998 Pillar Creek Hatchery AMP (Honnold et al. 1998), will be followed in 2006 for all projects.

To protect wild stocks and maintain their genetic integrity, adults produced from hatchery stocking projects must be prevented from straying into stream and lake systems supporting wild stocks. A management strategy targeting unharvested enhanced production is required by ADF&G to insure compliance with state regulations for private nonprofit (PNP) salmon hatcheries (5AAC 40.005.(f)). This strategy must address ADF&G PNP permitting requirements for salmon straying concerns and include detailed actions required when harvest of enhanced production is delayed or abandoned.

These actions were detailed in an unplanned cost recovery operational plan (UCROP) as part of the 2003 PCH annual management plan, and included as cost recovery fisheries in the THAs (currently SHAs; Honnold and Clevenger 2003). If commercial fishing does not occur for some reason in 2006, salmon returning to the SHAs will be harvested using the guidelines described in the UCROP.

POLICIES AND GUIDELINES FOR HEALTH AND DISEASE CONTROL

The State of Alaska Pathology Review Committee has developed a long range goal to prevent dissemination of infectious finfish (and shellfish) disease within or outside the borders of Alaska (McGee 1995). This goal is intended to protect stocks without constraining aquaculture or stock renewal programs. The policy and guidelines do not advocate transplanting wild finfish stocks between geographic zones to minimize the risk of transporting disease from one zone to another. This policy includes hatchery stocks in order to be consistent with the Genetics policy. Some exceptions may be made on a case by case basis. The policy and guidelines for health and disease control, as described in the 1998 Pillar Creek Hatchery AMP (Honnold et al. 1998), will be followed in 2006 for all projects.

SPECIAL STUDIES/RESEARCH

The 1994 to 1997 Spiridon Lake sockeye salmon runs were reconstructed using scale pattern analysis to delineate Spiridon Lake fish in the Northwest Kodiak District or in the Southwest Afognak Section commercial harvests (Nelson and Barrett 1994; Nelson and Swanton 1996; Nelson and Swanton 1997; Nelson 1999). The runs from 1998 to 2005, however, have not been formally reconstructed due to the run timing differences between the original late-run Upper Station broodstock (stocked from 1991 to 1994 and 1996 to 1997) and the Saltery Lake broodstock (stocked in 1995 and from 1998 to 2005). Stock separation techniques used when only the late-run Upper Station stock fish returned (1994 to 1997) were not appropriate for application to the mixed stock runs (1998 to 2002) or for future runs when only the Saltery Lake fish return (P. Nelson, Alaska Department of Fish and Game, Kodiak, personal communication). This is primarily due to the increased number of both local and non-local stocks present in the Northwest Kodiak District during the earlier Saltery Lake broodstock run timing.

The average proportion of the Spiridon-bound sockeye salmon harvested in the Spiridon Lake THA from 1994 to 1997 (41%) was applied to the 1998 through 2005 THA harvest to reconstruct the recent Spiridon Lake sockeye salmon contribution to the harvest in the SW Afognak Section and Northwest Kodiak District (Schrof and Honnold 2003; Honnold and Byrne 2004). This method of run reconstruction will be used for the 2006 and future Spiridon Lake sockeye salmon runs until a new method of stock separation is developed and implemented to identify the Saltery Lake stock returns (S. Honnold, Alaska Department of Fish and Game, Kodiak, personal communication).

Smolt abundance will be estimated and samples collected for age and condition during their emigration from Spiridon Lake as a check on stocking density and to assist with run forecasts (Foster et al. 2006).

Smolt will also be sampled for condition and age at all other systems stocked with juvenile sockeye salmon. Stocked lakes will also be sampled to evaluate zooplankton trends and water quality parameters.

ACKNOWLEDGMENTS

We acknowledge KRAA Director Kevin Brennan and all KRAA permanent and seasonal personnel that staff Pillar Creek Hatchery. We also acknowledge the ADF&G salmon managers, project biologists, and field staff that contribute to Pillar Creek Hatchery programs including Jeff Wadle, Len Schwarz, Donn Tracy, Rob Baer, Greg Watchers, and Steve Thomsen. We also thank Lucinda Neel for her publication expertise, Lynn Mattes, and David Barnard who provided editorial comments, and Steve Honnold, the Division of Commercial Fisheries Finfish Regional editor who also reviewed this document.

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TABLES AND FIGURES

Table 1.-Pillar Creek Hatchery early-run sockeye salmon egg takes (Afognak Lake broodstock) in 2005, resultant juvenile releases planned in 2006, projected adult production, and fish transport permit (FTP) information.

Parameter	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Totals
<u>Egg take</u>					
eggs	455,681	306,708	43,815	464,444	1,270,649
adults	465	313	45	474	1,296
<u>Releases</u>					
location	Hidden Lake	Hidden Lake	Little Waterfall Lake	Crescent Lake	
number	260,000	175,000	25,000	265,000	725,000
size (g)	0.4	12.2	0.4	0.4	
lifestage	Fry	Presmolt	Fry	Fry	
date	07-May-06	05-Oct-06	07-May-06	07-May-06	
Projected Returns^a					
2008	854	1,978	82	871	3,784
2009	3,077	5,793	296	3,136	12,302
2010	5,464	9,170	525	5,569	20,728
2011	1,931	0	186	1,968	4,084
total	11,326	16,940	1,089	11,543	40,898
<u>Fish Transport Permit (FTP)^b</u>					
number	99A-0053	99A-0054	06A-0042	06A-0047	
expires	31-Dec-08	31-Dec-08	31-Dec-11	31-Dec-11	
max. no.	500,000	500,000	400,000	500,000	
lifestage	Fry	Presmolt	Fry	Fry	

^a Projected returns are calculated from Table 3 survival and age assumptions.

^b FTP 04A-0042 - for 4.1 million green eggs, expiring 31 Dec-09, authorizes egg take for these projects.

Table 2.-Pillar Creek Hatchery early-run sockeye salmon egg takes (Malina Lake broodstock) in 2005, resultant juvenile releases planned in 2006, projected adult production, and FTP information.

Parameter	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Totals
<u>Egg take</u>					
eggs	96,561	241,403	144,842	164,154	646,960
adults	109	271	163	184	727
<u>Releases</u>					
location	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Malina Lake	
number	50,000	125,000	75,000	85,000	335,000
size (g)	0.4	11.8	11.8	0.4	
lifestage	Fry	Presmolt	Presmolt	Fry	
date	21-May-06	05-Oct-06	05-Oct-06	21-May-06	
<u>Projected Returns</u> ^a					
2008	164	1,413	848	279	2,703
2009	592	4,138	2,483	1,006	8,218
2010	1,051	6,550	3,930	1,786	13,317
2011	371	0	0	631	1,002
total	2,178	12,100	7,260	3,703	25,241
<u>Fish Transport Permit (FTP)</u> ^b					
number	04A-0038	04A-0038	04A-0031	06A-0043	
expires	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-11	
max. no.	400,000	350,000	250,000	500,000	
lifestage	Fry	Presmolt	Presmolt	Fry	

^a Projected returns are calculated from Table 3 survival and age assumptions.

^b FTP 04A-0042 - for 4.1 million green eggs, expiring 31 Dec-09, authorizes egg take for these projects.

Table 3.-Salmon survival and age assumptions used to estimate returns for Pillar Creek Hatchery stocking projects.

Species	Broodstock ^a	Stocking		Survival ^b	Age-at-return Proportions ^b							
		Life Stage ^c	Size (g)	Stocking-to-adult return	1.1	1.2	2.1	1.3	2.2	1.4	2.3	1.5
Sockeye	AL/ML	F	0.4	4.5%	0.07	0.22	0.04	0.36	0.11			0.17
Sockeye	AL/ML	FG	1.0-3.0	6.5%	0.07	0.22	0.04	0.36	0.11			0.17
Sockeye	AL/ML	PS	8.0-15.0	10.0%	0.11	0.33		0.52				
Sockeye	SL	F	0.4-0.6	4.5%	0.01	0.31	0.01	0.39	0.24			0.05
Sockeye	SL	FG	3.0-6.0	6.5%	0.01	0.31	0.01	0.39	0.24			0.05
Sockeye	SL	PS	8.0-13.0	12.5%	0.02	0.55		0.44				
Coho	BL	FG	3.0-5.0	6.5%			1.00					
Coho	BL	PS	8.0	10.0%	1.00							
Coho	BL	S	15.0	12.5%	1.00							
Chinook	KR	S	30.0	2.5%	0.02	0.12		0.32		0.50		0.03

^a AL=Afognak Lake early run, ML=Malina Lake early run, SL=Saltery Lake late run, BL=Buskin Lake, and KR=Karluk River.

^b based on actual survival and age-at-return data from Pillar Creek Hatchery and/or other ADF&G research projects.

^c F=fry, FG=fingerling, PS=presmolt, and S=smolt.

Table 4.-Pillar Creek Hatchery late-run sockeye salmon egg takes (Saltery Lake broodstock) in 2005, resultant juvenile releases planned for 2006, projected adult production, and FTP information.

Parameter	Late-run Sockeye	Totals				
<u>Egg take</u>						
eggs	4,855,396	582,647	77,686	77,686	77,686	5,671,102 ^a
adults	4,133	496	66	66	66	4,827
<u>Releases</u>						
location	Spiridon Lake	Spiridon Lake	Ruth Lake	Jennifer Lake	Little Kitoi Lake	
number	3,125,000	375,000	50,000	50,000	50,000	3,650,000
size (g)	0.4	11.4	0.4	0.4	2.0	
lifestage	Fry	Presmolt	Fry	Fry	Fingerling	
date	07-Jun-06	05-Oct-05	07-Jun-06	07-Jun-06	20-Jul-06	
<u>Projected Returns</u> ^b						
2008	703	750	11	11	16	1,492
2009	44,719	25,547	716	716	727	72,423
2010	87,469	20,578	1,400	1,400	1,637	112,482
2011	7,594	0	122	122	176	8,012
total	140,484	46,875	2,248	2,248	2,555	194,410
<u>Fish Transport Permit (FTP)</u> ^c						
number	04A-0040	04A-0040	04A-0039	04A-0036	04A-0037	
expires	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
max. no.	7,000,000	1,000,000	300,000	400,000	100,000	
lifestage	Fry	Presmolt	Fry	Fry	Fingerling	

^a An additional 716,030 eggs were taken, and 595 adult brood utilized, for Kitoi Bay Hatchery late-run sockeye production. Eggs are transferred at the eyed egg stage of development.

^b Projected returns are calculated from Table 2 survival and age assumptions.

^c FTP 97A-0071 - for 9.8 million green eggs, expiring 31 Dec-08, authorizes egg take for these projects.

Table 5.-Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2004, resultant juvenile (planned) releases at Road System Lakes in 2006, projected adult production, and FTP information.

Parameter	Coho	Coho	Coho	Coho	Coho	Totals
<u>Egg take</u>						
eggs	27,278	11,860	4,151	4,151	11,860	59,300
adults	16	7	2	2	7	34
<u>Releases</u>	Island	Big (Lily)	Margaret	Abercrombie	Monashka	
location	Lake	Lake	Lake	Lake	Creek	
number	23,000	10,000	3,500	3,500	10,000	50,000
size (g)	17.5	17.5	15.5	15.5	20.0	
lifestage	Smolt	Smolt	Smolt	Smolt	Smolt	
date	07-May-06	07-May-06	18-Apr-06	18-Apr-06	03-Jun-06	
<u>Projected Returns</u> ^a						
2007	2,300	1,000	0	0	1,250	4,550
total	2,300	1,000	landlocked	landlocked	1,250	4,550
<u>Fish Transport Permit (FTP)</u> ^b						
number	04A-0006	05A-0004	04A-0013	05A-0003	04A-0007	
expires	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-08	
max. no.	50,000 ^c	10,000	3,500	3,500	10,000	
lifestage	any	any	any	any	smolt	

^a Projected returns are calculated from Table 3 survival and age assumptions.

^b FTP 04A-0004 - for 200,000 green eggs, expiring 31 Dec-13, authorized egg take for these projects.

^c FTP 04A-0006 was amended for calendar year 2006 only to allow the release of up to 50,000 coho juveniles, only 22,500 of which may be of fingerling/rearing size.

Table 6.-Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2005, resultant juvenile releases planned for road system lakes in 2006 and 2007, projected adult production, and FTP information.

Parameter	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Totals
Egg take											
eggs	24,801	8,267	13,778	10,471	11,022	7,165	3,858	3,858	3,858	11,022	98,100
adults	14	5	8	6	6	4	2	2	2	6	56
Releases	Island	Dark	Mission	P.Patch	Big (Lily)	Mayflower	Southern	Margaret	Abercrombie	Monashka	
location	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Creek ^a	
number	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	3,500	10,000	89,000
size (g)	3.0	3.0	3.0	3.0	12.0	3.0	3.0	12.0	12.0	15.0	
lifestage	Fingerling	Fingerling	Fingerling	Fingerling	Presmolt	Fingerling	Fingerling	Presmolt	Presmolt	Smolt	
date	10-Jul-06	10-Jul-06	10-Jul-06	10-Jul-06	15-Mar-07	10-Jul-06	10-Jul-06	15-Mar-07	15-Mar-07	03-Jun-07	
Projected Returns	^b										
2008	1,463	488	813	618	1,000	423	0	0	0	1,250	6,053
2009	0	0	0	0	0	0	0	0	0	0	0
total	1,463	488	813	618	1,000	423	landlocked	landlocked	landlocked	1,250	6,053
Fish Transport Permit (FTP)	^c										
number	04A-0006	04A-0006	04A-0006	04A-0006	05A-0004	04A-0006	04A-0005	04A-0013	05A-0003	04A-0007	
expires	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-08	
max. no.	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	3,500	10,000	
lifestage	any	any	any	any	any	any	any	any	any	smolt	

^a Coho may be reared to, and released as, spring smolt depending upon hatchery chinook salmon smolt inventory. Possible 2007 releases are not included in total releases for all locations.

^b Projected returns are calculated from Table 3 survival and age assumptions. If smolt are released in 2007, they would return in 2008 (age 1.1 fish).

^c 04A-0004 - for 200,000 green eggs, expiring 31 Dec-13, authorized egg take for these projects.

Table 7.-Karluk River chinook salmon egg takes (2000-2004), Monashka Creek chinook salmon egg takes (2005-2006), Monashka Creek releases (2002-2008), projected returns (2003-2013), and FTP information.

Year	Egg Take ^{a,b}		Releases			Adult Returns ^b										Total Return	
	Eggs	Adults	Number	Size (g)	Date	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		2013
Karluk River Brood																	
2000	124,818	48	60,398	30.0	May-02	34	180	482	761	51							1,509
2001	86,120	34	32,554	25.3	May-03		18	97	260	410	28						813
2002	147,000	59	11,252	29.9	May-04			6	34	90	142	10					281
2003	172,300	70	72,068	15.1	May-05				41	215	575	908	61				1,800
2004	181,600	76	29,000	20.0	May-06					16	86	231	366	25			724
Monashka Creek Brood																	
2005	208,673	92	110,000	20.0	May-07						62	328	878	1,387	94		2,748
2006	300,000	120	130,000	20.0	May-08							73	388	1,037	1,639	111	3,247
Total Run:						34	198	585	1,095	783	893	1,551	1,692	2,448	1,732	111	
FTP	Summary					Maximal number					Expiration						
00A-0010	Allows chinook egg take at Karluk River, and release of resultant smolt into Monashka Creek					60 pairs / 300,000 eggs					12/31/08						
05A-0050	Allows chinook egg take at Monashka Creek release of resultant smolt into Monashka Creek					300,000 eggs					9/1/14						

^a In 2000, 2001, and 2003 equal numbers of females (F) and males (M) were used; in 2002, 25 F and 34 M were used, in 2004, 39 F and 37 M, and in 2005, 44 F and 48 M.

^b 2005 was the first year that adult progeny of this chinook project returned to Monashka Creek. The 2005 egg take was conducted at Monashka Creek utilizing a portion of the run as brood. Monashka Creek will be the preferred brood source for 2006, but eggs could also be taken from Karluk River brood. The combined total of the egg takes will not exceed 300,000 eggs.

^c Projected returns are calculated from Table 3 survival and age assumptions.

Table 8.-Donor stock, broodstock numbers, escapement goal range, egg take guidelines, and egg take replacement criteria for 2006 egg takes.

Species	Donor Stock	Broodstock Numbers	Escapement Goal Range	Egg take Guidelines - Escapement		Egg take Replacement Criteria	
				Egg take Prohibited Escapement is ≤:	Full Egg take Allowed Escapement is >: ^a	Replacement Required Escapement is: ^b	Replacement Requirement ^c
Sockeye	Malina Lake	2,150	1,000-10,000	500	2,650	501-3,149	43,250 presmolt
Sockeye	Afognak Lake	1,900	20,000-50,000	10,000	11,900	10,001 - 21,899	38,250 presmolt
Sockeye	Saltery Lake ^d	5,600	15,000-30,000	7,500	13,100	7,501 - 20,599	152,750 presmolt
Coho	Buskin Lake	52	3,200-7,200	1,600	1,652	none	none
Chinook	Karluk River/Monashka Creek	120	3,600-7,300	1,800	1,920	none	none

^a Full egg take refers to removal of proposed broodstock numbers. If escapements are less than this guideline, then broodstock removals will be reduced (Appendix B-C) to maintain escapements at or above 50% of the lower bound of the escapement goal range.

^b 50% of lower bound of escapement goal range plus one (lower number) to the lower bound of escapement goal range minus one plus broodstock numbers (upper number). For example, for Afognak Lake - lower number is 50%*20,000+1=10,001; upper number is 20,000-1+1900=21,899.

^c Refers to the number of juvenile fish necessary to replace lost production from the removal of adults used for broodstock.

^d Broodstock numbers include approximately 700 adults for Kitoi Bay Hatchery projects (Schrof and Aro *in prep*).

Table 9.-Proposed Pillar Creek Hatchery early-run sockeye salmon egg takes (Afognak Lake and/or Malina Lake broodstock) in 2006, juvenile releases in 2007, projected adult production, and FTP information.

Parameter	Early-run Sockeye	Totals						
<u>Egg take</u> ^a								
eggs	345,455	345,455	86,364	259,091	172,727	345,455	345,455	1,900,000
adults	345	345	86	259	173	345	345	1,900
<u>Releases</u>								
location	Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake	Crescent Lake	
number	200,000	200,000	50,000	150,000	100,000	200,000	200,000	1,100,000
size (g)	0.4	10.0	0.4	10.0	10.0	0.4	10.0	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
date	15-May-07	15-Oct-07	15-May-07	15-Oct-07	15-Oct-07	15-May-07	15-Oct-07	
<u>Projected Returns</u> ^b								
2009	657	2,260	164.25	1,695	1,130	657	2,260	8,166
2010	2,367	6,620	592	4,965	3,310	2,367	6,620	24,474
2011	4,203	10,480	1,051	7,860	5,240	4,203	10,480	39,314
2012	1,485	0	371	0	0	1,485	0	1,856
total	8,712	19,360	2,178	14,520	9,680	8,712	19,360	73,810
<u>Fish Transport Permit (FTP) (Afognak Lake stock)</u> ^c								
number	99A-0053	99A-0054	06A-0042	97A-0076	04A-0032	06A-0047	04A-0034	
expires	31-Dec-08	31-Dec-08	31-Dec-11	31-Dec-08	31-Dec-09	31-Dec-11	31-Dec-09	
max. no.	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
<u>Fish Transport Permit (FTP) (Malina Lake stock)</u> ^c								
number	04A-0035	04A-0035	04A-0038	04A-0038	04A-0031	04A-0033	04A-0033	
expires	31-Dec-09							
max. no.	600,000	500,000	400,000	350,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	

^a Afognak Lake sockeye salmon has traditionally been the primary broodstock for early-run stocking projects. Afognak Lake adult runs since 2001 have not been as strong as those of the 1990s, and in 2004, Malina Lake sockeye were utilized as an alternative early-run broodstock. Early-run sockeye egg takes were conducted at both Malina and Afognak Lakes in 2005. Afognak Lake is the preferred brood source for the 2006 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2006 brood source if egg-take goals cannot be achieved using Afognak Lake brood exclusively.

^b Projected returns are calculated from Table 3 survival and age assumptions.

^c FTP 99A-0051 - for 4.1 million green eggs, expiring 31 Dec-08, authorizes Afognak Lake egg take for these projects. Malina Lake egg take is provided for under FTP 04A-0042, for 4.1 million eggs, expiring 31 Dec-09.

Table 10.-Proposed Pillar Creek Hatchery late-run sockeye salmon egg takes (Saltery Lake broodstock) in 2006, juvenile releases for Spiridon, Jennifer, and Ruth Lakes in 2007, projected adult production, and FTP information.

Parameter	Late-run Sockeye	Late-run Sockeye	Totals	Late-run Sockeye	Late-run Sockeye	Totals	Late-run Sockeye	Late-run Sockeye	Totals	Late-run Totals
<u>Egg take</u>										
eggs	4,400,000	666,667	5,066,667	333,333	200,000	533,333	66,667	133,333	200,000	5,671,102
adults^a	3,248	492	3,740	246	148	394	49	98	148	4,900
<u>Releases</u>										
location	Spiridon Lake	Spiridon Lake	Spiridon Lake	Jennifer Lakes	Jennifer Lakes	Jennifer Lakes	Ruth Lake	Ruth Lake	Ruth Lake	
number	3,300,000	500,000	3,800,000	250,000	150,000	400,000	50,000	100,000	150,000	4,350,000
size (g)	0.4	10.0		0.4	10.0		0.4	10.0		
lifestage	Fry	Presmolt		Fry	Presmolt		Fry	Presmolt		
date	01-Jun-07	15-Oct-07		01-Jun-07	15-Oct-07		01-Jun-07	15-Oct-07		
<u>Projected Returns</u>^b										
2009	743	1,000	1,743	56	300	356	11	200	211	2,310
2010	47,223	34,063	81,286	3,578	10,219	13,796	716	6,813	7,528	102,610
2011	92,367	27,438	119,805	6,998	8,231	15,229	1,400	5,488	6,887	141,920
2012	8,019	0	8,019	608	0	608	122	0	122	8,748
total	148,352	62,500	210,852	11,239	18,750	29,989	2,248	12,500	14,748	255,588
<u>Fish Transport Permit (FTP)^c</u>										
number	04A-0040	04A-0040		04A-0036	04A-0036		04A-0039	04A-0039		
expires	31-Dec-09	31-Dec-09		31-Dec-09	31-Dec-09		31-Dec-09	31-Dec-09		
max. no.	7,000,000	1,000,000		400,000	250,000		300,000	300,000		
lifestage	Fry	Presmolt		Fry	Presmolt		Fry	Presmolt		

^a Totals adults do not include additional fish that will be utilized for Kitoi Bay Hatchery projects (Schrof and Aro *in prep*)

^b Projected returns are calculated from Table 3 survival and age assumptions.

^c FTP 99A-0071 - for 9.8 million green eggs, expiring 31 Dec-08, authorizes egg take for these projects.

Table 11.-Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2006, resultant juvenile releases planned for Road System Lakes in 2007 (Monashka Creek in 2008), projected adult production, and FTP information.

Parameter	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho
Egg take										
eggs	24,978	8,326	13,876	10,546	11,101	7,216	3,885	3,885	3,885	11,101
adults	13	4	7	6	6	4	2	2	2	6
Releases										
location	Island Lk.	Dark Lk.	Mission Lk.	P.Patch Lk.	Big (Lily) Lk.	Mayflower Lk.	Southern Lk.	Margaret Lk.	Abercrombie Lk.	Monashka Cr.
number	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	3,500	10,000
size (g)	3.0	3.0	3.0	3.0	12.0	3.0	3.0	12.0	12.0	15.0
lifestage	Fingerling	Fingerling	Fingerling	Fingerling	Presmolt	Fingerling	Fingerling	Presmolt	Presmolt	Smolt
date	15-Jul-07	15-Jul-07	15-Jul-07	15-Jul-07	15-Mar-08	15-Jul-07	15-Jul-07	15-Mar-08	15-Mar-08	03-Jun-08
Projected Returns ^b										
2008	0	0	0	0	0	0	0	0	0	0
2009	1,463	488	813	618	1,000	423	0	0	0	1,250
total	1,463	488	813	618	1,000	423	landlocked	landlocked	landlocked	1,250
Fish Transport Permit (FTP) ^c										
number	04A-0006	04A-0006	04A-0006	04A-0006	05A-0004	04A-0006	04A-0005	04A-0013	05A-0003	04A-0007
expires	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-08
max. no.	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	3,500	10,000
lifestage	any	any	any	any	any	any	any	any	any	smolt

^a Coho may be reared to spring smolt and then released at Island Lk., Mission Lk., landlocked lakes, and/or Monashka Creek depending upon chinook salmon smolt production. Possible 2008 releases are not included in column above of total releases for all locations.

^b Projected returns are calculated from Table 3 survival and age assumptions.

^c FTP 04A-0004 - for 200,000 green eggs, expiring 31 Dec-13, authorized egg take for these projects.

Table 12.-Estimated 2006 sockeye salmon runs as a result of Pillar Creek Hatchery stocking projects.

Lake Stocked	Broodstock ^a	Harvest Location	Estimated Enhanced Run			
			Point	Range		
Hidden	Afognak Lake (ER)	Foul Bay SHA	3,665	1,483	to	8,231
Big & Little Waterfall	Afognak Lake (ER)	Waterfall Bay SHA	6,816	4,345	to	12,524
Crescent	Afognak Lake (ER)	Settler Cove SHA ^b	474	119	to	2,331
Spiridon	Saltery Lake (LR)	Spiridon Bay SHA ^c	160,912	142,787	to	183,457
Total Early Run:			10,955	5,947	to	23,086
Total Late Run:			160,912	142,787	to	183,457
Total Both Runs:			171,867	148,734	to	206,543

^a ER = early run; LR = late run

^b Some fish may be harvested in the Central Section of the Northwest Kodiak District.

^c Fish will also be harvested in traditional commercial fishing areas in the Northwest Kodiak District.

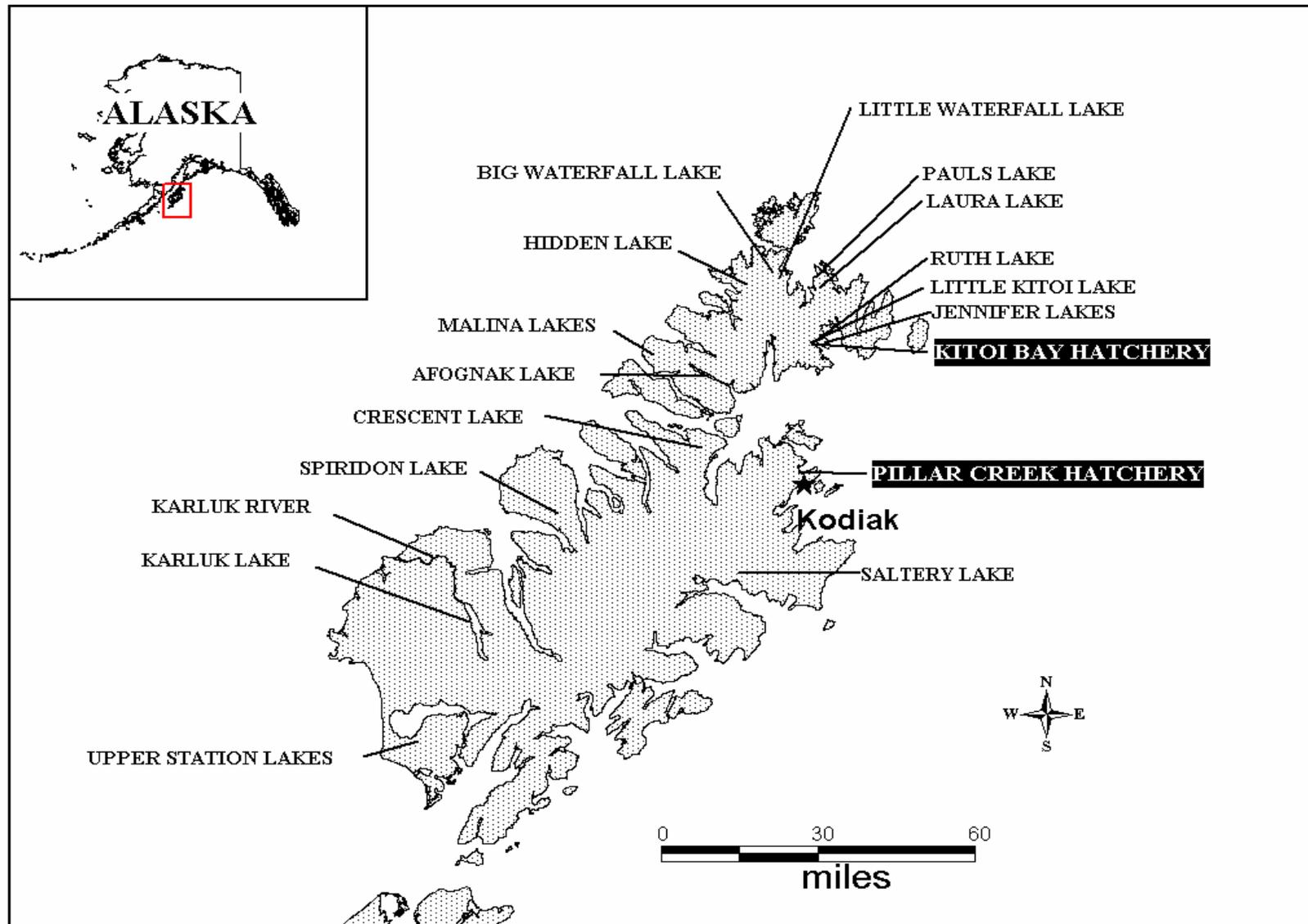


Figure 1.-Locations of sockeye salmon enhancement, previous rehabilitation projects, and egg take sites on Kodiak and Afognak Islands, 2006.

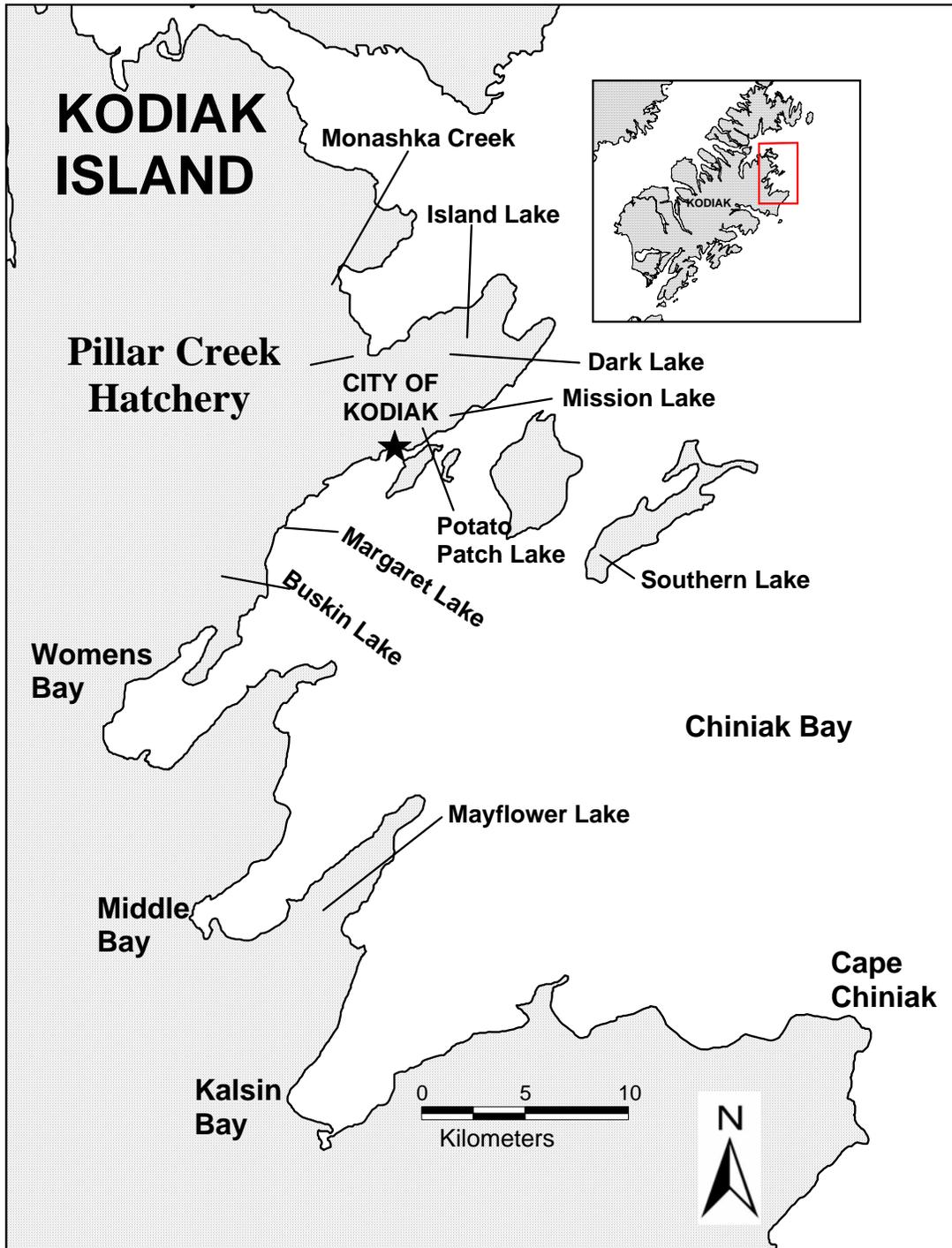


Figure 2.-Locations of Kodiak Island road system lakes stocked with coho and Chinook (Monashka Creek) salmon.

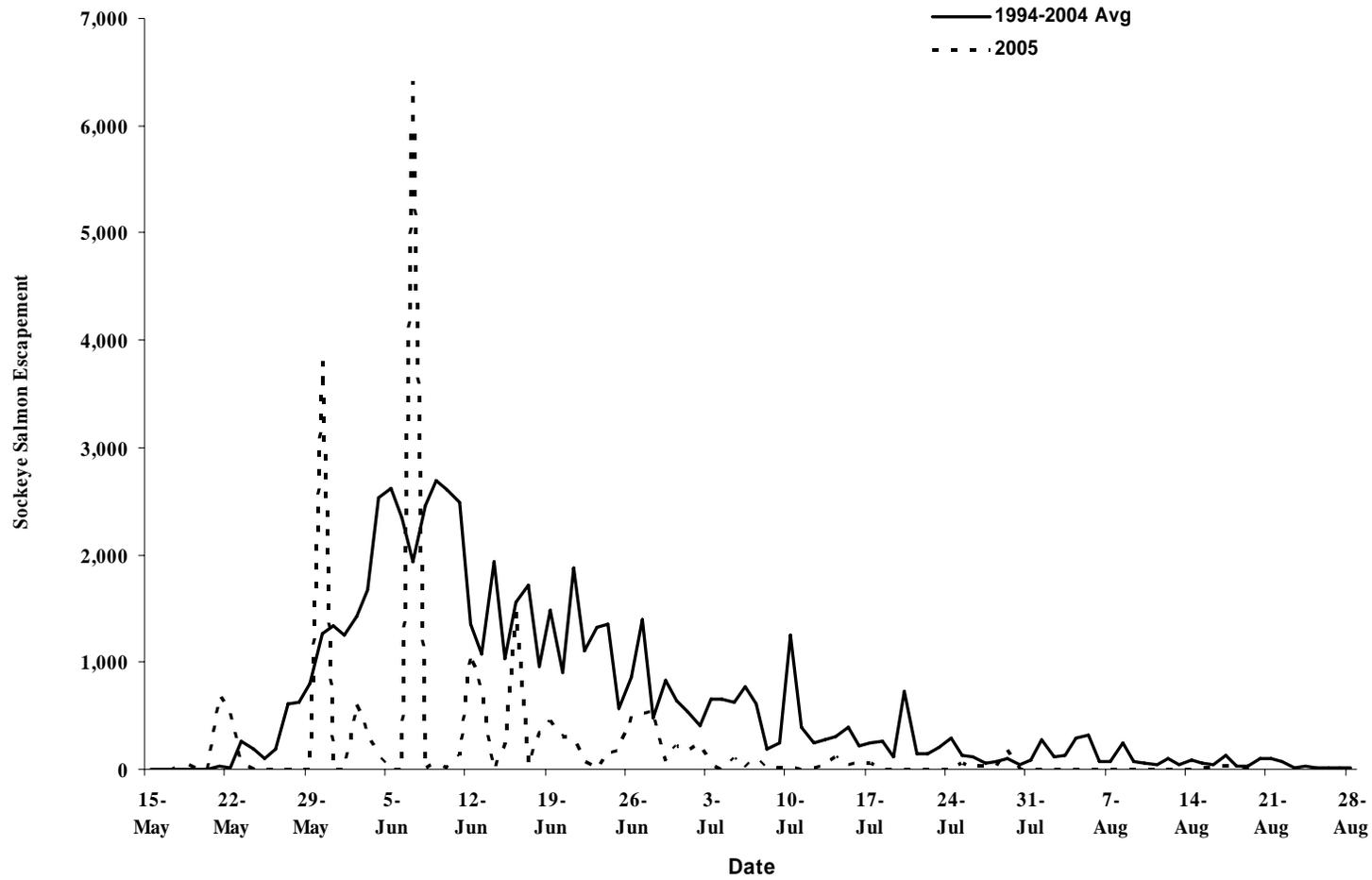


Figure 3.-Afognak Lake (Litnik) sockeye salmon average escapement timing (1994-2004) compared to the 2005 escapement timing.

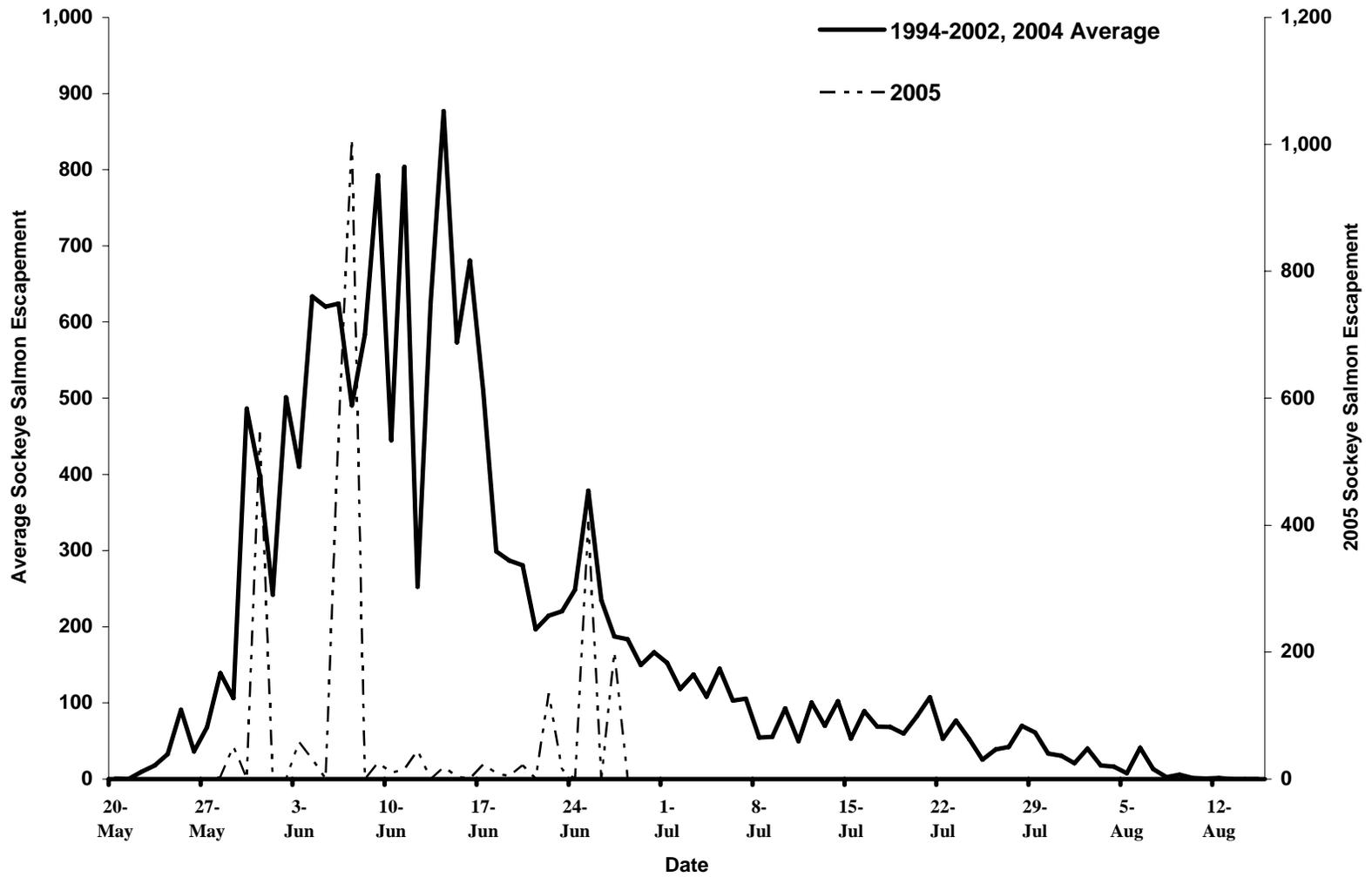


Figure 4.-Malina Lake sockeye salmon average escapement timing (1994-2002, 2004) compared to the 2005 escapement timing.

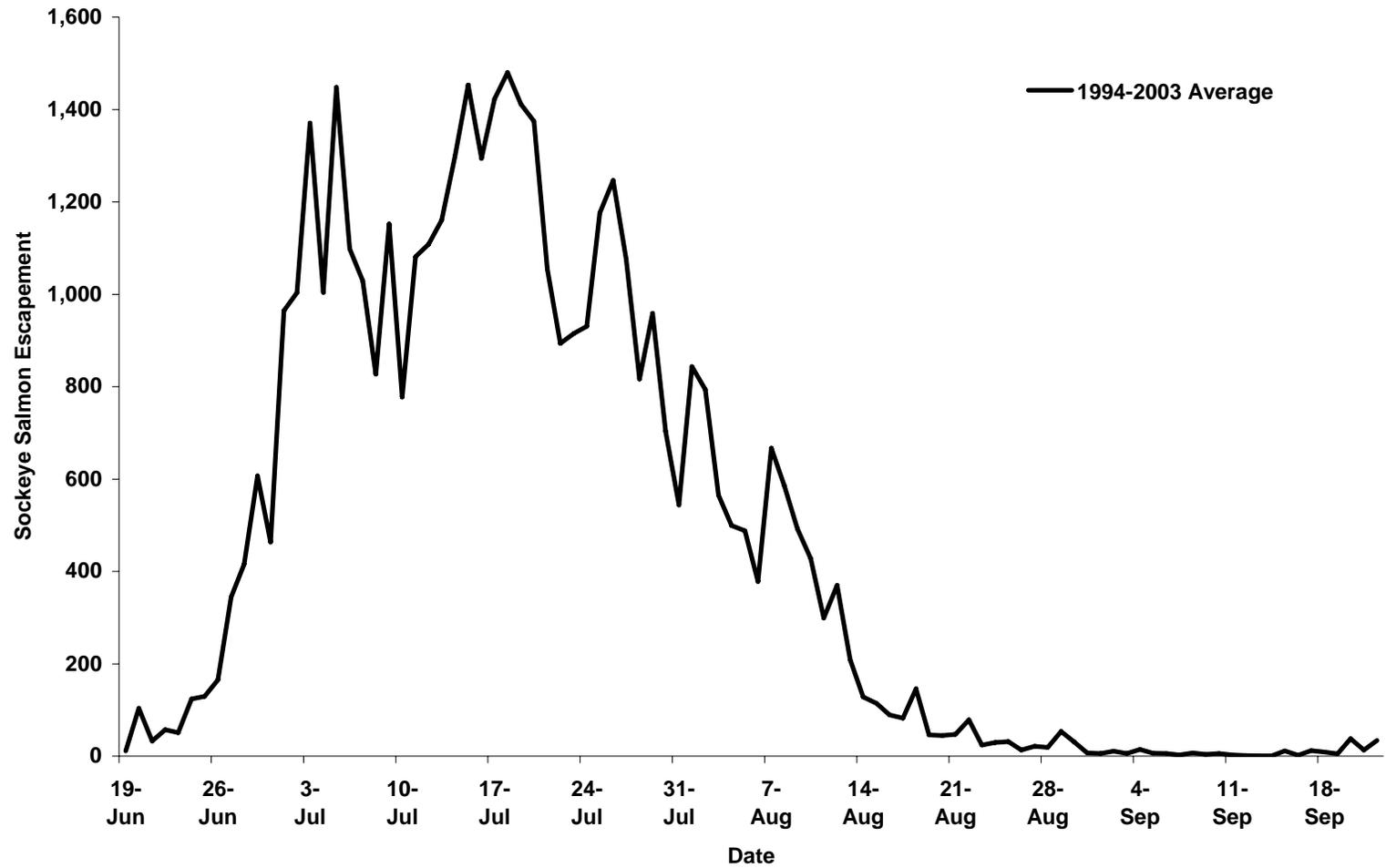


Figure 5.-Saltery Lake sockeye salmon average escapement timing, 1994-2003 (weir was not operated in 2004, 2005).

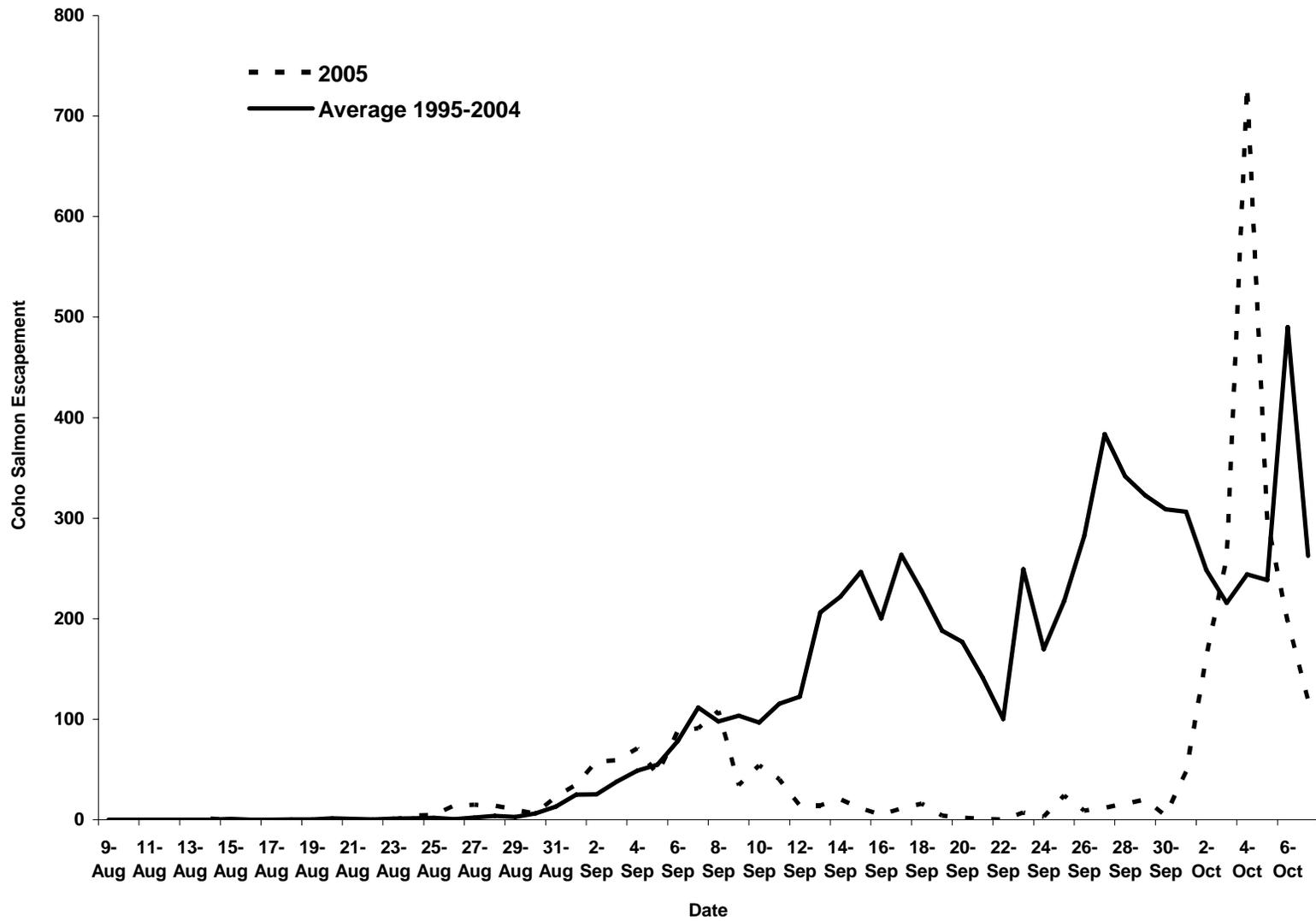


Figure 6.-Buskin River coho salmon average escapement timing (1995-2004) compared to the 2005 escapement timing.

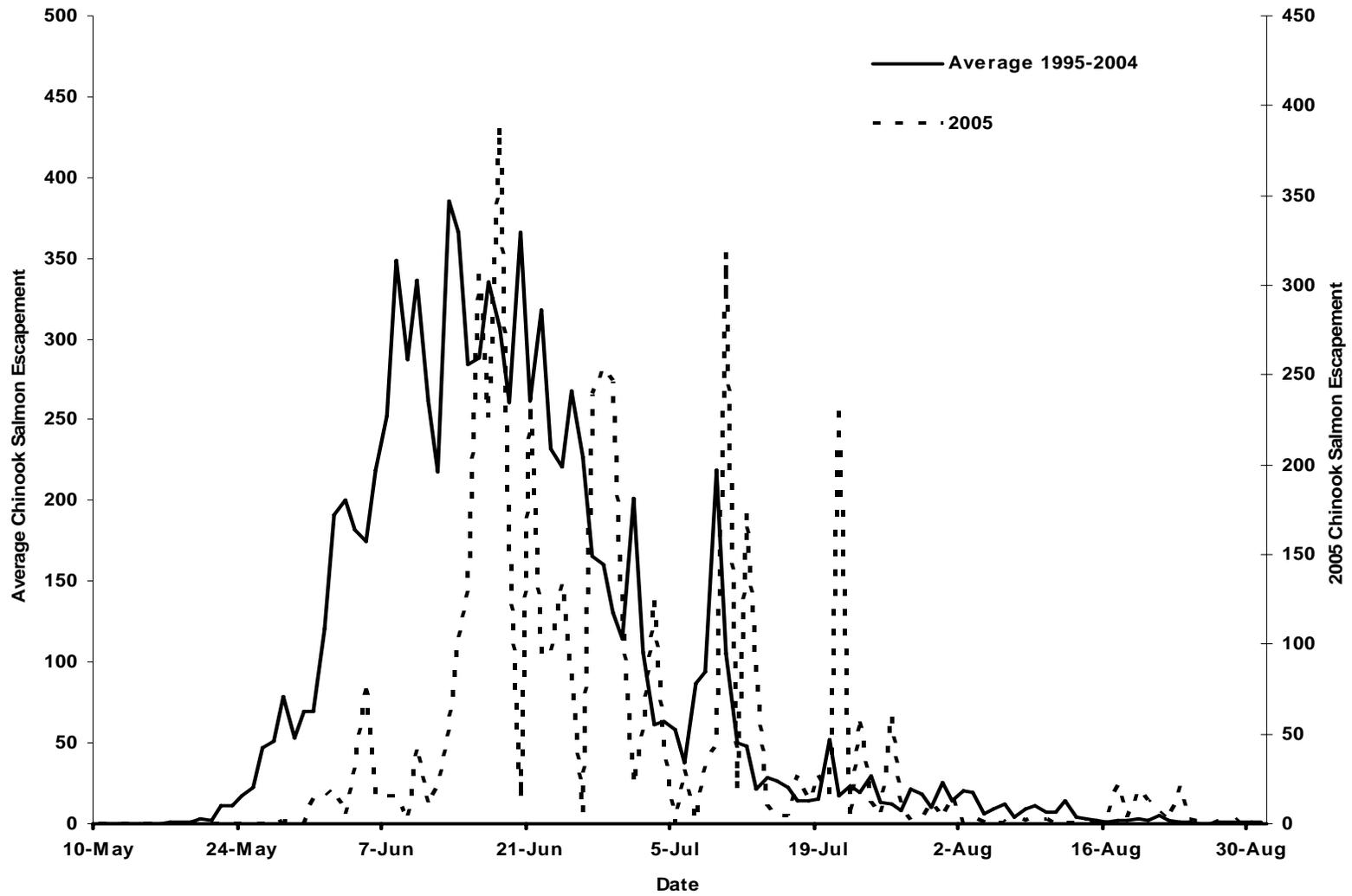


Figure 7.-Karluk River Chinook salmon average escapement timing (1995-2004) compared to the 2005 escapement timing.

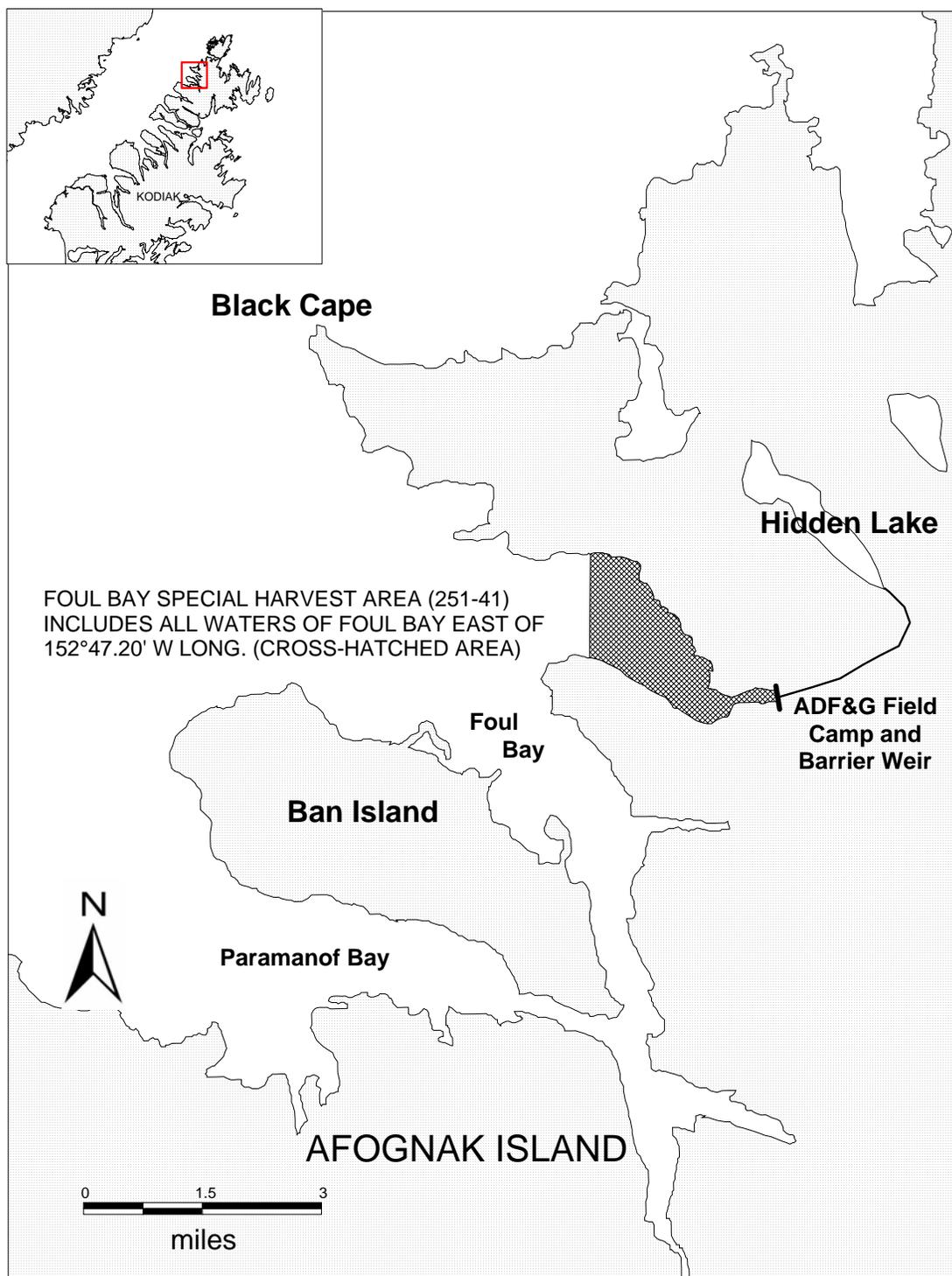


Figure 8.-Location of the Foul Bay special harvest area, and former locations of ADF&G field camp and fish weir at Hidden Creek.

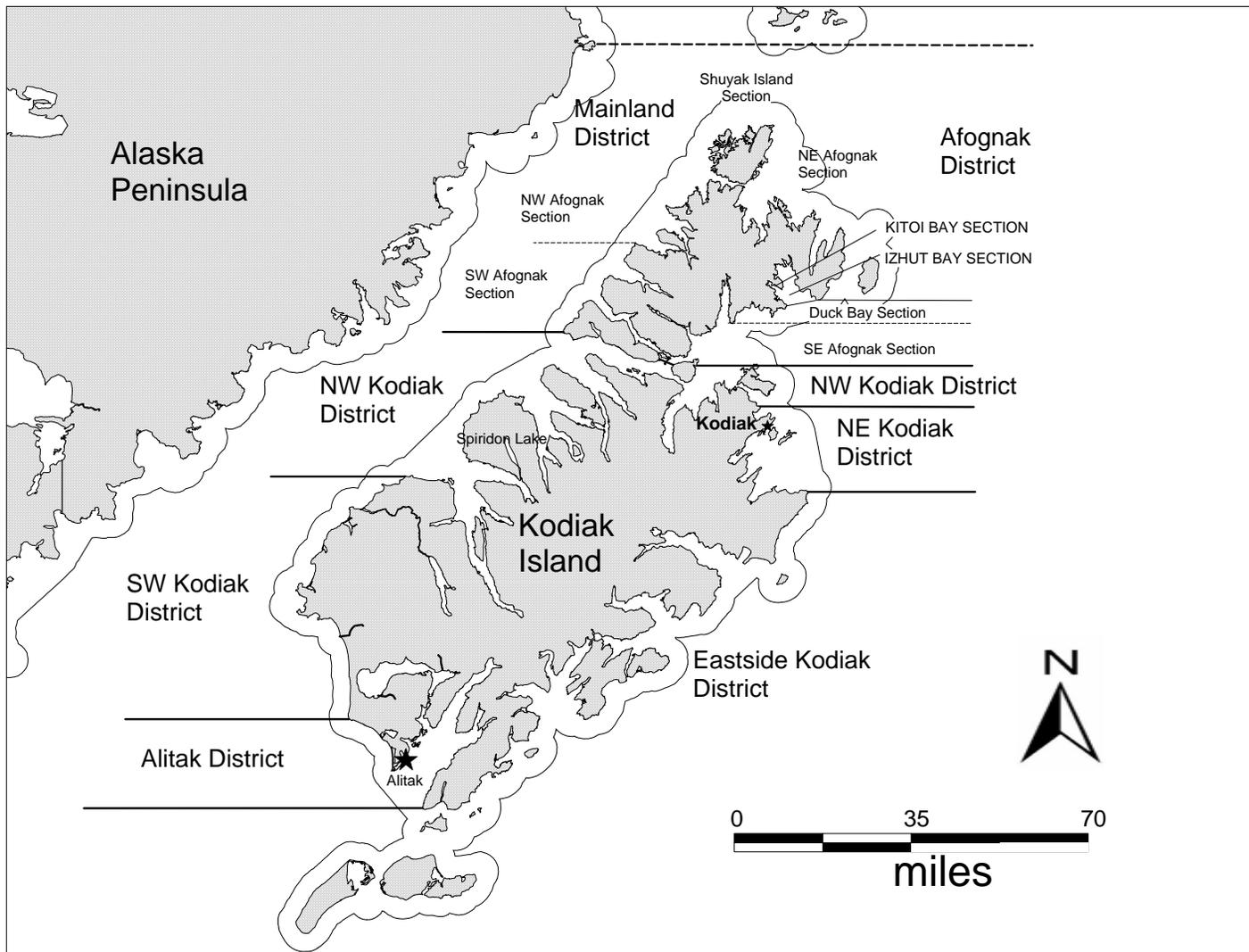


Figure 9.-Map of the Kodiak Management Area depicting commercial fishing districts and selected sections.

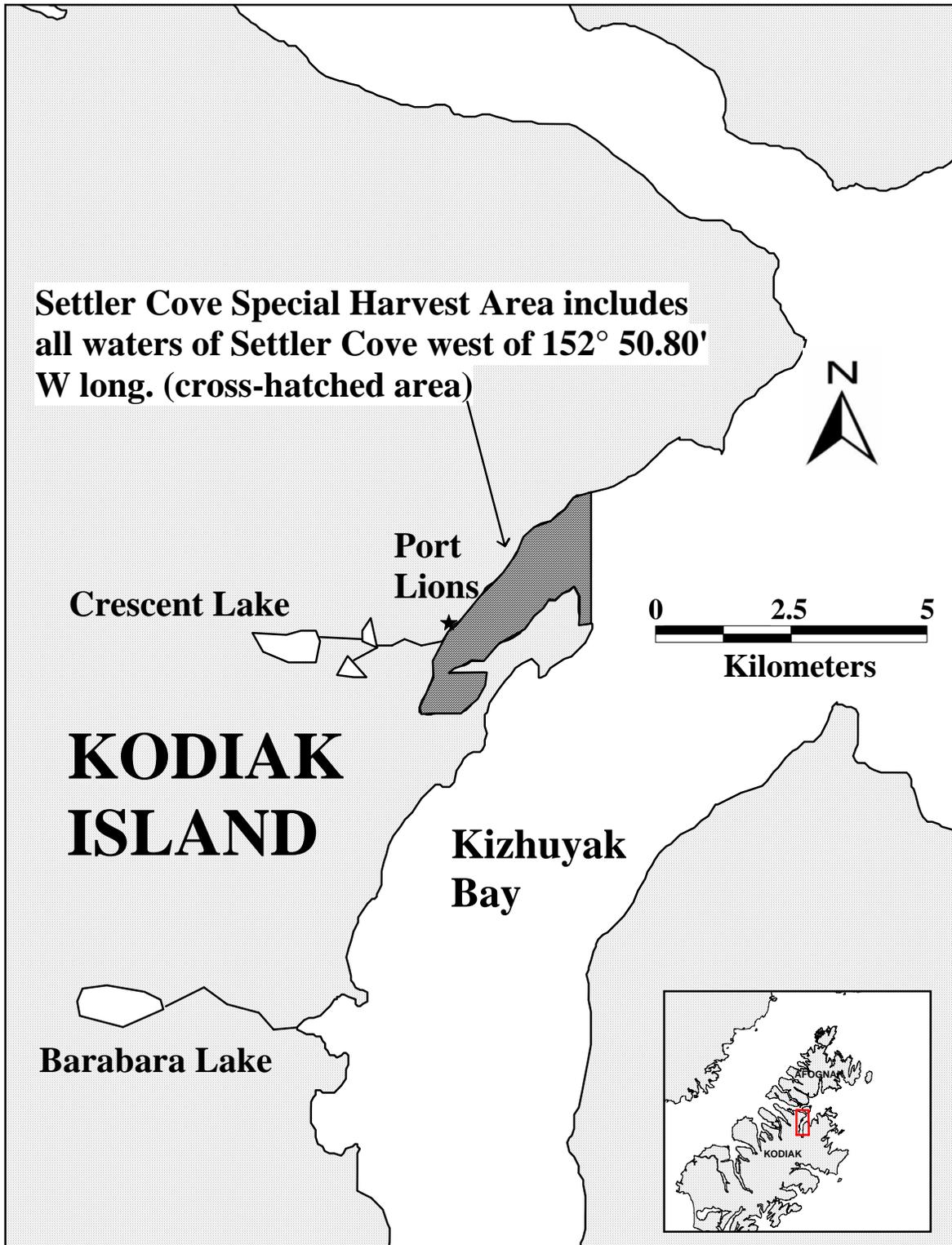


Figure 10.-Settler Cove (Crescent Lake) special harvest area boundaries in Kizhuyak Bay.

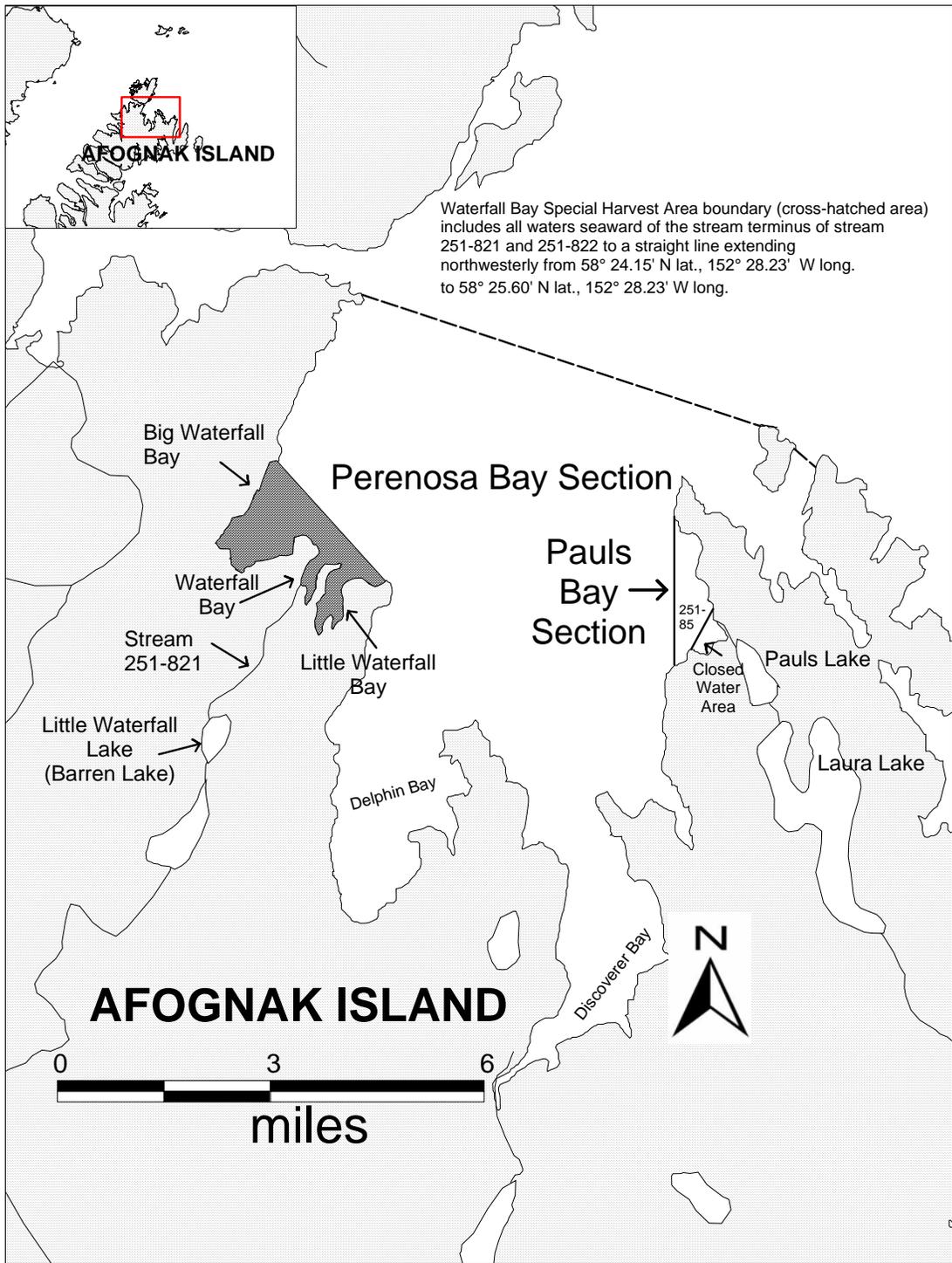


Figure 11.-Waterfall Bay (Little and Big Waterfall Lakes) special harvest area, Pauls Bay system (Pauls and Laura Lakes), and the Pauls Bay Section in Perenosa Bay.

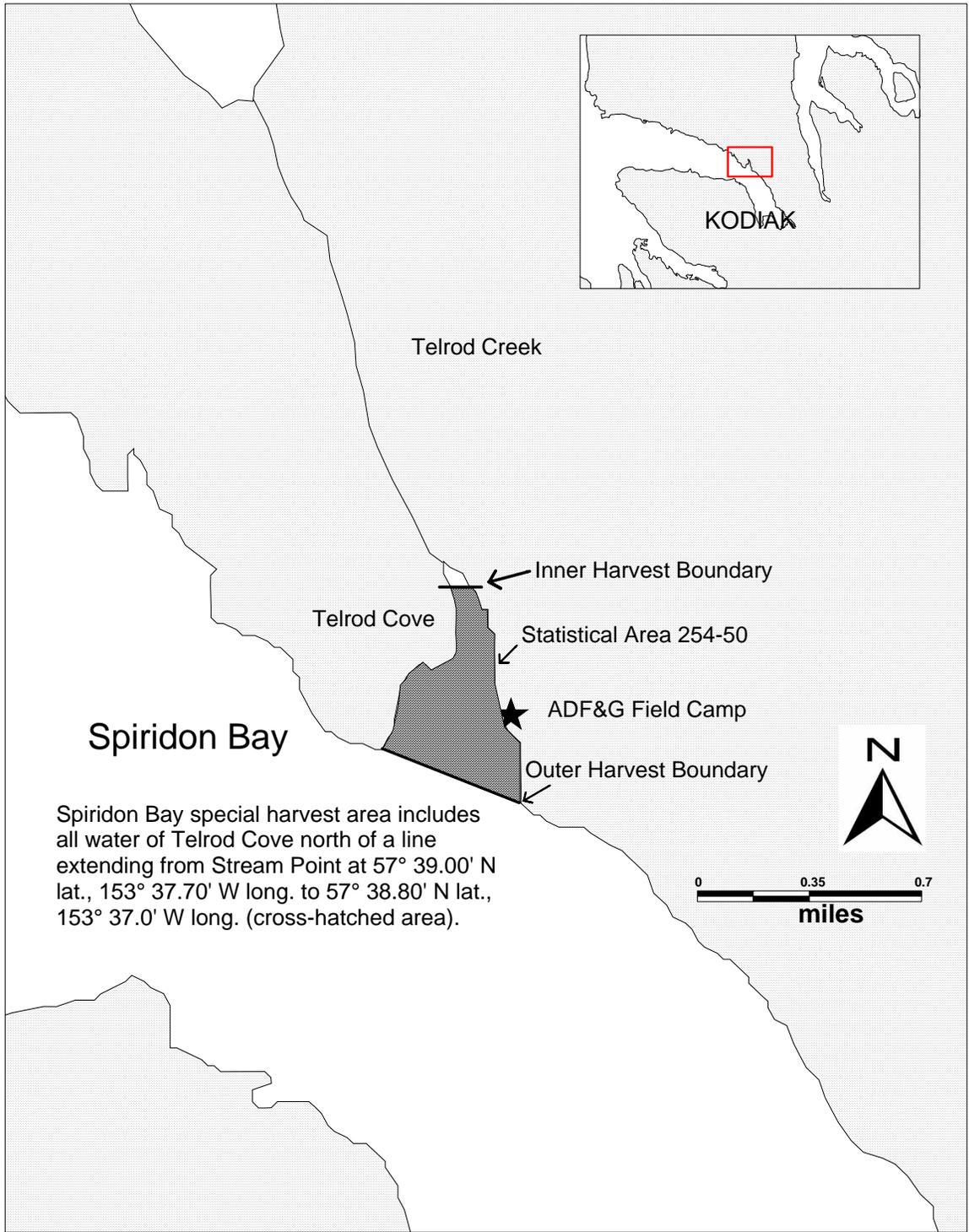


Figure 12.-Spiridon Bay (Telrod Cove) special harvest area boundaries, and ADF&G camp location in Telrod Cove.

**APPENDIX A. PILLAR CREEK HATCHERY SALMON EGG
TAKES, 1991-2006**

Appendix A1.-Pillar Creek Hatchery sockeye salmon egg takes at Afognak Lake, 1991-2006.

Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1991	2,076	2.6	260,000	1992	Hidden Lake
			399,000	1992	Crescent Lake
			493,000	1992	Little Waterfall Lake
			96,000	1992	Big Waterfall Lake
			464,000	1992	Afognak Lake
			182,000	1992	Little Kitoi Bay
1992	1,890	2.7	554,600	1993	Hidden Lake
			202,000	1993	Crescent Lake
			205,000	1993	Little Waterfall Lake
1993	2,169	3.4	250,000	1994	Hidden Lake
			314,000	1994	Crescent Lake
			150,000	1994	Little Waterfall Lake
			183,000	1994	Little Kitoi Lake
			311,000	1994	Afognak Lake
			293,000	1994	Little Kitoi Bay
			3,500	1995	Little Kitoi Lake
			97,800	1995	Little Waterfall Lake
1994	1,190	1.6	98,650	1995	Hidden Lake
			90,200	1995	Crescent Lake
			100,000	1995	Little Waterfall Lake
			112,900	1995	Little Kitoi Lake
1995	1,440	2.2	390,800	1996	Hidden Lake
			427,000	1996	Crescent Lake
			82,300	1996	Little Waterfall Lake
			146,000	1996	Sorg Lake
			50,600	1996	Little Kitoi Lake
			528,000	1996	Afognak Lake
1996	1,700	2.2	455,200	1997	Hidden Lake
			432,000	1997	Crescent Lake
			246,800	1997	Little Waterfall Lake
			125,800	1997	Little Kitoi Lake
			328,300	1997	Afognak Lake
1997	1,600	2.4	340,400	1998	Hidden Lake
			571,000	1998	Crescent Lake
			237,300	1998	Little Waterfall Lake
			422,700	1998	Afognak Lake
1998	1,060	1.6	310,000	1999	Hidden Lake
			273,000	1999	Little Waterfall Lake
			42,000	1999	Big Waterfall Lake
			371,700	1999	Crescent Lake

-continued-

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Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1999	1,350	1.8	504,400	2000	Hidden Lake
			358,800	2000	Little Waterfall Lake
			124,400	2000	Big Waterfall Lake
			206,000	2000	Crescent Lake
2000	1,420	2.1	315,500	2001	Hidden Lake
			310,000	2001	Little Waterfall Lake
			224,300	2001	Big Waterfall Lake
			331,500	2001	Crescent Lake
2001	290	0.4	51,600	2002	Hidden Lake
			46,100	2002	Little Waterfall Lake
			44,300	2002	Big Waterfall Lake
			33,600	2002	Crescent Lake
2002	180	0.3	31,000	2003	Hidden Lake
			72,500	2003	Little Waterfall Lake
			0	2003	Big Waterfall Lake
			36,500	2003	Crescent Lake
2003	268	0.4	64,100	2004	Hidden Lake
			16,600	2004	Little Waterfall Lake
			16,600	2004	Big Waterfall Lake
			22,750	2004	Crescent Lake
2004 ^a	0	0.0	0	2005	
2005 ^b	1,296	1.3	435,000	2006	Hidden Lake
			25,000	2006	Little Waterfall Lake
			265,000	2006	Crescent Lake
2006 ^c	1,900	1.9	400,000	2007	Hidden Lake
			200,000	2007	Little Waterfall Lake
			100,000	2007	Big Waterfall Lake
			400,000	2007	Crescent Lake

^a No egg take occurred at Afognak Lake in 2004. Malina Lake was utilized as an alternative broodstock for early-run sockeye stocking projects because adult returns to Afognak Lake had been depressed since 2001.

^b Afognak Lake was one of two brood sources utilized for the 2005 early-run sockeye eggtake; Malina Lake sockeye were also utilized. A total of 1,917,609 early run sockeye eggs were taken from the two brood sources in 2005.

^c Afognak Lake is the preferred brood source for the 2006 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2006 brood source if egg take goals cannot be achieved using Afognak Lake sockeye salmon; egg take goal to be determined after inseason limnology evaluation and escapement results.

Appendix A2.-Pillar Creek Hatchery sockeye salmon egg takes at Malina Lake, 1991-2006.

Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1991	120	0.141	85,000	1992	Malina Lake
1992	1,005	1.410	318,000	1993	Malina Lake
1993	644	0.930	547,000	1994	Malina Lake
1994	350	0.475	53,500	1995	Malina Lake
1995	400	0.590	426,300	1996	Malina Lake
1996	454	0.791	390,400	1997	Malina Lake
1997	470	0.800	350,500	1998	Malina Lake
1998 ^a	550	0.710	406,000	1999	Malina Lake
2004 ^b	2,450	1.582	188,300	2005	Hidden Lake
			78,700	2005	Little Waterfall Lake
			49,100	2005	Big Waterfall Lake
			54,000	2005	Crescent Lake
2005 ^c	727	0.647	175,000	2006	Little Waterfall Lake
			75,000	2006	Big Waterfall Lake
			85,000	2006	Malina Lake
2006 ^d	2,150	1.900	400,000	2007	Hidden Lake
			200,000	2007	Little Waterfall Lake
			100,000	2007	Big Waterfall Lake
			400,000	2007	Crescent Lake

^a Escapement goal was achieved from 1999 to 2002 and no additional rehabilitation egg takes are planned.

^b Malina Lake sockeye were utilized as an alternative broodstock for early-run sockeye enhancement projects in 2004. Afognak Lake had been the primary broodstock in the 1990s, but adult returns have been lower since 2001.

^c Malina Lake was one of two brood sources utilized for the 2005 early-run sockeye egg take; Afognak Lake sockeye were also utilized. A total of 1,917,609 early run sockeye eggs were taken from the two brood sources in 2005.

^d Afognak Lake is the preferred brood source for the 2006 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2006 brood source if egg-take goals cannot be achieved using Afognak Lake sockeye salmon; egg take goal to be determined after inseason limnology evaluation and escapement results.

Appendix A3.-Sockeye salmon egg takes at Saltery Lake, 1994-2006.

Brood Year	Adult Salmon	Eggs (millions)	Hatchery ^a	Number Stocked	Year Stocked	Stocking Location
1994	4,238	7.60	PCH	4,599,000	1995	Spiridon Lake
1995	122	0.20	PCH	150,000	1996	Ruth Lake
1996	103	0.20	PCH	147,000	1997	Ruth Lake
1997	2,700	4.00	PCH	3,340,000	1998	Spiridon Lake
			PCH	100,000	1998	Ruth Lake
			KBH	106,700	1999	Little Kitoi Lake
1998	2,560	4.30	PCH	3,564,000	1999	Spiridon Lake
			PCH	66,500	1999	Ruth Lake
			KBH	98,700	1999	Little Kitoi Lake
			KBH	74,500	2000	Little Kitoi Lake
			KBH	23,800	2000	Little Kitoi Bay
1999	4,318	6.80	PCH	4,397,100	2000	Spiridon Lake
			PCH	78,700	2000	Ruth Lake
			KBH	154,000	2000	Little Kitoi Lake
2000	2,582	4.80	PCH	1,700,600	2001	Spiridon Lake
			PCH	0	2001	Ruth Lake
			KBH	282,100	2001	Little Kitoi Lake
2001	845	1.57	PCH	1,182,000	2002	Spiridon Lake
			PCH	0	2002	Ruth Lake
			KBH	212,400	2002	Little Kitoi Lake
2002	2,000	3.30	PCH	1,417,500	2003	Spiridon Lake
			PCH	0	2003	Ruth Lake
			KBH	102,800	2003	Little Kitoi Lake
			KBH	193,600	2004	Little Kitoi Lake
2003	4,175	5.96	PCH	2,800,000	2004	Spiridon Lake
			PCH	111,400	2004	Ruth Lake
			PCH	0	2004	Jennifer Lake
			PCH	97,400	2004	Little Kitoi Lake
			KBH	20,700	2004	Little Kitoi Lake
			KBH	280,000	2005	Little Kitoi Lake
2004	4,079	4.99	PCH	1,380,000	2005	Spiridon Lake
			PCH	35,000	2005	Ruth Lake
			PCH	0	2005	Jennifer Lake
			PCH	56,900	2005	Little Kitoi Lake
			KBH	20,700	2005	Little Kitoi Lake
			KBH	380,000	2006	Little Kitoi Lake

-continued-

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Brood Year	Adult Salmon	Eggs (millions)	Hatchery ^a	Number Stocked	Year Stocked	Stocking Location
2005	5,422	6.39	PCH	3,500,000	2006	Spiridon Lake
			PCH	50,000	2006	Ruth Lake
			PCH	50,000	2006	Jennifer Lake
			PCH	50,000	2006	Little Kitoi Lake
			KBH	100,000	2006	Little Kitoi Lake
			KBH	400,000	2007	Little Kitoi Lake
2006 ^b	5,600	7.00	PCH	3,800,000	2007	Spiridon Lake
			PCH	150,000	2007	Ruth Lake
			PCH	400,000	2007	Jennifer Lake
			PCH	100,000	2007	Little Kitoi Lake
			KBH	100,000	2007	Little Kitoi Lake
			KBH	400,000	2008	Little Kitoi Lake

^a Pillar Creek Hatchery (PCH), Kitoi Bay Hatchery (KBH).

^b Egg take goal to be determined after inseason limnology evaluation and escapement results.

Appendix A4.-Pillar Creek Hatchery coho salmon egg takes, 1991-2006.

Brood Year	Adult Salmon	Green Eggs	Number Stocked	Year Stocked	Stocking Location
<u>Monashka Creek stock:</u>					
1991	25	60,100	52,000	1992	Monashka Creek
1992	6	10,500	9,000	1993	Monashka Creek
<u>Buskin River stock:</u>					
1993 ^a	78	156,000	136,200	1994	Kodiak Road System Lakes ^b
1994	56	98,000	76,140	1995	"
1995	85	120,000	28,000	1996	"
1996	65	177,000	148,200	1997	"
1997	65	153,000	134,500	1998	"
1998	102	158,000	128,000	1999	"
1999	40	91,000	63,800	2000	"
2000	60	112,000	73,400	2001	"
2001	60	146,000	110,000	2002	"
2002	29	57,100	48,300	2003	"
	25	51,000	43,100	2004	Kodiak road system lakes, Monashka Creek ^c
2003	49	98,500	88,100	2004	"
	21	43,200	33,500	2005	"
2004	22	36,700	33,900	2005	"
	32	54,100	50,000	2006	"
2005	39	68,300	62,000	2006	"
	17	29,800	27,000	2007	"
2006	36	68,800	63,000	2007	"
	16	30,000	27,000	2008	"

^a Prior to 1993, Kitoi Bay Hatchery supplied juvenile coho salmon for stocking the road system lakes.

^b Road system lakes include: Island, Dark, Mission, Potato Patch, Big (Lily), Mayflower, Southern (on Long Island), Margaret (Boy Scout), and Abercrombie (Gertrude) Lakes.

^c Smolt releases occur only as rearing space allows. Lower than anticipated chinook production can make available rearing space for spring coho smolt production. The determination to take eggs for coho smolt is made just prior to the coho egg take, when chinook egg survival for the brood year has been assessed.

Appendix A5.-Pillar Creek Hatchery chinook salmon egg takes, 2000-2006.

Brood Year	Adult Salmon	Number of Eggs	Number Stocked	Year Stocked	Stocking Location
2000 ^a	48	124,818	60,400	2002	Monashka Creek
2001	34	86,120	34,000	2003	Monashka Creek
2002	59	147,000	12,300	2004	Monashka Creek
2003	70	172,300	72,150	2005	Monashka Creek
2004	76	181,600	29,000	2006	Monashka Creek
2005 ^a	92	208,700	110,000	2007	Monashka Creek
2006	120	300,000	130,000	2008	Monashka Creek

^a Chinook egg takes for Brood Years 2000-2004 were conducted at the Karluk River. 2005 was the first year that adult progeny of the chinook project returned to Monashka Creek. The 2005 egg take was conducted at Monashka Creek, utilizing a portion of the run as brood. Monashka Creek will be the preferred brood source for 2006, but eggs could also be taken from Karluk River brood. The combined total of the egg takes will not exceed 300,000 eggs.

**APPENDIX B. WORKSHEETS FOR BROODSTOCK
NUMBERS AND REPLACEMENT OPTIONS FOR
ADULT REMOVALS**

Appendix B1.-Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Afognak Lake, 2006.

50% Lower Bound	2006	Broodstock	50% Lower Bound	2006	Broodstock	50% Lower	2006	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	Bound EGR	Escapement	Allowed
10,000	15,000	5,000	10,000	13,250	3,250	10,000	11,500	1,500
10,000	14,950	4,950	10,000	13,200	3,200	10,000	11,450	1,450
10,000	14,900	4,900	10,000	13,150	3,150	10,000	11,400	1,400
10,000	14,850	4,850	10,000	13,100	3,100	10,000	11,350	1,350
10,000	14,800	4,800	10,000	13,050	3,050	10,000	11,300	1,300
10,000	14,750	4,750	10,000	13,000	3,000	10,000	11,250	1,250
10,000	14,700	4,700	10,000	12,950	2,950	10,000	11,200	1,200
10,000	14,650	4,650	10,000	12,900	2,900	10,000	11,150	1,150
10,000	14,600	4,600	10,000	12,850	2,850	10,000	11,100	1,100
10,000	14,550	4,550	10,000	12,800	2,800	10,000	11,050	1,050
10,000	14,500	4,500	10,000	12,750	2,750	10,000	11,000	1,000
10,000	14,450	4,450	10,000	12,700	2,700	10,000	10,950	950
10,000	14,400	4,400	10,000	12,650	2,650	10,000	10,900	900
10,000	14,350	4,350	10,000	12,600	2,600	10,000	10,850	850
10,000	14,300	4,300	10,000	12,550	2,550	10,000	10,800	800
10,000	14,250	4,250	10,000	12,500	2,500	10,000	10,750	750
10,000	14,200	4,200	10,000	12,450	2,450	10,000	10,700	700
10,000	14,150	4,150	10,000	12,400	2,400	10,000	10,650	650
10,000	14,100	4,100	10,000	12,350	2,350	10,000	10,600	600
10,000	14,050	4,050	10,000	12,300	2,300	10,000	10,550	550
10,000	14,000	4,000	10,000	12,250	2,250	10,000	10,500	500
10,000	13,950	3,950	10,000	12,200	2,200	10,000	10,450	450
10,000	13,900	3,900	10,000	12,150	2,150	10,000	10,400	400
10,000	13,850	3,850	10,000	12,100	2,100	10,000	10,350	350
10,000	13,800	3,800	10,000	12,050	2,050	10,000	10,300	300
10,000	13,750	3,750	10,000	12,000	2,000	10,000	10,250	250
10,000	13,700	3,700	10,000	11,950	1,950	10,000	10,200	200
10,000	13,650	3,650	10,000	11,900	1,900	10,000	10,150	150
10,000	13,600	3,600	10,000	11,850	1,850	10,000	10,100	100
10,000	13,550	3,550	10,000	11,800	1,800	10,000	10,050	50
10,000	13,500	3,500	10,000	11,750	1,750	10,000	10,000	0
10,000	13,450	3,450	10,000	11,700	1,700	10,000	9,950	0
10,000	13,400	3,400	10,000	11,650	1,650	10,000	9,900	
10,000	13,350	3,350	10,000	11,600	1,600	10,000	9,850	
10,000	13,300	3,300	10,000	11,550	1,550	10,000	9,800	

Appendix B2.-Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Malina Lake, 2006.

50% Lower Bound	2006	Broodstock	50% Lower Bound	2006	Broodstock	50% Lower	2006	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	Bound EGR	Escapement	Allowed
500	3,000	2,500	500	2,125	1,625	500	1,250	750
500	2,975	2,475	500	2,100	1,600	500	1,225	725
500	2,950	2,450	500	2,075	1,575	500	1,200	700
500	2,925	2,425	500	2,050	1,550	500	1,175	675
500	2,900	2,400	500	2,025	1,525	500	1,150	650
500	2,875	2,375	500	2,000	1,500	500	1,125	625
500	2,850	2,350	500	1,975	1,475	500	1,100	600
500	2,825	2,325	500	1,950	1,450	500	1,075	575
500	2,800	2,300	500	1,925	1,425	500	1,050	550
500	2,775	2,275	500	1,900	1,400	500	1,025	525
500	2,750	2,250	500	1,875	1,375	500	1,000	500
500	2,725	2,225	500	1,850	1,350	500	975	475
500	2,700	2,200	500	1,825	1,325	500	950	450
500	2,675	2,175	500	1,800	1,300	500	925	425
500	2,650	2,150	500	1,775	1,275	500	900	400
500	2,625	2,125	500	1,750	1,250	500	875	375
500	2,600	2,100	500	1,725	1,225	500	850	350
500	2,575	2,075	500	1,700	1,200	500	825	325
500	2,550	2,050	500	1,675	1,175	500	800	300
500	2,525	2,025	500	1,650	1,150	500	775	275
500	2,500	2,000	500	1,625	1,125	500	750	250
500	2,475	1,975	500	1,600	1,100	500	725	225
500	2,450	1,950	500	1,575	1,075	500	700	200
500	2,425	1,925	500	1,550	1,050	500	675	175
500	2,400	1,900	500	1,525	1,025	500	650	150
500	2,375	1,875	500	1,500	1,000	500	625	125
500	2,350	1,850	500	1,475	975	500	600	100
500	2,325	1,825	500	1,450	950	500	575	75
500	2,300	1,800	500	1,425	925	500	550	50
500	2,275	1,775	500	1,400	900	500	525	25
500	2,250	1,750	500	1,375	875	500	500	0
500	2,225	1,725	500	1,350	850	500	475	0
500	2,200	1,700	500	1,325	825	500	450	
500	2,175	1,675	500	1,300	800	500	425	
500	2,150	1,650	500	1,275	775	500	400	

Appendix B3.-Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Sallery Lake, 2006.

50% Lower Bound	2006	Broodstock	50% Lower Bound	2006	Broodstock	50% Lower	2006	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	Bound EGR	Escapement	Allowed
7,500	15,000	7,500	7,500	12,375	4,875	7,500	9,750	2,250
7,500	14,925	7,425	7,500	12,300	4,800	7,500	9,675	2,175
7,500	14,850	7,350	7,500	12,225	4,725	7,500	9,600	2,100
7,500	14,775	7,275	7,500	12,150	4,650	7,500	9,525	2,025
7,500	14,700	7,200	7,500	12,075	4,575	7,500	9,450	1,950
7,500	14,625	7,125	7,500	12,000	4,500	7,500	9,375	1,875
7,500	14,550	7,050	7,500	11,925	4,425	7,500	9,300	1,800
7,500	14,475	6,975	7,500	11,850	4,350	7,500	9,225	1,725
7,500	14,400	6,900	7,500	11,775	4,275	7,500	9,150	1,650
7,500	14,325	6,825	7,500	11,700	4,200	7,500	9,075	1,575
7,500	14,250	6,750	7,500	11,625	4,125	7,500	9,000	1,500
7,500	14,175	6,675	7,500	11,550	4,050	7,500	8,925	1,425
7,500	14,100	6,600	7,500	11,475	3,975	7,500	8,850	1,350
7,500	14,025	6,525	7,500	11,400	3,900	7,500	8,775	1,275
7,500	13,950	6,450	7,500	11,325	3,825	7,500	8,700	1,200
7,500	13,875	6,375	7,500	11,250	3,750	7,500	8,625	1,125
7,500	13,800	6,300	7,500	11,175	3,675	7,500	8,550	1,050
7,500	13,725	6,225	7,500	11,100	3,600	7,500	8,475	975
7,500	13,650	6,150	7,500	11,025	3,525	7,500	8,400	900
7,500	13,575	6,075	7,500	10,950	3,450	7,500	8,325	825
7,500	13,500	6,000	7,500	10,875	3,375	7,500	8,250	750
7,500	13,425	5,925	7,500	10,800	3,300	7,500	8,175	675
7,500	13,350	5,850	7,500	10,725	3,225	7,500	8,100	600
7,500	13,275	5,775	7,500	10,650	3,150	7,500	8,025	525
7,500	13,200	5,700	7,500	10,575	3,075	7,500	7,950	450
7,500	13,125	5,625	7,500	10,500	3,000	7,500	7,875	375
7,500	13,050	5,550	7,500	10,425	2,925	7,500	7,800	300
7,500	12,975	5,475	7,500	10,350	2,850	7,500	7,725	225
7,500	12,900	5,400	7,500	10,275	2,775	7,500	7,650	150
7,500	12,825	5,325	7,500	10,200	2,700	7,500	7,575	75
7,500	12,750	5,250	7,500	10,125	2,625	7,500	7,500	0
7,500	12,675	5,175	7,500	10,050	2,550	7,500	7,425	0
7,500	12,600	5,100	7,500	9,975	2,475	7,500	7,350	
7,500	12,525	5,025	7,500	9,900	2,400	7,500	7,275	
7,500	12,450	4,950	7,500	9,825	2,325	7,500	7,200	

Appendix B4.-Worksheet for calculating sockeye salmon "replacement" options for adult removals from Afognak Lake, 2006.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMEND	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMEND
								ED ^a Fall Presmolt (8-10)			ED ^a Fall Presmolt (8-10)
300	134	333,750	23,363	4,906	491	25,000	12,500	6,250	500	500	500
350	156	389,375	27,256	5,724	572	29,000	14,500	7,250	580	580	580
400	178	445,000	31,150	6,542	654	33,000	16,500	8,250	660	660	660
450	200	500,625	35,044	7,359	736	37,000	18,500	9,250	740	740	740
500	223	556,250	38,938	8,177	818	41,000	20,500	10,250	820	820	820
550	245	611,875	42,831	8,995	899	45,000	22,500	11,250	900	900	900
600	267	667,500	46,725	9,812	981	49,000	24,500	12,250	980	980	980
650	289	723,125	50,619	10,630	1,063	53,000	26,500	13,250	1,060	1,060	1,060
700	312	778,750	54,513	11,448	1,145	57,000	28,500	14,250	1,140	1,140	1,140
750	334	834,375	58,406	12,265	1,227	61,000	30,500	15,250	1,220	1,220	1,220
800	356	890,000	62,300	13,083	1,308	65,000	32,500	16,250	1,300	1,300	1,300
850	378	945,625	66,194	13,901	1,390	69,000	34,500	17,250	1,380	1,380	1,380
900	401	1,001,250	70,088	14,718	1,472	73,000	36,500	18,250	1,460	1,460	1,460
950	423	1,056,875	73,981	15,536	1,554	77,000	38,500	19,250	1,540	1,540	1,540
1,000	445	1,112,500	77,875	16,354	1,635	81,000	40,500	20,250	1,620	1,620	1,620
1,050	467	1,168,125	81,769	17,171	1,717	85,000	42,500	21,250	1,700	1,700	1,700
1,100	490	1,223,750	85,663	17,989	1,799	89,000	44,500	22,250	1,780	1,780	1,780
1,150	512	1,279,375	89,556	18,807	1,881	93,000	46,500	23,250	1,860	1,860	1,860
1,200	534	1,335,000	93,450	19,625	1,962	97,000	48,500	24,250	1,940	1,940	1,940
1,250	556	1,390,625	97,344	20,442	2,044	101,000	50,500	25,250	2,020	2,020	2,020
1,300	579	1,446,250	101,238	21,260	2,126	105,000	52,500	26,250	2,100	2,100	2,100
1,350	601	1,501,875	105,131	22,078	2,208	109,000	54,500	27,250	2,180	2,180	2,180
1,400	623	1,557,500	109,025	22,895	2,290	113,000	56,500	28,250	2,260	2,260	2,260
1,450	645	1,613,125	112,919	23,713	2,371	117,000	58,500	29,250	2,340	2,340	2,340
1,500	668	1,668,750	116,813	24,531	2,453	121,000	60,500	30,250	2,420	2,420	2,420
1,550	690	1,724,375	120,706	25,348	2,535	125,000	62,500	31,250	2,500	2,500	2,500
1,600	712	1,780,000	124,600	26,166	2,617	129,000	64,500	32,250	2,580	2,580	2,580
1,650	734	1,835,625	128,494	26,984	2,698	133,000	66,500	33,250	2,660	2,660	2,660
1,700	757	1,891,250	132,388	27,801	2,780	137,000	68,500	34,250	2,740	2,740	2,740
1,750	779	1,946,875	136,281	28,619	2,862	141,000	70,500	35,250	2,820	2,820	2,820
1,800	801	2,002,500	140,175	29,437	2,944	145,000	72,500	36,250	2,900	2,900	2,900
1,850	823	2,058,125	144,069	30,254	3,025	149,000	74,500	37,250	2,980	2,980	2,980
1,900	846	2,113,750	147,963	31,072	3,107	153,000	76,500	38,250	3,060	3,060	3,060
Assumptions: 1. "jack" % = 11% 2. Fecundity = 2500 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% = ~1.6 Return per spawner						Highlighted indicates proposed adult removals in 2006 and replacement stocking recommended for 2007.			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

^a Presmolt stocking is recommended because late fall stocking should reduce competition for food with resident fish (majority should emigrate the following spring) and growth characteristics from scale patterns can be used to identify these fish when they return as adults.

Appendix B5.-Worksheet for calculating sockeye salmon "replacement" options for adult removals from Malina Lake, 2006.

Lost Production Estimates							Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^a Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^a Fall Presmolt (8-10 g)	
300	134	333,750	23,363	4,906	491	25,000	12,500	6,250	500	500	500	
350	156	389,375	27,256	5,724	572	29,000	14,500	7,250	580	580	580	
400	178	445,000	31,150	6,542	654	33,000	16,500	8,250	660	660	660	
450	200	500,625	35,044	7,359	736	37,000	18,500	9,250	740	740	740	
500	223	556,250	38,938	8,177	818	41,000	20,500	10,250	820	820	820	
550	245	611,875	42,831	8,995	899	45,000	22,500	11,250	900	900	900	
600	267	667,500	46,725	9,812	981	49,000	24,500	12,250	980	980	980	
650	289	723,125	50,619	10,630	1,063	53,000	26,500	13,250	1,060	1,060	1,060	
700	312	778,750	54,513	11,448	1,145	57,000	28,500	14,250	1,140	1,140	1,140	
750	334	834,375	58,406	12,265	1,227	61,000	30,500	15,250	1,220	1,220	1,220	
800	356	890,000	62,300	13,083	1,308	65,000	32,500	16,250	1,300	1,300	1,300	
850	378	945,625	66,194	13,901	1,390	69,000	34,500	17,250	1,380	1,380	1,380	
900	401	1,001,250	70,088	14,718	1,472	73,000	36,500	18,250	1,460	1,460	1,460	
950	423	1,056,875	73,981	15,536	1,554	77,000	38,500	19,250	1,540	1,540	1,540	
1,000	445	1,112,500	77,875	16,354	1,635	81,000	40,500	20,250	1,620	1,620	1,620	
1,050	467	1,168,125	81,769	17,171	1,717	85,000	42,500	21,250	1,700	1,700	1,700	
1,100	490	1,223,750	85,663	17,989	1,799	89,000	44,500	22,250	1,780	1,780	1,780	
1,150	512	1,279,375	89,556	18,807	1,881	93,000	46,500	23,250	1,860	1,860	1,860	
1,200	534	1,335,000	93,450	19,625	1,962	97,000	48,500	24,250	1,940	1,940	1,940	
1,250	556	1,390,625	97,344	20,442	2,044	101,000	50,500	25,250	2,020	2,020	2,020	
1,300	579	1,446,250	101,238	21,260	2,126	105,000	52,500	26,250	2,100	2,100	2,100	
1,350	601	1,501,875	105,131	22,078	2,208	109,000	54,500	27,250	2,180	2,180	2,180	
1,400	623	1,557,500	109,025	22,895	2,290	113,000	56,500	28,250	2,260	2,260	2,260	
1,450	645	1,613,125	112,919	23,713	2,371	117,000	58,500	29,250	2,340	2,340	2,340	
1,500	668	1,668,750	116,813	24,531	2,453	121,000	60,500	30,250	2,420	2,420	2,420	
1,550	690	1,724,375	120,706	25,348	2,535	125,000	62,500	31,250	2,500	2,500	2,500	
1,600	712	1,780,000	124,600	26,166	2,617	129,000	64,500	32,250	2,580	2,580	2,580	
1,650	734	1,835,625	128,494	26,984	2,698	133,000	66,500	33,250	2,660	2,660	2,660	
1,700	757	1,891,250	132,388	27,801	2,780	137,000	68,500	34,250	2,740	2,740	2,740	
1,750	779	1,946,875	136,281	28,619	2,862	141,000	70,500	35,250	2,820	2,820	2,820	
1,800	801	2,002,500	140,175	29,437	2,944	145,000	72,500	36,250	2,900	2,900	2,900	
1,850	823	2,058,125	144,069	30,254	3,025	149,000	74,500	37,250	2,980	2,980	2,980	
1,900	846	2,113,750	147,963	31,072	3,107	153,000	76,500	38,250	3,060	3,060	3,060	
1,950	868	2,169,375	151,856	31,890	3,189	157,000	78,500	39,250	3,140	3,140	3,140	
2,000	890	2,225,000	155,750	32,708	3,271	161,000	80,500	40,250	3,220	3,220	3,220	
2,050	912	2,280,625	159,644	33,525	3,353	165,000	82,500	41,250	3,300	3,300	3,300	
2,100	935	2,336,250	163,538	34,343	3,434	169,000	84,500	42,250	3,380	3,380	3,380	
2,150	957	2,391,875	167,431	35,161	3,516	173,000	86,500	43,250	3,460	3,460	3,460	
2,200	979	2,447,500	171,325	35,978	3,598	177,000	88,500	44,250	3,540	3,540	3,540	
Assumptions: 1. "jack" % = 11% 2. Fecundity = 2500 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% = ~1.6 Return per spawner							Highlighted indicates proposed adult removals in 2006 and replacement stocking recommended for 2007.			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

^a Presmolt stocking is recommended because late fall stocking should reduce competition for food with resident fish (majority should emigrate the following spring) and growth characteristics from scale patterns can be used to identify these fish when they return as adults.

Appendix B6.-Worksheet for calculating sockeye salmon "replacement" options for adult removals from Saltery Lake, 2006.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer RECOMMENDED ^a		Spring Fry (0.4 g)	Summer RECOMMENDED ^a	
							Fingerling (3.0 g)	Fall Presmolt (8-10 g)		Fingerling (3.0 g)	Fall Presmolt (8-10 g)
1500	738	2,214,000	154,980	32,546	3,255	160,000	80,000	40,000	3,200	3,200	3,200
1600	787	2,361,600	165,312	34,716	3,472	171,000	85,500	42,750	3,420	3,420	3,420
1700	836	2,509,200	175,644	36,885	3,689	182,000	91,000	45,500	3,640	3,640	3,640
1800	886	2,656,800	185,976	39,055	3,905	193,000	96,500	48,250	3,860	3,860	3,860
1900	935	2,804,400	196,308	41,225	4,122	204,000	102,000	51,000	4,080	4,080	4,080
2000	984	2,952,000	206,640	43,394	4,339	215,000	107,500	53,750	4,300	4,300	4,300
2100	1,033	3,099,600	216,972	45,564	4,556	226,000	113,000	56,500	4,520	4,520	4,520
2200	1,082	3,247,200	227,304	47,734	4,773	237,000	118,500	59,250	4,740	4,740	4,740
2300	1,132	3,394,800	237,636	49,904	4,990	248,000	124,000	62,000	4,960	4,960	4,960
2400	1,181	3,542,400	247,968	52,073	5,207	259,000	129,500	64,750	5,180	5,180	5,180
2500	1,230	3,690,000	258,300	54,243	5,424	270,000	135,000	67,500	5,400	5,400	5,400
2600	1,279	3,837,600	268,632	56,413	5,641	281,000	140,500	70,250	5,620	5,620	5,620
2700	1,328	3,985,200	278,964	58,582	5,858	292,000	146,000	73,000	5,840	5,840	5,840
2800	1,378	4,132,800	289,296	60,752	6,075	303,000	151,500	75,750	6,060	6,060	6,060
2900	1,427	4,280,400	299,628	62,922	6,292	314,000	157,000	78,500	6,280	6,280	6,280
3000	1,476	4,428,000	309,960	65,092	6,509	325,000	162,500	81,250	6,500	6,500	6,500
3100	1,525	4,575,600	320,292	67,261	6,726	336,000	168,000	84,000	6,720	6,720	6,720
3200	1,574	4,723,200	330,624	69,431	6,943	347,000	173,500	86,750	6,940	6,940	6,940
3300	1,624	4,870,800	340,956	71,601	7,160	358,000	179,000	89,500	7,160	7,160	7,160
3400	1,673	5,018,400	351,288	73,770	7,377	369,000	184,500	92,250	7,380	7,380	7,380
3500	1,722	5,166,000	361,620	75,940	7,594	380,000	190,000	95,000	7,600	7,600	7,600
3600	1,771	5,313,600	371,952	78,110	7,811	391,000	195,500	97,750	7,820	7,820	7,820
3700	1,820	5,461,200	382,284	80,280	8,028	402,000	201,000	100,500	8,040	8,040	8,040
3800	1,870	5,608,800	392,616	82,449	8,245	413,000	206,500	103,250	8,260	8,260	8,260
3900	1,919	5,756,400	402,948	84,619	8,462	424,000	212,000	106,000	8,480	8,480	8,480
4000	1,968	5,904,000	413,280	86,789	8,679	435,000	217,500	108,750	8,700	8,700	8,700
4100	2,017	6,051,600	423,612	88,959	8,896	446,000	223,000	111,500	8,920	8,920	8,920
4200	2,066	6,199,200	433,944	91,128	9,113	457,000	228,500	114,250	9,140	9,140	9,140
4300	2,116	6,346,800	444,276	93,298	9,330	468,000	234,000	117,000	9,360	9,360	9,360
4400	2,165	6,494,400	454,608	95,468	9,547	479,000	239,500	119,750	9,580	9,580	9,580
4500	2,214	6,642,000	464,940	97,637	9,764	490,000	245,000	122,500	9,800	9,800	9,800
4600	2,263	6,789,600	475,272	99,807	9,981	501,000	250,500	125,250	10,020	10,020	10,020
4700	2,312	6,937,200	485,604	101,977	10,198	512,000	256,000	128,000	10,240	10,240	10,240
4800	2,362	7,084,800	495,936	104,147	10,415	523,000	261,500	130,750	10,460	10,460	10,460
4900	2,411	7,232,400	506,268	106,316	10,632	534,000	267,000	133,500	10,680	10,680	10,680
5000	2,460	7,380,000	516,600	108,486	10,849	545,000	272,500	136,250	10,900	10,900	10,900
5100	2,509	7,527,600	526,932	110,656	11,066	556,000	278,000	139,000	11,120	11,120	11,120
5200	2,558	7,675,200	537,264	112,825	11,283	567,000	283,500	141,750	11,340	11,340	11,340
5300	2,608	7,822,800	547,596	114,995	11,500	578,000	289,000	144,500	11,560	11,560	11,560
5400	2,657	7,970,400	557,928	117,165	11,716	589,000	294,500	147,250	11,780	11,780	11,780
5500	2,706	8,118,000	568,260	119,335	11,933	600,000	300,000	150,000	12,000	12,000	12,000
5600	2,755	8,265,600	578,592	121,504	12,150	611,000	305,500	152,750	12,220	12,220	12,220
Assumptions: 1. "jack" % = 1.6% 2. Fecundity = 3000 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to-adult = 10% = ~2.1 Return per spawner						Highlighted indicates proposed adult removals in 2006 and replacement stocking recommended for 2007.			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

^a Presmolt stocking is recommended because late fall stocking should reduce competition for food with resident fish (majority should emigrate the following spring) and growth characteristics from scale patterns can be used to identify these fish when they return as adults.

**APPENDIX C. GUIDELINES FOR REPLACEMENT STOCKING OF
SOCKEYE SALMON**

Appendix C1.-Guidelines for "replacement" stocking (backstocking) of sockeye salmon as applicable to adult removals from Afognak, Malina and Saltery Lakes in 2006.

(The following text is from Dan Moore, Fishery Biologist, Division of Commercial Fisheries, SW Genetics, Anchorage)

There are currently about 12 "backstocking" projects (including Malina or Afognak and Saltery) statewide. Eight are in the south central/Kodiak area and 8 of the 12 are sockeye projects. Only two (Malina or Afognak and Saltery) will be conducted as a replacement for broodstock removed for other enhancement projects.

Backstocking is a high risk practice with regards to viability of the wild stock. Deleterious effects can include changed run timing, change in adult size, reduced spawning success and other reductions in fitness.

(The literature is rich with examples of supplementation/backstocking projects that have not had the results hoped for by the managers. To be fair, these are mostly from the lower 48 but then we have not examined our projects to the extent they have outside. We do not want to repeat these mistakes.)

Specific guidelines:

1) Collect eggs from throughout the duration of the run in proportion to their occurrence in the natural population. Also spawn adults randomly with respect to age and size.

(Randomizing selection of spawning pairs during the egg take will maximize genetic variability. Selecting individuals for anthropogenic reasons may decrease the genetic viability of the population. Propagating eggs from only one portion of the return could select for that particular segment of the population and result in shifts in the timing of subsequent returns of adults, their age and size composition.)

2) When taking eggs from a system with multiple spawning locations do not combine the different populations (e.g. inlet and outlet spawners).

(The separate populations may exhibit different return timings, different rheotactic responses and may be adapted to specific temperature regimes and other environmental parameters in their spawning environments.)

3) When returning progeny to an egg take site containing wild fish, the progeny should not exceed a 1:1 wild/cultured ratio. This applies to all life stages. Return the progeny to the egg take site.

(The 1:1 ratio may not apply in certain rehabilitation projects, determined on a case by case basis. No examples of this scenario come to mind.)

SIGN-OFF for the 2006 Pillar Creek Hatchery Annual Management Plan

G.D. Byrne 7/25/06
Gary Byrne: Pillar Creek Hatchery Manager, KRAA Date

Steve Schrof 7/18/06
Steve Schrof: Regional Resource Development Biologist, CFD Date

David A. Sterritt 7/20/06
David Sterritt: Regional Finfish Management Supervisor, CFD Date

Steve Honnold 7/24/06
Steve Honnold: Regional Finfish Research Supervisor, CFD Date

Jeff Wade 7/18/06
Jeff Wade: Area Finfish Management Biologist, CFD Date

Jim McCullough 7/24/06
Jim McCullough: Regional Supervisor, CFD Date

Len Schwarz 7/24/06
Len Schwarz: Area Biologist, SFD Date

Barry Stratton *Len Schwarz for* 7/24/06
Barry Stratton: Regional Supervisor, SFD Date

Kevin Brennan *Gary Byrne for* 7/25/06
Kevin Brennan: Executive Director, KRAA Date

The 2006 Hatchery Management Plan for PCH is hereby approved:

McKie Campbell *Deputy Commissioner* 8/9/06
McKie Campbell McKie Campbell: Commissioner, ADF&G, Juneau Date