

Fishery Management Report No. 08-40

**Pillar Creek Hatchery Annual Management Plan,
2008**

by

Switgard Duesterloh

and

Gary Byrne

June 2008

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
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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

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**PREFACE:
EXECUTIVE SUMMARY, 2008, AND SUMMARY OF ACTIVE
FISH TRANSPORT PERMITS**

**PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN
EXECUTIVE SUMMARY, 2008**

New Projects for 2008: Late-run sockeye egg take at Little Kitoi Lake.^a

Cost Recovery Harvests for 2008: NONE

Stocking Location	Broodstock	2008 Projected Enhanced Return	2008 Stocking (brood year 2007)	2008 Stocking (brood year 2006)	2008 Eggtake Goals	2009 Stocking (brood year 2008)	2010 Stocking (brood year 2008)
Sockeye:							
Hidden Lake	Afognak Lake early run	2,900	350,000		617,000	500,000	
Little Waterfall Lake	Afognak Lake early run	1,100 ^b	250,000		308,000	250,000	
Big Waterfall Lake	Afognak Lake early run		50,000		123,000	100,000	
Crescent Lake	Afognak Lake early run	175	350,000		370,000	300,000	
Total	Afognak Lake early run	4,175	1,000,000	0	1,418,000^c	1,150,000	0
Hidden Lake	Malina Lake early run	10,100					
Little Waterfall Lake	Malina Lake early run	5,400 ^b					
Big Waterfall Lake	Malina Lake early run						
Crescent Lake	Malina Lake early run	325					
Total	Malina Lake early run	15,825	0	0	0^c	0	0
	Early run sockeye total	20,000	1,000,000	0	1,418,000	1,150,000	0
Spiridon Lake	Little Kitoi Lake late run				4,342,000	3,340,000	
Ruth Lake	Little Kitoi Lake late run				65,000	50,000	
Jennifer Lake	Little Kitoi Lake late run				325,000	250,000	
Little Kitoi Lake	Little Kitoi Lake late run				568,000 ^e	500,000	
Total	Little Kitoi Lake late run	0	0	0	5,300,000	4,140,000	0
Spiridon Lake	Saltery Lake late run	207,000	1,000,000				
Ruth Lake	Saltery Lake late run	1,700	50,000				
Jennifer Lake	Saltery Lake late run		150,000				
Little Kitoi Lake	Saltery Lake late run	2,400 ^d					
Total	Saltery Lake late run	208,700	1,200,000	0	0^e	0	0
	Late run sockeye total	208,700	1,200,000	0	5,300,000	4,140,000	0
Total Sockeye		228,700	2,200,000	0	6,718,000	5,290,000	0

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Stocking Location	Broodstock	2008 Projected Enhanced Return	2008 Stocking (brood year 2007)	2008 Stocking (brood year 2006)	2008 Eggtake Goals	2009 Stocking (brood year 2008)	2010 Stocking (brood year 2008)
Coho:							
Island Lake	Buskin Lake	1,335	22,500		24,300	22,500	
Dark Lake	Buskin Lake	258	7,500		8,100	7,500	
Mission Lake	Buskin Lake	430	12,500		13,500	12,500	
Potato Patch Lake	Buskin Lake	326	9,500		10,200	9,500	
Big (Lily) Lake	Buskin Lake	86	3,000		6,500	6,000	
Mayflower Lake	Buskin Lake		6,500		7,000	6,500	
Southern Lake	Buskin Lake	landlocked	3,500		3,800	3,500	
Abercrombie Lake	Buskin Lake	landlocked	3,500		3,800	3,500	
Chiniak Lake	Buskin Lake	landlocked	20,000		21,600	20,000	
Monashka Creek	Buskin Lake		0				
Total Coho	Buskin Lake	2,435	88,500	0	98,800	91,500	0
Chinook:							
Monashka Creek	Monashka Creek	470		60,000	108,500 ^f	0	47,000
American River	Monashka Creek			44,250	95,750	0	41,500
Olds River	Monashka Creek			44,250	95,750	0	41,500
Island Lake	Monashka Creek						
Abercrombie (Gertrude) Lake	Monashka Creek	landlocked					
Total Chinook	Monashka Creek	470	0	148,500	300,000	0	130,000
Rainbow Trout:							
Abercrombie (Gertrude) Lake	Ft. Richardson/Swanson R.	landlocked	3,700		7,265 ^g	3,700	
Aurel Lake	Ft. Richardson/Swanson R.	landlocked	3,000		5,890	3,000	
Big (Lily) Lake	Ft. Richardson/Swanson R.	landlocked	3,600		7,068	3,600	
Bull Lake	Ft. Richardson/Swanson R.	landlocked	2,000		3,927	2,000	
Caroline Lake	Ft. Richardson/Swanson R.	landlocked	1,400		2,749	1,400	
Cicely Lake	Ft. Richardson/Swanson R.	landlocked	1,150		2,258	1,150	
Dolgoi Lake	Ft. Richardson/Swanson R.	landlocked	5,150		10,111	5,150	

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Dragonfly Lake	Ft. Richardson/Swanson R.	landlocked	1,550	3,043	1,550
Heitman Lake	Ft. Richardson/Swanson R.	landlocked	3,250	6,381	3,250
Horseshoe Lake	Ft. Richardson/Swanson R.	landlocked	1,000	1,963	1,000
Jack Lake	Ft. Richardson/Swanson R.	landlocked	1,000	1,963	1,000
Jupiter Lake	Ft. Richardson/Swanson R.	landlocked	3,600	7,068	3,600
Lee Lake	Ft. Richardson/Swanson R.	landlocked	2,800	5,497	2,800
Lily Pond Lake	Ft. Richardson/Swanson R.	landlocked	1,600	3,141	1,600
Long Lake	Ft. Richardson/Swanson R.	landlocked	3,600	7,068	3,600
Saturn Lake	Ft. Richardson/Swanson R.	landlocked	2,400	4,712	2,400
Tanignak Lake	Ft. Richardson/Swanson R.	landlocked	6,000	11,780	6,000
Twin Lake	Ft. Richardson/Swanson R.	landlocked	4,000	7,854	4,000
Ft. Richardson					
Total Rainbow Trout	Hatchery/Swanson River		0	50,800	0
				99,738	50,800
					0

XI.

^a Little Kitoi Lake is the preferred brood source for the Pillar Creek Hatchery late run sockeye eggtake; the Little Kitoi Lake eggtake FTP was issued in 2004. Although the Little Kitoi sockeye eggtake is not a new plan or project, the 2008 Pillar Creek Hatchery AMP is the first plan in which it is described. To date, Little Kitoi Lake escapement has not been sufficient to meet the hatchery's late run sockeye eggtake goals, and Saltery Lake sockeye have been utilized as an alternative late-run broodstock. Saltery Lake sockeye may be utilized as a 2008 brood source if Little Kitoi Lake escapement is not adequate to support eggtake goals.

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

^c 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 eggtakes 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 2008. Malina Lake sockeye may be utilized as a 2008 brood source if eggtake goals cannot be achieved using Afognak Lake brood exclusively.

^d The projected return to Little Kitoi Lake of 3,700 late run Saltery stock sockeye represents the portion of the 2008 run produced by PCH stocking of Little Kitoi Lake in 2004 and 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 2008 Annual Management Plan.

^e 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.

^f The 2008 eggtake is projected to result in a release of 130,000 smolt in 2010. If survival and hatchery rearing densities allow, it is possible that a greater number of smolt may be produced.

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

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

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

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

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Little Waterfall Lake 06A-0045	4/17/2006	12/31/2011	Allows the release of up to 400,000 Afognak Lake stock fingerling, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 97A-0076	10/1/1997	12/31/2008	Allows the release of up to 200,000 Afognak Lake stock presmolt, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 04A-0038	4/1/2004	12/31/2009	Allows the release of up to 400,000 each Malina Lake stock fry and fingerling, and 350,000 presmolt, incubated and reared at PCH, into Little Waterfall Lake.
Big Waterfall Lake 06A-0046	4/14/2006	12/31/2011	Allows the release of up to 250,000 Afognak Lake stock fry, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 99A-0055	7/15/1999	12/31/2008	Allows the release of up to 250,000 Afognak Lake stock fingerling, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 04A-0032	4/1/2004	12/31/2009	Allows the release of up to 250,000 Afognak Lake stock presmolt, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 04A-0031	4/1/2004	12/31/2009	Allows the release of up to 250,000 each Malina Lake stock fry, fingerling and presmolt, incubated and reared at PCH, into Big Waterfall Lake.
Crescent Lake 06A-0047	4/17/2006	12/31/2011	Allows the release of up to 500,000 Afognak Lake stock fry, incubated and reared at PCH into Crescent Lake.
Crescent Lake 99A-0052	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock fingerling, incubated and reared at PCH into Crescent Lake.
Crescent Lake 04A-0034	4/1/2004	12/31/2009	Allows the release of up to 275,000 Afognak Lake stock presmolt, incubated and reared at PCH, into Crescent Lake.
Crescent Lake 04A-0033	4/1/2004	12/31/2009	Allows the release of up to 500,000 each Malina Lake stock fry and fingerling, and 275,000 presmolt, incubated and reared at PCH, into Crescent Lake.
Malina Lake 06A-0043	4/14/2006	12/31/2011	Allows the release of up to 500,000 Malina Lake stock fry, incubated and reared at PCH, into Malina Lake.
Malina Lake 99A-0056	7/15/1999	12/31/2008	Allows the release of up to 500,000 Malina Lake stock fingerling, incubated and reared at PCH, into Malina Lake.
Malina Lake 97A-0078	7/15/1999	12/31/2008	Allows the release of up to 300,000 Malina Lake stock presmolt, incubated and reared at PCH, into Malina Lake.
Laura Lake 99A-0062	7/15/1999	12/31/2008	Allows the release of up to 200,000 Laura Lake stock fingerling, incubated and reared at PCH, into Laura Lake.
Laura Lake 99A-0061	7/15/1999	12/31/2008	Allows the release of up to 200,000 Laura Lake stock presmolt, incubated and reared at PCH, into Laura Lake.

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

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Stocking, late-run sockeye			
Saltery Lake 04A-0056	8/1/2004	12/31/2009	Allows the release of up to 800,000 Saltery Lake stock fry, or 400,000 fingerling, or 200,000 presmolt, incubated and reared at PCH, into Saltery Lake.
Spiridon Lake 99A-0059	7/15/1999	12/31/2008	Allows the release of up to 7,000,000 Saltery Lake stock fingerling, incubated and reared at PCH into Spiridon Lake.
Spiridon Lake 04A-0040	4/4/2004	12/31/2009	Allows the release of up to 7,000,000 Saltery Lake stock fry, and 1,000,000 presmolt, incubated and reared at PCH, into Spiridon Lake.
Little Kitoi Lake 04A-0037	5/1/2004	12/31/2009	Allows the release of up to 100,000 Saltery Lake stock fingerling, and 150,000 presmolt, incubated and reared at PCH, into Ruth Lake.
Ruth Lake 99A-0058	7/15/1999	12/31/2008	Allows the release of up to 300,000 Saltery Lake stock fingerling, incubated and reared at PCH, into Ruth Lake.
Ruth Lake 04A-0039	5/1/2004	12/31/2009	Allows the release of up to 300,000 each Saltery Lake stock fry and presmolt, incubated and reared at PCH, into Ruth Lake.
Jennifer Lake 04A-0036	3/1/2004	12/31/2009	Allows the release of 400,000 and 250,000 Saltery Lake stock fry and presmolt, incubated and reared at PCH, into Jennifer Lake.
Egg takes, coho			
Buskin Lake 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 (plus 27,500 smolt, amendment exp. 12/07) 7,500 into Dark Lake 12,500 into Mission Lake (plus 47,500 smolt, amendment exp. 12/07) 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 ^a 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 04A-0007	1/1/2004	12/31/2008	Allows the release of up to 10,000 Buskin Lake stock smolt, incubated and reared at PCH, into Monashka Creek.

-continued-

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

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Egg takes, Chinook			
Karluk River ^b 00A-0010	2/6/2000	12/31/2008	Allows egg take of 300,000 green eggs at Karluk River; incubation and rearing at PCH, and release of the resultant presmolt into Monashka Creek.
Monashka 05A-0050	4/1/2005	9/1/2014	Allows egg take of 300,000 green eggs at Monashka Creek; incubation and rearing at PCH, and release of the resultant smolt into Monashka Creek. egg take may occur at Karluk River during transition from Karluk to Monashka broodstock.
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 Creek egg take, incubated and reared at PCH, into the American River. No limit is specified; releases are not expected to exceed 150,000 fish.
Olds River 07A-0020	5/1/2007	12/31/2011	Allows the release of Chinook smolt resulting from the Monashka Creek egg take, incubated and reared at PCH, into the American River. No limit is specified; releases are not expected to exceed 150,000 fish.
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 Kodiak Road System Lakes.
Stocking, rainbow trout			
Road System Lakes 07A-0018	1/26/2007	7/31/2012	Allows the release of Ft. Richardson Hatchery stock juveniles (original donor stock; Swanson River), incubated and reared at PCH, into Kodiak road system lakes, as follows: 3,700 into Abercrombie (Gertrude) Lake 3,000 into Aurel Lake 3,600 into Big (Lily) Lake 2,000 into Bull Lake 1,400 into Caroline Lake 1,150 into Cicely Lake 5,150 into Dolgoi Lake 1,550 into Dragonfly Lake 3,250 into Heitman Lake 1,000 into Horseshoe Lake 1,000 into Jack Lake 3,600 into Jupiter Lake 2,800 into Lee Lake 1,600 into Lily Pond Lake 3,600 into Long Lake 1,600 into Lupine Lake ^c 1,600 into Margaret (Boy Scout) Lake ^a 2,400 into Saturn Lake 6,000 into Tanignak Lake 4,000 into Twin Lake

^a Not landlocked anymore; stocking discontinued.

^b The ADF&G will not need additional Chinook salmon brood stock for release into Monashka Creek.

^c Voluntarily discontinued.

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* and rainbow trout *O. mykiss*, and two stocks of sockeye salmon *O. nerka*.

A total of 1,000,000 early-run juvenile sockeye salmon (Afognak Lake broodstock) will be released in 2008. Prior releases of the Afognak Lake early-run stock are expected to produce approximately 4,250 adult sockeye salmon returning in June 2008. Releases of Malina Lake early-run stock in 2005 are expected to produce approximately 15,650 additional returning adult sockeye salmon. About 1,418,000 early run sockeye eggs will be collected in 2008 for incubation at PCH. Afognak Lake sockeye salmon are the preferred broodstock for this project; Malina Lake sockeye salmon serve as an alternate brood source. After emergence and rearing at the hatchery, a total of 1,150,000 juveniles will be released in 2009.

Approximately 1,200,000 late run juvenile sockeye salmon (Saltery Lake broodstock) will be released in 2008. The majority of these fish will be released into Spiridon Lake (1,000,000) with additional releases into Ruth (50,000) and Jennifer (150,000) Lakes. Prior juvenile releases are expected to produce 226,000 adult sockeye salmon returning to Spiridon Lake in late June through early August 2008. Approximately 5,300,000 Little Kitoi Lake sockeye salmon eggs will be collected in 2008 for stocking Spiridon (3,340,000), Jennifer (250,000), and Ruth (50,000) Lakes in 2009. In the autumn of 2008, 568,000 eyed eggs will be transferred 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. Little Kitoi Lake sockeye are the preferred broodstock for this project; Saltery Lake sockeye serve as an alternate brood source.

A total of approximately 88,500 coho salmon fingerlings (Buskin Lake broodstock) will be released into nine road system lakes in 2008. If hatchery rearing densities allow, as many as 10,000 of these fish may be held to smolt and released into Monashka Creek in June 2009. Prior releases of this coho salmon stock are expected to produce a return of approximately 2,400 adult coho salmon in late August and September 2008. The 2008 Buskin River coho salmon egg take goal will be to collect about 98,800 eggs for releasing juvenile coho salmon in 2009 and 2010.

Approximately 60,000 brood year 2006 Chinook salmon smolt will be released into Monashka Creek in 2008, and an additional 88,500 Chinook smolt into the American and Olds rivers (44,250 into each river). About 470 adult Chinook salmon are expected to return to Monashka Creek in 2008. Approximately 300,000 Chinook salmon eggs will be collected in 2008 for an eventual release of approximately 47,000 smolt into Monashka Creek, and 41,500 each into the American and Olds rivers in 2010.

Approximately 50,800 triploid rainbow trout fingerling will be stocked into 18 landlocked lakes on the Kodiak Road System in 2008. Approximately 99,700 rainbow trout eggs taken in 2008 from captive broodstock at the ADF&G's Ft. Richardson Hatchery in Anchorage and will be transferred to Pillar Creek Hatchery at the eyed-egg stage with the resultant fingerling being 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 serves as a resource document that summarizes the hatchery's stocking, rearing, and egg takes into an annual management plan for sockeye *Oncorhynchus nerka*, coho *O. kisutch* and Chinook *O. tshawytscha* salmon, and rainbow trout *O. mykiss* in 2008.

Pillar Creek Hatchery (PCH) is located on the Kodiak road system about seven miles north of Kodiak City (Figures 1, 2, and 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, presmolt, and smolt). The facility is operated primarily by funds provided by KRAA and, to a lesser extent, through a cooperative agreement with the ADF&G, Division of Sport Fish. PCH was 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 gill net, subsistence, and recreational fishers.

Spiridon Lake was selected as the primary barren-lake sockeye salmon stocking project for PCH and has been stocked annually since 1991 (Figure 1). Malina and Laura Lakes were the first anadromous lake stocking projects, which were initiated in 1992 and 1993 respectively, and discontinued in the late 1990s after successfully rebuilding both sockeye salmon runs (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 stock will be the preferred brood source for the Spiridon Lake project in 2008. Little Kitoi Lake has been stocked with Saltery Lake sockeye salmon stock from KBH annually since 1999 and this stocking will continue (Schrof and Aro 2007). Depending on the magnitude of the adult sockeye salmon run, an egg take may occur at Little Kitoi Lake in 2008 for the first time since the brood source was changed. If the 2008 run is not sufficient to meet the 2008 egg-take goals, 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 2008 (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. The 2006 and 2007 escapements at Afognak Lake were sufficient 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 2008, if egg-take goals cannot be achieved using Afognak Lake brood exclusively.

Lake fertilization (1991-2001) and sockeye salmon stocking (1992-1999) projects were conducted at the Malina Lake system from 1991 to 2001 to restore adult production levels to

adequately achieve escapement goals (Schrof and Honnold 2003; Figure 1). 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. Sockeye salmon escapement goals were achieved from 1999 through 2002 (Wadle 2004). Stocking was planned for the 2000 - 2002 seasons, but escapement levels were sufficient to forego egg takes. Planning for rehabilitation egg takes was discontinued after 2002 and the stock is now considered to be rehabilitated (McCullough and Clevenger 2002).

A similar restoration project was conducted at Laura Lake, which was also fertilized (1993-2001) and supplemented with sockeye fry (1994-1996 and 1999) of Laura Lake origin (Figure 1). In 1996, 1997, and 1999 through 2002, sockeye salmon eggs were not collected at Laura Lake due to adequate adult escapement. As a result of reaching escapement goals for four consecutive years, lake fertilization and egg takes were discontinued after 2002 and the stock was considered rehabilitated (McCullough and Clevenger 2002).

PCH will also raise coho salmon juveniles for stocking lakes along the Kodiak Island road system to enhance recreational sport fishing opportunities (KRAA 1998). Buskin Lake coho salmon were reared to the fry or fingerling life stages at PCH annually from 1992 to 2007 for road system stocking (Figure 2). The availability of additional rearing space for coho salmon since 2003 has allowed for the rearing and release of coho salmon presmolt and smolt into road system lakes, and Monashka Creek has been added as a smolt stocking location, which can be utilized in years when the hatchery has adequate raceway space. Coho salmon smolt stocking is not planned for 2008, as it is precluded by the brood year (BY) 2006 juvenile Chinook salmon inventory. Future releases of coho smolt will be dependent upon the number of Chinook salmon reared at PCH, and available rearing space. Buskin Lake coho salmon eggs are also used for several classroom incubation programs in Kodiak area schools.

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 Pillar Creek Hatchery to increase recreational fishing opportunities. Chinook salmon eggs were collected for the first time from the Karluk River in August 2000 (Figure 1). These eggs were incubated and reared at PCH and about 60,400 smolt were released into Monashka Creek in the spring of 2002 (Figure 2). This project was continued with egg takes occurring at Karluk River during 2001 to 2004, and the release of Karluk stock Chinook smolt from 2003 to 2005. In 2004, KRAA and ADF&G entered into a formal cooperative agreement which specifies the responsibilities of each entity and allows ADF&G to provide project-related funding to KRAA. ADF&G Sport Fish staff will be responsible for broodstock collection, development of release locations, and smolt imprinting and release. PCH staff will be responsible for the eggs and alevin, rearing juveniles to smolt, and transfer of smolt to stocking destinations. Both parties will participate in egg takes, project planning, reporting and permitting. In 2005, the first return of adult Chinook salmon produced by this project allowed for an egg take at Monashka Creek. Monashka Creek is now the established brood source for the KRAA/ADF&G Cooperative Kodiak Road System Chinook Enhancement Project, and the 2008 egg take will utilize returns to Monashka Creek.

In 2007, a PAR was approved for the PCH Basic Management Plan, which allows the hatchery to incubate and rear rainbow trout. Prior to 2007, ADF&G annually stocked juvenile all-female 3N triploid rainbow trout from the ADF&G Fort (Ft.) Richardson Hatchery in Anchorage into 20 landlocked Kodiak Road System lakes for sport fish enhancement, continuing a rainbow trout stocking program that began in 1953. In 2007, rainbow trout eyed eggs were transferred from Ft. Richardson Hatchery to PCH, and stocked following successful incubation and rearing. In 2008, a new PAR has been submitted with an updated eyed egg transfer figure; the new figure will ensure that stocking levels will remain consistent with those of past years. Stocking locations in 2008 will remain consistent with the past locations, with one exception: Margaret (Boy Scout) and Lupine lakes have been removed from the stocking list.

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

2008 SOCKEYE SALMON RELEASES

Below we describe stock-specific sockeye salmon releases planned for 2008. Juvenile sockeye will be transported from Kodiak to specific lakes by either float-equipped aircraft which will release fish after landing on the lake, or by a wheel-equipped aircraft which will stock by aerial release.

EARLY-RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK

A total of approximately 1,000,000 early run Afognak Lake stock juveniles will be released into four lakes (Hidden, Little Waterfall, Big Waterfall, and Crescent) in 2008 (Table 1; Figure 1; Appendix A1). About 350,000 fry will be released in May with the remaining 650,000 juveniles reared until October and released as presmolt. Fry releases will range from about 50,000 (Little Waterfall Lake) to 150,000 (Hidden and Crescent Lakes). Releases of presmolt will range from approximately 50,000 (Big Waterfall Lake) to 200,000 (Hidden, Little Waterfall and Crescent Lakes).

Adult returns from these releases are estimated to total about 58,800 fish (Tables 1 and 2). Approximately 6,200 “jacks” (age 1.1 fish) will return in 2010, with the remaining returns expected in 2011 (19,000 fish), 2012 (31,000 fish), and 2013 (2,600). 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 (Figure 4 and 5).

LATE-RUN SOCKEYE SALMON: SALTERY LAKE DONOR STOCK

Spiridon Lake will be stocked with approximately 1,000,000 Saltery Lake sockeye salmon fry in June 2008 (Table 3; Figure 1; Appendix A6). Ruth Lake will be stocked with 50,000 fry and Jennifer Lake with 150,000 Saltery Lake fry in June 2008 (Table 3; Figure 1; Appendix A2).

We expect about 53,900 adult salmon to return as a result of the 2008 late-run sockeye releases (Tables 2 and 3). Stocking into Spiridon Lake is projected to produce a small number of jacks (200) returning in 2010 and some older age fish (2,400) returning in 2013. However, the majority of adult returns to Spiridon should occur in 2011 (14,300) and 2012 (28,000). Ruth and Jennifer Lake releases in 2008 are expected to produce 9,000 adults returning primarily in 2011 (2,900)

and 2012 (5,600). 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).

2008 COHO SALMON RELEASES

BUSKIN LAKE DONOR STOCK

PCH plans to release 88,500 coho salmon fingerling (BY 2007) into Kodiak road system lakes in 2008 (Table 4; Figure 2; Appendix A3). The fish are scheduled for releases into Island, Dark, Mission, Potato Patch, Big (Lily), Mayflower, Southern, Abercrombie (Gertrude), and Chiniak Lake in August 2008 (Table 4; Figure 2; Appendix A3). Margaret (Boy Scout) Lake has been removed from the coho stocking list because the control structure which maintained the lake's landlocked status has washed out.

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 2007) in 2008 are expected to produce about 4,000 returning adults in 2010 (Tables 2 and 4). Estimates of adult returns will vary if fingerling releases are reduced in 2008 in lieu of smolt releases in 2009. 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 8).

During the 2007/2008 school year, Kodiak Island Borough schools were provided 500 coho salmon eggs for educational programs. Eggs from the 2007 egg take were incubated in classroom incubators with resultant fry to be released by students into one of the several previously mentioned lakes.

2008 CHINOOK SALMON RELEASES

MONASHKA CREEK DONOR STOCK

Approximately 148,500 Chinook salmon smolt will be released into Kodiak road system streams in 2008. Smolt will be transported from PCH to the stocking locations in a truck-mounted fish transport tank, then held for imprinting. Approximately 60,000 Chinook salmon smolt will be released into Monashka Creek in May 2008 from a raceway adjacent to the creek (Table 5; Figure 2; Appendix A4). Following confinement in instream pens during the spring imprinting period, approximately 88,500 BY 2006 Chinook smolt will be stocked into the American River and Olds River (44,250 each) in May-June 2008 (Table 5; Figure 2).

Approximately 1,800 adult Chinook salmon are expected to return from the 2008 releases with the majority (900) of the adults returning in 2012 (Tables 2 and 5). 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, Chinook salmon returning to Monashka Creek since 2005 have been approximately two weeks later than the Chinook salmon returns to the Karluk River (L. Schwarz, Sport Fish Biologist, ADF&G, Kodiak; personal communication).

2008 RAINBOW TROUT RELEASES

FORT RICHARDSON HATCHERY CAPTIVE BROOD/SWANSON RIVER ORIGINAL DONOR STOCK

In August-October 2008, approximately 50,800 all-female triploid rainbow trout fingerling raised at PCH will be stocked into eighteen landlocked lakes on the Kodiak Road System (Table 6; Figure 3). PCH incubated and reared rainbow trout for the first time in 2007.

BROODSTOCK NUMBERS, ESCAPEMENT GOALS, AND EGG TAKE GUIDELINES

In 2008, we propose collecting the following broodstock for egg takes: 1,201 Afognak Lake early-run sockeye salmon (or 1,196 sockeye salmon if Malina Lake is used as an alternate early-run broodstock), 4,412 Little Kitoi Lake late-run sockeye salmon (same estimated number if Saltery Lake is used as an alternate late-run broodstock), 56 Buskin Lake coho salmon, and 108 Monashka Creek Chinook salmon (Table 7). 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 (back up brood source to Afognak Lake, if necessary), 15,000-30,000 sockeye salmon at Saltery Lake (back up brood source 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 egg-take guidelines established by Honnold and Byrne (2005) will be used for 2008:

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 7).
2. Broodstock removals will not reduce escapements below 50% of the lower bound of the escapement goal range for a given system (Table 7); broodstock removals will be reduced accordingly if necessary (Appendices B1-B3).
3. Broodstock removals for sockeye salmon egg takes may be contingent upon specific “replacement requirements” to compensate for the adults that were removed from the spawning population. Replacement requirement is defined as the number of juvenile sockeye salmon of the specific stock needed for “backstocking” into each system (Appendices B4-B6).
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 1,201 for broodstock. Thus, $50\% \times 20,000 + 1 = 10,001$ and $20,000 - 1 + 1,201 = 21,200$, so replacement backstocking will be required if the escapement is from 10,001 to 21,200 sockeye salmon in 2008. 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 2008 are outlined in Appendices B4-B6.
7. Backstocking of sockeye salmon presmolt is recommended to lessen lake grazing pressure and to provide for easy identification of returning adults (through unique scale patterns).
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, Sport Fish Biologist, ADF&G, Kodiak; personal communication). If the Buskin River coho salmon run is weak in 2008, replacement for broodstock removal may occur and, if needed, backstocking options will be developed.

2008 SOCKEYE SALMON EGG TAKES (2009 STOCKING)

Egg-take goals for 2008 and stocking levels for 2009, as described below for each broodstock, are based on the evaluation of the zooplankton production in each lake. This evaluation was based on zooplankton data collected in 2007 and may be adjusted in season as a result of the analysis of zooplankton data collected at each lake in 2008. 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 2009.

EARLY RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK

The 2008 early-run sockeye salmon egg-take goal is approximately 1,418,000 Afognak Lake sockeye salmon eggs (1,201 adults), which should provide for stocking about 1,150,000 juveniles in 2009 (Table 8; Appendix A1). These fish will be released into Hidden (300,000 fry and 200,000 presmolt), Little Waterfall (100,000 fry and 150,000 presmolt), Big Waterfall (100,000 presmolt), and Crescent (200,000 fry and 100,000 presmolt) lakes.

The escapement levels at Afognak Lake in 2008 will determine the number of broodstock available for an egg take (Tables 7 and 8; Appendix B1). Malina Lake sockeye salmon may be used as an alternative broodstock for the aforementioned stocking projects if escapement levels preclude or do not allow the egg-take goal to be met at Afognak Lake (Tables 7 and 8; Appendices A1 and A5). The egg-take guidelines previously described will be adhered to regardless of the egg-take location (Table 8; Appendices B1 and B2).

LATE RUN SOCKEYE SALMON: LITTLE KITOI LAKE DONOR STOCK

The 2008 late-run sockeye salmon egg-take goal for PCH stocking projects is approximately 4,732,000 Little Kitoi Lake sockeye salmon eggs (3,939 adults), which should provide for stocking of approximately 3,640,000 juveniles in 2009 (Table 9; Appendix A2). The resulting fry will be released into Spiridon (approximately 3,340,000), Jennifer (250,000) and Ruth (50,000) Lakes.

In addition to the primary egg-take goal for PCH, approximately 568,000 green eggs (473 adults) 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 (Duesterloh and Aro *In prep*).

The 2008 egg-take at Little Kitoi Lake will be dependent upon an escapement adequate to meet broodstock requirements (Table 9). 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.

2008 COHO SALMON EGG TAKES (2009 STOCKING)

Approximately 98,800 Buskin Lake coho salmon eggs (56 adults) will be collected in 2008, which will provide approximately 91,500 fingerlings to stock into nine road system lakes in 2009 (Table 10; Appendix A3). Depending upon the hatchery Chinook salmon inventory, a number of the resulting juveniles may be held to smolt in 2010 for stocking into Kodiak Road System lakes and/or Monashka Creek.

We do not expect that Buskin River coho salmon escapement levels will preclude or reduce the broodstock collection in 2008, due to the small number (56) of broodstock needed to attain egg take goals (Table 7; Appendix A3) and the anticipated magnitude of the 2008 coho salmon escapement (L. Schwarz, 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 2008. Replacement requirements have not been identified for the Buskin River coho salmon stock, but may be developed in 2008.

2008 CHINOOK SALMON EGG TAKES (2010 STOCKING)

The 2008 Chinook salmon egg-take goal is for 300,000 Monashka Creek eggs (125 adults), which will provide for the stocking of approximately 47,000 smolt into Monashka Creek, 41,500 smolt into the Olds River, and 41,500 smolt into the American River in 2010 (Table 11; Appendix A4). There is not an escapement goal for Chinook salmon into Monashka Creek, and thus, all of the escapement will be available for broodstock. The projected 2008 return should provide adequate broodstock to meet the hatchery egg-take goals.

2008 RAINBOW TROUT EGG TAKES (2009 STOCKING)

Fort Richardson Hatchery will take approximately 99,740 eggs (129 adults) for juvenile Rainbow Trout releases into Kodiak Road System lakes in 2009 (Table 12). The eggs will be taken from captive broodstock at the Fort Richardson Hatchery in Anchorage. Approximately 82,000 eyed eggs 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.

SOCKEYE SALMON HARVEST AND MANAGEMENT

A total of 250,100 sockeye salmon produced from PCH stocking projects are expected to return in 2008 (Table 13). The majority of these fish (226,000) 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 in the unlikely event that the commercial salmon fishery was not taking place to harvest the run (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 type for the SHA is seine gear. Because a harvestable surplus of enhanced sockeye salmon is expected in the SHA, continuous fishing periods through the duration of the sockeye run will be allowed by the ADF&G, beginning 5 June (Wadle et al. 2008). 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 analysis of the commercial harvest have indicated a minimal wild stock bycatch (Schrof et al. 2000; Schrof and Honnold 2003). Therefore, a reduction in the size of the SHA is not expected in 2008 (G. Spalinger, Commercial Fish 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 2008, the fishery will open in the Central Section of the Northwest Kodiak District on 5 June for a 57-hour period (Wadle et al. 2008). 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 2008, 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 areas 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 type for the Waterfall Bay SHA is seine gear. Since 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 2008, continuous fishing through the duration of the sockeye run will be allowed beginning 5 June (Wadle et al. 2008).

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. 2008; Figure 13) and to provide adequate protection for escapements of wild salmon stocks returning to streams in the area (Spiridon River sockeye, pink, chum, and coho salmon; stream number 254-401). The intent of this stocking project is to provide enhanced sockeye salmon in traditional commercial fishing areas in the Northwest (NW) Kodiak District (Figure 10). The run timing of the 2008 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 and westside pink and chum salmon stocks (Wadle et al. 2008). 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. 2008). By regulation, the only legal gear type for the Spiridon Bay SHA is seine gear. A series of barrier falls prevents salmon from entering Spiridon Lake, but sockeye salmon returning to Telrod Cove have access to Telrod Creek (Figure 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, specifically those returning to Spiridon River (pink and chum salmon) and Telrod Creek (pink salmon).

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

HARVEST OF RETURNS TO RUTH AND LITTLE KITOI LAKES

The combined return of PCH-stocked enhanced sockeye salmon to Ruth and Little Kitoi Lakes is projected to be 4,100 in 2008 (Table 13). Additional returning sockeye will be attributed to Kitoi Bay Hatchery stocking of Little Kitoi Lake. KBH has been stocking Little Kitoi Lake with Saltery stock late-run sockeye salmon annually since 1999 with only minor supplemental stocking by PCH, prior to 2004. The enhanced sockeye salmon returning to these systems will be harvested incidentally in 2008 during pink, chum, and coho salmon fisheries in the Kitoi, Izhut, and Duck Bay sections of the Afognak District (Figures 1 and 9; Wadle et al. 2008; Duesterloh and Aro *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 (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.

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 2008 for all projects.

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

straying concerns and include detailed actions required when harvest of enhanced production is delayed or abandoned.

These actions were detailed in an unplanned cost recovery operational plan (UCROP) as part of the 2003 PCH annual management plan, and included as cost recovery fisheries in the THAs (currently SHAs; Honnold and Clevenger 2003). If commercial fishing does not occur for some reason in 2008, salmon returning to the SHAs will be harvested using the guidelines described in the UCROP.

POLICIES AND GUIDELINES FOR HEALTH AND DISEASE CONTROL

The State of Alaska Pathology Review Committee has developed a long range goal to prevent dissemination of infectious finfish (and shellfish) disease within or outside the borders of Alaska (McGee 1995). This goal is intended to protect stocks without constraining aquaculture or stock renewal programs. The policy and guidelines 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 2008 for all projects.

SPECIAL STUDIES/RESEARCH

The 1994 to 1997 Spiridon Lake sockeye salmon runs were reconstructed using scale pattern analysis 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 2007, however, have not been formally reconstructed due to the run timing differences between the original late-run Upper Station broodstock (stocked from 1991 to 1994 and 1996 to 1997) and the Saltery Lake broodstock (stocked in 1995 and from 1998 to 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 future runs when only the Saltery 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 recent Spiridon Lake sockeye salmon contribution to the harvests in the SW Afognak Section and Northwest Kodiak District (Honnold and Byrne 2004; Schrof et al. 2000). This method of run reconstruction will be used for the 2008 and future Spiridon Lake sockeye salmon runs until a new method of stock separation is developed and implemented to identify the Saltery Lake stock returns.

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. 2008).

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

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TABLES AND FIGURES

Table 1.–Pillar Creek Hatchery early-run sockeye salmon egg take (Afognak Lake broodstock) from 2007, resultant juvenile releases planned in 2008, projected adult production, and Fish Transport Permit information.

Fish Species	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Totals
<u>Egg take</u>								
eggs	200,606	267,474	66,869	267,474	66,869	200,606	267,474	1,337,370
adults	156	207	52	207	52	156	207	1,037
<u>Releases</u>								
location	Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake	Crescent Lake	
number	150,000	200,000	50,000	200,000	50,000	150,000	200,000	1,000,000
size (g)	0.4	10.5	0.4	10.5	10.5	0.4	10.5	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
date	26-May-08	05-Oct-08	26-May-08	05-Oct-08	05-Oct-08	26-May-08	05-Oct-08	
<u>Projected Returns</u> ^a								
2010	493	2,260	164	2,260	565	493	2,260	6,235
2011	1,775	6,620	592	6,620	1,655	1,775	6,620	19,037
2012	3,152	10,480	1,051	10,480	2,620	3,152	10,480	30,935
2013	1,114	0	371	0	0	1,114	0	2,599
total	6,534	19,360	2,178	19,360	4,840	6,534	19,360	58,806
<u>Fish Transport Permit (FTP)</u> ^b								
number	99A-0053	99A-0054	06A-0042	97A-0076	04A-0032	06A-0047	04A-0034	
expires	31-Dec-08	31-Dec-08	31-Dec-11	31-Dec-08	31-Dec-09	31-Dec-11	31-Dec-09	
max. no.	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	

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

^b FTP 99A-0051 - for 4.1 million green eggs, expiring 31 Dec-08, authorizes egg take for these projects.

Table 2.—Salmon survival and age assumptions used to estimate returns for Pillar Creek Hatchery stocking projects.

Species	Broodstock ^a	Stocking		Survival ^b	Age-at-return Proportions ^b							
		Life Stage ^c	Size (g)	Stocking-to-adult return	1.1	1.2	2.1	1.3	2.2	1.4	2.3	1.5
Sockeye	AL/ML	F	0.4	4.5%	0.07	0.22	0.04	0.36	0.11			0.17
Sockeye	AL/ML	FG	1.0-3.0	6.5%	0.07	0.22	0.04	0.36	0.11			0.17
Sockeye	AL/ML	PS	8.0-15.0	10.0%	0.11	0.33		0.52				
Sockeye	SL	F	0.4-0.6	4.5%	0.01	0.31	0.01	0.39	0.24			0.05
Sockeye	SL	FG	3.0-6.0	6.5%	0.01	0.31	0.01	0.39	0.24			0.05
Sockeye	SL	PS	8.0-13.0	12.5%	0.02	0.55		0.44				
Coho	BL	FG	3.0-5.0	6.5%			1.00					
Coho	BL	PS	8.0	10.0%	1.00							
Coho	BL	S	15.0	12.5%	1.00							
Chinook	MC	S	20.0	1.2%	0.02	0.12		0.32		0.50		0.03
Chinook	MC	FG	1.5	0.01%	0.02	0.12		0.32		0.50		0.03

^a AL=Afognak Lake early run, ML=Malina Lake early run, SL=Saltery Lake late run, BL=Buskin Lake, and 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 3.—Pillar Creek Hatchery late-run sockeye salmon egg take (Saltery Lake broodstock) from 2007, resultant juvenile releases planned for 2008, projected adult production, and Fish Transport Permit information.

Fish Species	Late-run Sockeye	Late-run Sockeye	Late-run Sockeye	Late-run Sockeye	Totals
<u>Egg take</u>					
eggs	1,324,261	66,213	132,426	66,213	1,589,113 ^a
adults	1,097	55	110	55	1,316
<u>Releases</u>					
location	Spiridon Lake	Ruth Lake	Upper Jennifer Lake	Lower Jennifer Lake	
number	1,000,000	50,000	100,000	50,000	1,200,000
size (g)	0.4	0.4	0.4	0.4	
lifestage	Fry	Fry	Fry	Fry	
date	14-Jun-08	14-Jun-08	14-Jun-08	14-Jun-08	
<u>Projected Returns</u> ^b					
2010	225	11	23	11	270
2011	14,310	716	1,431	716	17,172
2012	27,990	1,400	2,799	1,400	33,588
2013	2,430	122	243	122	2,916
total	44,955	2,248	4,496	2,248	53,946
<u>Fish Transport Permit (FTP)</u> ^c					
number	04A-0040	04A-0039	04A-0036	04A-0036	
expires	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
max. no.	7,000,000	300,000	400,000	400,000	
lifestage	Fry	Fry	Fry	Fry	

^a An additional 605,883 eggs were taken, and 502 adult brood utilized for Kitoy Bay Hatchery late-run sockeye production. Eggs are transferred at the eyed egg stage of development.

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

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

Table 4.—Pillar Creek Hatchery coho salmon egg take (Buskin Lake broodstock) from 2007, resultant juvenile releases planned for Road System Lakes in 2008 and 2009, projected adult production, and Fish Transport Permit information.

Fish Species	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Totals
<u>Egg take</u>											
eggs	23,539	7,846	13,077	9,939	3,138	6,800	3,662	3,662	20,923	0	92,585
adults	14	5	8	6	2	4	2	2	13	0	56
<u>Releases</u>											
location	Island Lake	Dark Lake	Mission Lake	P.Patch Lake	Big (Lily) Lake	Mayflower Lake	Southern Lake	Abercrombie Lake	Chiniak Lake	Monashka Creek ^a	
number	22,500	7,500	12,500	9,500	3,000	6,500	3,500	3,500	20,000	0	88,500
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	Smolt	
date	27-Jul-08	27-Jul-08	27-Jul-08	27-Jul-08	27-Jul-08	27-Jul-08	27-Jul-08	27-Jul-08	27-Jul-08	03-Jun-09	
<u>Projected Returns</u> ^b											
2010	1,463	488	813	618	195	423	0	0	0	0	3,998
2011	0	0	0	0	0	0	0	0	0	0	0
total	1,463	488	813	618	195	423	landlocked	landlocked	landlocked	0	3,998
<u>Fish Transport Permit (FTP)</u> ^c											
number	04A-0006	04A-0006	04A-0006	04A-0006	05A-0004	04A-0006	04A-0005	05A-0003	07A-0019	04A-0007	
expires	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	01-Jul-12	31-Dec-08	
max. no.	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	20,000	10,000	
lifestage	any	any	any	any	any	any	any	any	any	Smolt	

^a Coho may be reared to, and released as, spring smolt depending upon hatchery Chinook salmon smolt inventory. Possible 2009 releases are not included in total releases for all locations.

^b Projected returns are calculated from Table 2 survival and age assumptions. If smolt are released in 2008, they would return in 2009 (age 1.1 fish).

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

^d Big and Chiniak lakes will only be stocked if coho smolt production is more than necessary to fulfill all other stocking objectives.

Table 5.–Pillar Creek Hatchery Chinook salmon egg take (Monashka Creek broodstock) conducted in 2006, resultant juvenile releases in 2008, projected adult production, and Fish Transport Permit information.

Fish Species	Chinook	Chinook	Chinook	Totals
<u>Egg take</u>				
eggs	103,429	103,429	140,243	347,101
adults	37	37	50	123
<u>Releases</u>				
location	American River	Olds River	Monashka Creek	
number	44,250	44,250	60,000	148,500
size (g)	15.0	15.0	15.0	
lifestage	Smolt	Smolt	Smolt	
date	31-May-08	31-May-08	31-May-08	
<u>Projected Returns</u> ^a				
2009	12	12	16	40
2010	63	63	86	213
2011	169	169	230	569
2012	268	268	363	898
2013	18	18	25	61
total	531	531	719	1,781
<u>Fish Transport Permit (FTP)</u> ^b				
number	07A-0017	05A-0004	05A-0050	
expires	31-Dec-11	31-Dec-11	01-Sep-14	
max. no.	none	none	none	
lifestage	Smolt	Smolt	Smolt	

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

^b FTP 05A-0050 - for 300,000 green eggs, expiring 1 Sep-14, authorized egg take for these projects.

Table 6.–Pillar Creek Hatchery rainbow trout egg take (Ft. Richardson Hatchery captive brood, original donor stock Swanson River) in 2007 - eyed egg transfer from Ft. Richardson Hatchery, resultant juvenile releases planned for Road System Lakes in 2008, and Fish Transport Permit information.

Fish Species	RBT	RBT	RBT	RBT	RBT	RBT	RBT	RBT	RBT	Totals
<u>Egg take</u>										
eggs	7,265	5,890	7,068	3,927	2,749	2,258	10,111	3,043	6,381	48,692
adults	9	8	9	5	4	3	13	4	8	63
<u>Releases</u>	Abercrombie	Aurel	Big (Lily)	Bull	Caroline	Cicely	Dolgoi	Dragonfly	Heitman	
location	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	
number	3,700	3,000	3,600	2,000	1,400	1,150	5,150	1,550	3,250	24,800
size (g)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
lifestage	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	
date	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	
<u>Eggtake</u>										
eggs	1,963	1,963	7,068	5,497	3,141	7,068	4,712	11,780	7,854	51,048
adults	3	3	9	7	4	9	6	15	10	66
<u>Releases</u>	Horseshoe	Jack	Jupiter	Lee	Lily Pond	Long	Saturn	Tanignak	Twin	
location	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	
number	1,000	1,000	3,600	2,800	1,600	3,600	2,400	6,000	4,000	26,000
size (g)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
lifestage	Smolt	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Smolt	
date	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	15-Sep-08	
<u>Projected Returns</u>	No returns; all stocked lakes are landlocked.									
<u>Fish Transport Permit (FTP)</u>	<u>Summary</u>						Maximum			
							Number	Expiration		
07A-0029	Allows transfer of eyed eggs from Ft. Richardson Hatchery to PCH						92,000	31-Dec-12		
07A-0018	Allows release of juveniles into Kodiak Road System Lakes						57,300	31-Jul-12		

Table 7.–Donor stock, broodstock numbers, escapement goal range, egg take guidelines, and egg take replacement criteria for 2008 egg takes.

Species	Donor Stock	Broodstock Numbers	Escapement Goal Range	Egg take Guidelines - Escapement		Egg take Replacement Criteria	
				Egg take Prohibited Escapement is \leq :	Full Egg take Allowed Escapement is $>$: ^a	Replacement Required Escapement is: ^b	Replacement Requirement ^c
Sockeye	Malina Lake	1,196	1,000-10,000	500	1,696	501-2,195	22,860 Presmolt
Sockeye	Afognak Lake	1,201	20,000-50,000	10,000	11,201	10,001 - 21,200	22,760 Presmolt
Sockeye	Saltery Lake ^d	4,412	15,000-30,000	7,500	11,912	7,501 - 19,411	115,357 Presmolt
Sockeye	Little Kitoi Lake ^d	4,412	no escapement goal	n/a	n/a	none	none
Coho	Buskin Lake	56	3,200-7,200	1,600	1,656	none	none
Chinook	Monashka Creek	108	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 upper bound of escapement goal range minus one plus broodstock numbers (upper number). For example, for Afognak Lake - lower number is $50\% * 20,000 + 1 = 10,001$; upper number is $20,000 - 1 + 1201 = 21,200$.

^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 500 adults for Kitoi Bay Hatchery projects (Duesterloh and Aro *In prep*).

Table 8.—Proposed Pillar Creek Hatchery early-run sockeye salmon egg takes (Afognak Lake and/or Malina Lake broodstock) in 2008, juvenile releases in 2009, projected adult production, and Fish Transport Permit information.

Fish Species	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Totals
<u>Egg take</u> ^a								
eggs	369,950	246,633	123,317	184,975	123,317	246,633	123,317	1,418,142
adults	313	209	104	157	104	209	104	1,201
<u>Releases</u>								
location	Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake	Crescent Lake	
number	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	15-May-09	05-Oct-09	15-May-09	05-Oct-09	05-Oct-09	15-May-09	05-Oct-09	
<u>Projected Returns</u> ^b								
2011	986	2,260	329	1,695	1,130	657	1,130	7,201
2012	3,551	6,620	1,184	4,965	3,310	2,367	3,310	21,756
2013	6,305	10,480	2,102	7,860	5,240	4,203	5,240	35,125
2014	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
<u>FTP (Afognak Lake stock)</u> ^c								
number	99A-0053	99A-0054	06A-0042	97A-0076	04A-0032	06A-0047	04A-0034	
expires	31-Dec-08	31-Dec-08	31-Dec-11	31-Dec-08	31-Dec-09	31-Dec-11	31-Dec-09	
max. no.	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
<u>FTP (Malina Lake stock)</u> ^c								
number	04A-0035	04A-0035	04A-0038	04A-0038	04A-0031	04A-0033	04A-0033	
expires	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
max. no.	600,000	500,000	400,000	350,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	

^a Afognak Lake sockeye salmon has traditionally been the primary broodstock for early-run stocking projects. Afognak Lake adult 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 2008 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 brood exclusively.

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

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

Table 9.—Proposed Pillar Creek Hatchery late-run sockeye salmon egg takes (Little Kitoi Lake or Saltery Lake broodstock) in 2008, juvenile releases for Spiridon, Jennifer, and Ruth Lakes in 2009, projected adult production, and Fish Transport Permit information.

Fish Species	Late-run Sockeye	Late-run Sockeye	Late-run Sockeye	Late-run Totals
<u>Egg take</u>				
eggs	4,341,851	324,972	64,994	4,731,818
adults ^{a, b}	3,614	271	54	3,939
<u>Releases</u>				
location	Spiridon Lake	Jennifer Lakes	Ruth Lake	
number	3,340,169	250,000	50,000	3,640,169
size (g)	0.4	0.4	0.4	
lifestage	Fry	Fry	Fry	
date	15-Jun-08	15-Jun-08	15-Jun-08	
<u>Projected Returns</u> ^c				
2011	752	56	11	819
2012	47,798	3,578	716	52,091
2013	93,491	6,998	1,400	101,888
2014	8,117	608	122	8,846
total	150,157	11,239	2,248	163,644
<u>FTP (Little Kitoi Lake stock)</u> ^d				
number	09A-xxxx	09A-xxxx	09A-xxxx	
expires				
max. no.	7,000,000	400,000	300,000	
lifestage	Fry	Fry	Fry	
<u>FTP (Saltery Lake stock)</u> ^d				
number	04A-0040	04A-0036	04A-0039	
expires	31-Dec-09	31-Dec-09	31-Dec-09	
max. no.	7,000,000	400,000	300,000	
lifestage	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 2008 late run sockeye egg take. If 2008 Little Kitoi Lake escapement is insufficient to meet the Pillar Creek Hatchery egg take goal, the 2008 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 (Duesterloh and Aro *In prep.*)

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

^d FTP 99A-0071 - for 9.8 million green eggs, expiring 31 Dec-08, authorizes Saltery Lake egg take for these projects. New FTPs will be drafted for the release of Little Kitoi Lake juveniles as part of the late-run stocking program.

Table 10.—Proposed Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2008, resultant juvenile releases planned for Road System Lakes in 2009 (Monashka Creek in 2010), projected adult production, and Fish Transport Permit information.

Fish Species	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Totals
<u>Egg take</u>											
eggs	24,295	8,098	13,497	10,258	6,479	7,019	3,779	3,779	21,596	0 ^a	98,800
adults	14	5	8	6	4	4	2	2	12	0 ^a	56
<u>Releases</u>											
location	Island Lake	Dark Lake	Mission Lake	Potato Patch Lake	Big (Lily) Lake	Mayflower Lake	Southern Lake	Abercrombie Lake	Chiniak Lake	Monashka Creek ^a	
number	22,500	7,500	12,500	9,500	6,000	6,500	3,500	3,500	20,000	0	91,500
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	Smolt	
date	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Mar-09	15-Jul-08	15-Jul-08	15-Mar-09	15-Jul-08	03-Jun-09	
<u>Projected Returns</u> ^b											
2010	0	0	0	0	0	0	0	0	0	0	0
2011	1,463	488	813	618	390	423	0	0	0	0	4,193
total	1,463	488	813	618	390	423	landlocked	landlocked	landlocked	0	4,193
<u>Fish Transport Permit (FTP)</u> ^c											
number	04A-0006	04A-0006	04A-0006	04A-0006	05A-0004	04A-0006	04A-0005	05A-0003	07A-0019	04A-0007	
expires	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	01-Jul-12	31-Dec-08	
max. no.	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	20,000	10,000	
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 2010 releases are not included in column above of total releases for all locations.

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

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

Table 11.—Pillar Creek Hatchery Chinook salmon egg take (Monashka Creek broodstock) in 2007 and proposed egg take in 2008, resultant juvenile releases in 2009 and 2010, projected adult production, and Fish Transport Permit information.

Fish Species	Chinook	Chinook	Chinook	Chinook	Chinook	Chinook	Totals
<u>Eggtake</u>	BY2007	BY2007	BY2007	BY2008	BY2008	BY2008	
eggs	62,614	62,614	83,485	95,769	95,769	108,462	508,712
adults	25	25	33	40	40	45	207
<u>Releases</u>	American	Olds	Monashka	American	Olds	Monashka	
location	River	River	Creek	River	River	Creek	
number	45,000	45,000	60,000	41,500	41,500	47,000	280,000
size (g)	15	15	15	20	20	20	
lifestage	Smolt	Smolt	Smolt	Smolt	Smolt	Smolt	
date	31-May-09	31-May-09	31-May-09	31-May-10	31-May-10	31-May-10	
<u>Projected Returns</u> ^a							
2010	12	12	16	11	11	13	76
2011	64	64	86	59	59	67	401
2012	172	172	230	159	159	180	1,072
2013	272	272	363	251	251	284	1,694
2014	18	18	25	17	17	19	115
total	540	540	719	498	498	564	3,357
<u>Fish Transport Permit (FTP)</u> ^b							
number	07A-0017	05A-0004	05A-0050	07A-0017	05A-0004	05A-0050	
expires	31-Dec-11	31-Dec-11	01-Sep-14	31-Dec-11	31-Dec-11	01-Sep-14	
max. no.	none	none	none	none	none	none	
lifestage	smolt	smolt	smolt	smolt	smolt	smolt	

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

^b FTP 05A-0050 - for 300,000 green eggs, expiring 1 Sep-14, authorized egg take for these projects.

Table 12.—Proposed Pillar Creek Hatchery rainbow trout egg take (Ft. Richardson Hatchery captive brood, original donor stock Swanson River) in 2008 - eyed egg transfer from Ft. Richardson Hatchery, resultant juvenile releases planned for Road System Lakes in 2009, and Fish Transport Permit information.

Fish Species	RBT	RBT	RBT	RBT	RBT	RBT	RBT	RBT	RBT	Totals
<u>Egg take</u>										
eggs	7,265	5,890	7,068	3,927	2,749	2,258	10,111	3,043	6,381	48,692
adults	9	8	9	5	4	3	13	4	8	63
<u>Releases</u>	Abercrombie	Aurel	Big (Lily)	Bull	Caroline	Cicely	Dolgoi	Dragonfly	Heitman	
location	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	
number	3,700	3,000	3,600	2,000	1,400	1,150	5,150	1,550	3,250	24,800
size (g)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
lifestage	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	
date	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	
<u>Eggtake</u>										
eggs	1,963	1,963	7,068	5,497	3,141	7,068	4,712	11,780	7,854	51,048
adults	3	3	9	7	4	9	6	15	10	66
<u>Releases</u>	Horseshoe	Jack	Jupiter	Lee	Lily Pond	Long	Saturn	Tanignak	Twin	
location	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	
number	1,000	1,000	3,600	2,800	1,600	3,600	2,400	6,000	4,000	26,000
size (g)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
lifestage	Smolt	Fingerling	Smolt							
date	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	15-Sep-09	

Projected Returns No returns; all stocked lakes are landlocked.

Fish Transport		Maximum	
<u>Permit (FTP)</u>	<u>Summary</u>	Number	Expiration
07A-0029	Allows transfer of eyed eggs from Ft. Richardson Hatchery to PCH	92,000	31-Dec-12
07A-0018	Allows release of juveniles into Kodiak Road System Lakes	57,300	31-Jul-12

Table 13.—Estimated 2008 sockeye salmon runs as a result of Pillar Creek Hatchery stocking projects.

Lake Stocked	Broodstock ^a	Harvest Location	Forecasted Run	
			Point	Range
Hidden	Afognak Lake (ER)	Foul Bay SHA	13,000	5,300 - 29,200
Big & Little Waterfall	Afognak Lake (ER)	Waterfall Bay SHA	6,500	4,100 - 11,900
Crescent	Afognak Lake (ER)	Settler Cove SHA ^b	500	100 - 2,400
Spiridon	Saltery Lake (LR)	Spiridon Bay SHA ^c	226,000	93,000 - 359,000
Ruth Lake	Saltery Lake (LR)	Izhut and Ruth Bays	1,700	1,000-2,400
Little Kitoi Lake	Saltery Lake (LR)	Izhut and Kitoi Bays	2,400	1,400 - 3,500
Total Early Run:			20,000	9,500 - 43,500
Total Late Run:			230,100	95,400 - 364,900
Total Both Runs:			250,100	104,900 - 408,400

^a ER = early run; LR = late run

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

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

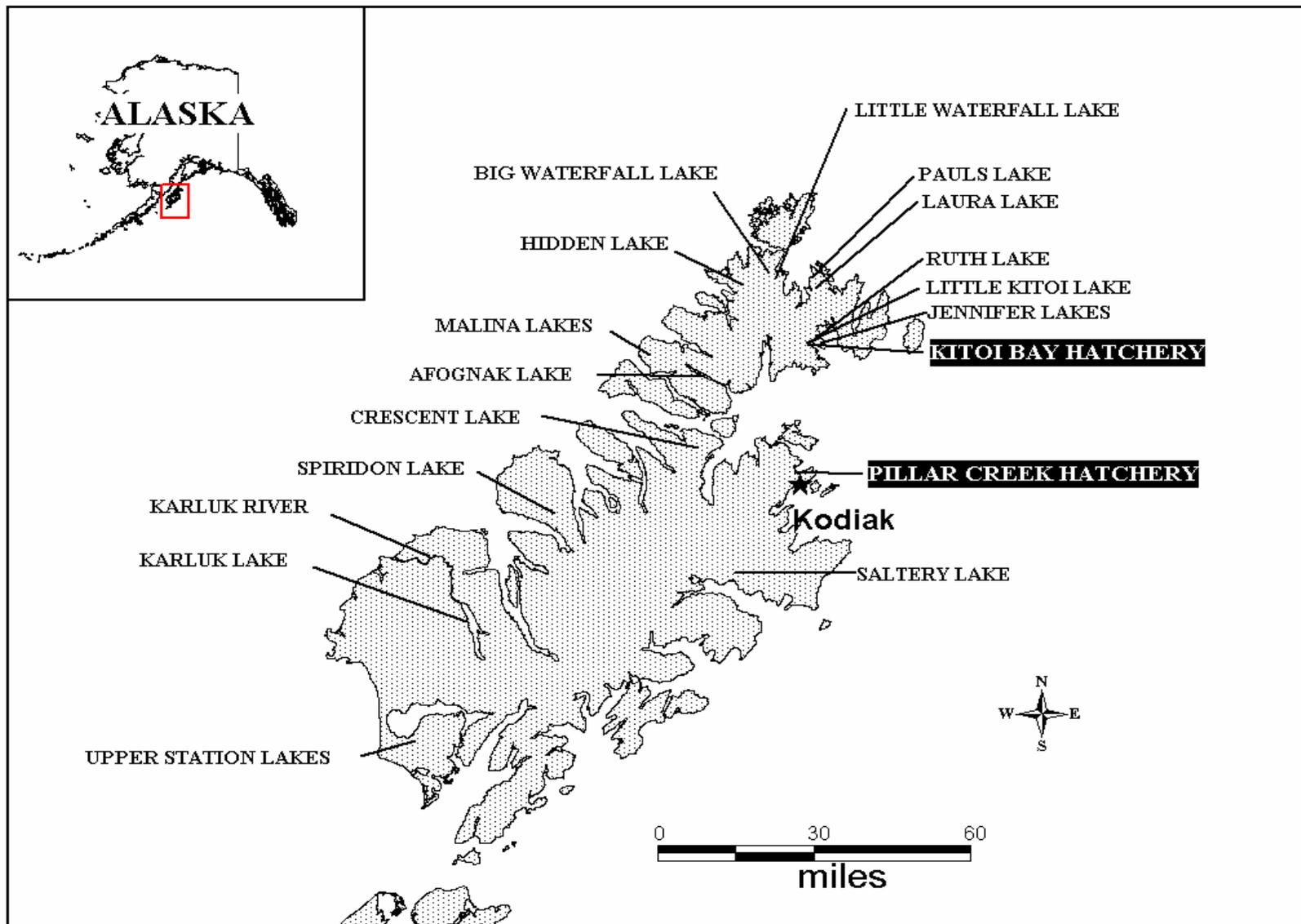


Figure 1.—Locations of past and present sockeye salmon enhancement and rehabilitation projects, and current egg take sites on Kodiak and Afognak Islands.

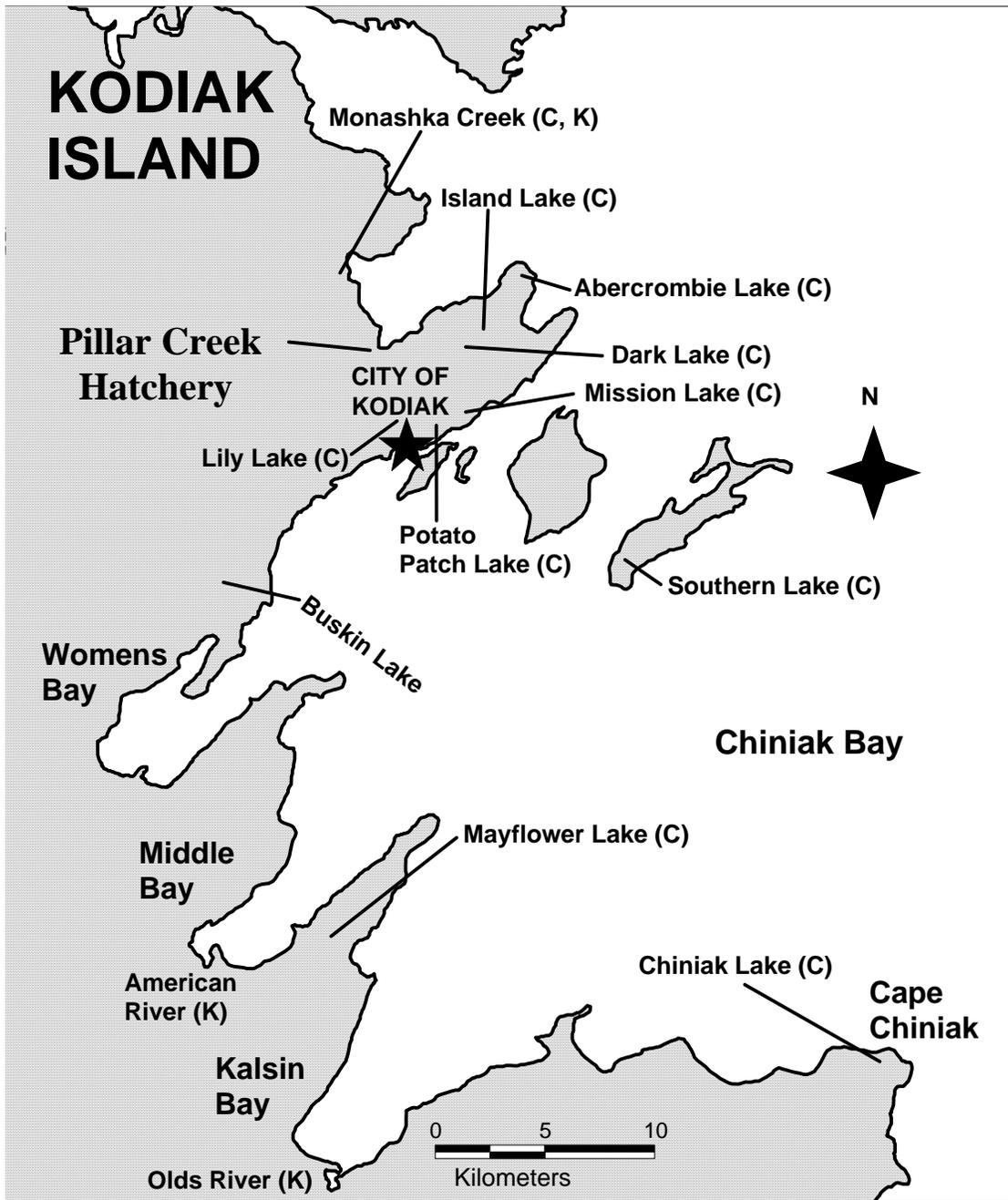


Figure 2.—Locations of Kodiak Island road system lakes and rivers that are to be stocked with coho (C) and Chinook (K) salmon in 2008.

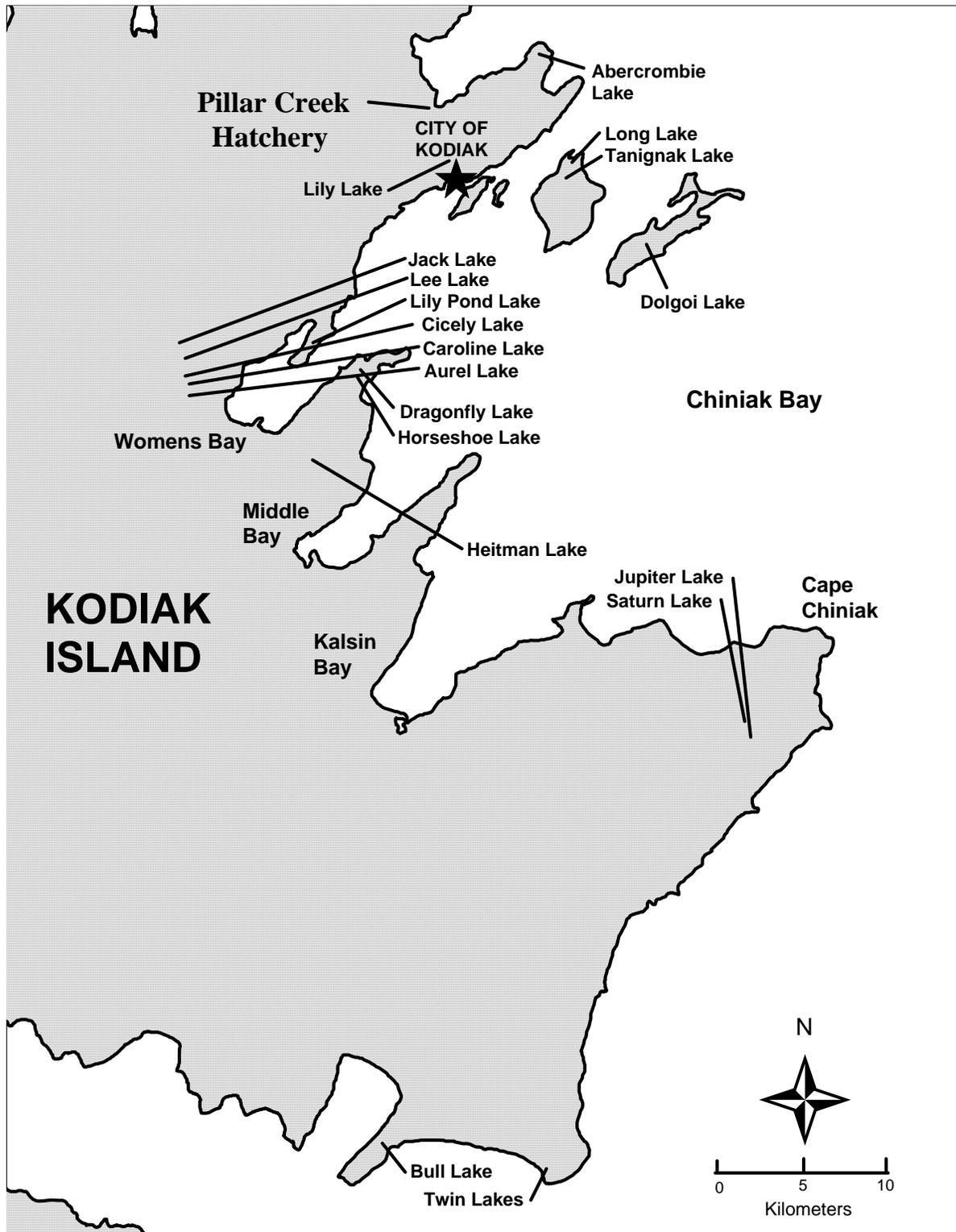


Figure 3.—Locations of Kodiak Island road system lakes that are to be stocked with rainbow trout in 2008.

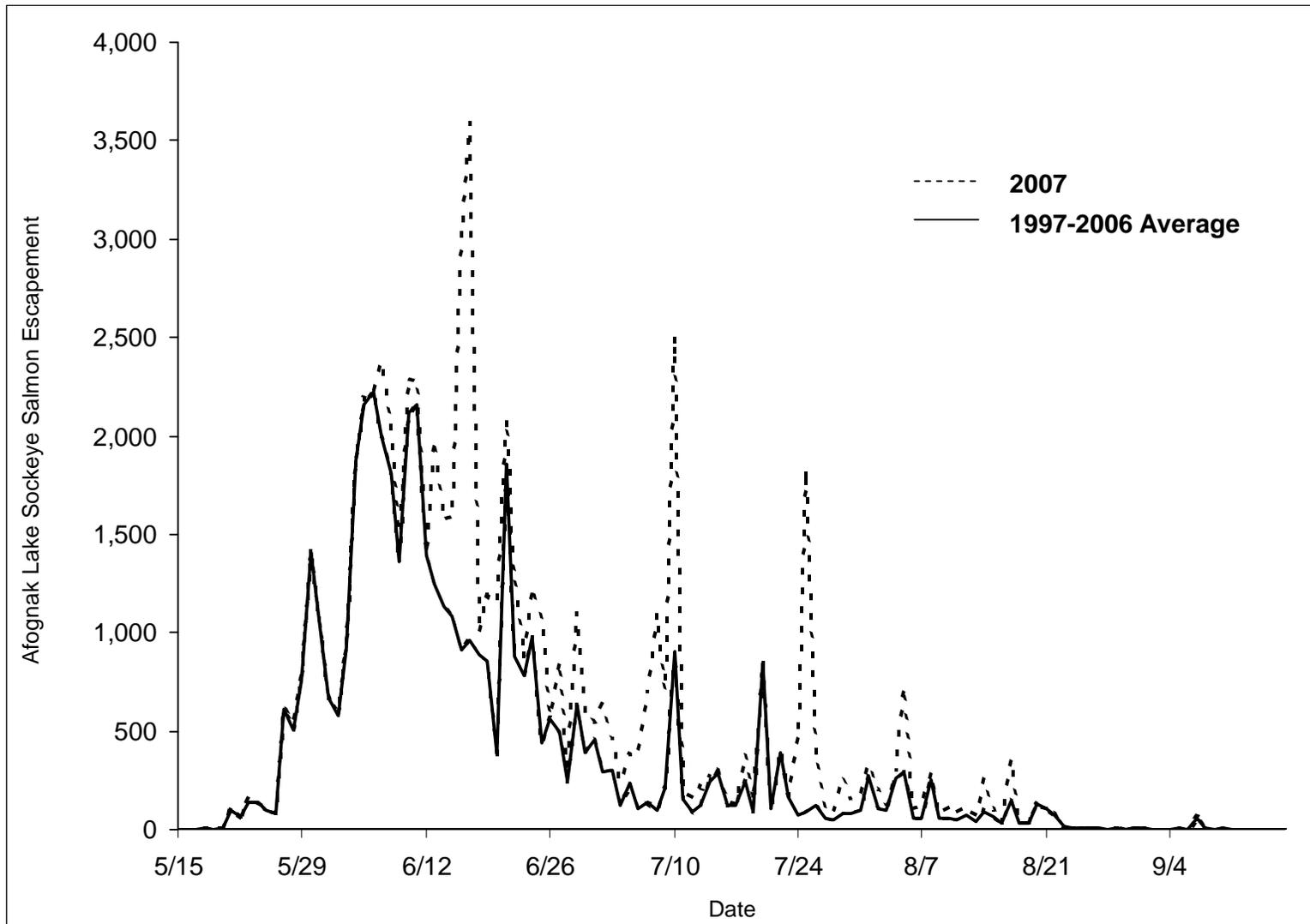


Figure 4.—Afognak Lake (Litnik) sockeye salmon average escapement timing (1997-2006) compared to the 2007 escapement timing.

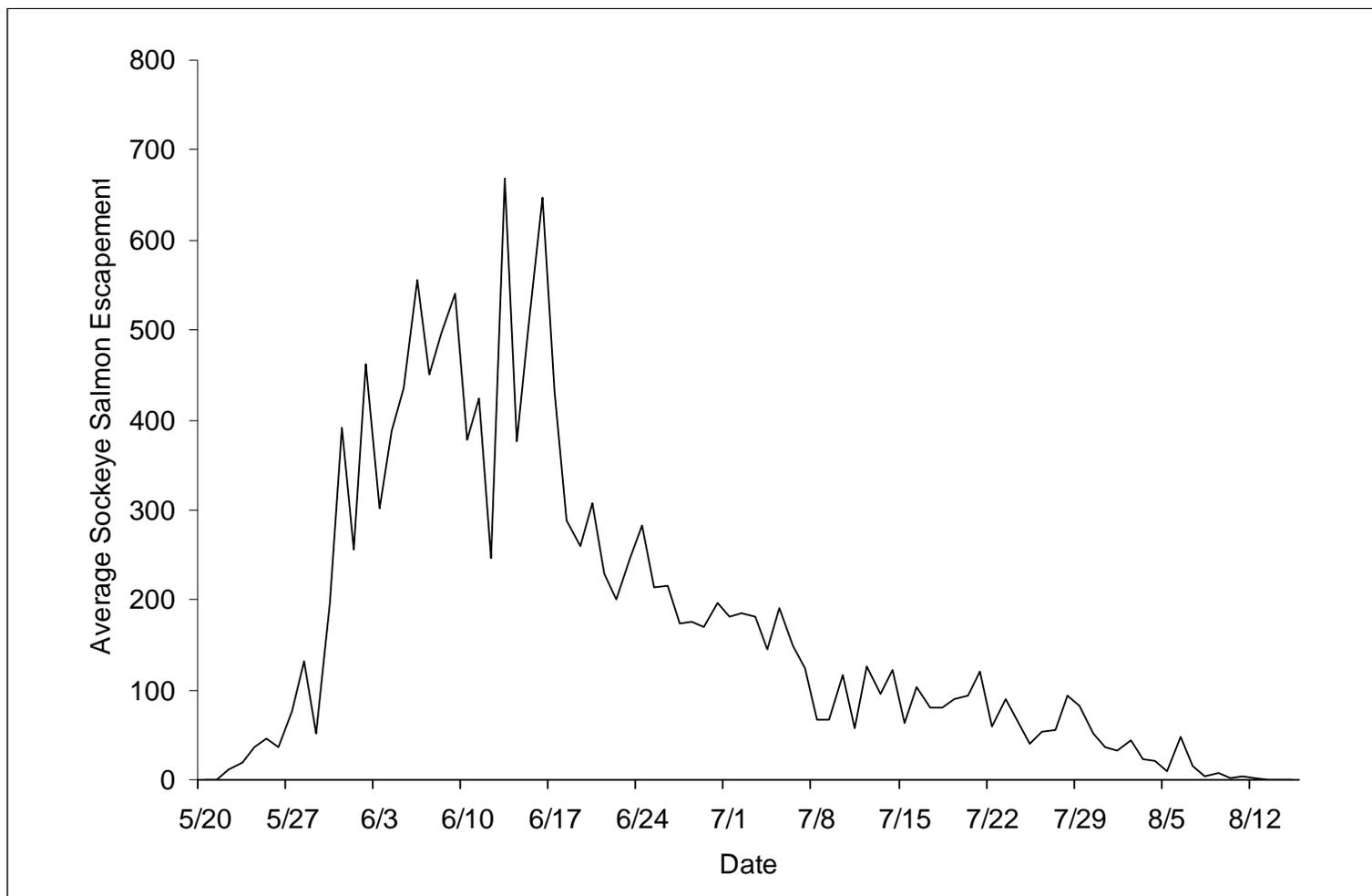


Figure 5.—Malina Lake sockeye salmon average escapement timing, 1993-2001. The weir was not operated over the entire duration of the run in 2002, 2004, and 2005, and was not operated at all in 2003.

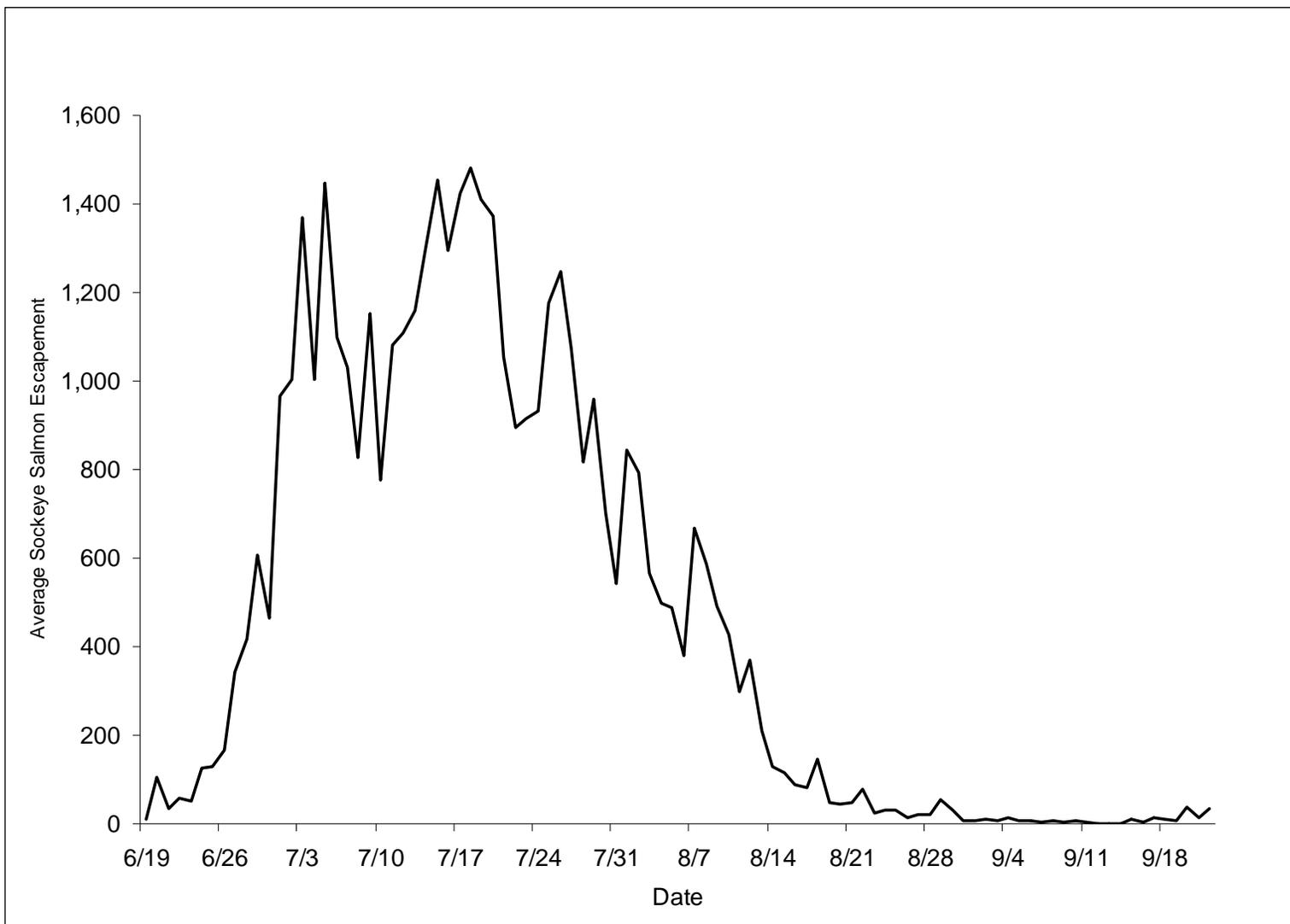


Figure 6.—Saltery Lake sockeye salmon average escapement timing, 1994-2003 (the weir has not operated since 2003).

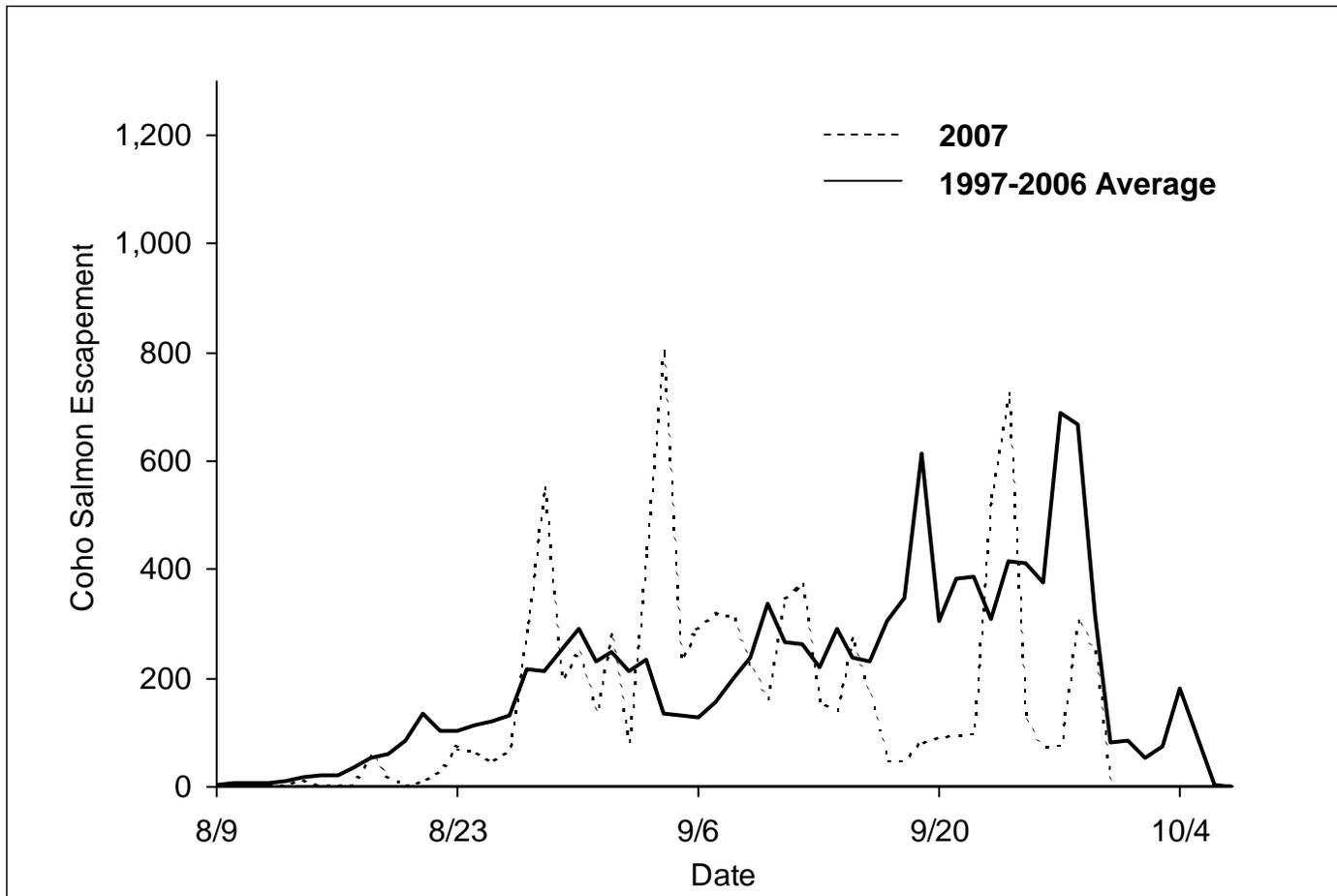


Figure 7.—Buskin River Coho salmon average escapement timing (1997-2006) compared to the 2007 escapement timing.

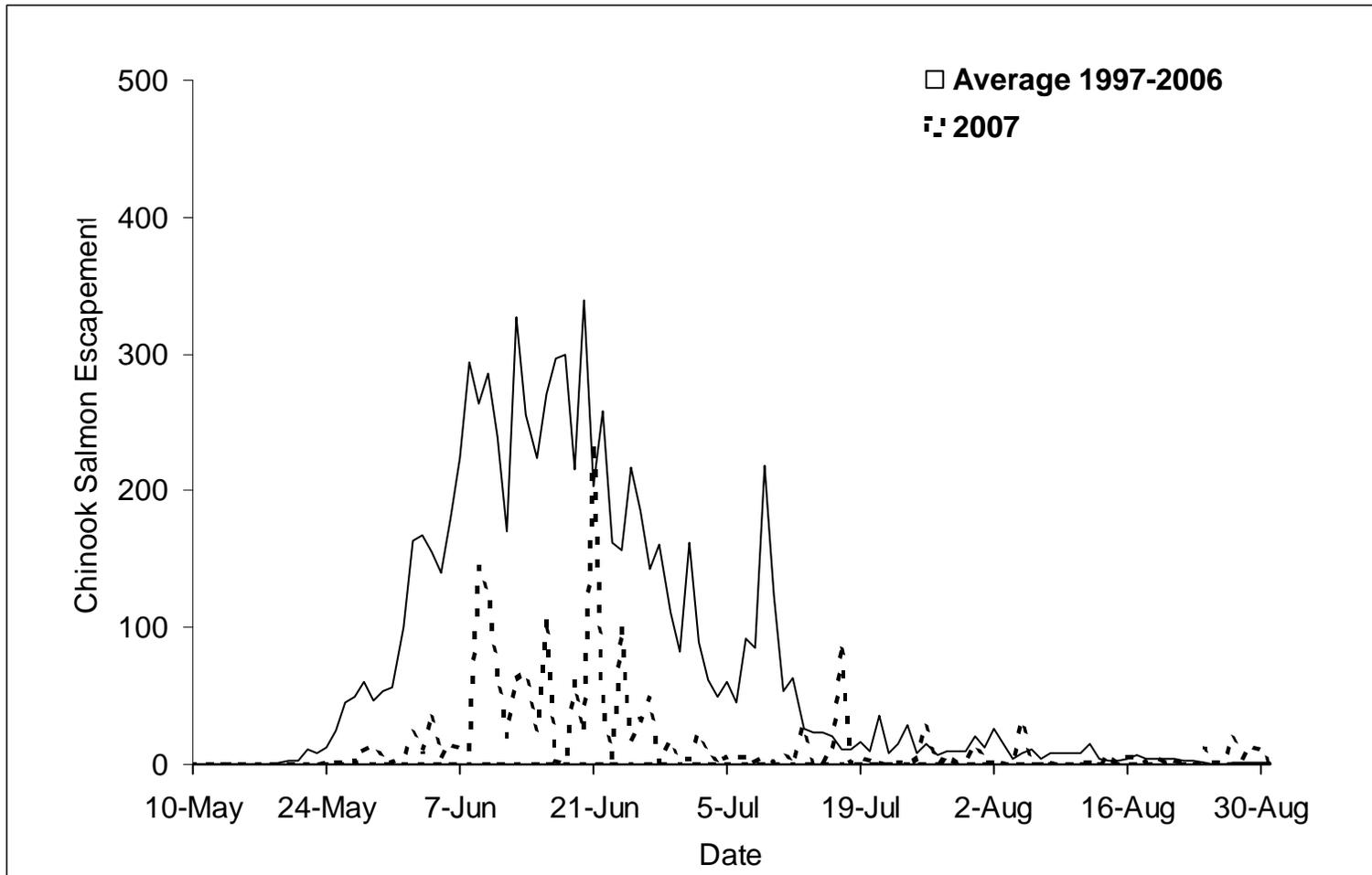


Figure 8.—Karluk River Chinook salmon average escapement timing (1997-2006) compared to the 2007 escapement timing.

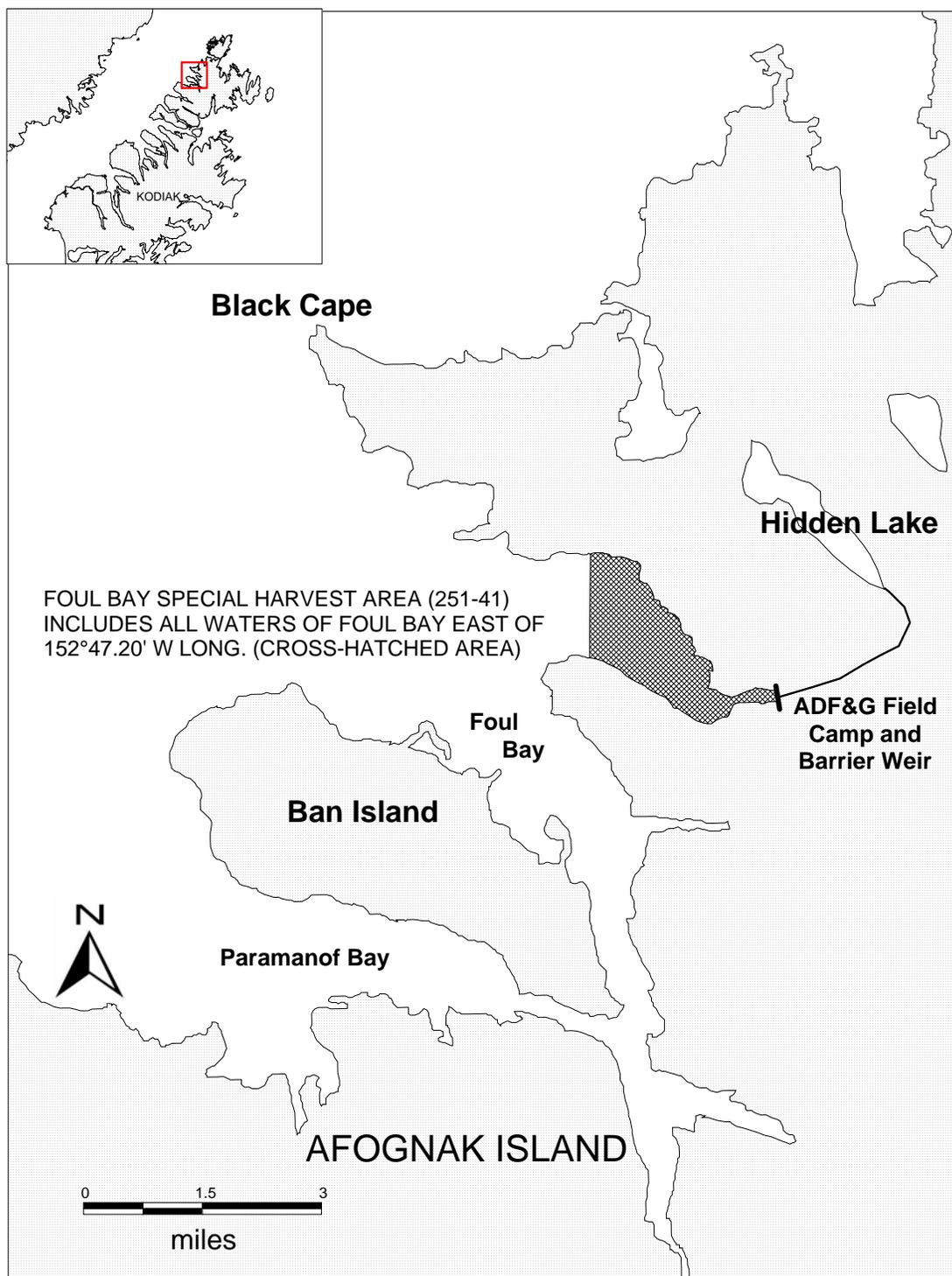


Figure 9.—Location of the Foul Bay special harvest area, and former locations of the ADF&G field camp and fish weir at Hidden Creek.

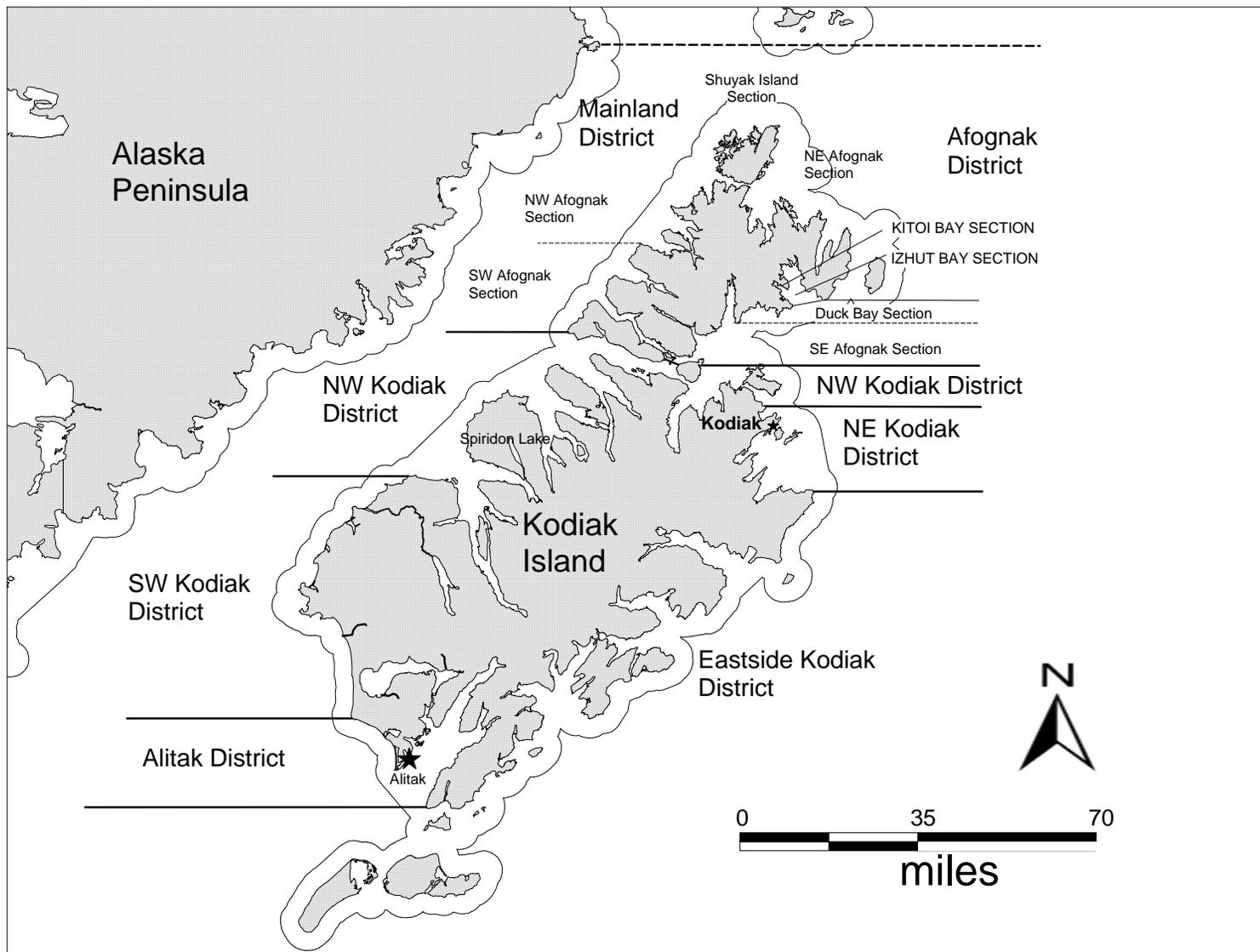


Figure 10.—Map of the Kodiak Management Area depicting commercial fishing districts and selected sections.

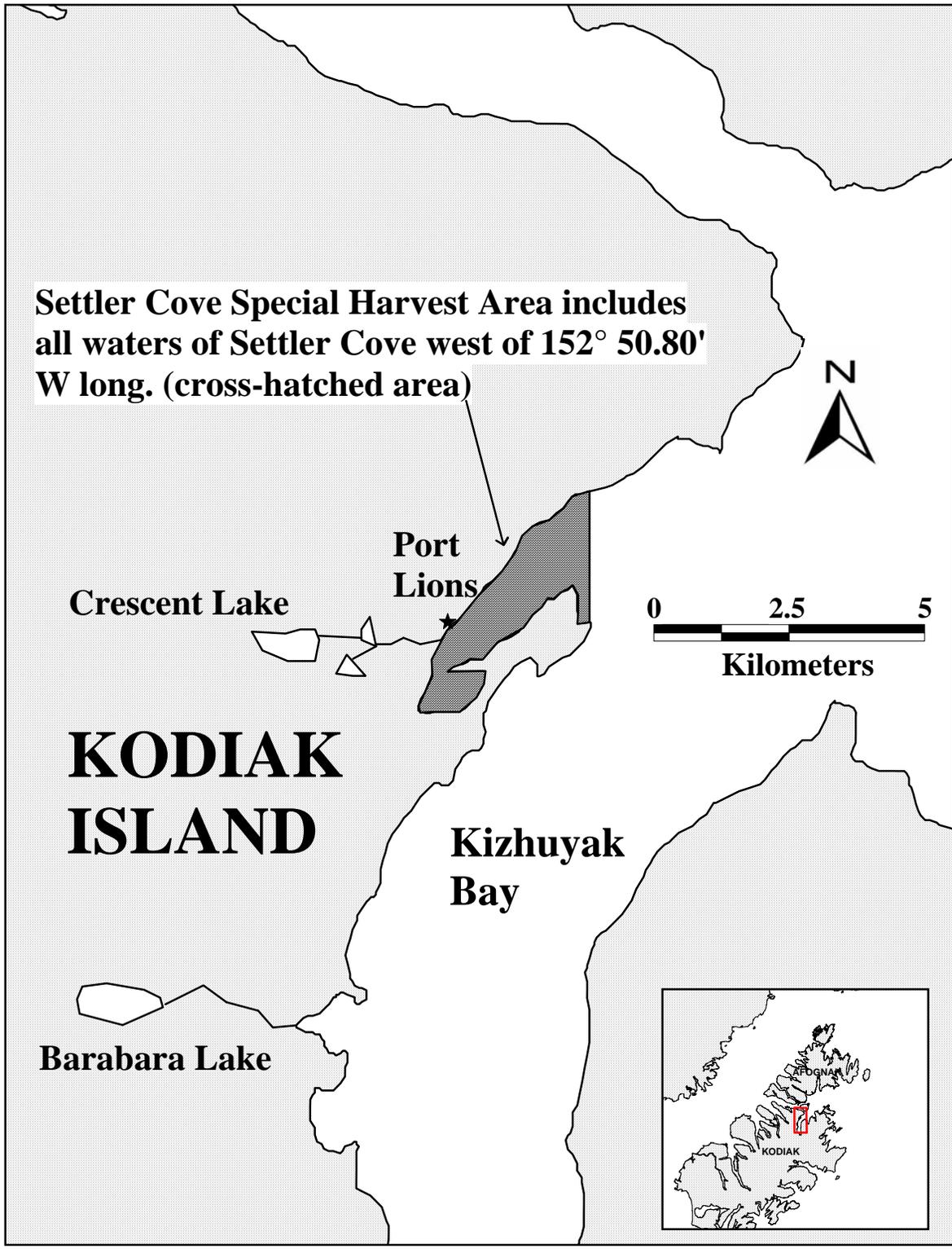


Figure 11.—Settler Cove (Crescent Lake) special harvest area boundaries in Kizhuyak Bay.

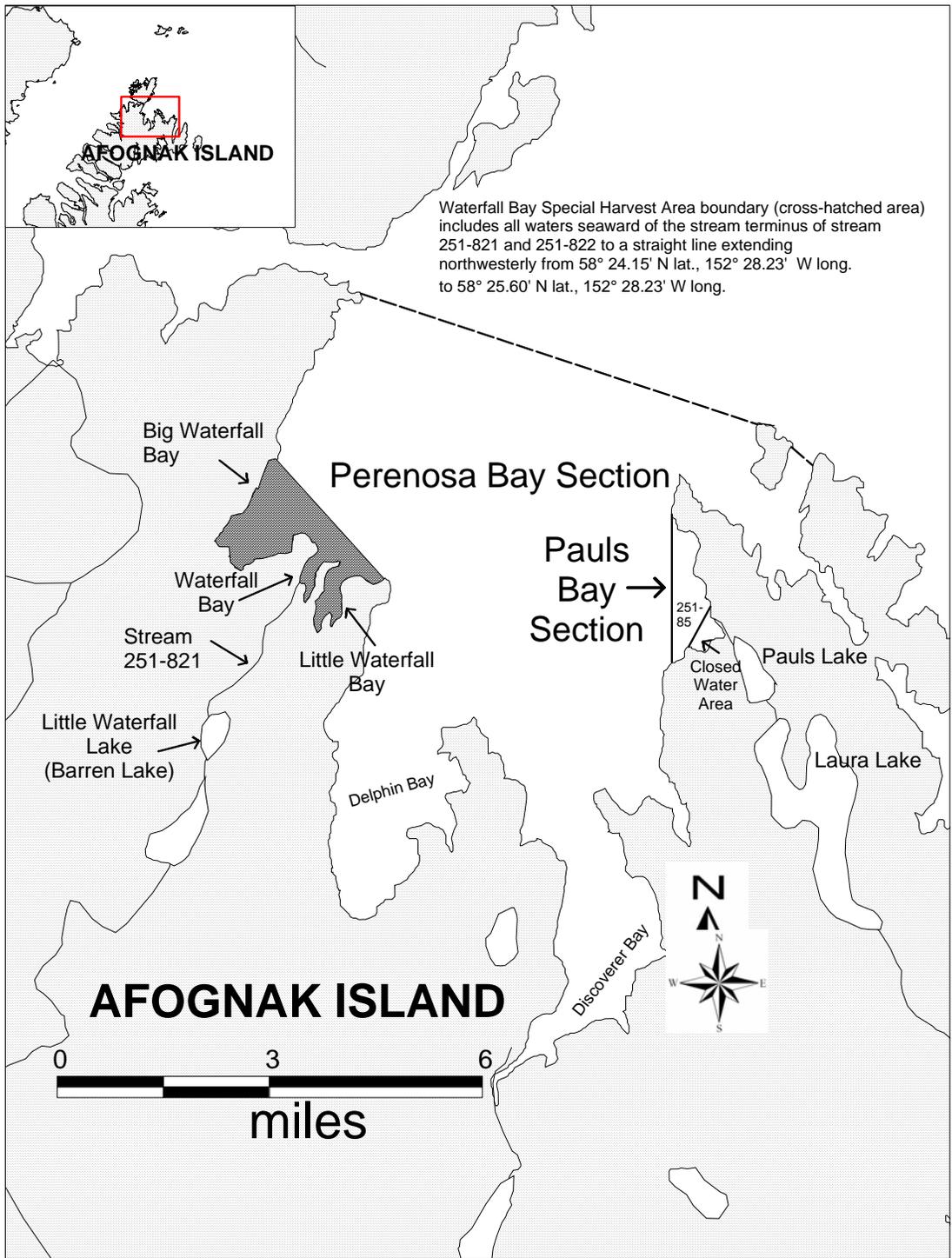


Figure 12.—Waterfall Bay (Little and Big Waterfall Lakes) special harvest area, Pauls Bay system (Pauls and Laura Lakes), and the Pauls Bay Section in Perenosa Bay.

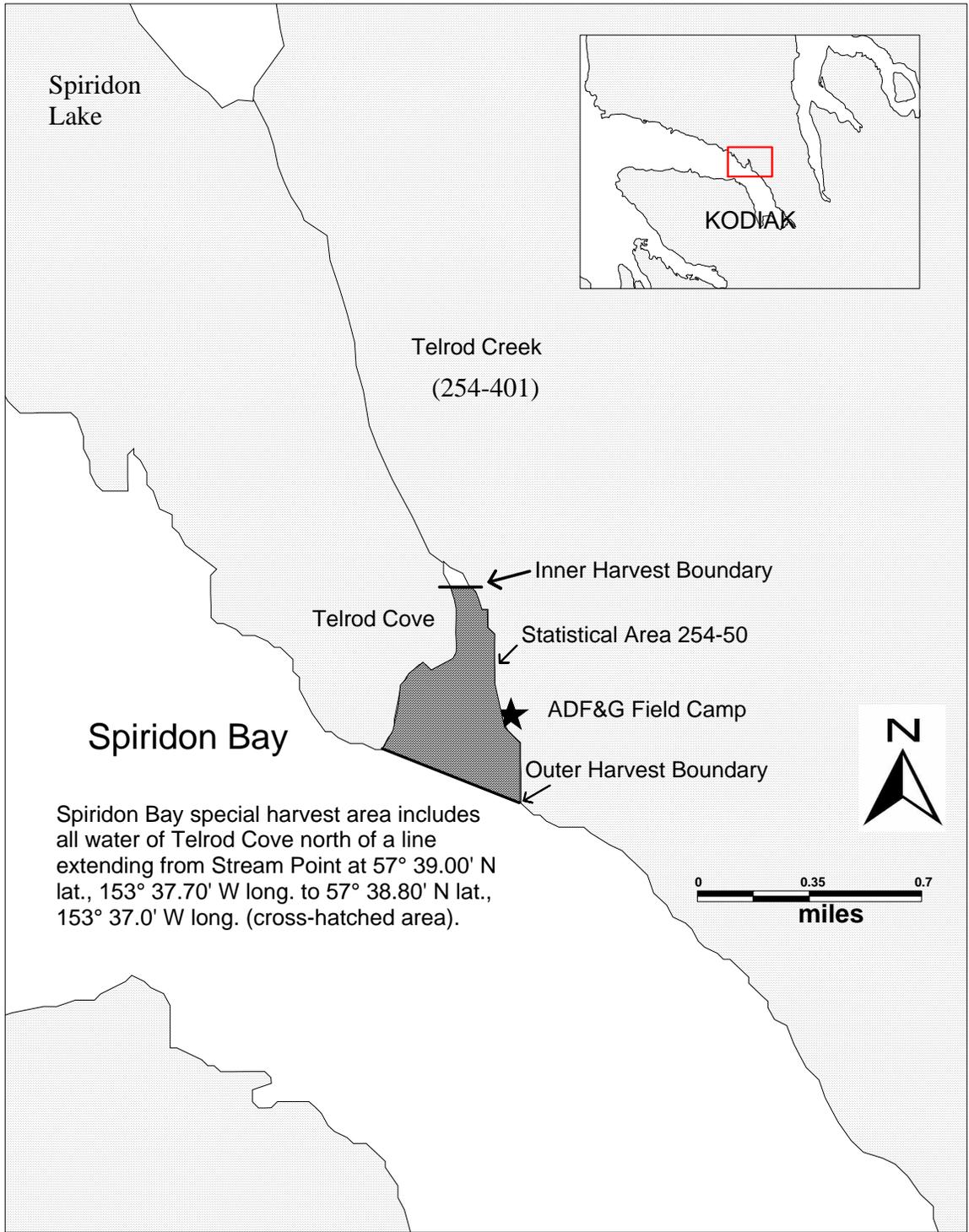


Figure 13.—Spiridon Bay (Telrod Cove) special harvest area boundaries, and ADF&G camp location in Telrod Cove.

**APPENDIX A. PILLAR CREEK HATCHERY SALMON EGG
TAKES, 1991-2008**

Appendix A1.—Pillar Creek Hatchery sockeye salmon egg takes at Afognak Lake, 1991-2008.

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
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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Appendix A1.–Page 2 of 3.

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 ^c	1,037	1.3	350,000	2008	Hidden Lake
			250,000	2008	Little Waterfall Lake
			50,000	2008	Big Waterfall Lake
			350,000	2008	Crescent Lake
2008 ^d	1,201	1.4	500,000	2009	Hidden Lake
			250,000	2009	Little Waterfall Lake
			100,000	2009	Big Waterfall Lake
			300,000	2009	Crescent Lake

-continued-

- ^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 2007 stocking figures are projected.
- ^d Afognak Lake is the preferred brood source for the 2008 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 in-season limnology evaluation and escapement results.

Appendix A2.—Sockeye salmon egg takes at Little Kitoi Lake, 1992-2008.

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 eggtake conducted
2005	0	0.00	Saltery Lake	PCH	0	2006	No eggtake conducted
2006	0	0.00	Saltery Lake	PCH	0	2007	No eggtake conducted
2007	0	0.00	Saltery Lake	PCH	0	2008	No eggtake conducted
2008 ^d	4,412	5.30	Saltery Lake	PCH	3,340,200	2009	Spiridon Lake
				PCH	50,000	2009	Ruth Lake
				PCH	250,000	2009	Jennifer Lake
				PCH		2009	Little Kitoi Lake
				KBH	100,000	2009	Little Kitoi Lake
				KBH	400,000	2010	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 2004-2007 were not sufficient to support egg take goals. Little Kitoi Lake is the preferred brood source for the 2008 late-run sockeye egg take; Saltery Lake is the alternate brood source.

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

Appendix A3.—Pillar Creek Hatchery coho salmon egg takes, 1991-2008.

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	56	98,800	91,500	2009	"
	0	0	0	2010	"

^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), Abercrombie (Gertrude), and Chiniak 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 A4.–Pillar Creek Hatchery Chinook salmon egg takes, 2000-2008.

Brood Year	Adult Salmon	Number of Eggs	Number Stocked	Year Stocked	Stocking Location
2000 ^a	48	124,818	60,400	2002	Monashka Creek
2001	34	86,120	34,000	2003	Monashka Creek
2002	59	147,000	12,300	2004	Monashka Creek
2003	70	172,300	72,150	2005	Monashka Creek
2004	76	181,600	29,000	2006	Monashka Creek
2005 ^a	92	208,700	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	60,000	2009	Monashka Creek
			44,250	2009	American River
			44,250	2009	Olds River
2008	125	300,000	47,000	2010	Monashka Creek
			41,500	2010	American River
			41,500	2010	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 A5.–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 eggtake conducted
2007 ^d	0	0.000	0	2008	No eggtake conducted
2008 ^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 salmon 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 or 2007. 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 2008 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 in-season limnology evaluation and escapement results.

Appendix A6.—Sockeye salmon egg takes at Saltery Lake, 1994-2008.

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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Appendix A6.—Page 2 of 3.

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

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Appendix A6.—Page 3 of 3.

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	2,290	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	71,000	2007	Jennifer Lake
			PCH		2007	Little Kitoi Lake
			KBH	133,500	2007	Little Kitoi Lake
			KBH	415,000	2008	Little Kitoi Lake
2007 ^b	1,818	2.19	PCH	1,000,000	2008	Spiridon Lake
			PCH	50,000	2008	Ruth Lake
			PCH	150,000	2008	Jennifer Lake
			PCH		2008	Little Kitoi Lake
			KBH	100,000	2008	Little Kitoi Lake
			KBH	400,000	2009	Little Kitoi Lake
2008 ^c	4,412	5.30	PCH	3,340,200	2009	Spiridon Lake
			PCH	50,000	2009	Ruth Lake
			PCH	250,000	2009	Jennifer Lake
			PCH		2009	Little Kitoi Lake
			KBH	100,000	2009	Little Kitoi Lake
			KBH	400,000	2010	Little Kitoi Lake

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

^b Brood year 2007 stocking figures are projected.

^c Little Kitoi Lake is the preferred brood source for the 2008 late run sockeye egg take. Sallery Lake sockeye may be utilized as a 2008 brood source if Little Kitoi Lake escapement is insufficient to meet egg take goals; egg take goal to be determined after in-season limnology evaluation.

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

Appendix B1.—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Afognak Lake, 2008.

50% Lower Bound	2008	Broodstock	50% Lower Bound	2008	Broodstock	50% Lower	2008	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	Bound EGR	Escapement	Allowed
10,000	15,000	5,000	10,000	13,250	3,250	10,000	11,500	1,500
10,000	14,950	4,950	10,000	13,200	3,200	10,000	11,450	1,450
10,000	14,900	4,900	10,000	13,150	3,150	10,000	11,400	1,400
10,000	14,850	4,850	10,000	13,100	3,100	10,000	11,350	1,350
10,000	14,800	4,800	10,000	13,050	3,050	10,000	11,300	1,300
10,000	14,750	4,750	10,000	13,000	3,000	10,000	11,250	1,250
10,000	14,700	4,700	10,000	12,950	2,950	10,000	11,200	1,200
10,000	14,650	4,650	10,000	12,900	2,900	10,000	11,150	1,150
10,000	14,600	4,600	10,000	12,850	2,850	10,000	11,100	1,100
10,000	14,550	4,550	10,000	12,800	2,800	10,000	11,050	1,050
10,000	14,500	4,500	10,000	12,750	2,750	10,000	11,000	1,000
10,000	14,450	4,450	10,000	12,700	2,700	10,000	10,950	950
10,000	14,400	4,400	10,000	12,650	2,650	10,000	10,900	900
10,000	14,350	4,350	10,000	12,600	2,600	10,000	10,850	850
10,000	14,300	4,300	10,000	12,550	2,550	10,000	10,800	800
10,000	14,250	4,250	10,000	12,500	2,500	10,000	10,750	750
10,000	14,200	4,200	10,000	12,450	2,450	10,000	10,700	700
10,000	14,150	4,150	10,000	12,400	2,400	10,000	10,650	650
10,000	14,100	4,100	10,000	12,350	2,350	10,000	10,600	600
10,000	14,050	4,050	10,000	12,300	2,300	10,000	10,550	550
10,000	14,000	4,000	10,000	12,250	2,250	10,000	10,500	500
10,000	13,950	3,950	10,000	12,200	2,200	10,000	10,450	450
10,000	13,900	3,900	10,000	12,150	2,150	10,000	10,400	400
10,000	13,850	3,850	10,000	12,100	2,100	10,000	10,350	350
10,000	13,800	3,800	10,000	12,050	2,050	10,000	10,300	300
10,000	13,750	3,750	10,000	12,000	2,000	10,000	10,250	250
10,000	13,700	3,700	10,000	11,950	1,950	10,000	10,200	200
10,000	13,650	3,650	10,000	11,900	1,900	10,000	10,150	150
10,000	13,600	3,600	10,000	11,850	1,850	10,000	10,100	100
10,000	13,550	3,550	10,000	11,800	1,800	10,000	10,050	50
10,000	13,500	3,500	10,000	11,750	1,750	10,000	10,000	0
10,000	13,450	3,450	10,000	11,700	1,700	10,000	9,950	0
10,000	13,400	3,400	10,000	11,650	1,650	10,000	9,900	
10,000	13,350	3,350	10,000	11,600	1,600	10,000	9,850	
10,000	13,300	3,300	10,000	11,550	1,550	10,000	9,800	

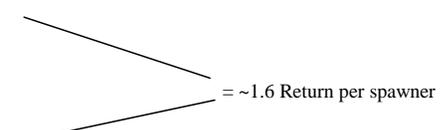
Appendix B2.—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at the Malina Lakes, 2008.

50% Lower Bound	2008	Broodstock	50% Lower Bound	2008	Broodstock	50% Lower	2008	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	Bound EGR	Escapement	Allowed
500	3,000	2,500	500	2,125	1,625	500	1,250	750
500	2,975	2,475	500	2,100	1,600	500	1,225	725
500	2,950	2,450	500	2,075	1,575	500	1,200	700
500	2,925	2,425	500	2,050	1,550	500	1,175	675
500	2,900	2,400	500	2,025	1,525	500	1,150	650
500	2,875	2,375	500	2,000	1,500	500	1,125	625
500	2,850	2,350	500	1,975	1,475	500	1,100	600
500	2,825	2,325	500	1,950	1,450	500	1,075	575
500	2,800	2,300	500	1,925	1,425	500	1,050	550
500	2,775	2,275	500	1,900	1,400	500	1,025	525
500	2,750	2,250	500	1,875	1,375	500	1,000	500
500	2,725	2,225	500	1,850	1,350	500	975	475
500	2,700	2,200	500	1,825	1,325	500	950	450
500	2,675	2,175	500	1,800	1,300	500	925	425
500	2,650	2,150	500	1,775	1,275	500	900	400
500	2,625	2,125	500	1,750	1,250	500	875	375
500	2,600	2,100	500	1,725	1,225	500	850	350
500	2,575	2,075	500	1,700	1,200	500	825	325
500	2,550	2,050	500	1,675	1,175	500	800	300
500	2,525	2,025	500	1,650	1,150	500	775	275
500	2,500	2,000	500	1,625	1,125	500	750	250
500	2,475	1,975	500	1,600	1,100	500	725	225
500	2,450	1,950	500	1,575	1,075	500	700	200
500	2,425	1,925	500	1,550	1,050	500	675	175
500	2,400	1,900	500	1,525	1,025	500	650	150
500	2,375	1,875	500	1,500	1,000	500	625	125
500	2,350	1,850	500	1,475	975	500	600	100
500	2,325	1,825	500	1,450	950	500	575	75
500	2,300	1,800	500	1,425	925	500	550	50
500	2,275	1,775	500	1,400	900	500	525	25
500	2,250	1,750	500	1,375	875	500	500	0
500	2,225	1,725	500	1,350	850	500	475	0
500	2,200	1,700	500	1,325	825	500	450	
500	2,175	1,675	500	1,300	800	500	425	
500	2,150	1,650	500	1,275	775	500	400	

Appendix B3.–Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Saltery Lake, 2008

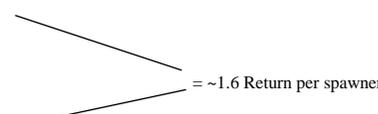
50% Lower Bound EGR	2008 Escapement	Broodstock Allowed	50% Lower Bound EGR	2008 Escapement	Broodstock Allowed	50% Lower Bound EGR	2008 Escapement	Broodstock Allowed
7,500	15,000	7,500	7,500	12,375	4,875	7,500	9,750	2,250
7,500	14,925	7,425	7,500	12,300	4,800	7,500	9,675	2,175
7,500	14,850	7,350	7,500	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 B4.–Worksheet for calculating sockeye salmon “replacement” options for adult removals from Afognak Lake, 2008.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMEND	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMEND
								ED ^a Fall Presmolt (8-10)			ED ^a Fall Presmolt (8-10)
300	134	309,720	21,680	4,553	455	22,750	11,375	5,687	455	455	455
350	156	361,340	25,294	5,312	531	26,543	13,272	6,636	531	531	531
400	178	412,960	28,907	6,071	607	30,336	15,169	7,584	607	607	607
450	200	464,580	32,521	6,829	683	34,129	17,066	8,533	683	683	683
500	223	516,200	36,134	7,588	759	37,922	18,963	9,481	758	759	758
550	245	567,820	39,747	8,347	835	41,715	20,860	10,430	834	834	834
600	267	619,440	43,361	9,106	911	45,508	22,757	11,378	910	910	910
650	289	671,060	46,974	9,865	986	49,301	24,654	12,327	986	986	986
700	312	722,680	50,588	10,623	1,062	53,094	26,551	13,275	1,062	1,062	1,062
750	334	774,300	54,201	11,382	1,138	56,887	28,448	14,224	1,138	1,138	1,138
800	356	825,920	57,814	12,141	1,214	60,680	30,345	15,172	1,214	1,214	1,214
850	378	877,540	61,428	12,900	1,290	64,473	32,242	16,121	1,289	1,290	1,290
900	401	929,160	65,041	13,659	1,366	68,266	34,139	17,069	1,365	1,366	1,366
950	423	980,780	68,655	14,417	1,442	72,059	36,036	18,018	1,441	1,441	1,441
1,000	445	1,032,400	72,268	15,176	1,518	75,852	37,933	18,966	1,517	1,517	1,517
1,050	467	1,084,020	75,881	15,935	1,594	79,645	39,830	19,915	1,593	1,593	1,593
1,100	490	1,135,640	79,495	16,694	1,669	83,438	41,727	20,863	1,669	1,669	1,669
1,150	512	1,187,260	83,108	17,453	1,745	87,231	43,624	21,812	1,745	1,745	1,745
1,200	534	1,238,880	86,722	18,212	1,821	91,024	45,521	22,760	1,820	1,821	1,821
1,250	556	1,290,500	90,335	18,970	1,897	94,817	47,418	23,709	1,896	1,897	1,897
1,300	579	1,342,120	93,948	19,729	1,973	98,610	49,315	24,657	1,972	1,973	1,973
1,350	601	1,393,740	97,562	20,488	2,049	102,403	51,212	25,606	2,048	2,048	2,048
1,400	623	1,445,360	101,175	21,247	2,125	106,196	53,109	26,554	2,124	2,124	2,124
1,450	645	1,496,980	104,789	22,006	2,201	109,989	55,006	27,503	2,200	2,200	2,200
1,500	668	1,548,600	108,402	22,764	2,276	113,782	56,903	28,451	2,276	2,276	2,276
1,550	690	1,600,220	112,015	23,523	2,352	117,575	58,800	29,400	2,352	2,352	2,352
1,600	712	1,651,840	115,629	24,282	2,428	121,368	60,697	30,348	2,427	2,428	2,428
1,650	734	1,703,460	119,242	25,041	2,504	125,161	62,594	31,297	2,503	2,504	2,504
1,700	757	1,755,080	122,856	25,800	2,580	128,954	64,491	32,245	2,579	2,580	2,580
1,750	779	1,806,700	126,469	26,558	2,656	132,747	66,388	33,194	2,655	2,656	2,655
1,800	801	1,858,320	130,082	27,317	2,732	136,540	68,285	34,142	2,731	2,731	2,731
1,850	823	1,909,940	133,696	28,076	2,808	140,333	70,182	35,091	2,807	2,807	2,807
1,900	846	1,961,560	137,309	28,835	2,883	144,126	72,079	36,039	2,883	2,883	2,883
Assumptions: 1. "jack" % = 11% 2. Fecundity = 2320 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% 						Bold type indicates proposed adult removals in 2008 and replacement presmolt stocking recommended for 2009.			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

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

Appendix B5.–Worksheet for calculating sockeye salmon “replacement” options for adult removals from the Malina Lakes, 2008.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^a	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^a
								Fall Presmolt (8-10 g)			Fall Presmolt (8-10 g)
300	134	311,055	21,774	4,573	457	22,850	11,425	5,710	457	457	457
350	156	362,898	25,403	5,335	533	26,661	13,331	6,663	533	533	533
400	178	414,740	29,032	6,097	610	30,472	15,236	7,616	609	609	609
450	200	466,583	32,661	6,859	686	34,283	17,142	8,568	686	686	685
500	223	518,425	36,290	7,621	762	38,094	19,047	9,521	762	762	762
550	245	570,268	39,919	8,383	838	41,905	20,953	10,474	838	838	838
600	267	622,110	43,548	9,145	915	45,716	22,858	11,427	914	914	914
650	289	673,953	47,177	9,907	991	49,527	24,764	12,379	991	991	990
700	312	725,795	50,806	10,669	1,067	53,338	26,669	13,332	1,067	1,067	1,067
750	334	777,638	54,435	11,431	1,143	57,149	28,575	14,285	1,143	1,143	1,143
800	356	829,480	58,064	12,193	1,219	60,960	30,480	15,238	1,219	1,219	1,219
850	378	881,323	61,693	12,955	1,296	64,771	32,386	16,190	1,295	1,295	1,295
900	401	933,165	65,322	13,718	1,372	68,582	34,291	17,143	1,372	1,372	1,371
950	423	985,008	68,951	14,480	1,448	72,393	36,197	18,096	1,448	1,448	1,448
1,000	445	1,036,850	72,580	15,242	1,524	76,204	38,102	19,049	1,524	1,524	1,524
1,050	467	1,088,693	76,208	16,004	1,600	80,015	40,008	20,001	1,600	1,600	1,600
1,100	490	1,140,535	79,837	16,766	1,677	83,826	41,913	20,954	1,677	1,677	1,676
1,150	512	1,192,378	83,466	17,528	1,753	87,637	43,819	21,907	1,753	1,753	1,753
1,200	534	1,244,220	87,095	18,290	1,829	91,448	45,724	22,860	1,829	1,829	1,829
1,250	556	1,296,063	90,724	19,052	1,905	95,259	47,630	23,812	1,905	1,905	1,905
1,300	579	1,347,905	94,353	19,814	1,981	99,070	49,535	24,765	1,981	1,981	1,981
1,350	601	1,399,748	97,982	20,576	2,058	102,881	51,441	25,718	2,058	2,058	2,057
1,400	623	1,451,590	101,611	21,338	2,134	106,692	53,346	26,671	2,134	2,134	2,134
1,450	645	1,503,433	105,240	22,100	2,210	110,503	55,252	27,623	2,210	2,210	2,210
1,500	668	1,555,275	108,869	22,863	2,286	114,314	57,157	28,576	2,286	2,286	2,286
1,550	690	1,607,118	112,498	23,625	2,362	118,125	59,063	29,529	2,363	2,363	2,362
1,600	712	1,658,960	116,127	24,387	2,439	121,936	60,968	30,482	2,439	2,439	2,439
1,650	734	1,710,803	119,756	25,149	2,515	125,747	62,874	31,434	2,515	2,515	2,515
1,700	757	1,762,645	123,385	25,911	2,591	129,558	64,779	32,387	2,591	2,591	2,591
1,750	779	1,814,488	127,014	26,673	2,667	133,369	66,685	33,340	2,667	2,667	2,667
1,800	801	1,866,330	130,643	27,435	2,744	137,180	68,590	34,293	2,744	2,744	2,743
1,850	823	1,918,173	134,272	28,197	2,820	140,991	70,496	35,245	2,820	2,820	2,820
1,900	846	1,970,015	137,901	28,959	2,896	144,802	72,401	36,198	2,896	2,896	2,896
1,950	868	2,021,858	141,530	29,721	2,972	148,613	74,307	37,151	2,972	2,972	2,972
2,000	890	2,073,700	145,159	30,483	3,048	152,424	76,212	38,104	3,048	3,048	3,048
2,050	912	2,125,543	148,788	31,245	3,125	156,235	78,118	39,056	3,125	3,125	3,125
2,100	935	2,177,385	152,417	32,008	3,201	160,046	80,023	40,009	3,201	3,201	3,201
2,150	957	2,229,228	156,046	32,770	3,277	163,857	81,929	40,962	3,277	3,277	3,277
2,200	979	2,281,070	159,675	33,532	3,353	167,668	83,834	41,915	3,353	3,353	3,353
Assumptions: 1. "jack" % = 11% 2. Fecundity = 2330 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% 						Bold type indicates proposed adult removals in 2008 and replacement presmolt stocking recommended for 2009.			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

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

Appendix B6.–Worksheet for calculating sockeye salmon “replacement” options for adult removals from Saltery Lake, 2008.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^a Fall Presmolt (8-10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED ^a Fall Presmolt (8-10 g)
1,500	738	2,140,200	149,814	31,461	3,146	157,300	78,650	39,325	3,146	3,146	3,146
1,600	787	2,282,880	159,802	33,558	3,356	167,787	83,894	41,947	3,356	3,356	3,356
1,700	836	2,425,560	169,789	35,656	3,566	178,274	89,137	44,569	3,565	3,565	3,565
1,800	886	2,568,240	179,777	37,753	3,775	188,761	94,381	47,190	3,775	3,775	3,775
1,900	935	2,710,920	189,764	39,851	3,985	199,249	99,624	49,812	3,985	3,985	3,985
2,000	984	2,853,600	199,752	41,948	4,195	209,736	104,868	52,434	4,195	4,195	4,195
2,100	1,033	2,996,280	209,740	44,045	4,405	220,223	110,111	55,056	4,404	4,404	4,404
2,200	1,082	3,138,960	219,727	46,143	4,614	230,710	115,355	57,678	4,614	4,614	4,614
2,300	1,132	3,281,640	229,715	48,240	4,824	241,197	120,599	60,299	4,824	4,824	4,824
2,400	1,181	3,424,320	239,702	50,338	5,034	251,684	125,842	62,921	5,034	5,034	5,034
2,500	1,230	3,567,000	249,690	52,435	5,243	262,172	131,086	65,543	5,243	5,243	5,243
2,600	1,279	3,709,680	259,678	54,532	5,453	272,659	136,329	68,165	5,453	5,453	5,453
2,700	1,328	3,852,360	269,665	56,630	5,663	283,146	141,573	70,786	5,663	5,663	5,663
2,800	1,378	3,995,040	279,653	58,727	5,873	293,633	146,816	73,408	5,873	5,873	5,873
2,900	1,427	4,137,720	289,640	60,824	6,082	304,120	152,060	76,030	6,082	6,082	6,082
3,000	1,476	4,280,400	299,628	62,922	6,292	314,607	157,304	78,652	6,292	6,292	6,292
3,100	1,525	4,423,080	309,616	65,019	6,502	325,094	162,547	81,274	6,502	6,502	6,502
3,200	1,574	4,565,760	319,603	67,117	6,712	335,582	167,791	83,895	6,712	6,712	6,712
3,300	1,624	4,708,440	329,591	69,214	6,921	346,069	173,034	86,517	6,921	6,921	6,921
3,400	1,673	4,851,120	339,578	71,311	7,131	356,556	178,278	89,139	7,131	7,131	7,131
3,500	1,722	4,993,800	349,566	73,409	7,341	367,043	183,522	91,761	7,341	7,341	7,341
3,600	1,771	5,136,480	359,554	75,506	7,551	377,530	188,765	94,383	7,551	7,551	7,551
3,700	1,820	5,279,160	369,541	77,604	7,760	388,017	194,009	97,004	7,760	7,760	7,760
3,800	1,870	5,421,840	379,529	79,701	7,970	398,504	199,252	99,626	7,970	7,970	7,970
3,900	1,919	5,564,520	389,516	81,798	8,180	408,992	204,496	102,248	8,180	8,180	8,180
4,000	1,968	5,707,200	399,504	83,896	8,390	419,479	209,739	104,870	8,390	8,390	8,390
4,100	2,017	5,849,880	409,492	85,993	8,599	429,966	214,983	107,491	8,599	8,599	8,599
4,200	2,066	5,992,560	419,479	88,091	8,809	440,453	220,227	110,113	8,809	8,809	8,809
4,300	2,116	6,135,240	429,467	90,188	9,019	450,940	225,470	112,735	9,019	9,019	9,019
4,400	2,165	6,277,920	439,454	92,285	9,229	461,427	230,714	115,357	9,229	9,229	9,229
4,500	2,214	6,420,600	449,442	94,383	9,438	471,915	235,957	117,979	9,438	9,438	9,438
4,600	2,263	6,563,280	459,430	96,480	9,648	482,402	241,201	120,600	9,648	9,648	9,648
4,700	2,312	6,705,960	469,417	98,578	9,858	492,889	246,444	123,222	9,858	9,858	9,858
4,800	2,362	6,848,640	479,405	100,675	10,068	503,376	251,688	125,844	10,068	10,068	10,068
4,900	2,411	6,991,320	489,392	102,772	10,277	513,863	256,932	128,466	10,277	10,277	10,277
5,000	2,460	7,134,000	499,380	104,870	10,487	524,350	262,175	131,088	10,487	10,487	10,487
5,100	2,509	7,276,680	509,368	106,967	10,697	534,837	267,419	133,709	10,697	10,697	10,697
5,200	2,558	7,419,360	519,355	109,065	10,906	545,325	272,662	136,331	10,906	10,906	10,906
5,300	2,608	7,562,040	529,343	111,162	11,116	555,812	277,906	138,953	11,116	11,116	11,116
5,400	2,657	7,704,720	539,330	113,259	11,326	566,299	283,149	141,575	11,326	11,326	11,326
5,500	2,706	7,847,400	549,318	115,357	11,536	576,786	288,393	144,196	11,536	11,536	11,536
5,600	2,755	7,990,080	559,306	117,454	11,745	587,273	293,637	146,818	11,745	11,745	11,745
Assumptions: 1. "jack" % = 1.6% 2. Fecundity = 2900 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10%						Bold type indicates proposed adult removals in 2008 and replacement presmolt stocking recommended for 2009.			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

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

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

Appendix C1.—Guidelines for “replacement” stocking (backstocking) of sockeye salmon as applicable to adult removals from Afognak, Malina and Saltery Lakes in 2008.

(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 2008 Pillar Creek Hatchery Annual Management Plan

Gary Byrne 7-7-08
Gary Byrne: Pillar Creek Hatchery Manager, KRAA Date

Steve Schrof 6/26/08
Steve Schrof: Regional Resource Development Biologist, CFD Date

David Sterritt 7/2/08
David Sterritt: Regional Finfish Management Supervisor, CFD Date

Steve Honnold 7/3/08
Steve Honnold: Regional Finfish Research Supervisor, CFD Date

Jeff Wadley 6/30/08
Jeff Wadley: Area Finfish Management Biologist, CFD Date

Jim McCullough 7/3/08
Jim McCullough: Regional Supervisor, CFD Date

Len Schwarz 7/4/08
Len Schwarz: Area Biologist, SFD Date

James J. Hasbrouck 7/9/2008
James Hasbrouck: Regional Supervisor, SFD Date

Kevin Brennan 7-7-08
Kevin Brennan: Executive Director, KRAA Date

The 2008 Hatchery Management Plan for PCH is hereby approved:

Denby S. Lloyd 8/11/08
Denby S. Lloyd: Commissioner, ADF&G, Juneau Date