

Fishery Management Report No. 09-35

**Pillar Creek Hatchery Annual Management Plan,
2009**

by

Heather Finkle

and

Gary Byrne

August 2009

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code	AAC	fork length	FL
deciliter	dL			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 professional titles	e.g., Dr., Ph.D., R.N., etc.	total length	TL
kilometer	km				
liter	L	at	@	Mathematics, statistics	
meter	m	compass directions:		<i>all standard mathematical signs, symbols and abbreviations</i>	
milliliter	mL	east	E	alternate hypothesis	H _A
millimeter	mm	north	N	base of natural logarithm	e
		south	S	catch per unit effort	CPUE
Weights and measures (English)		west	W	coefficient of variation	CV
cubic feet per second	ft ³ /s	copyright	©	common test statistics	(F, t, χ^2 , etc.)
foot	ft	corporate suffixes:		confidence interval	CI
gallon	gal	Company	Co.	correlation coefficient (multiple)	R
inch	in	Corporation	Corp.	correlation coefficient (simple)	r
mile	mi	Incorporated	Inc.	covariance	cov
nautical mile	nmi	Limited	Ltd.	degree (angular)	°
ounce	oz	District of Columbia	D.C.	degrees of freedom	df
pound	lb	et alii (and others)	et al.	expected value	E
quart	qt	et cetera (and so forth)	etc.	greater than	>
yard	yd	exempli gratia (for example)	e.g.	greater than or equal to	≥
		Federal Information Code	FIC	harvest per unit effort	HPUE
Time and temperature		id est (that is)	i.e.	less than	<
day	d	latitude or longitude	lat. or long.	less than or equal to	≤
degrees Celsius	°C	monetary symbols (U.S.)	\$, ¢	logarithm (natural)	ln
degrees Fahrenheit	°F	months (tables and figures): first three letters	Jan, ..., Dec	logarithm (base 10)	log
degrees kelvin	K	registered trademark	®	logarithm (specify base)	log ₂ , etc.
hour	h	trademark	™	minute (angular)	'
hour	h	United States (adjective)	U.S.	not significant	NS
minute	min	United States of America (noun)	USA	null hypothesis	H ₀
second	s	U.S.C.	United States Code	percent	%
		U.S. state	use two-letter abbreviations (e.g., AK, WA)	probability	P
Physics and chemistry				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. 09-35

PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN, 2009

by
Heather Finkle
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak
and
Gary Byrne
Kodiak Regional Aquaculture Association, Kodiak

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

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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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*Heather Finkle
Alaska Department of Fish and Game, Division of Commercial Fisheries,
211 Mission Road, Kodiak, AK 99615, USA*

and

*Gary Byrne
Kodiak Regional Aquaculture Association,
P.O. Box 3407, Kodiak, AK 99615, USA*

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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). PCH incubates and rears single stocks of Chinook salmon *Oncorhynchus tshawytscha*, coho salmon *O. kisutch*, rainbow trout *O. mykiss*, and two stocks of sockeye salmon *O. nerka*.

A total of 830,000 early-run juvenile sockeye salmon (Afognak Lake broodstock) will be released into Hidden, Big Waterfall, Little Waterfall, and Crescent lakes in 2009. Prior releases of the Afognak Lake stock are expected to produce approximately 19,200 early-run adult sockeye salmon returning in June 2009. Releases of Malina Lake stock in 2005 and 2006 are expected to produce an additional 4,600 returning early-run adult sockeye salmon. Preliminary plans are to collect 1,418,000 early-run sockeye eggs in 2009 for incubation and rearing at PCH, and subsequent release of the resulting 1,150,000 juveniles in 2010.

Approximately 1,500,000 late-run juvenile sockeye salmon (Saltery Lake broodstock) will be released into Spiridon Lake in 2009. No fish are expected to be released into Ruth and Jennifer lakes. Prior juvenile releases are expected to produce 130,000 late-run adult sockeye salmon returning to Spiridon Lake in late June through early August 2009. Preliminary plans call for collection of approximately 5,300,000 Little Kitoi Lake sockeye salmon eggs in 2009 for stocking Spiridon (3,340,000), Jennifer (250,000), and Ruth (75,000) Lakes in 2010. In the autumn of 2009, 568,000 eyed eggs will be transferred from PCH to Kitoi Bay Hatchery (KBH) for continued incubation, rearing and release of 500,000 juvenile sockeye salmon into Little Kitoi Lake for the Spiridon Lake broodstock development program.

A total of approximately 79,400 coho salmon fingerlings (Buskin Lake broodstock) will be released into nine Kodiak Road System lakes and streams in 2009. As many as 10,000 of these fish may be held to smolt and released into Monashka Creek in June 2010. Prior releases of this coho salmon stock are expected to produce a return of approximately 3,400 adult coho salmon in late August and September 2009. The 2009 Buskin River coho salmon egg-take goal will be to collect 110,000 eggs to provide 95,500 juveniles for release in 2010 and 2011.

Approximately 79,000 brood year 2007 Chinook salmon smolt will be released into Monashka Creek in 2009, and an additional 112,000 Chinook smolts into the American and Olds rivers (56,000 into each river). About 500 adult Chinook salmon are expected to return to Monashka Creek in 2009. Approximately 450,000 Chinook salmon eggs will be collected in 2009 for an eventual release of approximately 100,000 smolts into Monashka Creek, and 130,000 each into the American and Olds rivers in 2011.

Approximately 67,500 triploid rainbow trout fingerlings will be stocked into 18 landlocked lakes on the Kodiak Road System in 2009. Approximately 90,000 rainbow trout eggs will be taken in 2009 from captive broodstock at ADF&G's Ft. Richardson Hatchery in Anchorage and will be transferred to PCH at the eyed-egg stage. Resultant fingerlings will be released in 2009.

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

INTRODUCTION

The purpose of this report is to provide historical background on the Pillar Creek Hatchery (PCH) and to serve as a resource document that summarizes the hatchery's stocking, rearing, and egg takes into an annual management plan for sockeye salmon *Oncorhynchus nerka*, coho salmon *O. kisutch*, Chinook salmon *O. tshawytscha*, and rainbow trout *O. mykiss* in 2009 (Tables 1 and 2; Appendix A1).

Pillar Creek Hatchery is located on the Kodiak Road System about seven miles north of Kodiak City (Figures 1-3). 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 up to 20 million salmon eggs and rear 16 million juveniles to a variety of life stages (fry, fingerlings, presmolts, and smolts). 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 originally designed to produce juvenile sockeye salmon

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 fishermen.

Malina and Laura lakes were the first anadromous lake stocking projects initiated by PCH, which were initiated in 1992 and 1993 respectively, and discontinued in the late 1990s after successfully rebuilding both sockeye salmon runs (Figure 1). Lake fertilization (1991-2001) and sockeye salmon stocking (1992-1999) projects were conducted at the Malina Lake system to restore adult production levels to adequately achieve escapement goals. Juveniles (Malina Lake broodstock) were released back (“backstocked” – taking eggs from a system, hatching the eggs at the hatchery, and releasing the juveniles back into the same system) into the Malina system, which increased ensuing adult returns (Schrof and Honnold 2003; Figure 1). Sockeye salmon escapement goals were achieved or exceeded 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). Laura Lake 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, lake fertilization and egg takes were discontinued after 2002 and the stock was considered rehabilitated (McCullough and Clevenger 2002).

Spiridon Lake was selected as the primary barren-lake sockeye salmon stocking project for PCH and has been stocked annually since 1991 (Figure 1). 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 Saltery Lake stock would be preferred for Spiridon Lake stocking (Figure 1; Honnold 1997; Honnold et al. 1999). The earlier run timing of Saltery 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.

Little Kitoi Lake has been stocked with Saltery Lake sockeye salmon stock from KBH annually since 1999 (Schrof and Aro 2007). Little Kitoi Lake will continue to be stocked in an effort to build a large enough run to support its own egg take. The Little Kitoi Lake stock will also be the preferred broodstock for the Spiridon Lake project in 2009 if the adult sockeye salmon returns are ample for an egg take. If the 2009 run is not sufficient to meet the 2009 late run sockeye egg-take goal, broodstock from Saltery 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 2009 (Figure 1). Afognak Lake sockeye salmon have traditionally been the primary broodstock for early-run stocking projects. However, Afognak Lake adult sockeye returns since 2001 have not been as strong as the runs of the 1990s. In 2004, Malina Lake sockeye salmon were utilized as an alternative early-run broodstock. Early-run sockeye salmon egg takes were

conducted at both Malina and Afognak lakes in 2005, with resultant juveniles stocked in 2006. Annual Afognak Lake sockeye salmon escapements since 2005 have been of sufficient strength to allow full egg takes. Afognak Lake is the preferred brood source for the early-run sockeye salmon stocking program. However, Malina Lake sockeye salmon will be an alternative brood source in 2009, if egg-take goals cannot be achieved using Afognak Lake brood exclusively.

PCH will also raise coho salmon juveniles for stocking lakes along the Kodiak 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 2000 for road system stocking (Figure 2). The installation of additional raceways for sportfish production in 2000 has allowed the option of rearing coho salmon to the presmolt or smolt lifestages prior to release in subsequent years. However, the priority use of the increased rearing volume is to hold Chinook salmon, and releases of coho presmolts or smolts are thus dependent upon annual juvenile Chinook inventories. Coho salmon smolt stocking is not planned for 2009, as it is precluded by the brood year (BY) 2007 juvenile Chinook salmon inventory. Future releases of coho smolts will continue to 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.

In 2000, the ADF&G, Division of Sport Fish and KRAA initiated a cooperative recreational fisheries enhancement project to develop Chinook salmon returns to streams on the Kodiak Road System. A permit alteration request (PAR) was approved for the PCH Basic Management Plan in January 2000 (McCullough et al. 2000) providing for production of Chinook salmon at the facility. Chinook salmon eggs were collected for the first time from the Karluk River in August 2000. These eggs were incubated and reared at PCH and about 60,400 smolts were released into Monashka Creek in the spring of 2002 (Figure 2). This project continued with annual egg takes at the Karluk River through 2004, and the release of Karluk stock Chinook salmon smolts from 2003 to 2006. In 2005, the return of the project's first adult Chinook salmon allowed for an egg take at Monashka Creek, establishing Monashka Creek Chinook salmon as the sole brood source for the KRAA/ADF&G Cooperative Kodiak Road System Chinook Enhancement Project. In 2007, Monashka Creek stock Chinook salmon were released into the American and Olds Rivers for the first time. Installation of two raceways at Monashka Creek has provided a secure holding site for broodstock and additional rearing volume for juvenile Chinook salmon, and a PAR has been approved to increase the permitted number of eggs for the project from 300,000 to 450,000 in 2009 (Appendix A1).

In 2007 and 2008, PARs were approved for the PCH Basic Management Plan, allowing the hatchery to receive and incubate up to 92,000 eyed rainbow trout eggs transferred from the ADF&G Ft. Richardson Hatchery in Anchorage. Prior to 2007, ADF&G annually stocked juvenile all-female 3N triploid rainbow trout fry from Ft. Richardson Hatchery into 20 landlocked Kodiak Road System lakes for sport fish enhancement, continuing a rainbow trout stocking program that began in 1953. In 2007 and 2008, rainbow trout eyed eggs were transferred from Ft. Richardson Hatchery to PCH, and stocked into Kodiak lakes following successful incubation and rearing. In 2009, it is again the plan to transfer eyed eggs from Ft. Richardson Hatchery to Pillar Creek Hatchery. Juveniles surviving to the fingerling stage will be stocked into 18 landlocked lakes (Figure 3).

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.

2009 SOCKEYE SALMON RELEASES

Described below are stock-specific sockeye salmon releases planned for 2009. Juvenile sockeye salmon will be transported by aircraft which will stock by aerial release.

EARLY-RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK

A total of approximately 830,000 Afognak Lake stock juvenile early-run sockeye salmon will be released in 2009. Detailed plans for the release of the brood year 2008 fry and presmolts into Hidden, Little Waterfall, Big Waterfall, and Crescent Lakes are shown in Table 3 (Figure 1; Appendix B1).

Adult returns from these releases are estimated to total about 57,000 fish over the four-year period from 2011 to 2014 (Tables 3 and 4). The run timing of these returns should be similar to those of Afognak Lake and Malina Lake sockeye salmon (brood source) escapement, with runs beginning in late May, peaking about mid June, and substantially declining by early July (Figures 4 and 5).

LATE-RUN SOCKEYE SALMON: SALTERY LAKE DONOR STOCK

A total of approximately 1,500,000 Saltery Lake stock juvenile late-run sockeye salmon will be released in 2009 (Table 5). Detailed plans for the release of the brood year 2008 fry into Spiridon, Ruth, and Jennifer Lakes are shown in Table 5 (Figure 1; Appendix B2). No late-run sockeye salmon presmolts will be released in 2009.

Approximately 67,000 adult fish are expected to return as a result of the 2009 late-run sockeye salmon releases. Details of the preliminary return estimates for these fish from 2010 to 2013 are shown in Table 5. The run timing of returns from the stocking of Spiridon, Jennifer, 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 6).

2009 COHO SALMON RELEASES

BUSKIN LAKE DONOR STOCK

PCH plans to release 79,400 coho salmon fingerlings (BY 2008) into Kodiak road system lakes in 2009 (Table 6; Figure 2; Appendix B3). The fish are scheduled for releases into Island, Dark, Mission, Potato Patch, Mayflower, Southern, Abercrombie (Gertrude), Pillar Creek, and Chiniak lakes in August 2009, and potentially Monashka Creek in June 2010, as detailed in Table 6 (Figure 2; Appendix B3). The 2009 release will mark the first time coho salmon are released into Pillar Creek by PCH. The Board of Fish approved opening Pillar Creek to sport fishing in 2008; stocking is intended to mitigate the loss of coho brood to sport harvest.

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 fish are transported by skiff.

Fingerling releases (BY 2008) in 2009 are expected to produce about 4,500 returning adults in 2011 (Tables 4 and 6). 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 7).

During the 2008/2009 school year, Kodiak Island Borough schools were provided 250 to 500 coho salmon eggs for educational programs. A total of 4,000 eggs were divided and distributed among

12 schools. Eggs from the 2008 egg take were incubated in classroom incubators with resultant fry to be released by students into one of the several previously mentioned lakes. The program is expected to continue annually.

2009 CHINOOK SALMON RELEASES

MONASHKA CREEK DONOR STOCK

Approximately 191,000 Chinook salmon smolts will be released into Kodiak Road System streams in 2009 (Table 7). Smolts will be transported from PCH to the stocking locations where they will be held for imprinting. The detailed 2009 stocking plan for Chinook salmon smolt releases into Monashka Creek and the American and Olds rivers is shown in Table 7 (Figure 2; Appendix B4). Fish were released in May and June 2009 into Monashka Creek from a raceway adjacent to the creek where they have been held since October 2008. Fish were also released into the American and Olds Rivers following confinement in instream pens for approximately two weeks during the same spring imprinting period.

Approximately 2,300 adult Chinook salmon are expected to return from the 2009 releases over a five year period from 2010 to 2014 (Tables 4 and 7). At the time of the project's inception, it was anticipated that the run timing of the Road System Chinook salmon would be similar to that of the donor stock (Karluk River Chinook salmon), which returns in late May, peaking in mid June, and declining by early July (Figure 8). However, since 2005 Chinook salmon returning to Monashka Creek have been approximately two weeks later than the Chinook salmon returns to the Karluk River (L. Schwarz, retired Sport Fish Biologist, ADF&G, Kodiak; personal communication).

PCH will rear juvenile Chinook salmon resulting from the 2008 Monashka Creek egg take through 2009 for release as spring smolts in 2010. Detailed information regarding the 2008 egg take, projected 2010 release, and estimated resulting adult return figures are shown in Table 8 (Table 7; Figure 2; Appendix B4).

2009 RAINBOW TROUT EGG TAKE AND RELEASES

FORT RICHARDSON HATCHERY CAPTIVE BROOD/SWANSON RIVER ORIGINAL DONOR STOCK

In 2009, approximately 67,500 all-female triploid rainbow trout fingerling will be stocked into 18 landlocked lakes on the Kodiak Road System (Tables 2 and 9; Figure 3). These fish are from an April 2009 egg take of approximately 90,000 eggs (116 adults) taken from captive broodstock at the Fort Richardson Hatchery in Anchorage. Approximately 82,000 eggs surviving to the eyed stage will be transported via air freight to PCH in May 2009. Following incubation and rearing at PCH, the resulting juveniles will be stocked in August – October 2009.

BROODSTOCK NUMBERS, ESCAPEMENT GOALS, AND EGG-TAKE GUIDELINES

In 2009, we propose collecting the following broodstock for egg takes:

- 1,191 Afognak Lake early-run sockeye salmon (Tables 10 and 11; Appendix B1), or 1,196 sockeye salmon if Malina Lake is used as an alternate early-run broodstock (Tables 10 and 11; Appendix B5);

- 4,439 Little Kitoi Lake late-run sockeye salmon (Tables 10 and 12; Appendix B2), or the same estimated number if Saltery Lake is used as an alternate late-run broodstock (Tables 10 and 13; Appendix B6);
- 64 Buskin Lake coho salmon (Table 13; Appendix B3); and
- 150 Monashka Creek Chinook salmon (Table 14; Appendix B4).

Escapement goal ranges for these systems are 20,000-50,000 sockeye salmon at Afognak Lake, 1,000-10,000 sockeye salmon at Malina Lake (alternative broodstock to Afognak Lake, if necessary), 15,000-30,000 sockeye salmon at Saltery Lake (alternative broodstock to Little Kitoi Lake, if necessary), and 3,200-7,200 coho salmon at Buskin River (Honnold et al. 2007). Little Kitoi Lake does not have a sockeye salmon escapement goal. Monashka Creek does not have a Chinook salmon escapement goal.

The following egg-take guidelines established by Honnold and Byrne (2005) will be used for 2009:

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 10).
2. Broodstock removals will not reduce escapements below 50% of the lower bound of the escapement goal range for a given system (Table 10); broodstock removals will be reduced accordingly if necessary (Appendices C1 through C3).
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. A replacement requirement is defined as the number of juvenile sockeye salmon of the specific stock needed for “backstocking” into each system (Appendices C4 through C6).
4. Replacement will be required when escapements are one fish over 50% of the lower bound of the escapement goal range and just under (one fish) the sum of the lower goal range and brood stock removal 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 1,191 for broodstock. Thus, $50\% \times 20,000 + 1 = 10,001$ and $20,000 - 1 + 1,191 = 21,190$, so replacement backstocking will be required if the escapement is from 10,001 to 21,190 sockeye salmon in 2009. If the escapement is less than or equal to 10,000 fish, the egg take will be prohibited.
5. 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).
6. Specific backstocking options based on proposed broodstock removal in 2009 are outlined in Appendices C4 through C6.
7. Backstocking of sockeye salmon presmolts is recommended to lessen lake grazing pressure and to provide for easy identification of returning adults (through unique scale patterns).
8. Replacement will be optional for coho broodstock removal due to the small numbers of adults needed for the coho salmon egg take and the anticipation of the Buskin River coho escapement requirement being met (L. Schwarz, retired Sport Fish Biologist, ADF&G, Kodiak; personal communication). If the Buskin River coho salmon run is weak in 2009, replacement for broodstock removal may occur and, if needed, backstocking options will be developed.

2009 SOCKEYE SALMON EGG TAKES (2010 STOCKING)

The egg-take goals for 2009 and stocking levels for 2010 described below for each sockeye broodstock are assumptions based on historical goals. Actual stocking and egg-take targets may be adjusted in season (July and August 2009) as a result of the analysis of zooplankton data collected at each lake during the spring and summer. 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 2010.

EARLY RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK

The 2009 early-run sockeye salmon egg-take goal is approximately 1,418,000 Afognak Lake sockeye salmon eggs (1,191 adults; Table 11). Resulting juveniles will be stocked into Hidden, Little Waterfall, Big Waterfall, and Crescent lakes in 2010, as detailed in Table 11 (Appendix B1).

The escapement levels at Afognak Lake in 2009 may determine the number of broodstock available for an egg take (Tables 10 and 11; Appendix C1). 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 (Tables 10 and 11; Appendices B1 and B5). The egg-take guidelines previously described will be adhered to regardless of the egg-take location (Table 8; Appendices C1 and C2).

LATE RUN SOCKEYE SALMON: LITTLE KITOI LAKE DONOR STOCK

The 2009 late-run sockeye salmon egg-take goal for PCH stocking projects is approximately 4,764,500 Little Kitoi Lake sockeye salmon eggs (3,966 adults). Resulting juveniles will be stocked into Spiridon, Jennifer, and Ruth Lakes in 2010, as detailed in Table 12 (Appendix B2).

Included in the late-run sockeye egg-take goal are approximately 568,000 green eggs (473 adults) which will be collected as part of the ongoing KRAA late-run sockeye salmon broodstock development program. At the eyed-egg stage, eggs (approximately 520,000) will be transferred from PCH to KBH; KBH will incubate, rear, and release the juveniles into Little Kitoi Lake (Aro and Schrof *In prep*). With the development program eggs included, the total 2009 late-run egg-take goal is approximately 5,332,500 Little Kitoi Lake sockeye salmon eggs (4,439 adults).

The 2009 egg take at Little Kitoi Lake will be dependent upon an escapement adequate to meet broodstock requirements (Table 10). If inadequate escapement precludes attainment of the egg-take goal at Little Kitoi Lake, Saltery Lake sockeye salmon may be used as an alternative broodstock for the aforementioned late-run sockeye stocking projects.

2009 COHO SALMON EGG TAKES (2010 STOCKING)

Approximately 110,000 Buskin Lake coho salmon eggs (64 adults) will be collected in 2009, which will provide fingerlings to stock into Road System lakes and streams in 2010, as detailed in Table 13 (Appendix B3). Depending upon the hatchery Chinook salmon inventory, a number of the resulting juveniles may be held to smolt in 2011 for stocking into Kodiak Road System lakes or Monashka Creek.

We do not expect that Buskin River coho salmon escapement levels will preclude or reduce the broodstock collection in 2009, due to the small number (64) of broodstock needed to attain egg-take goals (Tables 10 and 13; Appendix B3) and the anticipated magnitude of the 2009 coho salmon escapement (L. Schwarz, retired Sport Fish Biologist, ADF&G, 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 2009. Replacement requirements have not been identified for the Buskin River coho salmon stock, but may be developed in 2009.

2009 CHINOOK SALMON EGG TAKES (2011 STOCKING)

The 2009 Chinook salmon egg-take goal is 450,000 Monashka Creek eggs (150 adults), which will provide smolts to stock Monashka Creek, the Olds River, and the American River in 2011 (Table 14; Appendix B4). There is no escapement goal for Chinook salmon in Monashka Creek, and thus, all of the escapement may be available for use as broodstock. The projected 2009 return should provide adequate broodstock to meet the project egg-take goals.

SOCKEYE SALMON HARVEST AND MANAGEMENT

A total of 159,200 sockeye salmon produced from PCH stocking projects are expected to return in 2009 (Table 15). The majority of these fish (130,000) will be a result of the Spiridon Lake project. Hidden, Little Waterfall, Big Waterfall, Crescent, Spiridon, Little Kitoi, and Ruth lakes are systems without native salmon runs. Salmon may be present in the lake outlet streams from marine waters to the salmon barrier. All sockeye salmon returning to these systems will be available for harvest. Prior to 2005, terminal harvest areas (THA) were designated to manage the harvest of enhanced sockeye salmon production from PCH in an orderly fashion (Honnold and Byrne 2004). Special Harvest Areas (SHA) replaced THAs to allow for cost recovery of the enhanced harvest if cost recovery is determined to be necessary or desirable (5 AAC 40.085).

HARVEST OF RETURNS TO HIDDEN LAKE

The Foul Bay (Hidden Lake; Figure 9) 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 10). The run timing of Hidden Lake returns should be similar to the timing of Afognak Lake and Malina Lake sockeye salmon (brood sources) escapement, with runs beginning in late May, peaking in early June, and declining substantially by early July (Figures 4 and 5).

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 9; 5 AAC 40.085(3)). By regulation the only legal gear types for the SHA are purse seines and beach seines. Because a harvestable surplus of enhanced sockeye salmon is expected in the SHA, continuous fishing periods through the duration of the sockeye salmon run will be allowed by the ADF&G, beginning 9 June (Wadle et al. 2009). The fishery directed at the Hidden Lake sockeye salmon run is not expected to impact pink salmon escapement to Hidden Creek because the fishery occurs prior to the arrival of 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 10).

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 analyses 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 2009 (J. Wadle, Kodiak Area Management Biologist, ADF&G, Kodiak; personal communication).

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 11). The run timing of Crescent Lake returns should be similar to the escapement timing of Afognak Lake and Malina Lake sockeye salmon (brood sources), with runs beginning in late May, peaking in early June, and declining substantially by early July (Figures 4 and 5).

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 10). During 2009, the fishery will open in the Central Section of the Northwest Kodiak District on 9 June for a 33-hour period (Wadle et al. 2009). 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 11; 5 AAC 40.085(5)), could open in 2009, 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 be able to utilize the inriver escapement for subsistence purposes.

HARVEST OF RETURNS TO LITTLE AND BIG WATERFALL LAKES

The Waterfall Bay harvest strategy was designed to harvest all enhanced sockeye salmon returning to Waterfall Bay and provide safeguards for the area's wild salmon escapements (Figure 12). The run timing of returns to Waterfall Bay should be similar to the escapement timing of Afognak Lake and Malina Lake sockeye salmon (brood sources), with runs beginning in late May, peaking in early June, and declining substantially by early July (Figures 4 and 5).

The sockeye salmon harvest is expected to occur in the Waterfall Bay SHA within the Perenosa Bay Section (Figure 12). 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 types for the Waterfall Bay SHA are purse seines and beach seines. Because there is no required escapement, all returning sockeye salmon will be available for harvest. Because a harvestable surplus of enhanced sockeye salmon is expected in 2009, continuous fishing through the duration of the sockeye run will be allowed beginning 9 June (Wadle et al. 2009).

A fish barrier will be used in the terminus of Little Waterfall Creek so that all returning adults are available for harvest. The net will be suspended and anchored to the bottom near the terminus of Little Waterfall Creek prior to the opening of the fishery.

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 et al. 2009; Figure 13) and

to provide adequate protection for escapements of wild salmon stocks returning to streams in the area (Spiridon River 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 10). The run timing of the 2009 return generated by the Spiridon Lake stocking program should be similar to the escapement timing of Saltery Lake sockeye salmon (brood source), with runs beginning in late June and continuing into mid-August (Figure 6).

Harvests of Spiridon Lake sockeye salmon are expected to occur during openings targeting Karluk Lake sockeye salmon and westside pink and chum salmon stocks (Wadle et al. 2009). 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 13). A continuous fishing period will be announced by the ADF&G when enhanced sockeye salmon are documented within the SHA (Wadle et al. 2009). By regulation, the only legal gear types for the Spiridon Bay SHA are purse seines and beach seines. A series of barrier falls prevents salmon from entering Spiridon Lake, but sockeye salmon returning to Telrod Cove have access to Telrod Creek (Figure 13). 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 returning to Spiridon River and Telrod Creek.

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, JENNIFER, AND LITTLE KITOI LAKES

The combined return of PCH-stocked enhanced sockeye salmon to Ruth, Jennifer, and Little Kitoi lakes is projected to be 5,400 in 2009 (Table 15). A greater number of additional returning sockeye will be attributed to KBH stocking of Saltery stock sockeye into Little Kitoi Lake. The enhanced sockeye salmon returning to these systems will be harvested incidentally in 2009 during pink, chum, and coho salmon fisheries in the Kitoi, Izhut, and Duck Bay sections of the Afognak District (Figures 1 and 10; Wadle et al. 2009; Aro and Schrof *In prep*). Harvest of all species in these sections will be managed with a goal of achieving late-run sockeye salmon escapement into Little Kitoi Lake adequate to meet PCH broodstock needs. The run timing is expected to be similar to that described for Spiridon Lake runs, since Saltery Lake sockeye salmon were used as broodstock for both enhancement projects (Figure 6).

HARVEST REPORTING

Spiridon Lake SHA, Foul Bay SHA, Waterfall Bay SHA, and Kitoi Bay Area (Ruth and Little Kitoi lakes) 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 where run strength is sufficient to warrant monitoring.

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 ensure 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 Annual Management Plan (Honnold et al. 1998), will be followed in 2009 for all projects. Additional guidelines are presented in Appendix D1 to help minimize potential viability risks to wild stocks that may include changes in run timing, spawning success, and reduced fitness.

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. Harvest strategies in the Kodiak Management Area target the enhanced production as required by ADF&G to ensure compliance with state regulations for private nonprofit salmon hatcheries (5 AAC 40.005.(f)).

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 are to prevent the transplanting of 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 2009 for all projects.

SPECIAL STUDIES/RESEARCH

The 1994 to 1997 Spiridon Lake sockeye salmon runs were reconstructed using scale pattern analyses to identify 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 2008, 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 Sallery Lake broodstock (stocked in 1995 and from 1998 to the present). 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 runs when only the Sallery Lake fish return (Nelson 1999). This is primarily due to the increased number of both local and non-local stocks present in the Northwest Kodiak District when Spiridon Lake bound sockeye salmon are migrating through.

The average proportion of the Spiridon-bound sockeye salmon harvested in the Telrod Cove THA from 1994 to 1997 (41%) was applied to the 1998 through 2007 THA (now SHA) harvest to reconstruct the Spiridon Lake sockeye salmon contribution to the harvests in the Southwest Afognak Section and Northwest Kodiak District (Honnold and Byrne 2004; Schrof et al. 2000). In 2008, harvest of Spiridon-bound sockeye salmon in Northwest Kodiak and Southwest Afognak Districts was estimated using an ad-hoc scale pattern analysis of the commercial harvest samples depending on recognition of the uniquely large freshwater scale pattern of the age-2.2 Spiridon sockeye salmon (M. B. Foster, Fishery Biologist, ADF&G, Kodiak; personal communication). Only in 2008 has such a clearly identifiable scale pattern appeared; it is unlikely that scale pattern analysis can be relied upon consistently in the future. Thus, it is anticipated that until a new method of stock separation is developed and implemented to identify the Saltery Lake stock returns to Spiridon, the method of estimation applied from 1998 through 2007 will be used for the 2009 and future Spiridon Lake sockeye salmon runs.

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. 2009). Stocked lakes will also be sampled to evaluate zooplankton trends and water quality parameters.

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TABLES AND FIGURES

Table 1.—The Pillar Creek Hatchery annual management plan executive summary for sockeye, Chinook, and coho salmon, 2009.

Stocking location	Species	Broodstock	2009 Projected enhanced return	2009 Stocking (brood year 2008)	2009 Stocking (brood year 2007)	2009 Egg-take goals	2010 Stocking (brood year 2009)	2011 Stocking (brood year 2009)
Hidden Lake	Sockeye	Afognak Lake early run	12,250	350,000		617,000	500,000	
Little Waterfall Lake	Sockeye	Afognak Lake early run	2,200 ^a	130,000		308,000	250,000	
Big Waterfall Lake	Sockeye	Afognak Lake early run		100,000		123,000	100,000	
Crescent Lake	Sockeye	Afognak Lake early run	4,750	250,000		370,000	300,000	
		Total Afognak Lake early run	19,200	830,000	0	1,418,000 ^b	1,150,000	0
Hidden Lake	Sockeye	Malina Lake early run	2,950					
Little Waterfall Lake	Sockeye	Malina Lake early run	1,200 ^a					
Big Waterfall Lake	Sockeye	Malina Lake early run						
Crescent Lake	Sockeye	Malina Lake early run	450					
		Total Malina Lake early run	4,600	0	0	0 ^b	0	0
		Total early-run sockeye salmon	23,800	830,000	0	1,418,000	1,150,000	0
Spiridon Lake	Sockeye	Little Kitoi Lake late run				4,342,000	3,340,000	
Ruth Lake	Sockeye	Little Kitoi Lake late run				97,500	75,000	
Jennifer Lake	Sockeye	Little Kitoi Lake late run				325,000	250,000	
Little Kitoi Lake	Sockeye	Little Kitoi Lake late run				568,000 ^{cf}	500,000	
		Total Little Kitoi Lake late run	0	0	0	5,332,500 ^d	4,165,000	0
Spiridon Lake	Sockeye	Saltery Lake late run	130,000	1,500,000				
Ruth Lake	Sockeye	Saltery Lake late run	2,150					
Jennifer Lake	Sockeye	Saltery Lake late run	750					
Little Kitoi Lake	Sockeye	Saltery Lake late run	2,500 ^e					
		Total Saltery Lake late run	135,400	1,500,000	0	0 ^d	0	0
		Total late-run sockeye salmon	135,400	1,500,000	0	5,332,500	4,165,000	0
		Total sockeye salmon	159,200	2,330,000	0	6,750,500	5,315,000	0
Monashka Creek	Chinook	Monashka Creek	500		79,000	125,000 ^f		100,000
American River	Chinook	Monashka Creek			56,000	162,500		130,000
Olds River	Chinook	Monashka Creek			56,000	162,500		130,000
		Total Chinook salmon	500	0	191,000	450,000	0	360,000

-continued-

Table 1.–Page 2 of 2.

Stocking Location	Species	Broodstock	2009 Projected enhanced return	2009 Stocking (brood year 2008)	Stocking (brood year 2007)	2009 Egg-take goals	2010 Stocking (brood year 2009)	2011 Stocking (brood year 2009)
Island Lake	Coho	Buskin Lake	1,461	22,500		25,916	22,500	
Dark Lake	Coho	Buskin Lake	486	7,500		8,639	7,500	
Mission Lake	Coho	Buskin Lake	812	12,500		14,398	12,500	
Potato Patch Lake	Coho	Buskin Lake	326	9,500		10,942	9,500	
Mayflower Lake	Coho	Buskin Lake	326	6,500		7,487	6,500	
Southern Lake	Coho	Buskin Lake	Landlocked	3,500		4,031	3,500	
Abercrombie Lake	Coho	Buskin Lake	Landlocked	3,500		4,031	3,500	
Chiniak Lake	Coho	Buskin Lake	Landlocked	3,900		23,037	20,000	
Monashka Creek	Coho	Buskin Lake						
Pillar Creek ^g	Coho	Buskin Lake		10,000		11,519	10,000	
Total coho salmon			3,411	79,400	0	110,000	95,500	0

^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 has been the sole early-run sockeye brood source since 2005, and is the preferred brood source for 2009. Malina Lake sockeye may be utilized as a 2009 brood source if egg-take goals cannot be achieved using Afognak Lake brood exclusively.

^c Late run sockeye eyed eggs (Little Kitoi Lake or Saltery Lake stock) are transferred to Kitoi Bay Hatchery; KBH incubates these eggs and rears resulting juveniles. Juveniles are released into Little Kitoi Lake.

^d Little Kitoi Lake is the preferred brood source for the Pillar Creek Hatchery late run sockeye egg take; the current FTP to take sockeye eggs at Little Kitoi Lake (original donor stock Saltery Lake) was issued in 2004. Although the Little Kitoi sockeye egg take is not a new plan or project, Little Kitoi Lake sockeye escapement has not been sufficient to meet the hatchery's late run sockeye egg-take goals, and egg takes have been conducted at Saltery Lake, which serves as the alternate brood source for the late-run sockeye projects.

^e The projected return to Little Kitoi Lake of 2,500 late run Saltery stock sockeye represents the portion of the 2009 run produced by PCH stocking of Little Kitoi Lake in 2005. The balance, and majority, of the run will be attributed to KBH stocking of Little Kitoi Lake, and the projection of those returns can be found in the Kitoi Bay Hatchery 2009 Annual Management Plan.

^f The 2009 egg take is projected to result in a release of as many as 360,000 smolts in 2011. However, if warm water temperatures accelerate fish growth, it is possible that fish will be culled in order to keep raceway densities within acceptable limits, and fewer smolts would be released.

^g The Board of Fish approved opening Pillar Creek to sport fishing in 2008. To mitigate removal of adult spawning coho salmon, Pillar Creek will be added to the Kodiak Road System locations into which juvenile coho are stocked by the cooperative KRAA/ADF&G Sport Fish Kodiak stocking program.

Table 2.—The Pillar Creek Hatchery annual management plan executive summary for rainbow trout, 2009.

Stocking Location	Broodstock ^a	2009 Projected enhanced return	2009 Stocking	2010 Egg-take goals	2010 Stocking
Abercrombie (Gertrude) Lake	Ft. Richardson/Swanson R.	Landlocked	4,917	6,556	4,917
Aurel Lake	Ft. Richardson/Swanson R.	Landlocked	3,986	5,315	3,986
Big (Lily) Lake	Ft. Richardson/Swanson R.	Landlocked	4,783	6,378	4,783
Bull Lake	Ft. Richardson/Swanson R.	Landlocked	2,658	3,544	2,658
Caroline Lake	Ft. Richardson/Swanson R.	Landlocked	1,860	2,481	1,860
Cicely Lake	Ft. Richardson/Swanson R.	Landlocked	1,528	2,038	1,528
Dolgoi Lake	Ft. Richardson/Swanson R.	Landlocked	6,843	9,124	6,843
Dragonfly Lake	Ft. Richardson/Swanson R.	Landlocked	2,059	2,746	2,059
Heitman Lake	Ft. Richardson/Swanson R.	Landlocked	4,318	5,758	4,318
Horseshoe Lake	Ft. Richardson/Swanson R.	Landlocked	1,329	1,771	1,329
Jack Lake	Ft. Richardson/Swanson R.	Landlocked	1,329	1,771	1,329
Jupiter Lake	Ft. Richardson/Swanson R.	Landlocked	4,783	6,378	4,783
Lee Lake	Ft. Richardson/Swanson R.	Landlocked	3,720	4,960	3,720
Lily Pond Lake	Ft. Richardson/Swanson R.	Landlocked	2,126	2,834	2,126
Long Lake	Ft. Richardson/Swanson R.	Landlocked	4,783	6,378	4,783
Saturn Lake	Ft. Richardson/Swanson R.	Landlocked	3,189	4,252	3,189
Tanignak Lake	Ft. Richardson/Swanson R.	Landlocked	7,972	10,630	7,972
Twin Lake	Ft. Richardson/Swanson R.	Landlocked	5,315	7,087	5,315
Total rainbow trout		0	67,500	90,000	67,500

^a Rainbow trout eggs are taken from captive brood at ADF&G's Ft. Richardson Hatchery in Anchorage, and transferred to PCH as eyed eggs.

Table 3.–Pillar Creek Hatchery early-run sockeye salmon egg-take results (Afognak Lake broodstock) from 2008, resultant juvenile releases planned in 2009, projected adult production, and fish transport permit information.

Stock information		Location						Totals	
		Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake		Crescent Lake
Egg Take	Eggs	308,531	123,412	37,024	123,412	123,412	185,119	123,412	1,024,323
	Adults	248	99	30	99	99	149	99	822
Releases	N	250,000	100,000	30,000	100,000	100,000	150,000	100,000	830,000
	Size (g)	0.4	9.3	0.4	9.3	9.3	0.4	9.3	
	Lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
	Date	07-Jun-09	01-Oct-09	07-Jun-09	01-Oct-09	01-Oct-09	07-Jun-09	01-Oct-09	
Projected	2011	821	1,130	99	1,130	1,130	493	1,130	5,933
Returns ^a	2012	2,959	3,310	355	3,310	3,310	1,775	3,310	18,329
	2013	5,254	5,240	630	5,240	5,240	3,152	5,240	29,996
	2014	1,856	0	223	0	0	1,114	0	3,193
	Total	10,890	9,680	1,307	9,680	9,680	6,534	9,680	57,451
	Fish Transport Permit (FTP) ^{b,c}	Number	09A-xxxx	09A-xxxx	06A-0042	09A-xxxx	04A-0032	06A-0047	04A-0034
	Expiration			31-Dec-11		31-Dec-09	31-Dec-11	31-Dec-09	
	Max N	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
	Lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	

^a Projected returns are calculated from Table 4 survival and age assumptions.

^b FTP 99A-0051 - for 4.1 million green eggs, expired 31 December, 2008, authorized the egg take for these projects.

^c The number of 09A-xxxx is assigned to FTPs that have been submitted for renewal or alteration.

Table 4.–Salmon survival and egg 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	LKL/SL	F	0.4-0.6	4.5%	0.01	0.31	0.01	0.39	0.24			0.05
Sockeye	LKL/SL	FG	3.0-6.0	6.5%	0.01	0.31	0.01	0.39	0.24			0.05
Sockeye	LKL/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	MC	S	20.0	1.2%	0.02	0.12		0.32		0.50		0.03

^a AL=Afognak Lake early run, ML=Malina Lake early run, LKL=Little Kitoi Lake late run, SL=Saltery Lake late run, BL=Buskin Lake, and MC=Monashka Creek.

^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 5.—Pillar Creek Hatchery late-run sockeye salmon egg-take results (Saltery Lake broodstock) from 2008, resultant juvenile releases planned for 2009, projected adult production, and fish transport permit information.

Stock information		Location				Totals
		Spiridon Lake	Ruth Lake	Upper Jennifer Lake	Lower Jennifer Lake	
Egg Take	Eggs	1,776,489	0	0	0	1,776,489 ^a
	Adults	1,439	0	0	0	1,439
Releases	N	1,500,000	0	0	0	1,500,000
	Size (g)	0.4	0.4	0.4	0.4	
	Lifestage	Fry	Fry	Fry	Fry	
	Date	07-Jul-09	07-Jul-09	07-Jul-09	07-Jul-09	
Projected	2011	338	0	0	0	338
Returns ^b	2012	21,465	0	0	0	21,465
	2013	41,985	0	0	0	41,985
	2014	3,645	0	0	0	3,645
	Total	67,433	0	0	0	67,433
Fish Transport Permit (FTP) ^c	Number	04A-0040	04A-0039	04A-0036	04A-0036	
	Expiration	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
	Max N	7,000,000	300,000	400,000	400,000	
	Lifestage	Fry	Fry	Fry	Fry	

^a An additional 615,274 eggs were taken, and 360 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, expired 31 December, 2008, authorized the egg take for these projects.

Table 6.–Pillar Creek Hatchery coho salmon egg-take results (Buskin Lake broodstock) from 2008, resultant juvenile releases planned for Road System Lakes in 2009, projected adult production, and fish transport permit information.

Stock information		Location										Totals
		Island Lake	Dark Lake	Mission Lake	P.Patch Lake	Mayflower Lake	Southern Lake	Abercrombie Lake	Chiniak Lake ^a	Pillar Creek	Monashka Creek	
Egg Take	Eggs	25,862	8,621	14,368	10,919	7,471	4,023	4,023	4,483	11,494	0	91,264
	Adults	15	5	8	6	4	2	2	3	7	0	52
Releases ^b	N	22,500	7,500	12,500	9,500	6,500	3,500	3,500	3,900	10,000	0	79,400
	Size (g)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	15.0	
	Lifestage Date	Fingerling 30-Aug-09	Fingerling 30-Aug-09	Fingerling 30-Aug-09	Smolt 03-Jun-10							
Projected	2011	1,463	488	813	618	423	0	0	0	650	0	4,453
Returns ^c	2012	0	0	0	0	0	0	0	0	0	0	0
	Total	1,463	488	813	618	423	Landlocked	Landlocked	Landlocked	650	0	4,453
Fish Transport Permit (FTP) ^{d,e}	Number	04A-0006	04A-0006	04A-0006	04A-0006	04A-0006	04A-0005	05A-0003	07A-0019	09A-xxxx	09A-xxxx	
	Expiration	31-Dec-13	01-Jul-12									
	Max N	22,500	7,500	12,500	9,500	6,500	3,500	3,500	20,000	10,000	10,000	
	Lifestage	Any	Any	Smolt								

^a Chiniak Lake is a lower stocking priority than other locations listed above; Chiniak Lake will only be stocked if all other stocking objectives are fulfilled.

^b Coho may be reared to, and released as, spring smolt depending upon hatchery Chinook salmon smolt inventory. Possible 2010 releases are not included in total releases for all locations.

^c Projected returns are calculated from Table 4 survival and age assumptions. If smolt are released in 2009, they would return in 2010 (age 1.1 fish).

^d FTP 04A-0004 - for 200,000 green eggs, expiring 31 December, 2013, authorized egg take for these projects.

^e The number of 09A-xxxx is assigned to FTPs that have been submitted for renewal or alteration.

Table 7.—Pillar Creek Hatchery Chinook salmon egg-take results (Monashka Creek broodstock) from 2007, resultant juvenile releases in 2009, projected adult production, and fish transport permit information.

Stock information		Location			Totals
		American River	Olds River	Monashka Creek	
Egg Take	Eggs	61,193	61,193	86,326	208,712
	Adults	22	22	31	74
Releases	N	56,000	56,000	79,000	191,000
	Size (g)	12.0	12.0	12.0	
	Lifestage	Smolt	Smolt	Smolt	
	Date	31-May-09	31-May-09	31-May-09	
Projected Returns ^a	2010	15	15	21	52
	2011	80	80	113	273
	2012	214	214	303	731
	2013	339	339	478	1,156
	2014	23	23	32	78
	Total	671	671	947	2,290
Fish Transport Permit (FTP) ^b	Number	07A-0017	05A-0004	05A-0050	
	Expiration	31-Dec-11	31-Dec-11	01-Sep-14	
	Max N	None	None	None	
	Lifestage	Smolt	Smolt	Smolt	

^a Projected returns are calculated from Table 4 survival and age assumptions.

^b FTP 05A-0050 - for 300,000 green eggs, expiring 1 September, 2014, authorized egg take for these projects.

Table 8.—Pillar Creek Hatchery Chinook salmon egg-take results (Monashka Creek broodstock) from 2008, resultant juvenile releases in 2010, projected adult production, and fish transport permit information.

Stock information		Location			Totals
		American River	Olds River	Monashka Creek	
Egg Take	Eggs	86,227	86,227	95,147	267,600
	Adults	53	53	58	164
Releases	N	72,500	72,500	80,000	225,000
	Size (g)	15	15	15	
	Lifestage	Smolt	Smolt	Smolt	
	Date	31-May-10	31-May-10	31-May-10	
Projected Returns ^a	2011	20	20	22	61
	2012	104	104	115	322
	2013	278	278	306	862
	2014	439	439	484	1,361
	2015	30	30	33	92
	Total	869	869	959	2,698
Fish Transport Permit (FTP) ^b	Number	07A-0017	05A-0004	05A-0050	
	Expiration	31-Dec-11	31-Dec-11	01-Sep-14	
	Max N	None	None	None	
	Lifestage	Smolt	Smolt	Smolt	

^a Projected returns are calculated from Table 4 survival and age assumptions.

^b FTP 05A-0050 - for 300,000 green eggs, expiring 1 September, 2014, authorized egg take for these projects.

Table 9.—Proposed Pillar Creek Hatchery rainbow trout egg-take results (Ft. Richardson Hatchery captive brood, original donor stock Swanson River) in 2009, eyed-egg transfer from Ft. Richardson Hatchery, resultant juvenile releases planned for Road System Lakes in 2009, and fish transport permit information.

Location	Egg Take ^{a,b}		Releases ^{a,c}				Projected Returns
	Eggs	Adults	N	Size (g)	Lifestage	Date	
Abercrombie Lake	6,556	9	4,917	2	Fingerling	15-Sep-09	Landlocked
Aurel Lake	5,315	7	3,986	2	Fingerling	15-Sep-09	Landlocked
Big (Lily) Lake	6,377	8	4,783	2	Fingerling	15-Sep-09	Landlocked
Bull Lake	3,544	5	2,658	2	Fingerling	15-Sep-09	Landlocked
Caroline Lake	2,480	3	1,860	2	Fingerling	15-Sep-09	Landlocked
Cicely Lake	2,037	3	1,528	2	Fingerling	15-Sep-09	Landlocked
Dolgoi Lake	9,124	12	6,843	2	Fingerling	15-Sep-09	Landlocked
Dragonfly Lake	2,745	4	2,059	2	Fingerling	15-Sep-09	Landlocked
Heitman Lake	5,757	7	4,318	2	Fingerling	15-Sep-09	Landlocked
Horseshoe Lake	43,937	57	1,329	2	Fingerling	15-Sep-09	Landlocked
Jack Lake	1,772	2	1,329	2	Fingerling	15-Sep-09	Landlocked
Jupiter Lake	1,772	2	4,783	2	Fingerling	15-Sep-09	Landlocked
Lee Lake	6,377	8	3,720	2	Fingerling	15-Sep-09	Landlocked
Lily Pond Lake	4,960	6	2,126	2	Fingerling	15-Sep-09	Landlocked
Long Lake	2,835	4	4,783	2	Fingerling	15-Sep-09	Landlocked
Saturn Lake	6,377	8	3,189	2	Fingerling	15-Sep-09	Landlocked
Tanignak Lake	4,252	6	7,972	2	Fingerling	15-Sep-09	Landlocked
Twin Lake	10,630	14	5,315	2	Fingerling	15-Sep-09	Landlocked

^a Unlike other salmon species, the egg take and stocking of rainbow trout occur in the same calendar year.

^b FTP 07A-0029 allows the transfer of a maximum of 92,000 eyed eggs from Ft. Richardson to PCH and expires on 31 December, 2012.

^c FTP 08A-0054 allows the release of a maximum of 92,000 juveniles into Kodiak Road System lakes and expires on 31 December, 2012.

Table 10.—Donor stock, broodstock numbers, escapement goal range, egg-take guidelines, and egg-take replacement criteria for 2009 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	Afognak Lake	1,191	20,000-50,000	10,000	11,191	10,001 - 21,190	30,958 Presmolt
Sockeye	Malina Lake	1,196	1,000-10,000	500	1,696	501- 2,195	30,826 Presmolt
Sockeye	Saltery Lake ^d	4,439	15,000-30,000	7,500	11,939	7,501 - 19,407	138,739 Presmolt
Sockeye	Little Kitoi Lake ^d	4,439	No escapement goal	n/a	n/a	none	none
Coho	Buskin Lake	64	3,200-7,200	1,600	1,664	none	none
Chinook	Monashka Creek	150	No escapement goal	n/a	n/a	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 F-H) 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 $50\% \times 20,000 + 1 = 10,001$; 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 (from Appendices I-K).

^d Broodstock numbers include approximately 470 adults for Kitoi Bay Hatchery projects (Aro and Schrof *In prep*).

Table 11.—Proposed Pillar Creek Hatchery early-run sockeye salmon egg takes (Afognak Lake or Malina Lake broodstock) in 2009, juvenile releases in 2010, projected adult production, and fish transport permit information.

Stock information		Location							Totals
		Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake	Crescent Lake	
Egg Take ^a	Eggs	369,913	246,609	123,304	184,957	123,304	246,609	123,304	1,418,000
	Adults	311	207	104	155	104	207	104	1,191
Releases	N	300,000	200,000	100,000	150,000	100,000	200,000	100,000	1,150,000
	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	01-Jun-10	01-Oct-10	01-Jun-10	01-Oct-10	01-Oct-10	01-Jun-10	01-Oct-10	
Projected Returns ^b	2012	986	2,260	329	1,695	1,130	657	1,130	7,201
	2013	3,551	6,620	1,184	4,965	3,310	2,367	3,310	21,756
	2014	6,305	10,480	2,102	7,860	5,240	4,203	5,240	35,125
	2015	2,228	0	743	0	0	1,485	0	2,228
	Total	13,068	19,360	4,356	14,520	9,680	8,712	9,680	66,308
Fish Transport Permit (FTP) Afognak Lake stock ^{c, d}	Number	09A-xxxx	09A-xxxx	06A-0042	09A-xxxx	04A-0032	06A-0047	04A-0034	
	Expiration			31-Dec-11		31-Dec-09	31-Dec-11	31-Dec-09	
	Max N	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
	Lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
Fish Transport Permit (FTP) Malina Lake stock ^{c, d}	Number	04A-0035	04A-0035	04A-0038	04A-0038	04A-0031	04A-0033	04A-0033	
	Expiration	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
	Max N	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 returns 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 2009 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2009 brood source if egg take goals cannot be achieved using Afognak Lake brood exclusively.

^b Projected returns are calculated from Table 4 survival and age assumptions.

^c FTP 99A-0051 - for 4.1 million green eggs, which expired 31 December, 2008, authorized Afognak Lake egg takes for these projects; request for a renewal has been submitted. Malina Lake egg take is provided for under FTP 04A-0042, for 4.1 million eggs, expiring 31 December, 2009.

^d The number of 09A-xxxx is assigned to FTPs that have been submitted for renewal or alteration.

Table 12.—Proposed Pillar Creek Hatchery late-run sockeye salmon egg takes (Little Kitoi Lake or Saltery Lake broodstock) in 2009, juvenile releases for Spiridon, Jennifer, and Ruth Lakes in 2010, projected adult production, and fish transport permit information.

Stock information		Location				Late-run Totals
		Spiridon Lake	U. Jennifer Lake	L. Jennifer Lake	Ruth Lake	
Egg Take ^{a, b}	Eggs	4,342,000	227,500	97,500	97,500	4,764,500
	Adults	3,614	189	81	81	3,966
Releases	N	3,340,000	175,000	75,000	75,000	3,665,000
	Size (g)	0.4	0.4	0.4	0.4	
	Lifestage	Fry	Fry	Fry	Fry	
	Date	19-Jun-10	19-Jun-10	19-Jun-10	19-Jun-10	
Projected	2012	752	39	17	17	825
Returns ^c	2013	47,795	2,504	1,073	1,073	52,446
	2014	93,487	4,898	2,099	2,099	102,583
	2015	8,116	425	182	182	8,906
	Total	150,150	7,867	3,372	3,372	164,760
Fish Transport Permit (FTP) Afognak Lake stock ^d	Number	09A-xxxx	09A-xxxx	09A-xxxx	09A-xxxx	
	Expiration					
Fish Transport Permit (FTP) ^d Malina Lake stock ^d	Max N	7,000,000	400,000	400,000	300,000	
	Lifestage	Fry	Fry	Fry	Fry	
Fish Transport Permit (FTP) ^d Malina Lake stock ^d	Number	04A-0040	04A-0036	04A-0036	04A-0039	
	Expiration	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
Fish Transport Permit (FTP) ^d Malina Lake stock ^d	Max N	7,000,000	400,000	400,000	300,000	
	Lifestage	Fry	Fry	Fry	Fry	

^a Saltery Lake sockeye salmon have been the primary broodstock for late-run stocking projects since 1997. Saltery Lake stock sockeye have been stocked into Little Kitoi Lake to build a new late-run sockeye brood source. Little Kitoi Lake is the preferred brood source for the 2009 late-run sockeye egg take. If 2009 Little Kitoi Lake escapement is insufficient to meet the Pillar Creek Hatchery egg-take goal, the 2009 late run sockeye egg take will be executed at Saltery Lake.

^b Totals do not include approximately 473 additional adult brood and 568,182 green eggs that will be utilized for Kitoi Bay Hatchery projects (Aro and Schrof In prep)

^c Projected returns are calculated from Table 4 survival and age assumptions.

^d FTP 99A-0071 - for 9.8 million green eggs, which expired 31 December, 2008, authorized the Saltery Lake egg take for these projects; request for a renewal has been submitted. FTP 04A-0041 authorizes an egg take of 9.8 million eggs at Little Kitoi Lake. New FTPs will be drafted for the release of Little Kitoi Lake juveniles as it becomes the established brood source for the late-run sockeye stocking program.

Table 13.—Proposed Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2009, resultant juvenile releases planned for Road System Lakes in 2010 (Monashka Creek in 2011), projected adult production, and fish transport permit information.

Stock information		Location										Totals
		Island Lake	Dark Lake	Mission Lake	P.Patch Lake	Mayflower Lake	Southern Lake	Abercrombie Lake	Chiniak Lake	Pillar Creek	Monashka Creek	
Egg Take	Eggs	25,916	8,639	14,398	10,942	7,487	4,031	4,031	23,037	11,518	0	110,000
	Adults	15	5	8	6	4	2	2	13	7	0	64
Releases ^a	N	22,500	7,500	12,500	9,500	6,500	3,500	3,500	20,000	10,000	0	95,500
	Size (g)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	15.0	
	Lifestage	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Smolt
	Date	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	03-Jun-11
Projected	2011	0	0	0	0	0	0	0	0	0	0	0
Returns ^b	2012	1,463	488	813	618	423	0	0	0	650	0	4,453
	Total	1,463	488	813	618	423	Landlocked	Landlocked	Landlocked	650	0	4,453
Fish Transport	Number	04A-0006	04A-0006	04A-0006	04A-0006	04A-0006	04A-0005	05A-0003	07A-0019	09A-xxxx	09A-xxxx	
Permit (FTP)	Expiration	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	01-Jul-12			
Afognak Lake	Max N	22,500	7,500	12,500	9,500	6,500	3,500	3,500	20,000	10,000	10,000	
stock ^{c, d}	Lifestage	Any	Any	Any	Any	Any	Any	Any	Any	Any	Smolt	

a Coho may be reared to spring smolt and then released into landlocked lakes, and/or Monashka Creek depending upon Chinook salmon smolt production. Possible 2011 releases are not included in column above of total releases for all locations.

b Projected returns are calculated from Table 4 survival and age assumptions.

c FTP 04A-0004 - for 200,000 green eggs, expiring 31 December, 2013, authorized egg take for these projects.

d The number of 09A-xxxx is assigned to FTPs that have been submitted for renewal or alteration.

Table 14.–Pillar Creek Hatchery Chinook salmon proposed egg take (Monashka Creek broodstock) in 2009, resultant juvenile releases in 2011, projected adult production, and fish transport permit information.

Stock information		Location			Totals
		American River	Olds River	Monashka Creek	
Egg Take	Eggs	162,500	162,500	125,000	450,000
	Adults	54	54	42	150
Releases	N	130,000	130,000	100,000	360,000
	Size (g)	12	12	12	
	Lifestage	Smolt	Smolt	Smolt	
	Date	31-May-11	31-May-11	31-May-11	
Projected	2012	35	35	27	97
Returns ^a	2013	186	186	143	515
	2014	498	498	383	1,379
	2015	787	787	605	2,178
	2016	53	53	41	147
	Total	1,559	1,559	1,199	4,317
Fish Transport	Number	07A-0017	05A-0004	05A-0050	
Permit (FTP) ^b	Expiration	31-Dec-11	31-Dec-11	01-Sep-14	
	Max N	None	None	None	
	Lifestage	Smolt	Smolt	Smolt	

^a Projected returns are calculated from Table 4 survival and age assumptions.

^b FTP 05A-0050 - for 300,000 green eggs, expiring 1 September, 2014, authorizes the egg take for these projects; request for new FTP allowing a maximum egg take of 450,000 green eggs has been submitted.

Table 15.—Estimated 2009 sockeye salmon runs as a result of Pillar Creek Hatchery stocking projects.

Lake Stocked	Broodstock ^a	Harvest Location	Run Forecast		
			Point	Range	
				Minimum	Maximum
Hidden	Afognak/Malina Lake (ER) ^b	Foul Bay SHA	15,200	9,300	33,300
Big & Little Waterfall	Afognak/Malina Lake (ER)	Waterfall Bay SHA	3,400	500	18,400
Crescent	Afognak/Malina Lake (ER)	Settler Cove SHA ^c	5,200	700	12,600
Spiridon	Saltery Lake (LR)	Spiridon Bay SHA ^d	130,000	64,900	315,000
Ruth Lake	Saltery Lake (LR)	Izhut and Ruth Bays	2,150	1,300	2,800
Jennifer Lake	Saltery Lake (LR)	Izhut and Kitoi Bays	750	200	1,100
Little Kitoi Lake ^e	Saltery Lake (LR)	Izhut and Kitoi Bays	2,500	1,200	5,000
Total Early Run:			23,800	10,500	64,300
Total Late Run:			135,400	67,600	323,900
Total Both Runs:			159,200	78,100	388,200

^a ER = early run; LR = late run

^b Afognak Lake serves as the primary brood source for early-run sockeye projects; Malina Lake is an alternate brood source. Early-run systems were stocked with BY04 Malina sockeye in 2005. In 2006, Hidden and Crescent Lakes were stocked with BY05 Afognak Lake sockeye; Big and Little Waterfall Lakes were stocked with BY05 Malina sockeye.

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

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

^e The projected return to Little Kitoi Lake of 2,500 late-run Saltery stock sockeye represents the portion of the 2009 run produced by PCH stocking of Little Kitoi Lake in 2005. The balance, and majority, of the run will be attributed to KBH stocking of Little Kitoi Lake, and the projection of those returns can be found in the Kitoi Bay Hatchery 2009 Annual Management Plan (Aro and Schrof *In Prep*).

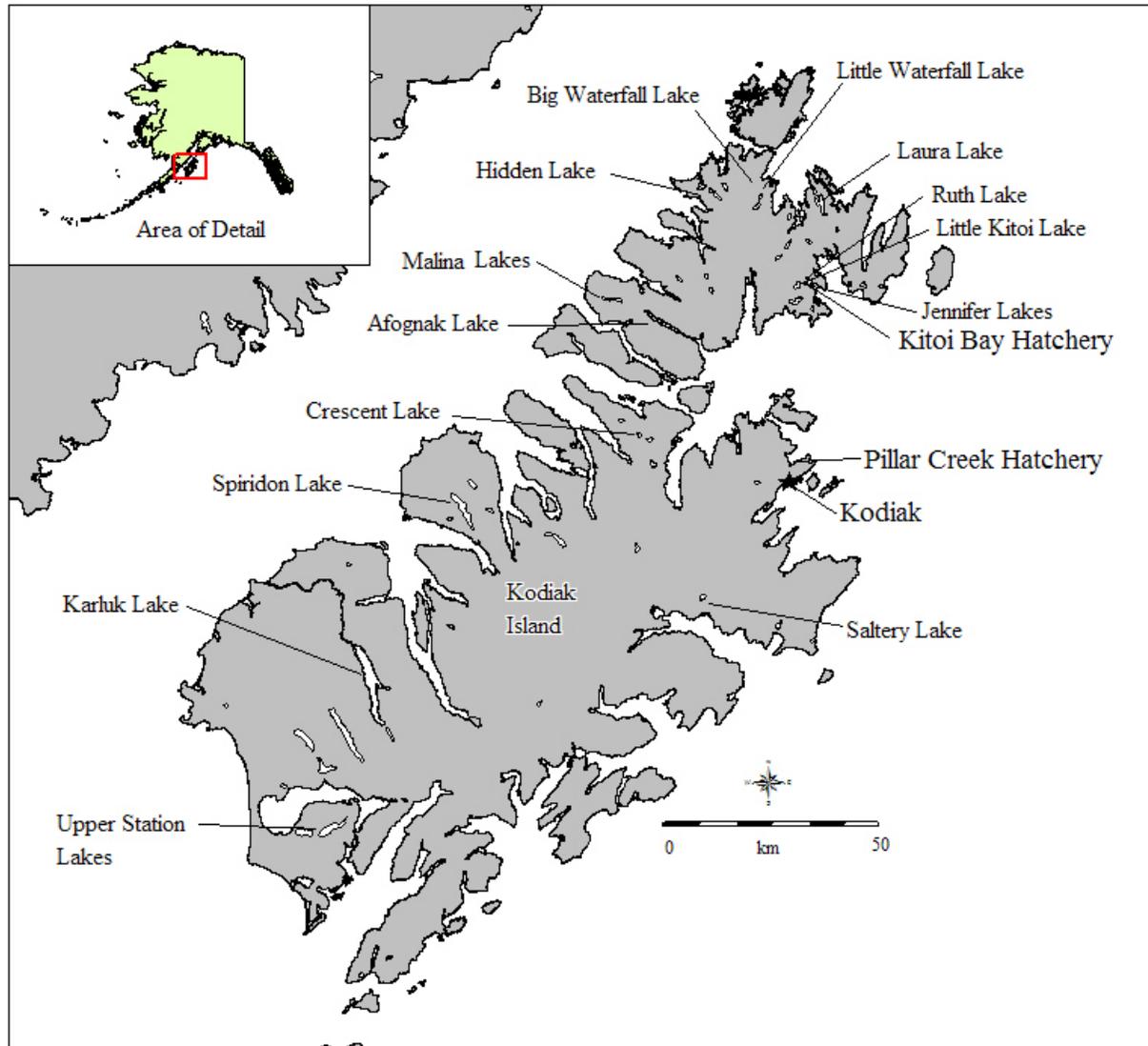


Figure 1.—Locations of past and present sockeye salmon enhancement and rehabilitation projects, and current egg take sites on Kodiak and Afognak Islands.

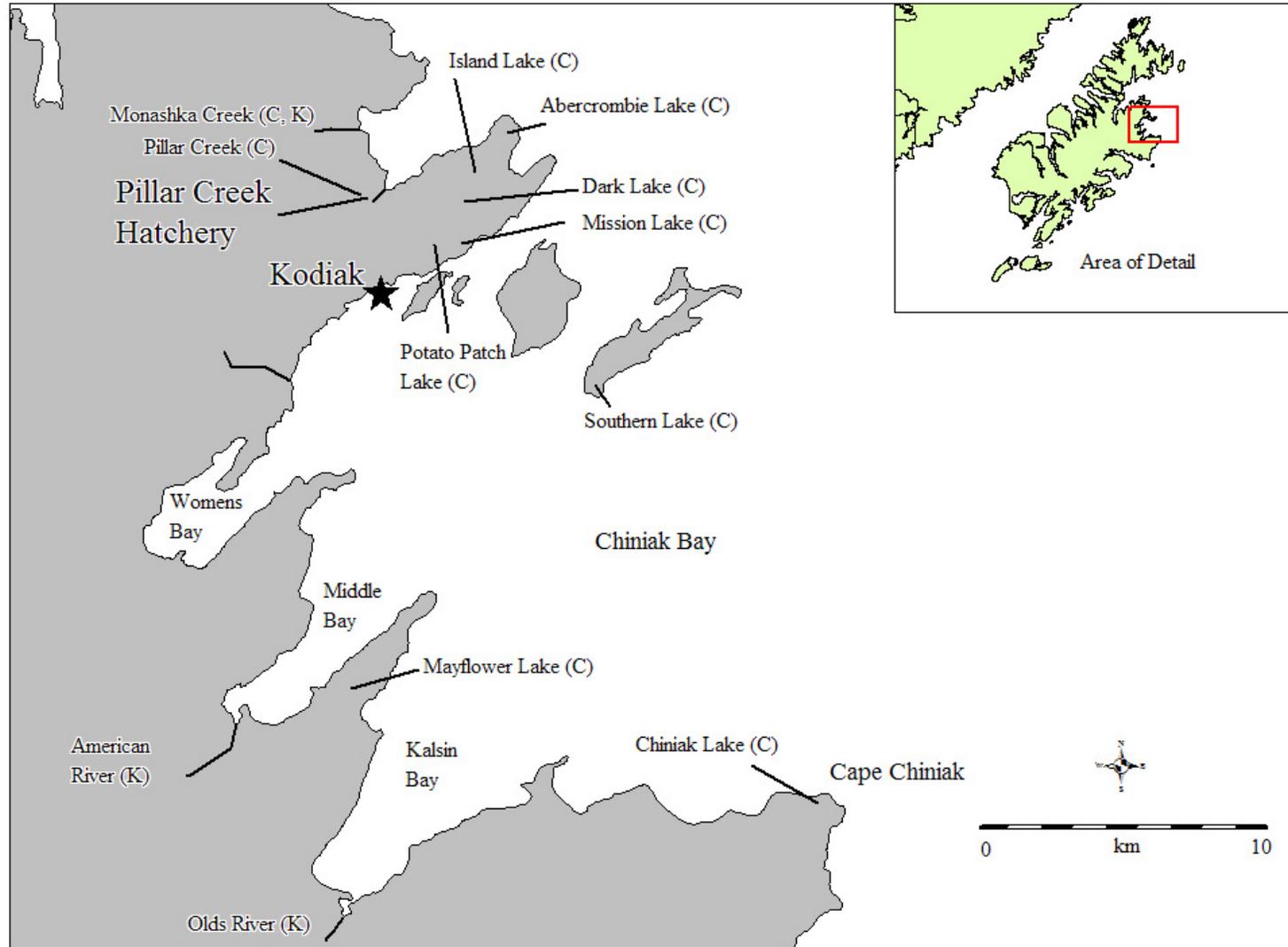


Figure 2.—Locations of Kodiak Island road system lakes and rivers that are to be stocked with coho (C) and Chinook (K) salmon in 2009.

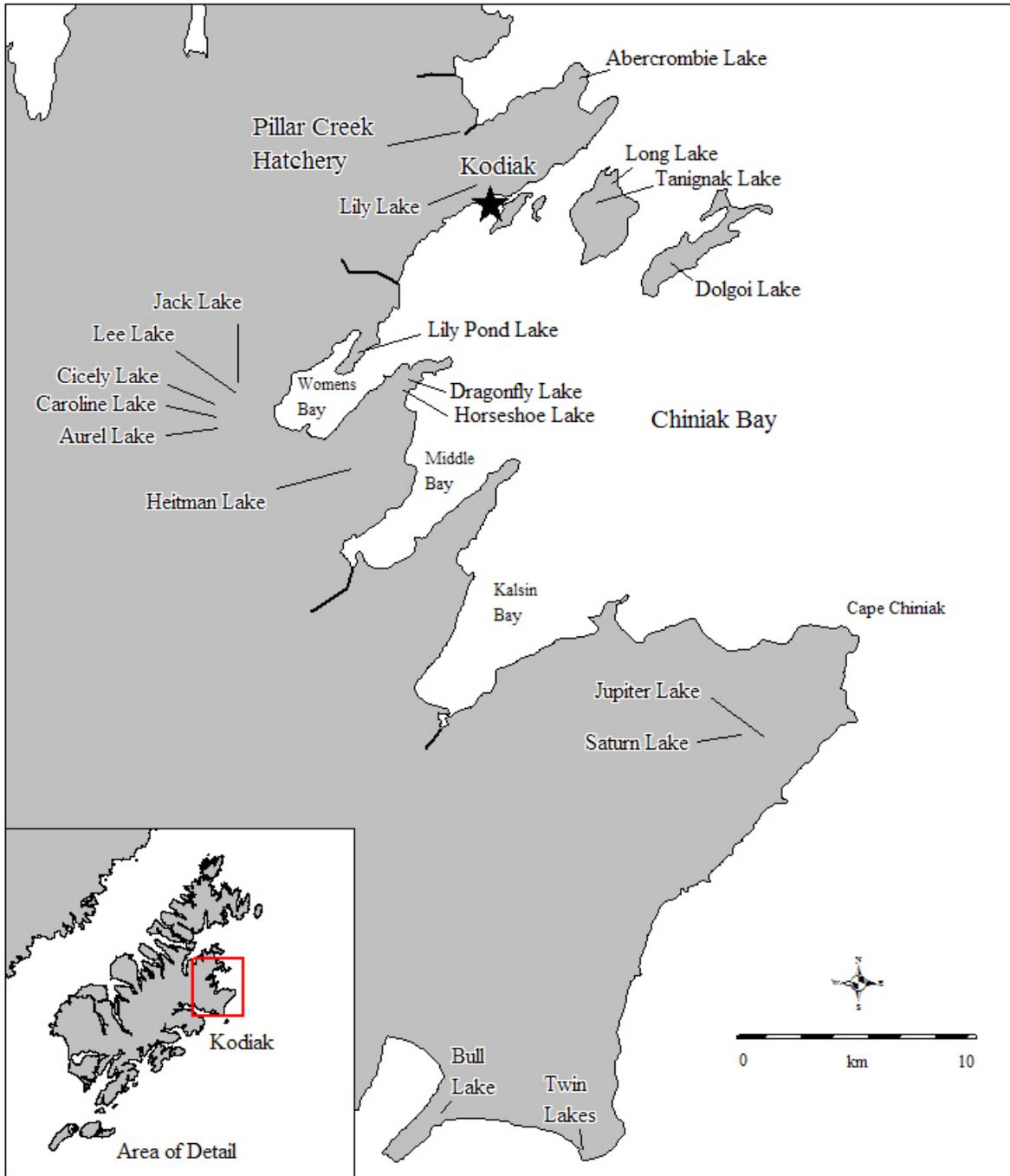


Figure 3.—Locations of Kodiak Island road system lakes that are to be stocked with rainbow trout in 2009.

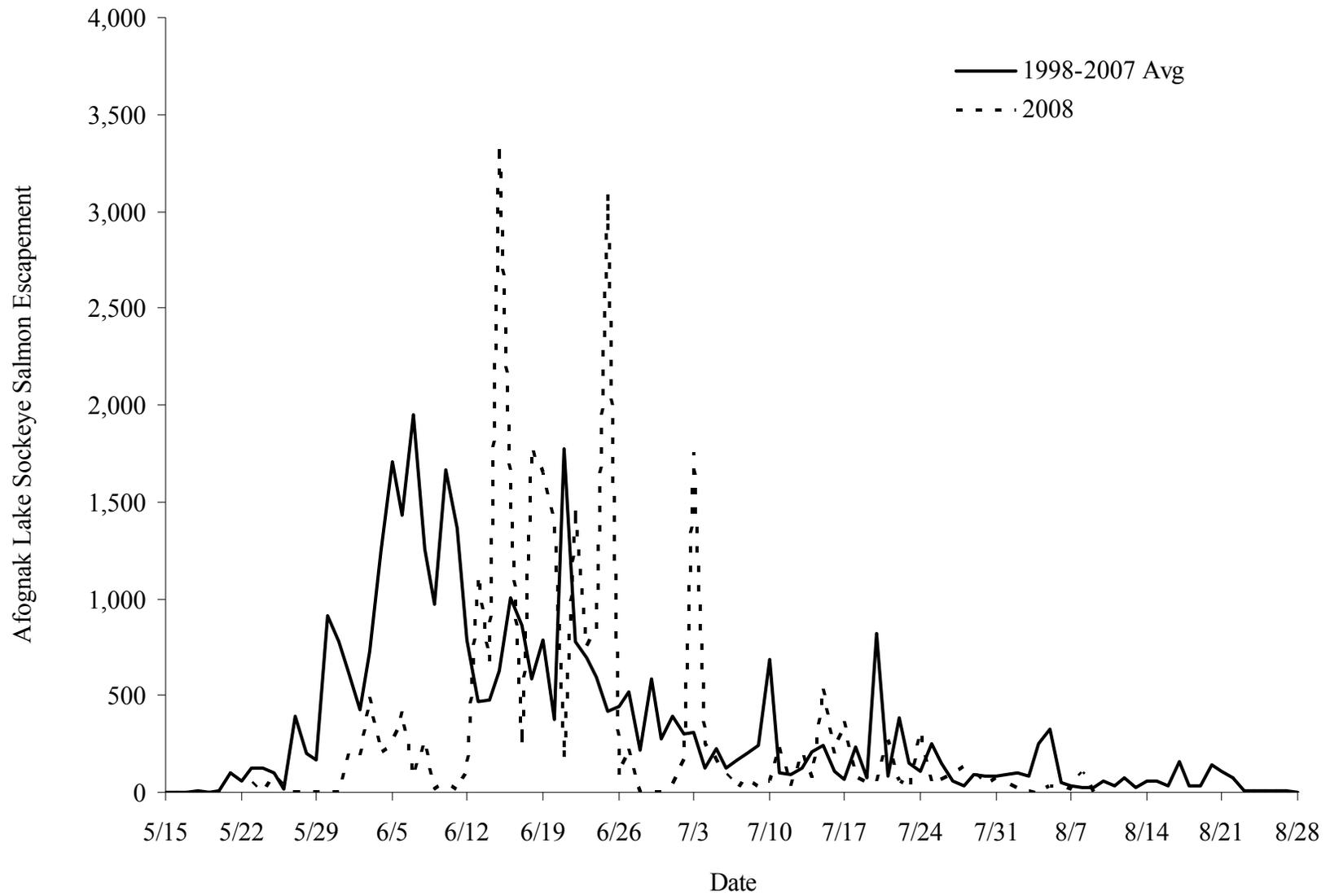


Figure 4.—Afognak Lake (Litnik) sockeye salmon average escapement timing (1997-2007) compared to the 2008 escapement timing.

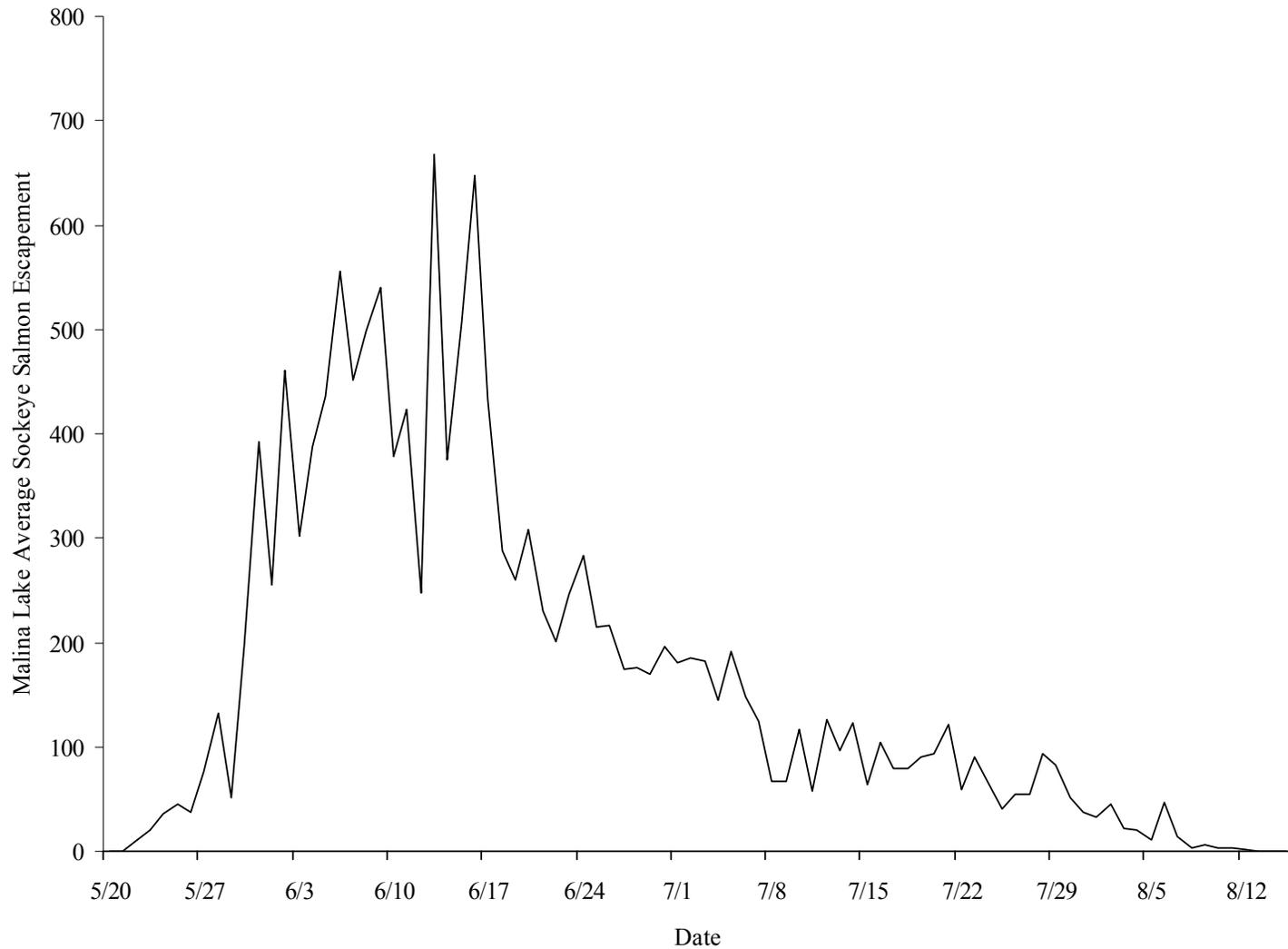


Figure 5.—Malina Lake sockeye salmon average escapement timing, 1993-2001. The weir was not operated over the entire duration of the run in 2002, 2004, and 2005, and was not operated at all in 2003 and from 2006 to 2008.

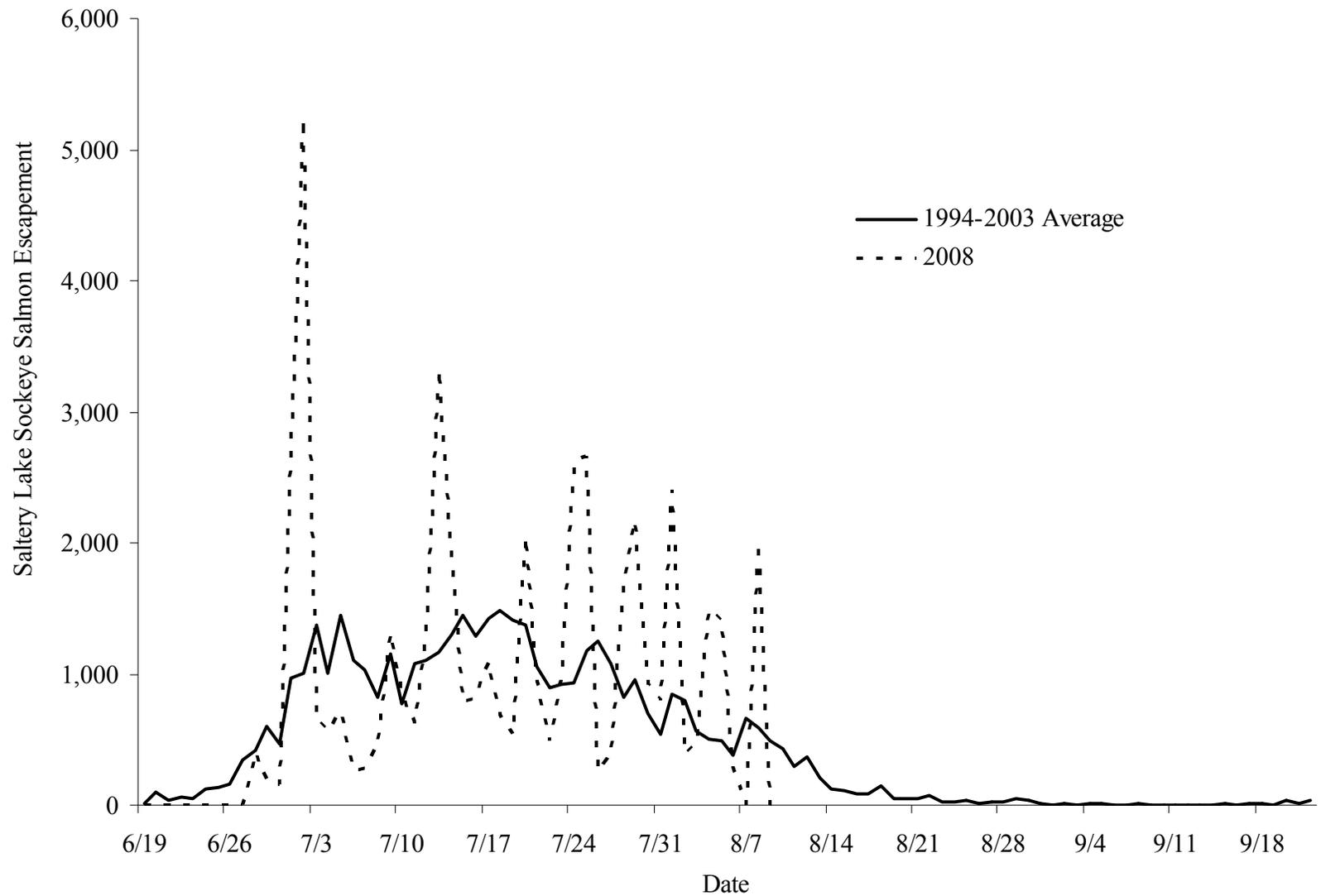


Figure 6.—Saltery Lake sockeye salmon average escapement timing, 1994-2003 compared to 2008 escapement timing. The weir was not operated from 2004 to 2007.

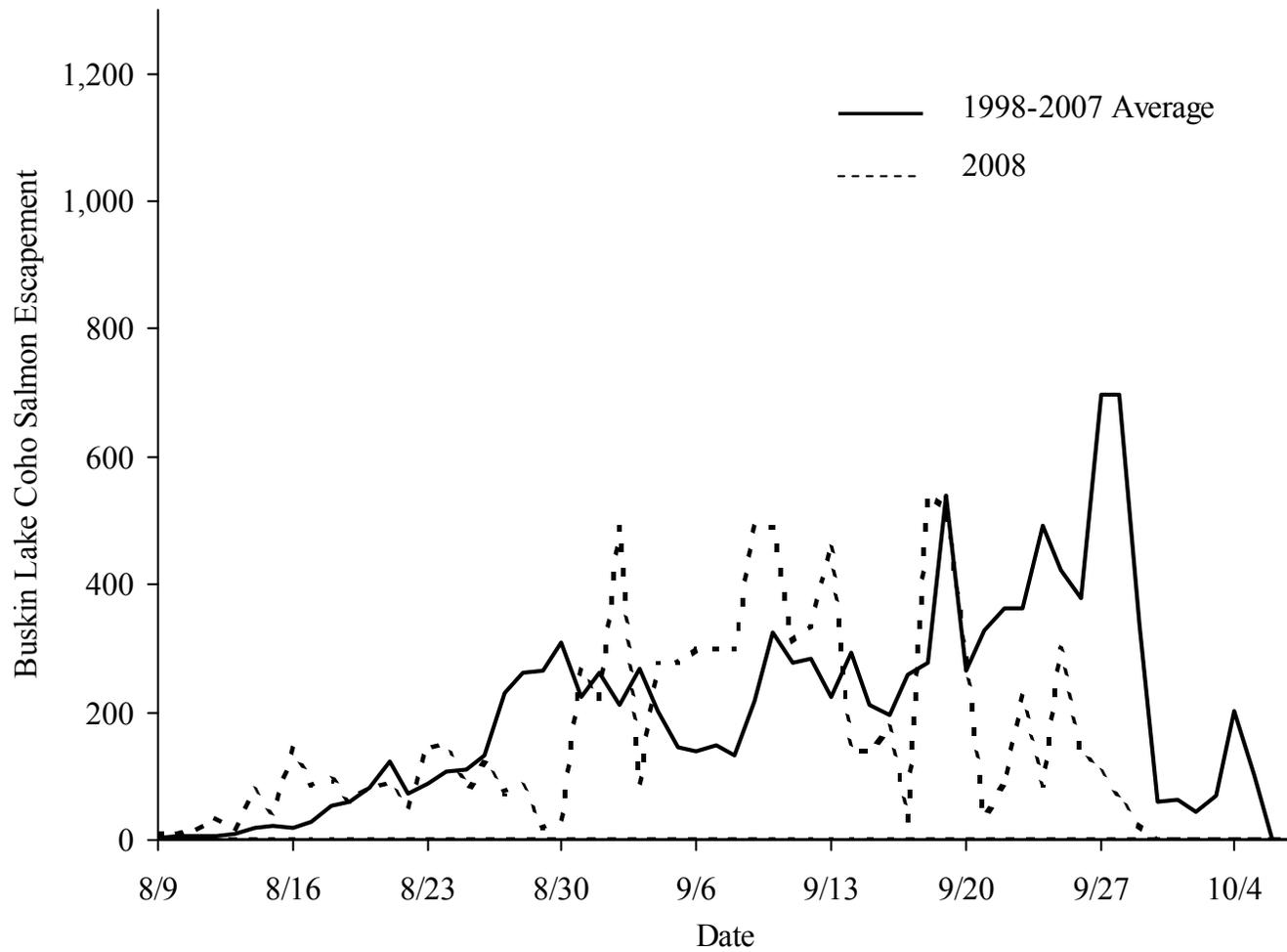


Figure 7.—Buskin River Coho salmon average escapement timing (1998-2007) compared to the 2008 escapement timing.

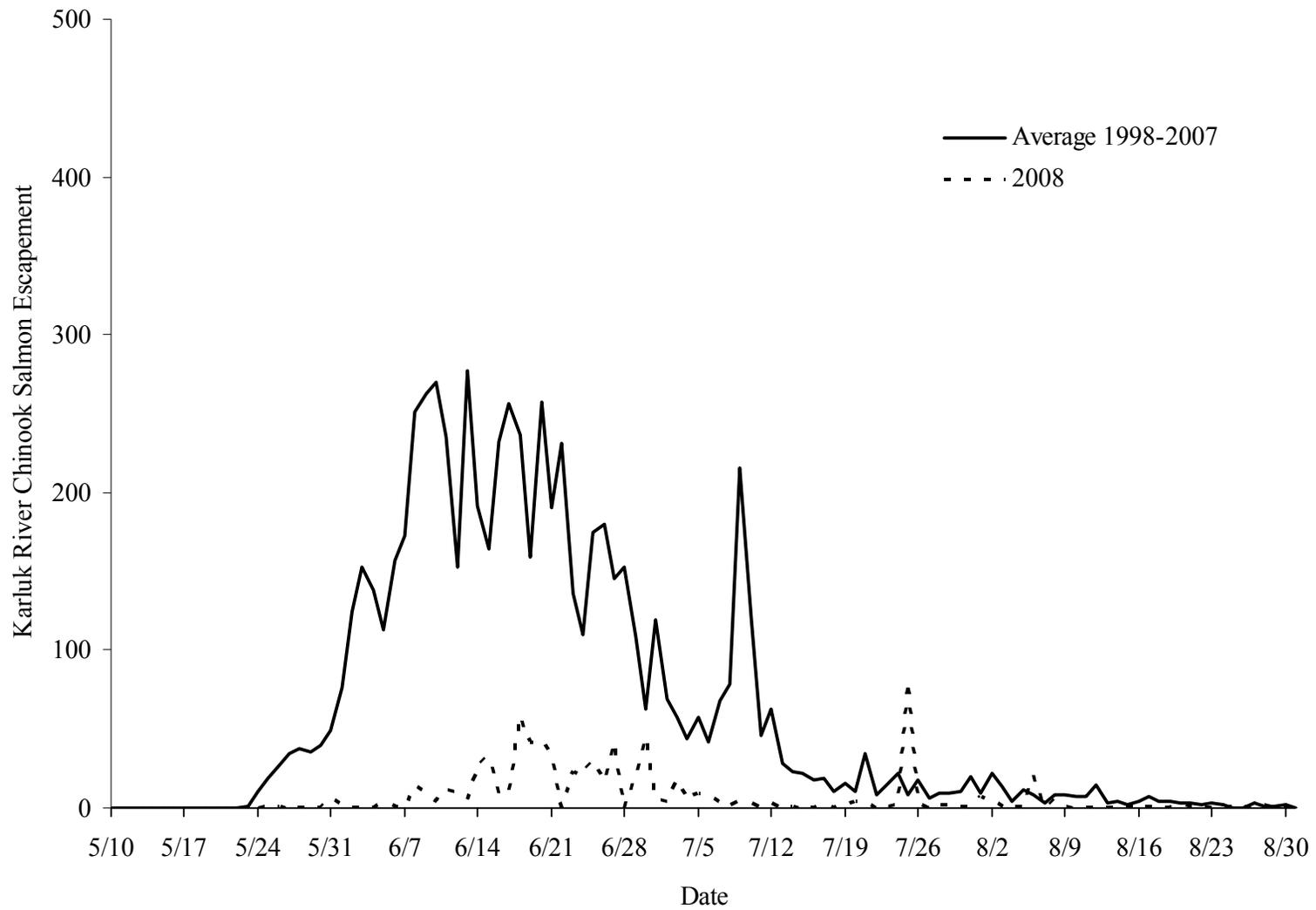


Figure 8.—Karluk River Chinook salmon average escapement timing (1998-2007) compared to the 2008 escapement timing.

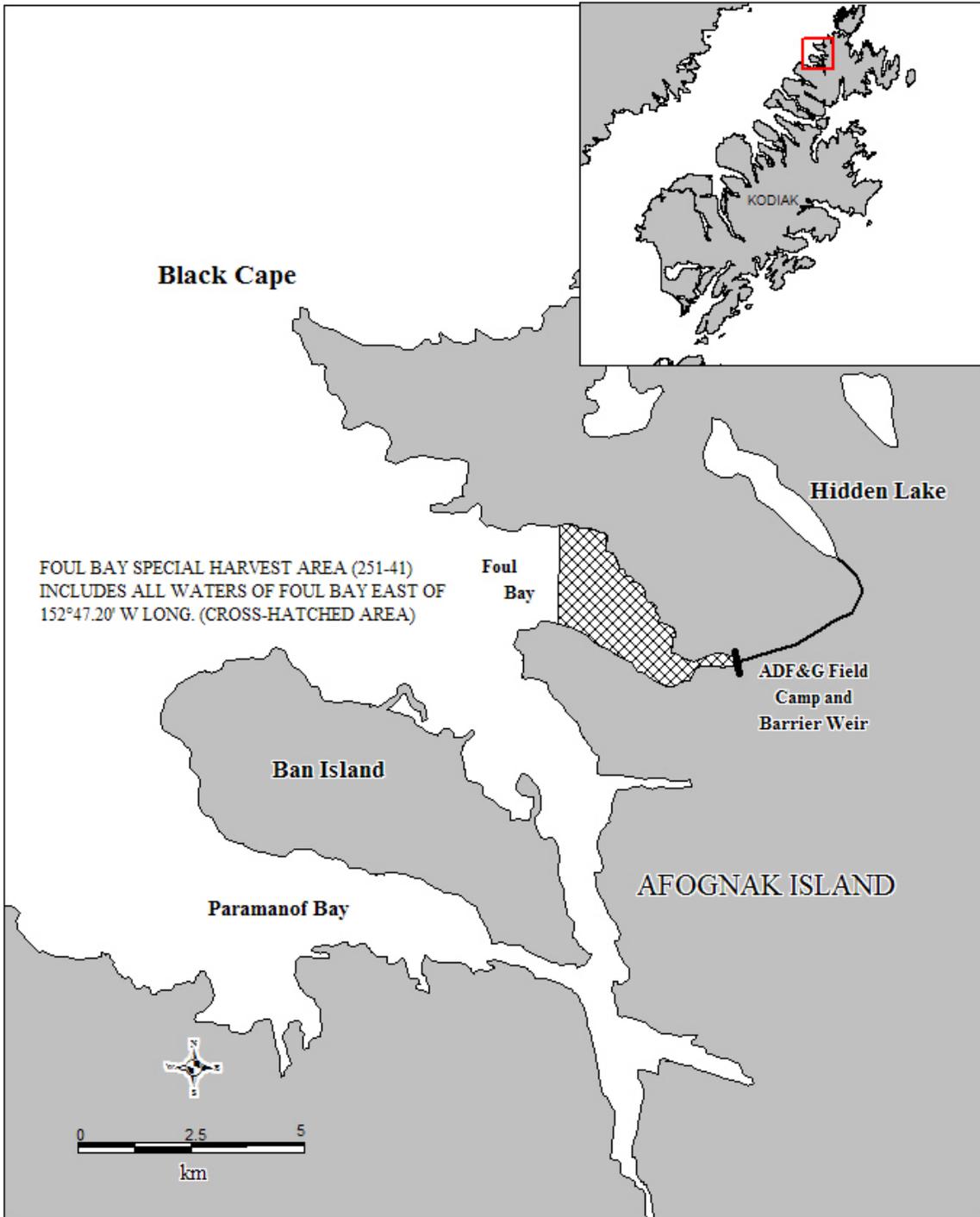


Figure 9.—Location of the Foul Bay special harvest area, and former locations of the ADF&G field camp and fish weir at Hidden Creek.

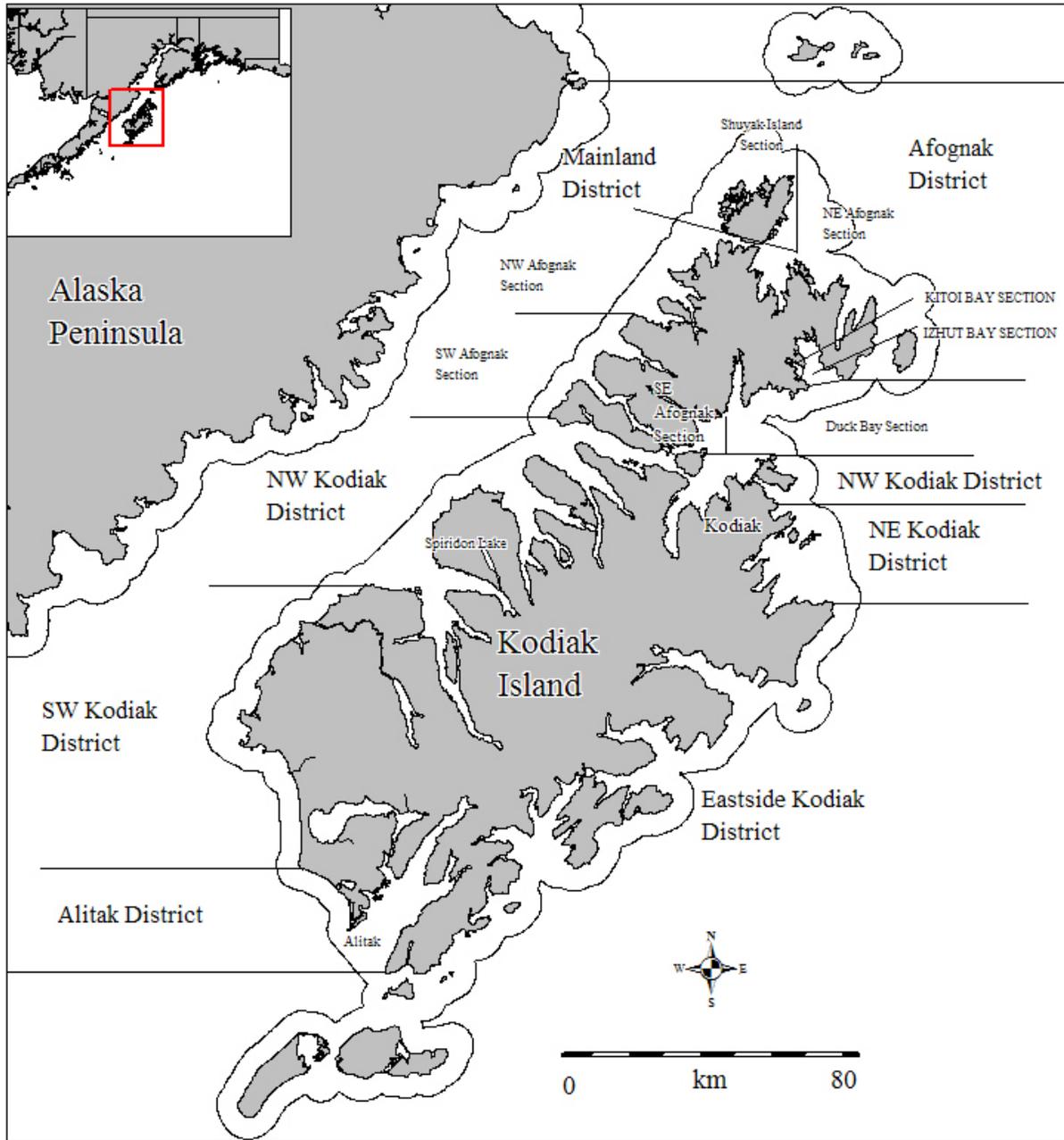


Figure 10.—Map of the Kodiak Management Area depicting commercial fishing districts and selected sections.

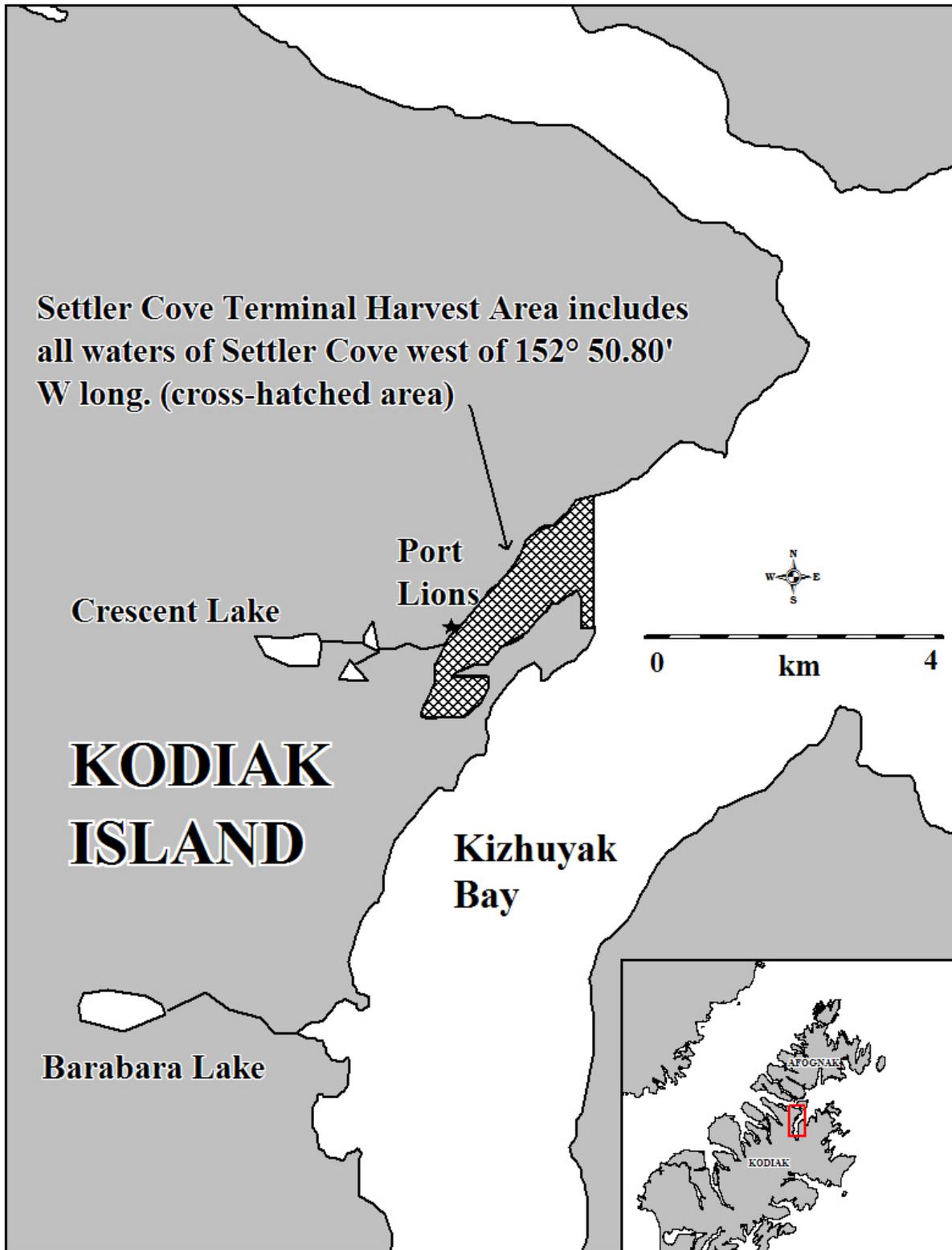


Figure 11.—Settler Cove (Crescent Lake) special harvest area boundaries in Kizhuyak Bay.

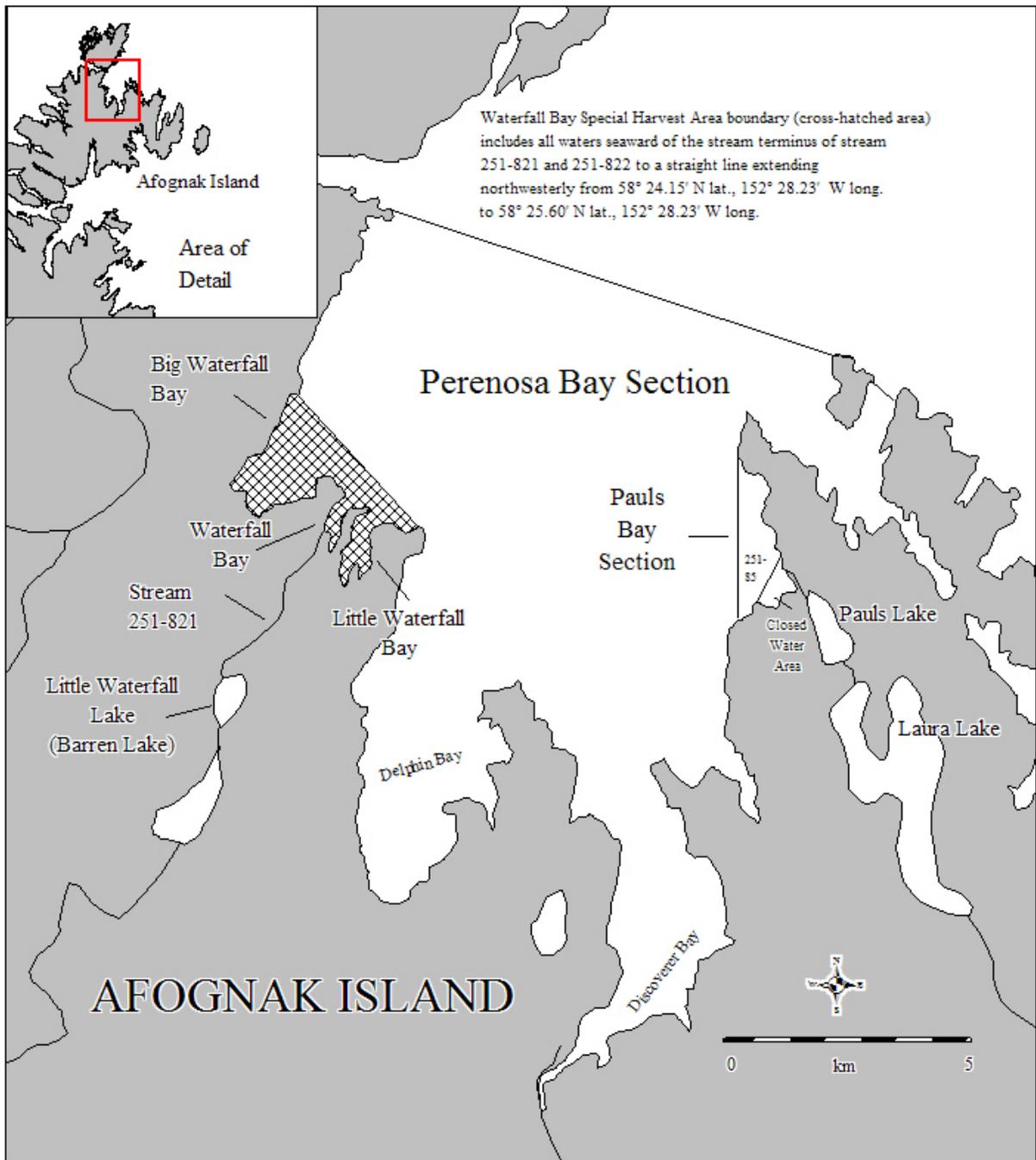


Figure 12.—Waterfall Bay (Little and Big Waterfall Lakes) special harvest area, Pauls Bay system (Pauls and Laura Lakes), and the Pauls Bay Section in Perenosa Bay.

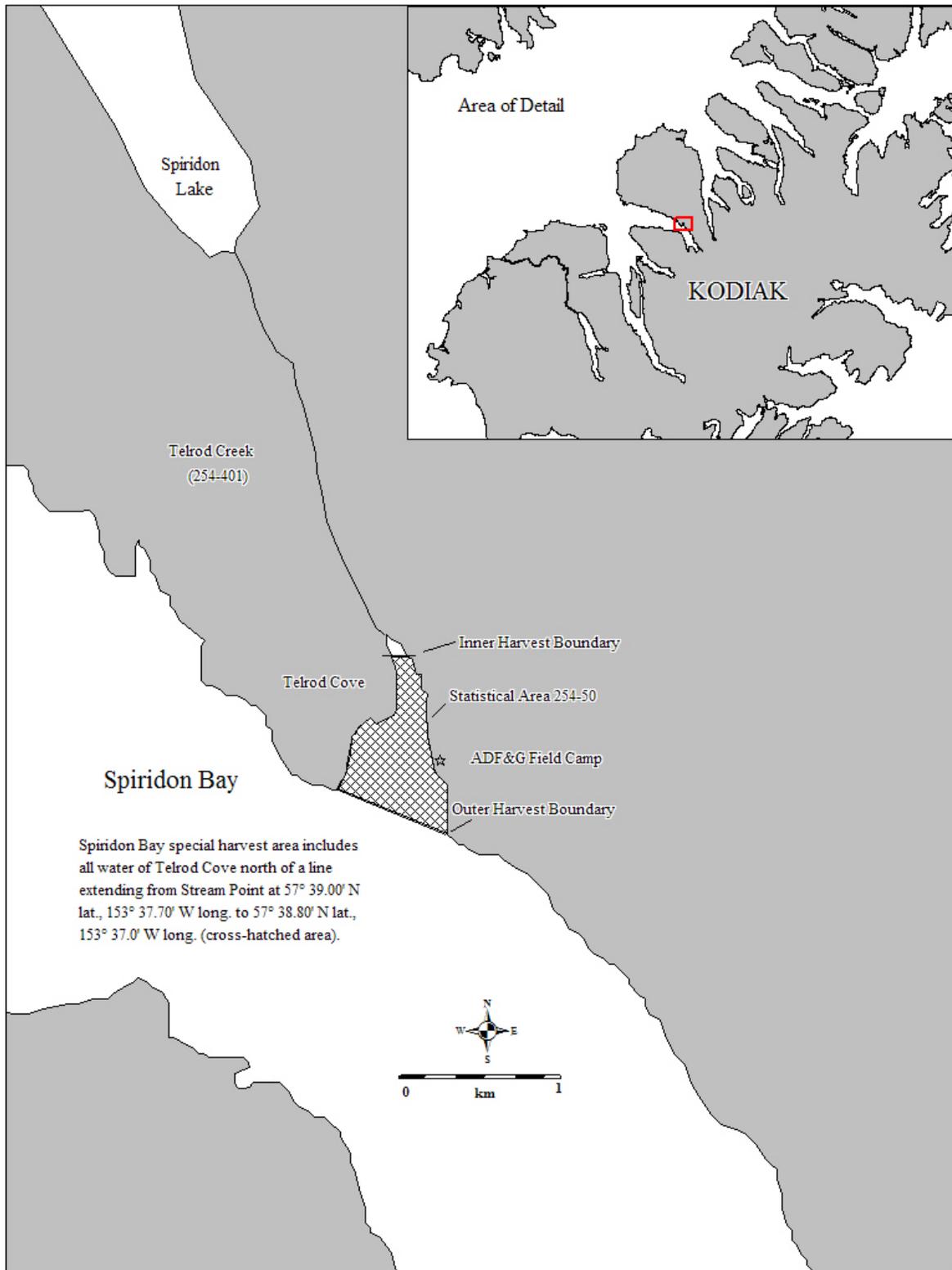


Figure 13.—Spiridon Bay (Telrod Cove) special harvest area boundaries, and ADF&G camp location in Telrod Cove.

**APPENDIX A. PILLAR CREEK ACTIVE FISH TRANSPORT
PERMIT SUMMARY**

Appendix A1.—A summary of the active (in use) Pillar Creek Hatchery fish transport permits (FTPs).

Project Name FTP Number	Issue Date	Expiration Date	Purpose
SOCKEYE: The permitted PCH sockeye salmon capacity authorized by PNP Permit Number 41 is 20,000,000 green eggs.			
Egg takes, early-run sockeye			
Afognak Lake 09A-0044	2009	2014	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 Lakes 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.
Egg takes, late-run sockeye			
Saltery Lake 09A-0052	2009	2014	Allows egg take of 11,000,000 green eggs at Saltery Lake: 9,800,000 for incubation, rearing and release by PCH, and 600,000 for transfer to Kitoi Bay Hatchery for incubation, rearing, and release.
Little Kitoi Lake 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 fingerlings, or 75,000 presmolt, incubated and reared at PCH, into Afognak Lake.
Hidden Lake 09A-0047	2009	2014	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 fingerlings, incubated and reared at PCH into Hidden Lake.
Hidden Lake 09A-0048	2009	2014	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 fingerlings, 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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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 fingerlings, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 09A-0049	2009	2014	Allows the release of up to 200,000 Afognak Lake stock presmolts, 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 fingerlings, 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 09A-0045	2009	2014	Allows the release of up to 250,000 Afognak Lake stock fingerlings, 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 presmolts, 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, fingerlings and presmolts, 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 09A-0046	2009	2014	Allows the release of up to 500,000 Afognak Lake stock fingerlings, 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 presmolts, 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 fingerlings, 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.
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 fingerlings, or 200,000 presmolts, incubated and at PCH, into Saltery Lake.
Spiridon Lake 09A-0050	2009	2014	Allows the release of up to 7,000,000 Saltery Lake stock fingerlings, incubated and reared at PCH into Spiridon Lake.

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Project Name FTP Number	Issue Date	Expiration Date	Purpose
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 presmolts, 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 fingerlings, and 150,000 presmolts, incubated and reared at PCH, into Little Kitoi
Ruth Lake 09A-0051	2009	2014	Allows the release of up to 300,000 Saltery Lake stock fingerlings, 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 presmolts, 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 presmolts, incubated and reared at PCH, into Jennifer Lake.
COHO SALMON: The permitted PCH coho capacity authorized by PNP Permit Number 41 is 500,000 green eggs.			
Egg takes, coho			
Buskin Lake 04A-0004	1/1/2004	12/31/2013	Allows egg take from 50 spawning pairs 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 7,500 into Dark Lake 12,500 into Mission Lake 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.
Abercrombie Lake 05A-0003	1/1/2005	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	1/1/2005	12/31/2013	Allows the release of up to 10,000 Buskin Lake stock juveniles, incubated and reared at PCH, into Big (Lily) Lake.
Chiniak Lagoon 07A-0019	3/15/2007	7/1/2012	Allows the release of up to 20,000 Buskin Lake stock juveniles, incubated and reared at PCH, into Chiniak Lagoon.
Monashka Creek 09A-xxxx	2009	2014	Allows the release of up to 10,000 Buskin Lake stock smolt, incubated and reared at PCH, into Monashka Creek. Replaces / renews FTP# 04A-0007.
Pillar Creek 09A-xxxx	2009	2014	Allows the release of up to 10,000 Buskin Lake stock juveniles, incubated and reared at PCH, into Pillar Creek. This is a new stocking location.

–continued–

Project Name FTP Number	Issue Date	Expiration Date	Purpose
CHINOOK SALMON: The permitted PCH Chinook capacity authorized by PNP Permit Number 41 is 300,000 green eggs. A Permit Alteration Request to increase capacity to 450,000 green eggs in 2009 is under review.			
Egg takes, Chinook			
Monashka Creek 09A-xxxx	2009	2014	Allows egg take of 450,000 green eggs at Monashka Creek, incubation and rearing at PCH, and release of the resultant smolt into Monashka Creek, the Olds River, and the American River. Replaces / renews FTP# 05A-0050.
Stocking, Chinook			
Monashka Creek			see above
American River 07A-0017	5/1/2007	12/31/2011	Allows the release of Chinook smolt resulting from the Monashka egg take, incubated and reared at PCH, into the American River. No fish.
Olds River 07A-0020	5/1/2007	12/31/2011	Allows the release of Chinook smolt resulting from the Monashka egg take, incubated and reared at PCH, into the Olds River. No fish.
RAINBOW TROUT: The permitted PCH coho capacity authorized by PNP Permit Number 41 is 92,000 green eggs.			
Egg transfer, rainbow trout			
Ft. Richardson transfer 07A-0029	3/20/2007	12/31/2012	Allows transfer of 92,000 eyed all-female 3N triploid eggs from ADF&G's Ft. Richardson Hatchery in Anchorage to PCH; incubation and rearing at PCH, and release of the resultant juveniles into Road System Lakes.
Stocking, rainbow trout			
Road System Lakes 08A-0054	1/26/2007	7/31/2012	Allows the release of Ft. Richardson Hatchery stock juveniles donor stock; Swanson River), incubated and reared at PCH, into Kodiak road system lakes, as follows: 6,440 into Abercrombie (Gertrude) Lake 5,520 into Aurel Lake 6,440 into Big (Lily) Lake 3,680 into Bull Lake 2,760 into Caroline Lake 1,840 into Cicely Lake 9,200 into Dolgoi Lake 2,760 into Dragonfly Lake 5,520 into Heitman Lake 1,840 into Horseshoe Lake 1,840 into Jack Lake 6,440 into Jupiter Lake 5,520 into Lee Lake 2,760 into Lily Pond Lake 6,440 into Long Lake 4,600 into Saturn Lake 11,040 into Taignak Lake 7,360 into Twin Lake

Note: Bold text denotes FTPs that have been submitted for renewal, alteration, or new projects. Summaries in this table reflect the language and figures of the new permit requests.

**APPENDIX B. PILLAR CREEK HATCHERY SALMON EGG
TAKES, 1991-2009**

Appendix B1.—Release locations from the Pillar Creek Hatchery Afognak Lake sockeye salmon egg takes, 1991-2009.

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

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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	70,700	2004	Hidden Lake
			32,100	2004	Little Waterfall Lake
			0	2004	Big Waterfall Lake
			22,600	2004	Crescent Lake
2004 ^a	0	0.0	0	2005	
2005 ^b	1,296	1.3	421,700	2006	Hidden Lake
			0	2006	Little Waterfall Lake
			238,000	2006	Crescent Lake
2006	1,445	1.7	500,300	2007	Hidden Lake
			249,500	2007	Little Waterfall Lake
			100,000	2007	Big Waterfall Lake
			309,000	2007	Crescent Lake
2007	1,037	1.3	353,800	2008	Hidden Lake
			252,400	2008	Little Waterfall Lake
			46,600	2008	Big Waterfall Lake
			345,200	2008	Crescent Lake
2008 ^c	822	1.0	350,000	2009	Hidden Lake
			130,000	2009	Little Waterfall Lake
			100,000	2009	Big Waterfall Lake
			250,000	2009	Crescent Lake

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Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
2009 ^d	1,191	1.4	500,000	2010	Hidden Lake
			250,000	2010	Little Waterfall Lake
			100,000	2010	Big Waterfall Lake
			300,000	2010	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 egg take; 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 Brood year 2008 and 2009 stocking figures are projected.

^d Afognak Lake is the preferred brood source for the 2009 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2008 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 B2.–Sockeye salmon egg takes at Little Kitoi Lake, 1992-2009.

Brood Year	Adult Salmon	Eggs (millions)	Stock of origin	Hatchery ^a	Number Stocked	Year Stocked	Stocking Location
1992	1,011	0.59	U. Station	KBH	0	1993	Little Kitoi Bay
1993	1,050	1.10	U. Station	KBH	880,000	1995	Little Kitoi Bay
1994	600	1.50	U. Station	KBH	150,000	1995	Little Kitoi Lake
					300,000	1995	Jennifer Lake
					880,000	1996	Little Kitoi Bay
1995	155	0.19	U. Station	KBH	150,000	1996	Little Kitoi Lake
1996	1,210	1.20	U. Station	KBH	150,000	1997	Little Kitoi Lake
					580,000	1998	Little Kitoi Bay
1997 ^b	0	0.00	U. Station	PCH	0	1998	Little Kitoi Lake
					0	1998	Spiridon Lake
					0	1998	Ruth Lake
					0	1998	Jennifer Lake
					0	1999	Little Kitoi Bay
2004 ^c	0	0.00	Saltery Lake	PCH	0	2005	No egg take conducted
2005	0	0.00	Saltery Lake	PCH	0	2006	No egg take conducted
2006	0	0.00	Saltery Lake	PCH	0	2007	No egg take conducted
2007	0	0.00	Saltery Lake	PCH	0	2008	No egg take conducted
2008	0	0.00	Saltery Lake	PCH	0	2009	No egg take conducted
2009 ^d	4,439	4.76	Saltery Lake	PCH	3,340,200	2010	Spiridon Lake
					75,000	2010	Ruth Lake
					250,000	2010	Jennifer Lake
						2010	Little Kitoi Lake
					100,000	2010	Little Kitoi Lake
	2011	Little Kitoi Lake					

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

^b Little Kitoi Lake was a contingency egg-take location in 1997; the late run sockeye brood source for KRAA projects was changed from Upper Station to Saltery Lake stock in 1997.

^c 2004 was the first year that the late run sockeye return to Little Kitoi Lake was composed exclusively of Saltery Lake origin stock, and that Little Kitoi Lake sockeye could be considered as the new late run sockeye brood source for KRAA projects. Little Kitoi Lake sockeye escapements from 2004-2008 were not sufficient to support egg-take goals. Little Kitoi Lake is the preferred brood source for the 2009 late run sockeye egg take; Saltery Lake is the alternate brood source.

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

Appendix B3.–Pillar Creek Hatchery coho salmon egg takes, 1991-2009.

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	48,600	2006	"
2005	39	76,600	33,000	2006	"
	17	19,800	8,500	2007	"
2006	60	114,500	75,200	2007	"
	0	0	0	2008	"
2007	56	92,600	88,500	2008	"
	0	0	0	2009	"
2008	52	91,300	79,400	2009	"
	0	0	0	2010	"
2009	64	110,000	95,500	2010	"
	0	0	0	2011	"

^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 B4.—Release locations from the Pillar Creek Hatchery Chinook salmon eggtakes, 2000-2009.

Brood Year ^a	Adult Salmon	Number of Eggs	Number Stocked	Year Stocked	Stocking Location
2000	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	92	208,700	46,800	2007	Monashka Creek
			28,200	2007	American River
			28,300	2007	Olds River
2006	123	357,100	113,100	2007	Island Lake
			10,000	2007	Abercrombie Lake
			60,000	2008	Monashka Creek
			44,250	2008	American River
			44,250	2008	Olds River
2007	83	208,700	86,300	2009	Monashka Creek
			61,200	2009	American River
			61,200	2009	Olds River
2008	139	269,600	80,000	2010	Monashka Creek
			72,500	2010	American River
			72,500	2010	Olds River
2009	150	450,000	125,000	2011	Monashka Creek
			162,500	2011	American River
			162,500	2011	Olds River

^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. Since 2005 egg takes have been conducted at Monashka Creek utilizing a portion of the return as brood. Monashka Creek is now the established brood source for the KRAA/ADF&G Cooperative Kodiak Road System Chinook Enhancement Project.

Appendix B5.–Pillar Creek Hatchery sockeye salmon egg takes at Malina Lake, 1991-2008.

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	184,600	2006	Little Waterfall Lake
			75,100	2006	Big Waterfall Lake
			80,800	2006	Malina Lake
2006 ^d	0	0.000	0	2007	No egg take conducted
2007 ^d	0	0.000	0	2008	No egg take conducted
2008 ^d	0	0.000	0	2008	No egg take conducted
2009 ^e	1,196	1.418	500,000	2009	Hidden Lake
			250,000	2009	Little Waterfall Lake
			100,000	2009	Big Waterfall Lake
			300,000	2009	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 is the primary early-run sockeye broodstock, but the low 2004 Afognak Lake escapement precluded conducting an egg take.
- ^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 No egg take occurred at Malina Lake in 2006 through 2008. Afognak Lake is the preferred brood source for the early-run sockeye egg take, and escapement has been sufficient to allow the full egg-take goal to be achieved there since 2005.
- ^e Afognak Lake is the preferred brood source for the 2009 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2008 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 B6.—Sockeye salmon egg takes at Saltery Lake, 1994-2009.

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	20,000	2005	Little Kitoi Lake
			KBH	380,000	2006	Little Kitoi Lake

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Brood Year	Adult Salmon	Eggs (millions)	Hatchery ^a	Number Stocked	Year Stocked	Stocking Location
2005	5,422	6.39	PCH	3,196,500	2006	Spiridon Lake
			PCH	46,800	2006	Ruth Lake
			PCH	22,900	2006	Jennifer Lake
			PCH	0	2006	Little Kitoi Lake
			KBH	206,900	2006	Little Kitoi Lake
			KBH	404,000	2007	Little Kitoi Lake
2006	3,537	4.41	PCH	1,810,100	2007	Spiridon Lake
			PCH	72,600	2007	Ruth Lake
			PCH	342,300	2007	Jennifer Lake
			PCH		2007	Little Kitoi Lake
			KBH	133,500	2007	Little Kitoi Lake
			KBH	415,000	2008	Little Kitoi Lake
2007	1,818	2.19	PCH	1,049,800	2008	Spiridon Lake
			PCH	0	2008	Ruth Lake
			PCH	0	2008	Jennifer Lake
			PCH	0	2008	Little Kitoi Lake
			KBH	116,500	2008	Little Kitoi Lake
			KBH	400,000 ^b	2009	Little Kitoi Lake
2008 ^b	1,799	2.39	PCH	1,500,000	2009	Spiridon Lake
			PCH	0	2009	Ruth Lake
			PCH	0	2009	Jennifer Lake
			PCH	0	2009	Little Kitoi Lake
			KBH	100,000	2009	Little Kitoi Lake
			KBH	400,000	2010	Little Kitoi Lake
2009 ^c	4,439	4.76	PCH	3,340,000	2010	Spiridon Lake
			PCH	75,000	2010	Ruth Lake
			PCH	250,000	2010	Jennifer Lake
			PCH		2010	Little Kitoi Lake
			KBH	100,000 ^b	2010	Little Kitoi Lake
			KBH	400,000 ^b	2011	Little Kitoi Lake

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

^b Stocking figures for brood year 2008 and 2009, and for the KBH 2009 release of brood year 2007 smolt, are projected.

^c Little Kitoi Lake is the preferred brood source for the 2009 late run sockeye egg take. Saltery Lake sockeye may be utilized as a 2009 brood source if Little Kitoi Lake escapement is insufficient to meet egg-take goals; egg-take goal to be determined after inseason limnology evaluation.

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

Appendix C1.—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Afognak Lake, 2009.

50%								
Lower			50% Lower			50% Lower		
Bound	2009	Broodstock	Bound	2009	Broodstock	Bound	2009	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	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 C2.—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Malina Lake, 2009.

50% Lower Bound			50% Lower Bound			50% Lower Bound		
EGR	2009 Escapement	Broodstock Allowed	EGR	2009 Escapement	Broodstock Allowed	EGR	2009 Escapement	Broodstock 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 C3.—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Saltery Lake, 2009.

50% Lower Bound			50% Lower Bound			50% Lower Bound		
EGR	2009 Escapement	Broodstock Allowed	EGR	2009 Escapement	Broodstock Allowed	EGR	2009 Escapement	Broodstock 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 C4.–Worksheet for calculating sockeye salmon "replacement" options for adult removals from Afognak Lake, 2009.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females ^a	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer RECOMMENDED ^b Fingerling (3.0 g)	Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer RECOMMENDED ^b Fingerling (3.0 g)	Fall Presmolt (8-10 g)
300	180	421,200	29,484	6,192	619	30,958	15,479	7,740	619	619	619
350	210	491,400	34,398	7,224	722	36,118	18,059	9,029	722	722	722
400	240	561,600	39,312	8,256	826	41,278	20,639	10,319	826	826	826
450	270	631,800	44,226	9,287	929	46,437	23,219	11,609	929	929	929
500	300	702,000	49,140	10,319	1,032	51,597	25,799	12,899	1,032	1,032	1,032
550	330	772,200	54,054	11,351	1,135	56,757	28,378	14,189	1,135	1,135	1,135
600	360	842,400	58,968	12,383	1,238	61,916	30,958	15,479	1,238	1,238	1,238
650	390	912,600	63,882	13,415	1,342	67,076	33,538	16,769	1,342	1,342	1,342
700	420	982,800	68,796	14,447	1,445	72,236	36,118	18,059	1,445	1,445	1,445
750	450	1,053,000	73,710	15,479	1,548	77,396	38,698	19,349	1,548	1,548	1,548
800	480	1,123,200	78,624	16,511	1,651	82,555	41,278	20,639	1,651	1,651	1,651
850	510	1,193,400	83,538	17,543	1,754	87,715	43,857	21,929	1,754	1,754	1,754
900	540	1,263,600	88,452	18,575	1,857	92,875	46,437	23,219	1,857	1,857	1,857
950	570	1,333,800	93,366	19,607	1,961	98,034	49,017	24,509	1,961	1,961	1,961
1,000	600	1,404,000	98,280	20,639	2,064	103,194	51,597	25,799	2,064	2,064	2,064
1,050	630	1,474,200	103,194	21,671	2,167	108,354	54,177	27,088	2,167	2,167	2,167
1,100	660	1,544,400	108,108	22,703	2,270	113,513	56,757	28,378	2,270	2,270	2,270
1,150	690	1,614,600	113,022	23,735	2,373	118,673	59,337	29,668	2,373	2,373	2,373
1,200	720	1,684,800	117,936	24,767	2,477	123,833	61,916	30,958	2,477	2,477	2,477
1,250	750	1,755,000	122,850	25,799	2,580	128,993	64,496	32,248	2,580	2,580	2,580
1,300	780	1,825,200	127,764	26,830	2,683	134,152	67,076	33,538	2,683	2,683	2,683
1,350	810	1,895,400	132,678	27,862	2,786	139,312	69,656	34,828	2,786	2,786	2,786
1,400	840	1,965,600	137,592	28,894	2,889	144,472	72,236	36,118	2,889	2,889	2,889
1,450	870	2,035,800	142,506	29,926	2,993	149,631	74,816	37,408	2,993	2,993	2,993
1,500	900	2,106,000	147,420	30,958	3,096	154,791	77,396	38,698	3,096	3,096	3,096

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Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females ^a	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 ^b Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^b Fall Presmolt (8-10 g)
1,550	930	2,176,200	152,334	31,990	3,199	159,951	79,975	39,988	3,199	3,199	3,199
1,600	960	2,246,400	157,248	33,022	3,302	165,110	82,555	41,278	3,302	3,302	3,302
1,650	990	2,316,600	162,162	34,054	3,405	170,270	85,135	42,568	3,405	3,405	3,405
1,700	1,020	2,386,800	167,076	35,086	3,509	175,430	87,715	43,857	3,509	3,509	3,509
1,750	1,050	2,457,000	171,990	36,118	3,612	180,590	90,295	45,147	3,612	3,612	3,612
1,800	1,080	2,527,200	176,904	37,150	3,715	185,749	92,875	46,437	3,715	3,715	3,715
1,850	1,110	2,597,400	181,818	38,182	3,818	190,909	95,454	47,727	3,818	3,818	3,818
1,900	1,140	2,667,600	186,732	39,214	3,921	196,069	98,034	49,017	3,921	3,921	3,921

Note: For “Lost Production Estimates”, it is assumed that the percentage of jacks = 0, fecundity = 2,340 eggs, the egg-to-emergence survival= 7%, the fry-to-smolt survival = 21%, and the smolt-to-adult survival = 10%, which yields approximately 3.4 returning adults per spawning female removed. For “Returns from Backstocking by Option”, it is assumed that the fry-to-adult survival = 2%, the fingerling-to-adult survival =4%, the presmolt-to-adult survival = 8%, and that survival rates are less than in Table 4 to account for interactions with resident fishes and smaller presmolt stocking size. Jacks are rarely used as broodstock. Thus, the number of jacks removed expressed as a percentage of total brood is insignificant. Bold type indicates proposed adult removals in 2009 and replacement presmolt stocking recommended for 2010.

^a Females comprise 60% of the adult fish removed from the system for broodstock.

^b 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 C5.–Worksheet for calculating sockeye salmon "replacement" options for adult removals from Malina Lake, 2009.

		Lost Production Estimates				Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females ^a	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 ^b Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^b Fall Presmolt (8-10 g)
300	180	419,400	29,358	6,165	617	30,826	15,413	7,706	617	617	617
350	210	489,300	34,251	7,193	719	35,964	17,982	8,991	719	719	719
400	240	559,200	39,144	8,220	822	41,101	20,551	10,275	822	822	822
450	270	629,100	44,037	9,248	925	46,239	23,119	11,560	925	925	925
500	300	699,000	48,930	10,275	1,028	51,377	25,688	12,844	1,028	1,028	1,028
550	330	768,900	53,823	11,303	1,130	56,514	28,257	14,129	1,130	1,130	1,130
600	360	838,800	58,716	12,330	1,233	61,652	30,826	15,413	1,233	1,233	1,233
650	390	908,700	63,609	13,358	1,336	66,789	33,395	16,697	1,336	1,336	1,336
700	420	978,600	68,502	14,385	1,439	71,927	35,964	17,982	1,439	1,439	1,439
750	450	1,048,500	73,395	15,413	1,541	77,065	38,532	19,266	1,541	1,541	1,541
800	480	1,118,400	78,288	16,440	1,644	82,202	41,101	20,551	1,644	1,644	1,644
850	510	1,188,300	83,181	17,468	1,747	87,340	43,670	21,835	1,747	1,747	1,747
900	540	1,258,200	88,074	18,496	1,850	92,478	46,239	23,119	1,850	1,850	1,850
950	570	1,328,100	92,967	19,523	1,952	97,615	48,808	24,404	1,952	1,952	1,952
1,000	600	1,398,000	97,860	20,551	2,055	102,753	51,377	25,688	2,055	2,055	2,055
1,050	630	1,467,900	102,753	21,578	2,158	107,891	53,945	26,973	2,158	2,158	2,158
1,100	660	1,537,800	107,646	22,606	2,261	113,028	56,514	28,257	2,261	2,261	2,261
1,150	690	1,607,700	112,539	23,633	2,363	118,166	59,083	29,541	2,363	2,363	2,363
1,200	720	1,677,600	117,432	24,661	2,466	123,304	61,652	30,826	2,466	2,466	2,466
1,250	750	1,747,500	122,325	25,688	2,569	128,441	64,221	32,110	2,569	2,569	2,569
1,300	780	1,817,400	127,218	26,716	2,672	133,579	66,789	33,395	2,672	2,672	2,672
1,350	810	1,887,300	132,111	27,743	2,774	138,717	69,358	34,679	2,774	2,774	2,774
1,400	840	1,957,200	137,004	28,771	2,877	143,854	71,927	35,964	2,877	2,877	2,877
1,450	870	2,027,100	141,897	29,798	2,980	148,992	74,496	37,248	2,980	2,980	2,980
1,500	900	2,097,000	146,790	30,826	3,083	154,130	77,065	38,532	3,083	3,083	3,083
1,550	930	2,166,900	151,683	31,853	3,185	159,267	79,634	39,817	3,185	3,185	3,185

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Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females ^a	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 ^b Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^b Fall Presmolt (8-10 g)
1,600	960	2,236,800	156,576	32,881	3,288	164,405	82,202	41,101	3,288	3,288	3,288
1,650	990	2,306,700	161,469	33,908	3,391	169,542	84,771	42,386	3,391	3,391	3,391
1,700	1,020	2,376,600	166,362	34,936	3,494	174,680	87,340	43,670	3,494	3,494	3,494
1,750	1,050	2,446,500	171,255	35,964	3,596	179,818	89,909	44,954	3,596	3,596	3,596
1,800	1,080	2,516,400	176,148	36,991	3,699	184,955	92,478	46,239	3,699	3,699	3,699
1,850	1,110	2,586,300	181,041	38,019	3,802	190,093	95,047	47,523	3,802	3,802	3,802
1,900	1,140	2,656,200	185,934	39,046	3,905	195,231	97,615	48,808	3,905	3,905	3,905

Note: For “Lost Production Estimates”, it is assumed that the percentage of jacks = 0, fecundity = 2,330 eggs, the egg-to-emergence survival= 7%, the fry-to-smolt survival = 21%, and the smolt-to-adult survival = 10%, which yields approximately 3.4 returning adults per spawning female removed. For “Returns from Backstocking by Option”, it is assumed that the fry-to-adult survival = 2%, the fingerling-to-adult survival =4%, the presmolt-to-adult survival = 8%, and that survival rates are less than in Table 4 to account for interactions with resident fishes and smaller presmolt stocking size. Jacks are rarely used as broodstock. Thus, the number of jacks removed expressed as a percentage of total brood is insignificant. Bold type indicates proposed adult removals in 2009 and replacement presmolt stocking recommended for 2010.

^a Females comprise 60% of the adult fish removed from the system for broodstock.

^b 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 C6.–Worksheet for calculating sockeye salmon "replacement" options for adult removals from Saltery Lake, 2009.

		Lost Production Estimates				Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females ^a	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 ^b Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^b Fall Presmolt (8-10 g)
1,500	900	2,574,000	180,180	37,838	3,784	189,189	94,595	47,297	3,784	3,784	3,784
1,600	960	2,745,600	192,192	40,360	4,036	201,802	100,901	50,450	4,036	4,036	4,036
1,700	1,020	2,917,200	204,204	42,883	4,288	214,414	107,207	53,604	4,288	4,288	4,288
1,800	1,080	3,088,800	216,216	45,405	4,541	227,027	113,513	56,757	4,541	4,541	4,541
1,900	1,140	3,260,400	228,228	47,928	4,793	239,639	119,820	59,910	4,793	4,793	4,793
2,000	1,200	3,432,000	240,240	50,450	5,045	252,252	126,126	63,063	5,045	5,045	5,045
2,100	1,260	3,603,600	252,252	52,973	5,297	264,865	132,432	66,216	5,297	5,297	5,297
2,200	1,320	3,775,200	264,264	55,495	5,550	277,477	138,739	69,369	5,550	5,550	5,550
2,300	1,380	3,946,800	276,276	58,018	5,802	290,090	145,045	72,522	5,802	5,802	5,802
2,400	1,440	4,118,400	288,288	60,540	6,054	302,702	151,351	75,676	6,054	6,054	6,054
2,500	1,500	4,290,000	300,300	63,063	6,306	315,315	157,658	78,829	6,306	6,306	6,306
2,600	1,560	4,461,600	312,312	65,586	6,559	327,928	163,964	81,982	6,559	6,559	6,559
2,700	1,620	4,633,200	324,324	68,108	6,811	340,540	170,270	85,135	6,811	6,811	6,811
2,800	1,680	4,804,800	336,336	70,631	7,063	353,153	176,576	88,288	7,063	7,063	7,063
2,900	1,740	4,976,400	348,348	73,153	7,315	365,765	182,883	91,441	7,315	7,315	7,315
3,000	1,800	5,148,000	360,360	75,676	7,568	378,378	189,189	94,595	7,568	7,568	7,568
3,100	1,860	5,319,600	372,372	78,198	7,820	390,991	195,495	97,748	7,820	7,820	7,820
3,200	1,920	5,491,200	384,384	80,721	8,072	403,603	201,802	100,901	8,072	8,072	8,072
3,300	1,980	5,662,800	396,396	83,243	8,324	416,216	208,108	104,054	8,324	8,324	8,324
3,400	2,040	5,834,400	408,408	85,766	8,577	428,828	214,414	107,207	8,577	8,577	8,577
3,500	2,100	6,006,000	420,420	88,288	8,829	441,441	220,721	110,360	8,829	8,829	8,829
3,600	2,160	6,177,600	432,432	90,811	9,081	454,054	227,027	113,513	9,081	9,081	9,081
3,700	2,220	6,349,200	444,444	93,333	9,333	466,666	233,333	116,667	9,333	9,333	9,333
3,800	2,280	6,520,800	456,456	95,856	9,586	479,279	239,639	119,820	9,586	9,586	9,586
3,900	2,340	6,692,400	468,468	98,378	9,838	491,891	245,946	122,973	9,838	9,838	9,838
4,000	2,400	6,864,000	480,480	100,901	10,090	504,504	252,252	126,126	10,090	10,090	10,090

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Appendix C6.–Page 2 of 2.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females ^a	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 ^b Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^b Fall Presmolt (8-10 g)
4,100	2,460	7,035,600	492,492	103,423	10,342	517,117	258,558	129,279	10,342	10,342	10,342
4,200	2,520	7,207,200	504,504	105,946	10,595	529,729	264,865	132,432	10,595	10,595	10,595
4,300	2,580	7,378,800	516,516	108,468	10,847	542,342	271,171	135,585	10,847	10,847	10,847
4,400	2,640	7,550,400	528,528	110,991	11,099	554,954	277,477	138,739	11,099	11,099	11,099
4,500	2,700	7,722,000	540,540	113,513	11,351	567,567	283,784	141,892	11,351	11,351	11,351
4,600	2,760	7,893,600	552,552	116,036	11,604	580,180	290,090	145,045	11,604	11,604	11,604
4,700	2,820	8,065,200	564,564	118,558	11,856	592,792	296,396	148,198	11,856	11,856	11,856
4,800	2,880	8,236,800	576,576	121,081	12,108	605,405	302,702	151,351	12,108	12,108	12,108
4,900	2,940	8,408,400	588,588	123,603	12,360	618,017	309,009	154,504	12,360	12,360	12,360
5,000	3,000	8,580,000	600,600	126,126	12,613	630,630	315,315	157,658	12,613	12,613	12,613
5,100	3,060	8,751,600	612,612	128,649	12,865	643,243	321,621	160,811	12,865	12,865	12,865
5,200	3,120	8,923,200	624,624	131,171	13,117	655,855	327,928	163,964	13,117	13,117	13,117
5,300	3,180	9,094,800	636,636	133,694	13,369	668,468	334,234	167,117	13,369	13,369	13,369
5,400	3,240	9,266,400	648,648	136,216	13,622	681,080	340,540	170,270	13,622	13,622	13,622
5,500	3,300	9,438,000	660,660	138,739	13,874	693,693	346,847	173,423	13,874	13,874	13,874
5,600	3,360	9,609,600	672,672	141,261	14,126	706,306	353,153	176,576	14,126	14,126	14,126

Note: For “Lost Production Estimates”, it is assumed that the percentage of jacks = 0, fecundity = 2,860 eggs, the egg-to-emergence survival= 7%, the fry-to-smolt survival = 21%, and the smolt-to-adult survival = 10%, which yields approximately 4.2 returning adults per spawning female removed. For “Returns from Backstocking by Option”, it is assumed that the fry-to-adult survival = 2%, the fingerling-to-adult survival =4%, the presmolt-to-adult survival = 8%, and that survival rates are less than in Table 4 to account for interactions with resident fishes and smaller presmolt stocking size. Jacks are rarely used as broodstock. Thus the number of jacks removed expressed as a percentage of total brood is insignificant. Bold type indicates proposed adult removals in 2009 and replacement presmolt stocking recommended for 2010.

^a Females comprise 60% of the adult fish removed from the system for broodstock.

^b 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 D. GUIDELINES FOR REPLACEMENT
STOCKING OF SOCKEYE SALMON**

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.)

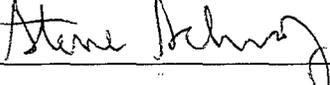
3) When returning progeny to an egg-take site containing wild fish, the progeny should not exceed a 1:1 wild/cultured ratio. This applies to all life stages. Return the progeny to the egg-take site.

(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 2009 Pillar Creek Hatchery Annual Management Plan



Gary Byrne: Pillar Creek Hatchery Manager, KRAA
Date 8/25/09



Steve Schrof: Regional Resource Development Biologist, CFD
Date 8/10/09



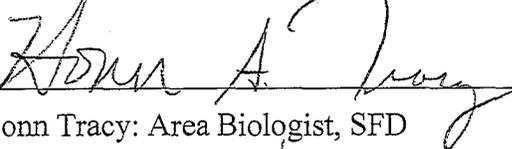
Mark Witteveen: Acting Regional Finfish Management Supervisor, CFD
Date 8/22/09



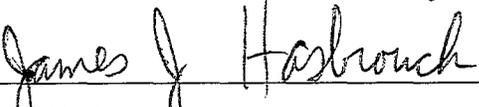
Steve Honnold: Regional Supervisor, CFD
Date 8/10/09



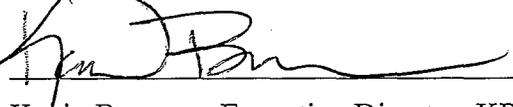
Jeff Wadle: Area Finfish Management Biologist, CFD
Date 8/10/09



Donn Tracy: Area Biologist, SFD
Date 08/11/09



James Hasbrouck: Regional Supervisor, SFD
Date 8/27/2009



Kevin Brennan: Executive Director, KRAA
Date 8-20-09

The 2009 Hatchery Management Plan for PCH is hereby approved:



Denby S. Lloyd: Commissioner, ADF&G, Juneau
Date 7/4/2009