

PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN, 2003



By

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and  
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PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN  
EXECUTIVE SUMMARY, 2003.

New Projects for 2003: NONE

Cost Recovery Harvests for 2003: NONE

Project (Broodstock)	Projected 2003 <sup>a</sup> Enhanced Return	Planned 2003 Stocking <sup>b</sup>	Goals	
			2003 Eggs	2004 Juveniles <sup>b</sup>
<b>Sockeye:</b>				
Hidden Lake (A.L.)	37,200	50,000	85,000	55,000
Little Waterfall Lake (A.L.)	25,700	50,000	85,000	55,000
Big Waterfall Lake (A.L.)	6,700	25,000	85,000	55,000
Crescent Lake (A.L.)	4,200	25,000	85,000	55,000
Total (A.L.)	73,800	150,000	340,000	220,000
Malina Lake (M.L.)	10,600 <sup>c</sup>	0	0	0
Laura Lake (L.L.)	7,000 <sup>c</sup>	0	0	0
Spiridon Lake (S.L.)	426,000	1,441,000	4,000,000	2,660,000
Ruth Lake (S.L.)	2,900	0	0	0
Total (S.L.)	428,900	1,441,000	4,000,000	2,660,000
<b>Total Sockeye</b>	<b>520,300</b>	<b>1,591,000</b>	<b>4,340,000</b>	<b>2,880,000</b>
<b>Coho:</b>				
Mayflower (B.L.)	600	3,250	10,000	6,500
Island (B.L.)	1,400	11,250	36,000	37,500 <sup>d</sup>
Dark (B.L.)	500	3,750	12,000	7,500
Mission (B.L.)	1,000	6,250	20,000	27,500 <sup>d</sup>
Potato Patch (B.L.)	600	4,750	15,000	9,500
Southern (B.L.)	180	1,750	5,000	3,500
Pony (B.L.)	180	1,050	3,000	2,100
Monashka (B.L.)				10,000 <sup>d</sup>
<b>Total Coho</b>	<b>4,460</b>	<b>32,050</b>	<b>101,000</b>	<b>104,100</b>
<b>Chinook:</b>				
Monashka (K.R.)	0	34,000	300,000 <sup>e</sup>	10,000
<b>Total Chinook</b>	<b>0</b>	<b>34,000</b>	<b>300,000</b>	<b>10,000</b>

Brood stocks: A.L. - Afognak Lake; M.L. - Malina Lake; L.L. - Laura Lake; S.L. - Saltery Lake;  
B.L. - Buskin Lake; K.R. - Karluk River

<sup>a</sup> ADF&G forecast prepared by S. Schrof, and R. Baer, except for coho by Len Schwarz.

<sup>b</sup> All juvenile sockeye salmon releases are recommended to be presmolt except for 781,000 fry in 2003 and 2,000,000 fingerling in 2004 released at Spiridon Lake.

<sup>c</sup> Does not refer to total run; only the portion that is a result of enhancement (stocking).

<sup>d</sup> Includes BR 02 smolt releases at Island (15,000), Mission (15,000), and Monashka (10,000) Lakes in 2004; the Monashka release will require a PAR and FTP for a new release location.

<sup>e</sup> The 2003 egg take should result in a release of 75,000 smolt in 2005.

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

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Afognak L. eggs 99A-0051	07/15/99	12/31/08	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, Waterfall, and Crescent Lakes.
Hidden Lake 99A-0053	07/15/99	12/31/08	Allows the release of up to 500,000 Afognak Lake stock fry, incubated and reared at PCH into Hidden Lake.
Hidden Lake 99A-0054	07/15/99	12/31/08	Allows the release of up to 500,000 Afognak Lake stock presmolt, incubated and reared at PCH into Hidden Lake
Little Waterfall 97A-0076	10/01/97	12/31/08	Allows the release of up to 200,000 Afognak Lake stock presmolt, incubated and reared at PCH into Little Waterfall Lake.
Big Waterfall 99A-0055	07/15/99	12/31/08	Allows the release of up to 250,000 Afognak Lake stock fingerling, incubated and reared at PCH into Big Waterfall Lake
<b>Big Waterfall 02A-XXXX</b>			<b>Allows the release of Afognak Lake stock presmolt, incubated and reared at PCH into Big Waterfall Lake. AMP requests the release of 25,000 presmolt in 2003.</b>
Crescent Lake 99A-0052	07/15/99	12/31/08	Allows the release of up to 500,000 Afognak Lake stock fingerling, incubated and reared at PCH into Crescent Lake.
<b>Crescent Lake 02A-XXXX</b>			<b>Allows the release of Afognak Lake stock presmolt, incubated and reared at PCH into Crescent Lake. AMP requests the release of 25,000 presmolt in 2003.</b>
Malina egg take 96A-0070	01/01/97	12/31/02 <b>expired</b>	Allows egg take of 1,500,000 green eggs at Malina Lake, incubation and rearing at PCH, and release of progeny into Malina Lake.
Malina Lake 99A-0056	07/15/99	12/31/08	Allows the release of up to 500,000 Malina Lake stock fingerling, incubated and reared at PCH into Malina Lake.
Malina Lake 97A-0078	07/15/99	12/31/08	Allows the release of up to 300,000 Malina Lake stock presmolt, incubated and reared at PCH into Malina Lake.
Laura egg take 99A-0060	07/15/99	12/31/08	Allows egg take of 1,500,000 green eggs at Laura Lake, incubation and rearing at PCH, and release of progeny into Laura Lake.
Laura Lake 99A-0062	07/15/99	12/31/08	Allows the release of up to 200,000 Laura Lake stock fingerling, incubated and reared at PCH into Laura Lake.
Laura Lake 99A-0061	07/15/99	12/31/08	Allows the release of up to 200,000 Laura Lake stock presmolt, incubated and reared at PCH into Laura Lake.

-Continued-

**Pillar Creek Hatchery summary of active (in use) sockeye salmon  
Fish Transport Permits (FTP): (page 2 of 2)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Saltery egg take 97A-0071	08/31/97	12/31/08	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.
<b>Saltery egg take 02A-XXXX</b>			<b>Allows egg take of 2,000,000 green eggs at Saltery Lake, incubation and rearing at PCH, and transfer of eyed eggs to Kitoi Bay Hatchery and release of progeny into Spiridon and Ruth Lakes. This is a contingency plan for a potential water shortage in 2003.</b>
<b>Little Kitoi Lake 02A-XXXX</b>			<b>Allows egg take of 9,800,000 green eggs at L. Kitoi Lake, incubation and rearing at PCH, and release of progeny into Spiridon and Ruth Lakes. (Brood are Saltery Lake origin). The first egg take at this location is expected to occur in 2003.</b>
Spiridon Lake 99A-0059	07/15/99	12/31/08	Allows the release of up to 7,000,000 Saltery Lake stock fingerling, incubated and reared at PCH into Spiridon Lake.
<b>Spiridon Lake 02A-XXXX</b>			<b>Allows the release of up to 7,000,000 Saltery Lake stock fry, incubated and reared at PCH into Spiridon Lake. The AMP proposes the release of 781,000 fry in 2003.</b>
<b>Spiridon Lake 02A-XXXX</b>			<b>Allows the release of up to 1,000,000 Saltery Lake stock presmolt, incubated and reared at PCH into Spiridon Lake. The AMP proposes the release of 660,000 presmolt in 2003.</b>
Ruth Lake 99A-0058	07/15/99	12/31/08	Allows the release of up to 300,000 Saltery Lake stock fingerling, incubated and reared at PCH into Ruth Lake.

**Bold denotes FTPs that require changes (e.g., stocking life stage or number stocked requires updating).**

**Pillar Creek Hatchery summary of active (in use) coho salmon  
Fish Transport Permits (FTP):**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Buskin egg take 93A-0105	09/15/93	12/31/03	Allows egg take of 150,000 green eggs at Buskin Lake; incubation and rearing at PCH, and release of the resultant fry in 5 anadromous and 2 landlocked systems in Chiniak Bay.
Mayflower 93A-0106	09/15/93	12/31/03	Allows the release of up to 13,000 Buskin Lake stock fry, incubated and reared at PCH into Mayflower Lake.
Island 93A-0107	09/15/93	12/31/03	Allows the release of up to 45,000 Buskin Lake stock fry, incubated and reared at PCH into Island Lake.
Dark 93A-0108	09/15/93	12/31/03	Allows the release of up to 15,000 Buskin Lake stock fry, incubated and reared at PCH into Dark Lake.
Mission 93A-0109	09/15/93	12/31/03	Allows the release of up to 24,500 Buskin Lake stock fry, incubated and reared at PCH into Mission Lake.
Potato Patch 93A-0110	09/15/93	12/31/03	Allows the release of up to 19,000 Buskin Lake stock fry, incubated and reared at PCH into Potato Patch Lake.
Pony 93A-0111	09/15/93	12/31/03	Allows the release of up to 4,200 Buskin Lake stock fry, incubated and reared at PCH into Pony Lake.
Southern 93A-0111	09/15/93	12/31/03	Allows the release of up to 7,000 Buskin Lake stock fry, incubated and reared at PCH into Southern Lake.

<sup>a</sup>All FTPs have been submitted for amendment to allow for the release of smolt.

**Pillar Creek Hatchery summary of active (in use) chinook salmon  
Fish Transport Permits (FTP):**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Karluk egg take 00A-0010	02/06/00	06/30/06	Allows egg take of 300,000 green eggs at Karluk River; incubation and rearing at PCH, and release of the resultant smolt into Monashka Creek.





## ABSTRACT

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

Approximately 150,000 juvenile sockeye salmon of Afognak Lake broodstock will be released into four lakes in 2003. Prior releases of this early-run broodstock are expected to produce a return in June 2003 of 91,400 adult sockeye salmon. Egg takes this fall will require about 340,000 Afognak Lake eggs for future releases.

Malina and Laura Lakes will not be stocked 2003. An estimated 11,000 adult sockeye salmon are expected to return to Malina Lake and 7,000 adults are expected to return to the Pauls Bay (Laura) system in June from prior stockings. No egg takes are planned for either of these lakes.

Prior PCH releases (Saltery Lake broodstock) into Ruth Lake are expected to produce a return of 2,900 adult sockeye salmon in the Kitoi Bay area in late June through early August 2003. PCH is not expected to stock this lake in the future; stocking will occur from the Kitoi Bay Hatchery.

About 1,441,000 juvenile sockeye salmon of Saltery Lake broodstock will be released into Spiridon Lake in 2003. Prior Spiridon Lake releases (Saltery Lake broodstock) are expected to produce a return of 426,000 adult sockeye salmon in late June through early August 2003. Saltery Lake egg takes this fall will require about 4,000,000 eggs for stocking in 2004.

Approximately 32,000 coho salmon fingerlings of Buskin Lake broodstock will be released into seven local lakes in 2003. An additional 40,000 fingerlings will be reared to smolt and released in June 2004. A request to amend Fish Transport Permits 93A0106-10 to allow for this change in lifestage has been submitted to the ADF&G permit coordinator. Prior releases of this broodstock are expected to produce a return of 4,460 adult coho salmon in late August and September 2003. Egg takes this fall will require about 101,000 eggs for future releases.

PCH will continue rearing juvenile chinook salmon of Karluk River broodstock for release in 2003 and 2004 at Monashka Creek. About 34,000 chinook smolt from the 2001 Karluk River egg take will be released into Monashka Creek in 2003 and 10,000 smolt from the 2002 egg take will be released in 2004. Egg takes this fall will require about 300,000 eggs for future releases.

There are no cost recovery projects planned for this facility in 2003; however, an “unplanned cost recovery operational plan” (UCROP) has been prepared by KRAA and will be implemented to prevent straying if, for any reason, sockeye salmon cannot be harvested at the terminal harvest areas.

## INTRODUCTION

Pillar Creek Hatchery (PCH) was constructed in 1990 as a cooperative project between the Alaska Department of Fish and Game (ADF&G) and the Kodiak Regional Aquaculture Association (KRAA). The facility is located on the Kodiak road system about seven miles north of the City of Kodiak (Figures 1 and 2). PCH was designed to increase salmon production for the Kodiak Management Area by using barren-lake systems to stock juvenile sockeye salmon *Oncorhynchus nerka* and coho salmon *O. kisutch* to produce adult returns for seine, set gillnet, subsistence, and recreational fisheries. In addition, hatchery programs were expected to supplement wild stocks in attempts to rehabilitate depleted runs. PCH has the capacity to incubate 20 million salmon eggs and rear up to 16 million juveniles of all life stages (fry, fingerlings, presmolt, and smolt). The facility is operated primarily by funds provided by KRAA and to a lesser extent by the ADF&G Division of Sport Fish, the Kodiak Sport Fish Association (KSFA), and the Kodiak Association of Charterboat Operators (KACO). The KSFA and KACO provide funding for the egg take and rearing portion of a chinook salmon *O. tshawytscha* enhancement project.

The primary project facilitated by PCH is the stocking of sockeye salmon into Spiridon Lake (Figure 1). This project utilizes Spiridon Lake as a nursery lake to produce smolt, which (after leaving the lake) return as adults to provide a common property sockeye salmon fishery. A conservative stocking strategy has been adopted in order to minimize the impacts of rearing juvenile salmon on the standing crop of macrozooplankton in the lake (Honnold 1997). The recommended stocking levels vary from year to year based on the inseason zooplankton biomass estimates, the availability of broodstock, and the hatchery rearing space. For example, the recommended stocking level for 2003, based on 2002 inseason zooplankton biomass, was 3,000,000 fry (June release) and 250,000 presmolt (October release). The final recommendation was revised after the early-run egg take was reduced due to escapement limitations and left more available rearing space in the hatchery for presmolt. Thus, the number of fry was lowered to 1,000,000 and the number of presmolt was increased to about 600,000.

Late-run Upper Station sockeye salmon were used in the initial development stage of the Spiridon Lake project to develop a brood source returning to Little Kitoi Lake near the Kitoi Bay Hatchery (KBH). The sockeye salmon run to Little Kitoi Lake, as a result of estuary releases of underyearlings and smolt, did not provide sufficient adults for broodstock. The 1994 Hatchery Management Plan was amended to change the brood source for the Spiridon Lake project from late-run Upper Station to Saltery Lake sockeye salmon for an interim period, until the brood source goals were attained at Little Kitoi Lake. Research by ADF&G and the U.S. Fish and Wildlife Service (FWS) indicated that the Saltery Lake stock would be preferred for Spiridon Lake stocking (Honnold 1997, Honnold et al. 1999). The run timing of Saltery Lake sockeye salmon is about three weeks earlier than the late-run Upper Station sockeye stock. The broodstock requirements at KBH are expected to be easier to achieve using the Saltery Lake stock since adults are expected to return after the peak of the KBH chum salmon run and before the peak of the KBH pink salmon run (Figure 3). This brood source change was approved by the FWS for one year, 1994 (ADF&G 1994). Upper Station sockeye salmon were again used for broodstock in 1995.

The approval to use Sallery Lake stock as the long-term brood source for Spiridon Lake was granted in 1997 by the Commissioner of ADF&G, representatives of the FWS, Kodiak Regional Planning Team, and KRAA. Sallery Lake stock will continue to be the brood source for the Spiridon Lake project in 2003. Little Kitoi Lake was stocked with Sallery Lake sockeye salmon stock from KBH for the first time in 1999 and this stocking will continue in 2003 (Honnold and Aro *in press*). The purpose of this project is to develop a run to Little Kitoi Lake that has Sallery Lake sockeye salmon run timing and to provide broodstock for Spiridon and Ruth Lakes stocking projects (McCullough et al. 2000). This year, the adult sockeye return to Little Kitoi Lake will be evaluated for potential future egg takes.

Sallery Lake fry (BY 2002), rather than green eggs, will be transferred from PCH to KBH for the broodstock development project (FTP 02A-0059) in 2003. This will be a temporary change in order to allow KBH to do some maintenance on their main water supply line and UV filtration system during the period when the sockeye salmon eggs would typically be seeded in the hatchery incubators.

PCH also provides early-run juvenile sockeye salmon for stocking several barren lakes in the Kodiak area. Hidden, Little Waterfall, Big Waterfall, and Crescent Lakes will be stocked with Afognak Lake sockeye salmon juveniles in 2003. Stocking of Afognak Lake sockeye salmon has been discontinued at Little Kitoi and other Kitoi Bay area lakes to simplify broodstock development (McCullough et al. 2000; Figure 1).

PCH stocked sockeye salmon juveniles into Malina Lakes from 1992-1999 (Figure 1). Pre-project investigations indicated that “back stocking” of indigenous fry and presmolt and the addition of liquid fertilizer into the lakes (1991-2001) were the best techniques to restore adult production of this early-run sockeye salmon stock. From 1999 through 2002, the Malina Lake sockeye salmon escapement goals were met which negated the need for an egg-take to provide for stocking. Both lake fertilization and egg takes were discontinued in 2002 because of budget considerations and the stock is now considered to be rehabilitated (McCullough and Clevenger 2002).

Laura Lake was also fertilized (1993-2001) and supplemented with sockeye fry (1994-1996 and 1999) of Laura Lake origin to rehabilitate this early run (Figure 1). In 1996, 1997, and 1999 through 2002 sockeye salmon eggs were not collected at Laura Lake due to adequate adult escapement. In 2002 both lake fertilization and egg takes were discontinued because of budget considerations and the stock is considered to be rehabilitated (McCullough and Clevenger 2002).

Buskin Lake coho salmon were reared at PCH from 1995 through 2002 to provide juvenile salmon for road system stocking to enhance recreational fishing opportunities (Figure 2). In addition, Buskin Lake coho salmon eggs were used for several classroom incubation programs in Kodiak area schools. Little Kitoi and Monashka Creek coho salmon were used for these programs prior to 1995. The ADF&G genetics staff recommended the use of Buskin Lake (Chiniak Bay stock) coho salmon for these projects because stocking locations drain into Chiniak Bay. We propose continuing these stocking programs in 2003 using Buskin Lake coho salmon as the brood source.

A permit alteration request (PAR) was approved for the PCH Basic Management Plan in January 2000 (McCullough et al. 2000). The PAR provides for the development of a chinook salmon

enhancement project for the Kodiak road system to increase recreational fishing opportunities (Figure 2). About 125,000 chinook salmon eggs from the Karluk River were collected in 2000 and were incubated and reared to smolt size at PCH. The resultant smolt (60,400) were released into Monashka Creek in the spring of 2002. This project continues in 2003 with planned release of about 34,000 Karluk River smolt (BY 2001). Only 10,000 chinook salmon fry are currently being raised at PCH due to poor survival (147,000 eggs were taken in 2002) and bear damage to a raceway. The reduced number of chinook salmon fry has resulted in additional rearing space for coho salmon at PCH. All coho salmon stocking Fish Transport Permits (FTP) 93A-0106-10 will expire 31 December 2003. New applications will be submitted, which will allow for coho salmon smolt rearing and release in 2004. We propose taking approximately 300,000 chinook salmon eggs in 2003 to produce 75,000 smolt (current rearing capacity at PCH) for release in 2005.

The City of Kodiak plans a structural upgrade of their water reservoirs in 2003. The Pillar Creek reservoirs supply water to the city and to the Pillar Creek Hatchery. A water shortage to the hatchery may result from this work. This may require a reduction in the use of Afognak Lake broodstock and a transfer of up to 2 million eyed Saltery Lake eggs to Kitoi Bay Hatchery in 2003 or 2004. A contingency FTP to transfer eyed Saltery Lake eggs from Pillar Creek Hatchery to Kitoi Bay Hatchery will be needed.

This management plan will continue to evolve in an effort to best take advantage of PCH facilities to enhance and rehabilitate Kodiak area salmon resources. There are many factors that have resulted in changes to this document. For example, inseason lake productivity assessment may have resulted in adjustments to stocking densities in order to maintain optimal stocking levels.

### **2003 SOCKEYE SALMON RELEASES**

Table 1 describes 2002 sockeye salmon egg takes, planned releases in 2003, projected returns in 2006 and 2007, and the status of FTPs. The stocking levels for 2003 may be adjusted after analysis of limnological and zooplankton data collected at each lake and/or because of rearing limitations at PCH (i.e., how many juvenile fish of each life stage can be cultured; McCullough et al. 2001; McCullough and Clevenger 2002). Appendices A through E describe PCH past, present, and proposed sockeye salmon egg takes and releases.

All sockeye will be transported by air as fed fry or presmolt to the remote lakes specified. Stocking of fry will correspond to the timing of each lake's plankton bloom (as determined by inseason limnology sampling). Fry will be released at the lake surface. Presmolt are scheduled for release by air dropping in mid October.

#### ***Early-Run Sockeye Salmon: Afognak Lake Donor Stock***

Presmolt (early-run Afognak Lake donor stock) will be released into Hidden (50,000 fish), Little Waterfall (50,000 fish), Big Waterfall (25,000 fish), and Crescent (25,000 fish) Lakes in 2003 (Table 1). Stocking levels are altered from the numbers indicated in the 2002 PCH Annual

Management Plan (McCullough and Clevenger 2002) due to low escapement levels that limited the egg take goal. A total of about 150,000 early-run (Afognak Lake stock-2002 brood year) juveniles will be stocked in 2003.

Adult returns from early-run (Afognak Lake broodstock) stocking in 2003 are projected (based on survivals summarized in Appendix F) to be about 18,750 fish (Table 1). An estimated 8,438 adults are expected to return in 2006 and 10,313 in 2007. The largest returns are expected at Hidden Lake (6,250) and Little Waterfall Lake (6,250), with the smallest returns to Big Waterfall Lake (3,125) and Crescent Lake (3,125). The run timing of these returns should be similar to Afognak Lake sockeye salmon (brood source), with runs beginning in late May, peaking in mid June, and ending by early July (Figure 4). This run timing affinity has been observed at terminal harvest areas (THAs) at both Foul Bay (Hidden Lake stocking) and Waterfall Bay (Big and Little Waterfall Lakes stocking; McCullough et al. 2001; Honnold and Schrof 2001b). Similar run timing has been reported at Settler Cove (Crescent Lake run; L.Malloy, Kodiak Regional Aquaculture Association, Kodiak, personal communication).

### ***Late-Run Sockeye Salmon: Sallery Lake Donor Stock***

Spiridon Lake will be stocked with about 781,000 Sallery Lake sockeye salmon fry and 660,000 presmolt in 2003 (Table 1). The fry stocking is approximately 75% less than previously planned. The increased presmolt release reflects concerns from limnology data that suggest that large numbers of fry are overgrazing the lake's zooplankton population (Schorf and Honnold *in press*).

It is projected that 125,455 adult salmon will return in 2006 and 2007 as a result of fry and presmolt stocking in Spiridon Lake in 2003. Spiridon Lake adults should return in 2006 (51%; 67,194) and in 2007 (49%; 58,262) from these stockings (Table 1). The run timing of these fish should be similar to Sallery Lake sockeye salmon, with the initial run beginning in late June, peaking in early to mid July, and ending in mid August (Figure 5).

Overall, we expect PCH to stock about 150,000 early-run and 1,441,000 late-run sockeye juveniles (1,591,000 total) in 2003, which should produce about 18,750 early-run adults and 125,455 late-run adults (144,205 total) in 2006 and 2007 (Table 1).

FTP applications will be submitted by KRAA to the ADF&G permitting coordinators in Juneau for review and approval by the Commissioner of ADF&G prior to all egg takes and stocking in 2003 and 2004. Specific projects that need new or renewed permits include: Big Waterfall Lake presmolt stocking, Crescent Lake presmolt stocking, Sallery Lake egg take for transfer of eyed eggs to Kitoi Bay Hatchery (contingency if water shortage occurs at PCH), Little Kitoi egg take, and Spiridon Lake fry and presmolt stocking.

## **2003 COHO SALMON RELEASES: BUSKIN LAKE DONOR STOCK**

Table 2 describes the 2002 coho salmon egg takes, 2003 planned releases (and 2004 planned smolt releases), projected adult returns in 2005 and 2006, and the status of FTPs. In August 2003 approximately 32,050 coho salmon fingerlings (5 g) will be released at seven lakes located near the Kodiak Island road system. These lakes include Mayflower (3,250), Island (11,250), Dark (3,750), Mission (6,250), Potato Patch (4,750), Southern (1,750), and Pony (1,050) Lakes (Figure 2). The coho fingerlings will be transported from PCH by a truck-mounted transport tank to each stocking location, except for Southern Lake on Long Island where fry will be transported via float-plane or helicopter. In addition to the August 2003 release of coho salmon fingerlings, 40,000 coho smolt (15 g) will be released in June 2004.

A small number of Buskin Lake coho salmon eggs will be used for educational programs in the Kodiak Island Borough school system. The current school program uses green eggs that are not part of the PCH operations.

Adult coho salmon returning in 2005 and 2006 to all stocked sites are expected to number about 7,083 salmon with the majority (6,875) returning in 2005 (Table 2). Appendix F provides the coho salmon survival assumptions used to estimate adult returns. Appendix G describes the history of coho salmon egg takes from Buskin Lake. The run timing should be similar to Buskin Lake coho, with fish returning in late August, peaking in mid September, and declining by late September (Figure 6).

## **2003 CHINOOK SALMON RELEASES: KARLUK RIVER DONOR STOCK**

Table 3 describes the 2000 to 2003 chinook salmon egg takes, the 2002 to 2005 planned releases, and the projected adult returns from 2003 to 2010. In May 2003 about 34,000 chinook salmon smolt will be released into Monashka Creek on the Kodiak Island road system. A truck-mounted transport tank will transport the smolts from PCH to the stocking location at Monashka Creek.

Approximately 960 adult chinook salmon are expected to return from 2003 releases with the majority (500) returning in 2007. Appendix F provides the chinook salmon survival assumptions used to estimate adult returns. Appendix H describes the history of chinook salmon egg takes from the Karluk River. The run timing should be similar to Karluk River chinook salmon, with fish returning in late May, peaking in mid June, and declining by early July (Figure 7).

## **2003 ESCAPEMENT GOALS AND BROODSTOCK REQUIREMENTS**

Early and late-run sockeye salmon escapement goals, minimum escapement goals allowing for egg takes, and projected brood numbers proposed by PCH in 2003 are described in Table 4. All egg takes will follow the criteria established in McCullough et al. (2001; egg-take and rehabilitation

criteria; adult removal criteria for the Afognak Lake sockeye salmon and Karluk River chinook salmon egg takes). In 1999 the KRPT and the ADF&G suggested that any escapement in excess of the minimum escapement goals for Afognak and Saltery Lakes sockeye salmon stocks would be available for broodstock collection. In 2001 the KRPT and the ADF&G agreed that if the spawning escapement for the Afognak Lake sockeye salmon and Karluk River chinook salmon was less than the lower escapement goal, 1% of the spawning escapement could be taken to allow for the continuation of enhancement projects (McCullough et al. 2001). Further discussions in 2001 and 2002 extended this egg-take guideline to all species and stocks in the Kodiak archipelago. The ADF&G does not believe these guidelines will significantly decrease future returns.

### **2003 SOCKEYE SALMON EGG TAKES (2004 STOCKING)**

Table 5 describes the 2003 sockeye salmon egg takes, planned releases in 2004, projected returns in 2007 and 2008, and the status of FTPs. The stocking levels for 2004 may be adjusted in season as a result of limnological analysis of zooplankton data collected at each lake and rearing limitations at PCH (i.e., how many of each life stage could be cultured). Appendices A through E describe PCH past, present, and proposed sockeye salmon egg takes and releases.

#### ***Early-Run Sockeye Salmon: Afognak Lake Donor Stock***

We propose stocking Hidden, Little Waterfall, Big Waterfall, and Crescent Lakes, each, with 55,000 sockeye salmon presmolt of the Afognak Lake donor stock in 2004 (Table 5).

A total of about 220,000 Afognak Lake brood source juveniles will be stocked in 2004. Egg-take goals will be based upon established egg-take criteria and the escapement level available for broodstock collection (McCullough et al. 2001; Table 4).

#### ***Late-Run Sockeye Salmon: Saltery Lake Donor Stock***

We propose that approximately 2,660,000 Saltery Lake sockeye salmon fry and presmolt be stocked into Spiridon Lake in 2004 (Table 5). The 2004 stocking level is contingent upon the stability of the food base (zooplankton) in the lakes. If any negative response is observed in the lakes' zooplankton community as a result of the 2003 stocking, the proposed 2004 stocking level will be reduced. Inseason monitoring of the zooplankton community will be conducted in 2003 and 2004 and seasonal trends will be analyzed prior to the Saltery Lake egg take. The final stocking plan will be determined in August 2003. Egg-take goals will be based upon the level of escapement available for broodstock collection (Table 4).

To summarize, in 2004 we expect PCH to stock about 220,000 (Afognak Lake brood source) early-run juvenile sockeye salmon and 2,660,000 late-run (Saltery Lake brood source) sockeye salmon juveniles, for a total of about 2,880,000 juvenile sockeye salmon stocked from brood year 2003 (Table 5).

## **2003 COHO SALMON EGG TAKES (2004 STOCKING)**

Table 6 describes proposed Buskin Lake brood source 2003 coho salmon egg takes, 2004 planned releases, projected adult returns in 2006 and 2007, and the status of FTPs. Appendix G describes the history and proposed egg-takes for the Buskin River coho stock.

About 101,000 Buskin Lake coho salmon eggs will be collected in 2003, which will provide approximately 64,100 fingerlings for stocking in August 2004 in seven road system lakes. The FTPs for each stocking location expire in December 2003, at which time new FTPs will be submitted to allow for both fingerling and smolt releases. The 2004 releases of fingerlings may be reduced at some lakes; some fingerlings may be reared to the smolt stage for release in 2005.

## **2003 CHINOOK SALMON EGG TAKES (2005 STOCKING)**

Table 3 describes proposed 2003 chinook salmon egg take, 2005 planned release, and projected adult returns.

This project will use Karluk River chinook salmon eggs from brood year 2003 to produce smolt for release into Monashka Creek in 2005 (Figures 1 and 2). Appendix H describes the proposed egg take of Karluk River chinook stock; 120 adult chinook salmon (60 spawning pair) will be used to ensure genetic stock integrity. We propose to take 300,000 chinook salmon eggs (brood year 2003) and release the resulting smolt (approximately 75,000) into Monashka Creek in year 2005. Approximately 1,880 adult chinook salmon should return from the smolt release in 2005. Most adult salmon will return in 2009 (1,100; Table 3).

## **SOCKEYE SALMON HARVEST AND MANAGEMENT**

Sockeye salmon runs to systems as a result of PCH stocking are estimated to total 520,300 salmon in 2003 (Table 7). The majority of these fish (426,000) are a result of Spiridon Lake stocking. Hidden, Little Waterfall, Big Waterfall, Crescent, Spiridon, and Ruth Lakes are barriered systems without native salmon runs. Salmon may be present in the lake outlet stream from marine waters to the salmon barrier. All sockeye salmon returning to these systems are available for harvest. Malina and Laura Lakes have anadromous salmon runs; hatchery produced fish will intermingle with naturally produced fish. Directed fisheries may occur to harvest surplus Malina and Laura Lakes sockeye salmon if the escapement goals are expected to be achieved.

### ***General Conditions of Harvest Management***

The primary objective of the PCH is to provide salmon for common property fisheries. It is recognized that a joint effort between the ADF&G and the KRAA is necessary to continue the operation of the hatchery at full production levels. The ADF&G Kodiak Area Management

Biologist manages all salmon fisheries. Most enhanced salmon are expected to be harvested incidentally to traditional fisheries targeting wild stocks. Most of the remaining enhanced salmon will be harvested in terminal and special harvest areas as announced by the Area Management Biologist.

### *Harvest of Returns to Hidden Lake*

The Foul Bay (Hidden Lake; Figure 8) harvest strategy is designed to allow for the harvest of sockeye salmon produced from the Hidden Lake enhancement project and to provide for the protection of wild salmon stocks returning to, or passing through, the Northwest Afognak Section of the Afognak District (Figure 9).

Hidden Lake sockeye salmon runs will be harvested in the Foul Bay THA (Figure 8; Alaska Administrative Code Chapter 18.375: 5 AAC 18.375). Fishing time directed at returning sockeye salmon is expected to begin on 5 June (Brennan et al. 2003). The fishery directed at the Hidden Lake sockeye salmon run is not expected to impact pink salmon escapement; the fishery occurs prior to the arrival of most of the pink salmon. The lower pink salmon escapement objective for Hidden Lake Creek is 3,000 salmon (KNWR 1992). 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 THA; however, some sockeye salmon may be harvested in the Northwest Afognak Section (Figure 9). Any sockeye salmon from this enhancement project harvested from 6 July through 25 July in the Northwest Afognak Section will count towards the 15,000 sockeye salmon fishery threshold (5 AAC 18.363; Brennan et al. 2003). Wild sockeye salmon systems are not present within Foul Bay. All of the sockeye salmon harvested in the Foul Bay THA will be attributed to the Hidden Lake enhancement project.

The Foul Bay THA includes the area of Foul Bay east of 152°47.20' W long. (Figure 8). By regulation the only legal gear type for the THA is seine gear. Because a harvestable surplus of enhanced sockeye salmon is forecasted in the THA, continuous fishing periods will be allowed by the ADF&G beginning 5 June (Brennan et al. 2003). Since 1995 a weir has been installed annually on Hidden Lake Creek to ensure that the majority of Hidden Lake sockeye salmon are harvested in the common property fishery. Large build-ups of sockeye salmon have never been observed in front of the weir either before or during the commercial fishery.

The ADF&G genetics staff recommended that the barrier weir not be used in Hidden Lake Creek in 1998 in order to reduce the risks of straying (Honnold et al. 1998). Geneticists believe that substantial straying may occur if sockeye salmon are impeded from entering freshwater. Specifically, straying may increase substantially if returns arrive prior to the initial fishery opening on 5 June and are not allowed to escape into Hidden Lake Creek. In addition, fish that are not caught after 5 June may also stray since the weir will impede their migration into fresh water. In 1998, the straying rate of the sockeye salmon returning to Hidden Lake Creek was evaluated (Wadle and Honnold 2000). This study indicated that it was unlikely that there was significant straying of enhanced sockeye salmon into nearby wild stock sockeye salmon systems. The Hidden Lake Creek fish weir will be installed in 2003, as recommended by Wadle and Honnold (2000).

The ADF&G recognizes that some incidental harvest of wild stocks (Thorsheim Lake or Long Lagoon sockeye salmon) could occur in the Foul Bay THA while the fishery is managed to harvest the Hidden Lake sockeye salmon run. The ADF&G could adjust the size of the THA to avoid the harvest of wild stocks and to target the Hidden Lake sockeye salmon. To date, age and scale pattern analysis of the harvests have indicated a minimal wild stock bycatch (Schrof et al. 2000; Honnold and Schrof 2001a). A reduction in the size of the THA is not expected in 2003 (K. Brennan, Alaska Department of Fish and Game, 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 10).

The harvest of Crescent Lake sockeye salmon is expected to occur during fishing periods targeting early-run sockeye, pink, and chum salmon in the Central Section of the Northwest Kodiak District (Figure 9). Special openings are not expected to occur within the Settler Cove THA (Figure 10; 5 AAC 18.377). During 2003 the fishery will open in the Central Section of the Northwest Kodiak District on 5 June and again on 9 June for 33-hour periods (Brennan et al. 2003). Additional fishing time is dependent on the run strength of early-run Karluk Lake sockeye salmon (5 AAC 18.362). The Settler Cove THA could open in 2003 if large numbers of sockeye salmon are not harvested during normal commercial fishery openings and are observed in the Settler Cove area. Broodstock collection is not required for the project, so all fish will be available for harvest. A barrier net is not necessary for this project since natural barriers prevent salmon access to the lake and villagers of Port Lions utilize all inriver escapement for subsistence purposes. Straying is not a concern for this project, since most fish are harvested and those that escape the fishery are allowed unimpeded access to freshwater.

### ***Harvest of Returns to Little and Big Waterfall Lakes***

The Waterfall Bay harvest strategy allows for the harvest of enhanced sockeye salmon returning to Waterfall Bay and provides safeguards for wild salmon escapements. The sockeye salmon harvest is expected to occur in the Waterfall Bay THA within the Perenosa Bay Section (Figure 11). A THA is required to provide for an orderly harvest of enhanced sockeye salmon (5 AAC 18.376). Since escapement and broodstock are not required, all returning enhanced sockeye salmon will be available for harvest. Because a harvestable surplus of enhanced sockeye salmon is forecasted, continuous fishing will be allowed beginning 5 June (Brennan et al. 2003). Since 1995 a fish barrier has been installed annually near the terminus of Little Waterfall Creek to assure that all Little Waterfall Lake sockeye salmon would be harvested.

The ADF&G genetics staff recommended that the fish barrier should not be used in the Little Waterfall Creek terminus in 1998 (Honnold et al. 1998). Geneticists have indicated that straying concerns, as described for the Hidden Lake Creek fish barrier, would also apply to this project. The barrier net was installed in 1998 and a straying study, similar to the study initiated for the

Hidden Lake project, was implemented (Wadle and Honnold 2000). Results from this study indicated that it was unlikely that there was significant straying of enhanced sockeye salmon into wild stock sockeye salmon systems. However, due to statistical uncertainties in the study, the ADF&G recommended that additional data be collected from future runs to conclusively determine the Waterfall Bay THA straying rates. Data were collected from the 2001 run and analyses used new methods to differentiate the Waterfall Bay THA fish from Portage Creek (an adjacent anadromous system) fish to determine the incidence of straying (Baer and Honnold 2002). The results of this study conclusively demonstrated that the barrier net at the Waterfall Bay THA does not cause adverse straying affects to nearby systems with natural salmon runs. The authors recommended the continued use of the barrier net during the terminal fishery as long as the effort to harvest fish remains aggressive as in most prior years. If a fishery does not occur, the net should be removed to allow returning sockeye salmon access to Little Waterfall Creek. The Little Waterfall Creek fish barrier will be installed in 2003 as recommended. A fish barrier will not be used in the terminus of Big Waterfall Creek; all returning adults that are not harvested will have unimpeded access to freshwater upstream to the barrier falls.

The Waterfall Bay THA was modified by the Alaska Board of Fisheries in 1999 to include waters near the stream terminus of Big Waterfall Creek (5 AAC 18.376). By regulation, the only legal gear type for the Waterfall Bay THA is seine gear.

The ADF&G recognizes that an incidental harvest of wild salmon could occur in this area while the fishery is managed to harvest the enhanced Little and Big Waterfall Lakes sockeye salmon. The ADF&G could adjust the size of the THA open to commercial fishing to avoid harvesting wild stocks. Wild early-run stocks that could potentially be in the THA include Pauls (Laura) and Portage Lake sockeye stocks; all of the aforementioned lakes are located in Perenosa Bay (Figure 11). To date, scale pattern and age analysis of harvest samples have indicated minimal wild stock harvest (Schrof et al. 2000). A reduction in the size of the Waterfall THA is not expected in 2003 (K. Brennan, Alaska Department of Fish and Game, Kodiak, personal communication).

### ***Harvest of Returns to Malina Lake***

The 2003 Malina Lake sockeye salmon run should provide the minimum escapement requirement (10,000 salmon; Nelson and Lloyd 2001) and the run is expected to be large enough for a commercial harvest (Table 7). A portion of this run will be harvested during fishing periods in the Southwest Afognak and, to a lesser extent, the Northwest Afognak Sections of the Afognak District (Figure 9). The first commercial fishing period for the entire Southwest Afognak Section will be on 14 June (Brennan et al. 2003). Additional fishing periods in June will depend on the Karluk Lake sockeye salmon runs. The Alaska Board of Fisheries approved a THA at the terminus of Malina Creek in 2002 to harvest salmon surplus to escapement requirements (statistical area 251-12; Figure 12). Commercial fishing within the Malina THA will begin the 5 June and, if escapement requirements are being met, may remain open continuously (Brennan et al. 2003). A weir was installed and operated to enumerate the Malina Lake escapement from 1992 to 2002 (Figure 13). The weir will not be operated in 2003, due to a shortage of personnel; aerial and foot surveys will be used to monitor the sockeye salmon escapement in 2003. Inseason closed water adjustments for

the Malina Lakes system will occur if it appears that the upper escapement goal of 20,000 will be exceeded (Brennan et al. 2003). Egg takes are not expected to occur at Malina Lakes in 2003.

### ***Harvest of Returns to Laura Lake***

In 2002, the Alaska Board of Fisheries approved a new section in Perenosa Bay (Pauls Bay Section, statistical area 251-85), modified the management plan, and adjusted the closed waters area at the terminus of Pauls Creek (Figure 11). For the Laura (Pauls) Lake system, surplus sockeye salmon will be harvested during fishing periods in the Perenosa Bay and Pauls Bay Sections of the Afognak District (Figures 9 and 11). The Pauls Bay Section will remain closed if it appears that the minimum escapement (20,000) will not be reached (Brennan et al. 2003). A weir to enumerate the escapement will be operated at the outlet of Pauls Lake (Laura Lake is upstream of Pauls Lake) from mid May through mid July to provide sockeye salmon escapement counts (Figure 14). Additional egg takes for this system are not planned.

### ***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 (Brennan et al. 2003; Figure 15) and to provide adequate protection for escapements of wild salmon stocks returning to streams in the area (Spiridon River sockeye, pink, chum, and coho salmon; stream number 254-401). The intent of this stocking project is to provide enhanced sockeye salmon in traditional commercial fishing areas in the Northwest Kodiak District (Figure 9). Harvests of Spiridon Lake sockeye salmon are expected to occur during openings directed to harvest Karluk Lake sockeye and west-side pink and chum salmon stocks (Brennan et al. 2003). A THA, 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. A series of falls prevents salmon from entering Spiridon Lake. A barrier seine was used from 1995 to 1997 to prevent sockeye salmon from entering Telrod Creek and to provide for increased harvest opportunities. The barrier net has not been used since 1997 and there are no plans to re-implement it in the future. This change to field operations was in response to concerns expressed by ADF&G genetics staff regarding the possibility that the barrier seine may cause returning sockeye salmon to stray to nearby streams (Spiridon River) and intermingle with wild salmon stocks. It was determined that a study, similar to those conducted at the Foul Bay and Waterfall Bay THAs, to evaluate the effects of the barrier net on straying would be cost prohibitive. Thus, sockeye salmon returning to Telrod Cove will continue to be given access to Telrod Creek.

Foot surveys will be used to document the number of sockeye salmon that escape the commercial fishery and enter Telrod Creek. Closed water markers will be set in the location where the barrier seine was previously deployed to assure that intertidal habitat is not disturbed during fishing operations.

The THA has included all waters of Telrod Cove since 1995 (5 AAC 18.366; Figure 15). A continuous fishing period will be announced by the ADF&G when enhanced sockeye salmon are

documented within the THA, (Brennan et al. 2003). By regulation, the only legal gear type for the Spiridon Bay THA is seine gear.

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 ADF&G intends, however, to prevent jeopardizing the escapement of wild salmon stocks, specifically those returning to Spiridon River (pink and chum salmon) and Telrod Creek (pink salmon). The broodstock for this project was collected at Saltery Lake in 1994 on an experimental basis; in 1997 this stock was approved as the primary brood source for the project. The run timing of Saltery Lake sockeye salmon stock is approximately three weeks earlier (Figure 5) than the previous brood source (late-run Upper Station Lake sockeye salmon). Sockeye salmon returns in 2003 are expected to begin in late June and continue into mid-August. The THA will be monitored by ground crews beginning in mid June and continuing until the Saltery Lake run is over or the THA is closed to fishing. We expect few, if any, returns of Upper Station broodstock since this broodstock has not been released into Spiridon Lake since 1996 (Appendix A).

### ***Harvest of Returns to Ruth Lake***

The Ruth Lake enhanced sockeye salmon run will be harvested incidentally in 2003 during pink, chum, and coho salmon fisheries in the Kitoi, Izhut, and Duck Bay Sections of the Afognak District (Figure 9; Brennan et al. 2003).

Barrier falls in Ruth Lake outlet stream prevents salmon from migrating into the lake. Salmon are able to enter freshwater in the lower portion of the lake outlet creek up to the barrier falls (McCullough et al. 2001). All salmon will be available for harvest in 2003.

The run timing is expected to be similar to that described for Spiridon Lake runs, since Saltery Lake sockeye salmon were used as broodstock (Figure 5).

### ***Harvest Reporting***

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

Harvest information from the Crescent Lake sockeye salmon run will be monitored through the ADF&G fish ticket database and subsistence permit reports. The projected harvest contribution from this project is determined by assigning all sockeye salmon harvested in the THA as originating from Crescent Lake. The run timing and location of the fishery (THA) provides for an isolated harvest of returning adults. The subsistence harvest is assigned through the ADF&G subsistence use reporting system. In addition, Port Lions residents provide estimates of the subsistence harvest to the ADF&G through interviewing of community members participating in the fishery.

## ADDITIONAL MEASURES FOR WILDSTOCK PROTECTION

### *Unplanned Cost Recovery*

At this time, the PCH does not require Special Harvest Areas (SHA) for cost recovery harvests. There may be situations that arise that will require cost recovery of salmon from the enhancement projects (economic, broodstock, environmental disasters, or price dispute considerations).

In 2002, large numbers of early-run sockeye salmon returned to the Foul Bay, Waterfall Bay, and Malina Creek THAs as a result of a lack of early season commercial fishing activity due to price disputes. The scheduled opening occurred on 9 June, but fishing did not commence until 16 June. The 2002 Pillar Creek Hatchery Management Plan stated that ***“if large numbers of salmon return to enhancement sites prior to 9 June or if commercial fishing activities do not occur within 48 hours of the initial fishery opening, the Kodiak Management Biologist and the KRAA will implement a harvest strategy to reduce the risk of straying salmon. The harvest strategy will include the removal of barrier nets or weirs to allow the enhanced salmon free access to freshwater. When fishing activity commences the barrier net or weir will be re-installed. The KRAA will help administer any special harvest operations in a similar manner as was implemented for the Kitoi Bay special cost recovery project in 1989. In that instance, as many fish as possible were harvested in as short a period as feasible to maintain an orderly fishery.”***

The preceding plan was delayed due to KRAA and fishers concerns about the 48-hour deadline. The ADF&G reviewed the historical run timing (Figure 16) of the Afognak Lake (broodstock for Hidden and Waterfall Lakes stocking) stock and determined that the removal of the barrier net and weir could be delayed until a specific harvest plan was ready to be implemented without increasing the risk of straying. However, since 50% for the Afognak Lake sockeye salmon run typically return by 15 June, the ADF&G recommended that the barriers be removed no later than 15 June if fish are still returning and no later than 20 June if the runs decline. The fishery dispute was settled and fishing commenced on 16 June, alleviating the need to remove the barriers or conduct a special fishery.

The KRAA has drafted an unplanned cost recovery operational plan (UCROP) for cost recovery fisheries in the THAs in 2003, in the event similar situations arise as occurred in 2002 (Appendix I). The UCROP proposes that the THAs previously described be designated as SHAs in 2003 (L. Malloy, Kodiak Regional Aquaculture Association, Kodiak, personal communication).

The KRAA-funded ADF&G crews will be located at any cost recovery site to monitor and document the fisheries and to address any straying concerns.

### *Genetics Policy*

The ADF&G Genetics policy, as described in the 1998 Pillar Creek Hatchery AMP (Honnold et al. 1998), will be followed in 2003 for all projects.

## ***Policies and Guidelines for Health and Disease Control***

The State of Alaska Pathology Review Committee policy and guidelines (McGee 1995), as described in the 1998 Pillar Creek Hatchery AMP (Honnold et al. 1998), will be followed in 2003 for all projects.

### **SPECIAL STUDIES/RESEARCH**

The 1994 to 1997 Spiridon Lake sockeye salmon runs were reconstructed to delineate Spiridon Lake fish in the NW Kodiak District or in the SW Afognak Section commercial harvests (Nelson and Barrett 1994; Nelson and Swanton 1996; Nelson and Swanton 1997; Nelson 1999). The runs from 1998 to 2002, 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 Sality Lake broodstock (stocked in 1995 and from 1998 to 2002). 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 Sality Lake fish return (P. Nelson, Alaska Department of Fish and Game, Kodiak, personal communication). This is primarily due to the increased number of both local and non-local stocks present in the NW Kodiak District during the earlier Sality Lake broodstock run timing.

The average proportion of the Spiridon-bound sockeye salmon harvested in the Spiridon Lake THA from 1994 to 1997 (41%) was applied to the 1998 through 2002 THA harvest to reconstruct the recent Spiridon Lake sockeye salmon contribution to the harvest in the SW Afognak Section and NW Kodiak District (Schrof and Honnold *in press*). This method of run reconstruction will be used for the 2003 and future Spiridon Lake sockeye salmon runs until a new method of stock separation is developed to identify the Sality Lake stock returns (P. Nelson, Alaska Department of Fish and Game, Kodiak, personal communication).

Smolt abundance will be estimated and samples collected for age and condition during their emigration from Spiridon Lake as a check on stocking density and to assist with run forecasts (ADF&G *in press*). 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 abundance and water quality parameters. Spiridon Lake will also be monitored by tow netting and hydroacoustics to evaluate juvenile sockeye salmon population trends.

## LITERATURE CITED

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Table 1. Sockeye salmon egg takes (2002), planned releases (2003), projected returns (2006-2007), and fish transport permits (FTP), Kodiak Management Area.

Lake	2002 Egg take		2003 Releases <sup>a</sup>			Adult Returns <sup>b</sup>			FTP	
	Eggs	Adults	Number	Size (g)	Date	2006	2007	Total	Number	Expires
<b><i>Early-Run (ER): donor stock Afognak Lake</i></b>										
Hidden	100,000	60	50,000	10.00	October	2,813	3,438	6,250	99A0054	12/31/08
Little Waterfall	100,000	60	50,000	10.00	October	2,813	3,438	6,250	97A0076	12/31/08
Big Waterfall	50,000	30	25,000	10.00	October	1,406	1,719	3,125		
Crescent	50,000	30	25,000	10.00	October	1,406	1,719	3,125		
<b>Total ER:</b>	<b>300,000</b>	<b>180</b>	<b>150,000</b>			<b>8,438</b>	<b>10,313</b>	<b>18,750</b>		
<b><i>Late-Run (LR): donor stock Saltery Lake</i></b>										
Spiridon <sup>c</sup>	3,300,000	2,000	781,000	0.30	May	30,069	12,887	42,955	99A0059	12/31/08
			660,000	10.00	October	37,125	45,375	82,500		
<b>Total LR:</b>	<b>3,300,000</b>	<b>2,000</b>	<b>1,441,000</b>			<b>67,194</b>	<b>58,262</b>	<b>125,455</b>		
<b>Total ER:</b>	<b>300,000</b>	<b>180</b>	<b>150,000</b>			<b>8,438</b>	<b>10,313</b>	<b>18,750</b>		
<b>Total LR:</b>	<b>3,300,000</b>	<b>2,000</b>	<b>1,441,000</b>			<b>67,194</b>	<b>58,262</b>	<b>125,455</b>		
<b>Grand Total:</b>	<b>3,600,000</b>	<b>2,180</b>	<b>1,591,000</b>			<b>75,631</b>	<b>68,574</b>	<b>144,205</b>		

<sup>a</sup> Expected release in 2003 are based on the current estimates of juveniles in PCH and 2002 lake limnology data.

<sup>b</sup> Returns are based on standard juvenile to adult survival assumptions (Appendix F) and adult age compositions observed to date for escapements and harvests.

<sup>c</sup> Saltery Lake has been the primary brood source since 1997.

Table 2. Coho salmon egg takes (2002), planned releases (2003, 2004), projected returns (2005-2006), and fish transport permits (FTP), Kodiak Management Area.

Lake	2002 Egg take <sup>a</sup>		2003 Releases (fingerlings)			2004 Releases (smolt)			Adult Returns <sup>b</sup>		FTP <sup>c</sup>	
	Eggs	Adults	Number	Size (g)	Date	Number	Size (g)	Date	2005	2006	Number	Expires
Mayflower	10,000		3,250	5.0	August				190	21	93A0106	12/31/03
Island	36,000		11,250	5.0	August	15,000	20.0	June	2,533	73	93A0107	12/31/03
Dark	12,000		3,750	5.0	August				219	24	93A0108	12/31/03
Mission	20,000		6,250	5.0	August	15,000	20.0	June	2,241	41	93A0109	12/31/03
Potato Patch	15,000		4,750	5.0	August				278	31	93A0110	12/31/03
Southern	5,000		1,750	5.0	August				102	11	93A0112	12/31/03
Pony	3,000		1,050	5.0	August				61	7	93A0111	12/31/03
Monashka						10,000	20.0	June	1,250	0	<sup>d</sup>	
<b>Total Road System</b>	101,000	54	32,050			40,000			6,875	208	93A0105 <sup>e</sup>	12/31/03

<sup>a</sup> Donor stock: Buskin River

<sup>b</sup> Assume 90% of adults return as age 1.1 fish and 10% as age 2.1 fish for fingerling releases; assume 100% of smolt outmigrate and return as 1.1 fish (Len Schwarz, personal communication).

<sup>c</sup> All FTPs expire 31 December 2003; new applications for FTPs will be submitted to allow for the release of smolt 2004. The life stage at release will depend on the rearing capacity in Pillar Creek Hatchery and may vary from year to year. Adult returns for smolt releases will be higher than the fingerling releases shown above.

<sup>d</sup> Monashka release will require a PAR and FTP for a new release location.

<sup>e</sup> FTP for Buskin Lake coho salmon egg take.

Table 3. Chinook salmon egg takes (2000-2003), Monashka Creek releases (2002-2005), and projected returns (2003-2010), Kodiak Management Area.

Year	Egg Take <sup>a</sup>		Releases <sup>b</sup>			Adult Returns <sup>c</sup>								Total Return
	Eggs	Adults	Number	Size (g)	Date	2003	2004	2005	2006	2007	2008	2009	2010	
2000	125,000	48	60,400	30.0	May-02	30	200	330	875	75				1,510
2001	86,000	34	34,000	21.0	May-03		20	210	190	500	40			960
2002	147,000	59	10,000	20.0	May-04			5	30	55	145	15		250
2003	300,000	120	75,000	20.0	May-05				40	240	410	1,100	90	1,880
Total Run:						30	220	545	1,135	870	595	1,115	90	

<sup>a</sup> Karluk River chinook salmon are used as the broodstock; in 2000 and 2001, equal numbers of females and males were used; in 2002, 25 females and 34 males were used.

<sup>b</sup> All of the smolt surviving from the 300,000 egg take (2003) will be released; current rearing capacity at Pillar Creek Hatchery is approximately 75,000 20 g smolt; FTP number 00A-0010 (expires 6/30/06).

<sup>c</sup> Assume 2.5% smolt-to-adult survival and adults return as age 1.1 (2 %); 1.2 (13%); 1.3 (22%); 1.4 (58%); 1.5 (5%).

Table 4. Escapement goals, egg-take criteria, and projected brood numbers required for 2003 sockeye salmon egg takes.

Donor Stock <sup>a</sup>	Biological Escapement Goal Range	Egg-take Criteria		Brood Stock Required
		Allowable Escapement Range	Allowable Proportion Within Range	
Afognak Lake	40,000-60,000	>40,000	100%	1,200
		<40,000	1%	1%
Saltery Lake	15,000-30,000 <sup>b</sup>	>15,000	100%	3,700
		<15,000	1%	1%

<sup>a</sup> Afognak Lake is the early-run brood source for enhancement projects at Hidden, Little and Big Waterfall, and Crescent Lakes. Saltery Lake is the late-run brood source for Spiridon and Ruth Lakes; and an additional 250 adults will be needed for Little Kitoi broodstock development (Honnold and Aro in press).

<sup>b</sup> Saltery Lake sockeye salmon escapement goal was changed in 2001 as recommended by Honnold and Saglakin (2001).

Table 5. Proposed sockeye salmon egg takes (2003), planned releases (2004), projected returns (2007-2008), and fish transport permits (FTP), Kodiak Management Area.

Lake	2003 Egg take <sup>a</sup>		2004 Releases <sup>a</sup>			Adult Returns <sup>b</sup>			FTP	
	Eggs	Adults	Number	Size (g)	Date	2007	2008	Total	Number	Expires
<b><i>Early-Run (ER): donor stock Afognak Lake</i></b>										
Hidden	85,000	60	55,000	10.00	October	3,094	3,781	6,875	99A0054	12/31/08
L. Waterfall	85,000	60	55,000	10.00	October	3,094	3,781	6,875	97A0076	12/31/08
Big Waterfall	85,000	60	55,000	10.00	October	3,094	3,781	6,875		
Crescent	85,000	60	55,000	10.00	October	3,094	3,781	6,875		
<b>Total ER:</b>	<b>340,000</b>	<b>240</b>	<b>220,000</b>			<b>12,375</b>	<b>15,125</b>	<b>27,500</b>		
<b><i>Late-Run (LR): donor stock Saltery Lake</i></b>										
Spiridon <sup>c</sup>	4,000,000	2,200	2,000,000	0.50	July	77,000	33,000	110,000	99A0059	12/31/08
			660,000	10.00	October	37,125	45,375	82,500		
<b>Total LR:</b>	<b>4,000,000</b>	<b>2,200</b>	<b>2,660,000</b>			<b>114,125</b>	<b>78,375</b>	<b>192,500</b>		
<b>Total ER:</b>	<b>340,000</b>	<b>240</b>	<b>220,000</b>			<b>12,375</b>	<b>15,125</b>	<b>27,500</b>		
<b>Total LR:</b>	<b>4,000,000</b>	<b>2,200</b>	<b>2,660,000</b>			<b>114,125</b>	<b>78,375</b>	<b>192,500</b>		
<b>Grand Total:</b>	<b>4,340,000</b>	<b>2,440</b>	<b>2,880,000</b>			<b>126,500</b>	<b>93,500</b>	<b>220,000</b>		

<sup>a</sup> Analysis of inseason zooplankton trends may change egg-take goals and stocking numbers.

<sup>b</sup> Returns are based on standard juvenile to adult survival assumptions (Appendix F) and adult age compositions observed to date for escapements and harvests.

<sup>c</sup> Saltery Lake has been the primary brood source since 1997.

Table 6. Proposed coho salmon egg takes (2003), planned releases (2004), projected returns (2006-2007), and fish transport permits (FTP), Kodiak Management Area.

Lake	2003 Egg take <sup>a</sup>		2004 Releases			Adult Returns <sup>c</sup>		FTP <sup>d</sup>	
	Eggs	Adults	Number <sup>b</sup>	Size (g)	Date	2006	2007	Number	Expires
Mayflower	10,000		6,500	5.0	August	380	42	93A0106	12/31/03
Island	36,000		22,500	5.0	August	1,316	146	93A0107	12/31/03
Dark	12,000		7,500	5.0	August	439	49	93A0108	12/31/03
Mission	20,000		12,500	5.0	August	731	81	93A0109	12/31/03
Potato Patch	15,000		9,500	5.0	August	556	62	93A0110	12/31/03
Southern	5,000		3,500	5.0	August	205	23	93A112	12/31/03
Pony	3,000		2,100	5.0	August	123	14	93A111	12/31/03
<b>Total Road System</b>	101,000	80	64,100	5.0	August	3,750	417	93A0105 <sup>e</sup>	12/31/03

<sup>a</sup> Donor stock: Buskin River

<sup>b</sup> Source: Statewide Stocking Plan For Recreational Fisheries, 2000-2004, ADF&G, Division of Sport Fish.

<sup>c</sup> Assume 90% of adults return as age 1.1 fish; 10% as age 2.1 fish, (Len Schwarz, personal communication).

<sup>d</sup> All FTPs expire 31 December 2003; new FTP applications will be submitted to allow for the release all juvenile life stages in the future. The life stage at release will depend on the rearing capacity in Pillar Creek Hatchery and may vary from year to year. Adult returns for smolt releases will be higher than the fingerling releases shown above.

<sup>e</sup> FTP for Buskin Lake coho salmon egg take.

Table 7. Estimated 2003 sockeye salmon runs as a result of Pillar Creek Hatchery stocking.

Lake Stocked	Broodstock <sup>a</sup>	Lake Type	Harvest Location	Estimated Enhanced Run			
				Point	Range		
Hidden	Afognak Lake (ER)	Barriered	Foul Bay THA	37,200	29,700	to	44,600
Big & Little Waterfall	Afognak Lake (ER)	Barriered	Waterfall Bay THA	32,400	25,900	to	38,800
Crescent	Afognak Lake (ER)	Barriered	Settler Cove THA <sup>b</sup>	4,200	3,400	to	5,000
Malina	Malina Lake (ER)	Anadromous	Malina Creek THA <sup>c</sup>	10,600	5,300	to	16,000
Laura	Laura Lake (ER)	Anadromous	Perenosa Bay	7,000	3,500	to	10,500
Spiridon	Saltery Lake (LR)	Barrier	Spiridon Lake THA <sup>d</sup>	426,000	284,000	to	568,000
Ruth	Saltery Lake (LR)	Barrier	Duck, Izhut, Kitoi Bays	2,900	1,900	to	3,900
Total Early Run:				91,400	67,800	to	114,900
Total Late Run:				428,900	285,900	to	571,900
Total Both Runs:				520,300	353,700	to	686,800

<sup>a</sup> ER = early run; LR = late run

<sup>b</sup> Some fish may be harvested in the Central Section of the Northwest Kodiak District.

<sup>c</sup> Some fish will likely be harvested in Southwest and Northwest Sections of the Afognak District.

<sup>d</sup> Fish will also be harvested in traditional commercial fishing areas in the Northwest Kodiak District.

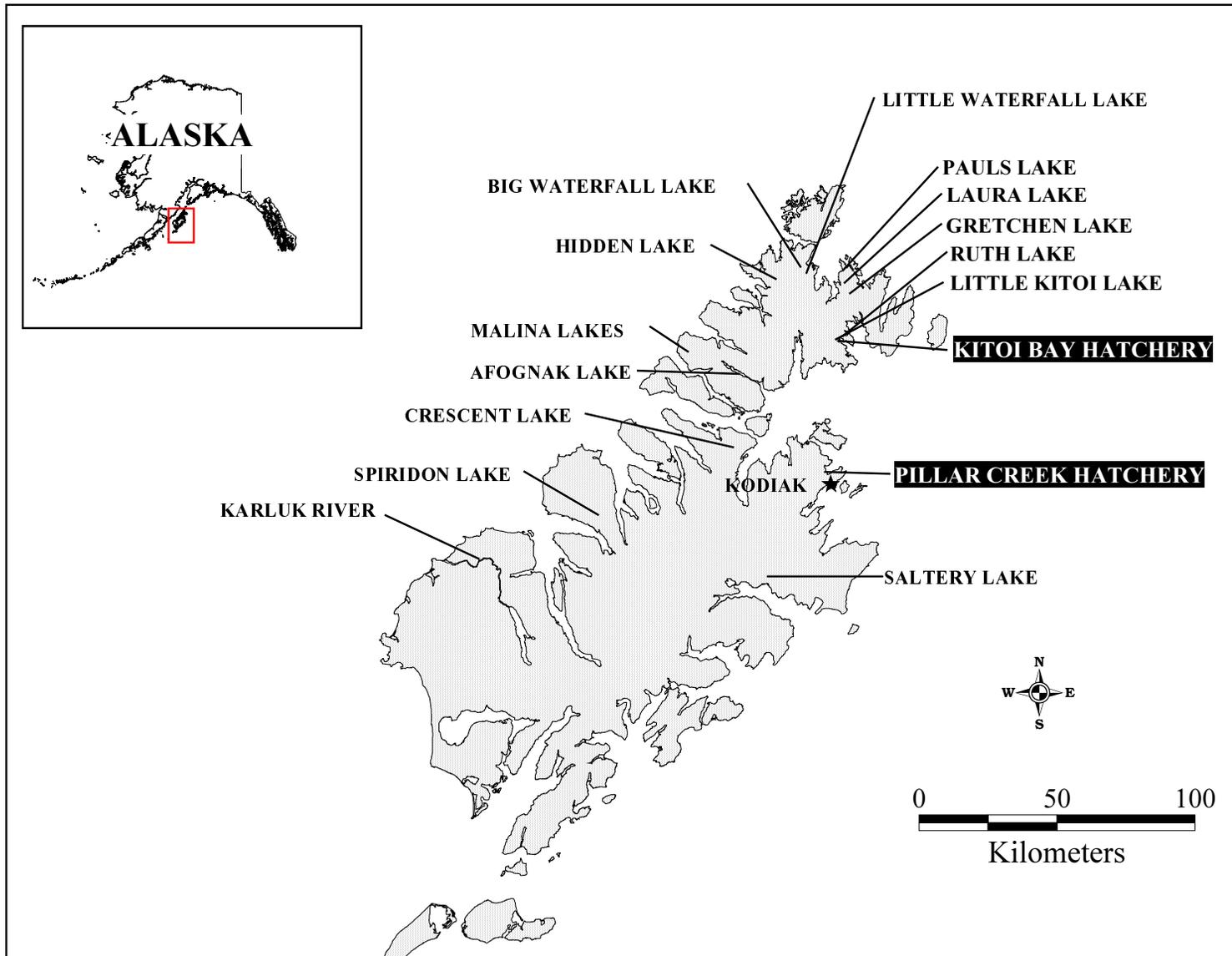


Figure 1. Locations of sockeye salmon enhancement and rehabilitation projects on Kodiak and Afognak Islands, 2003.

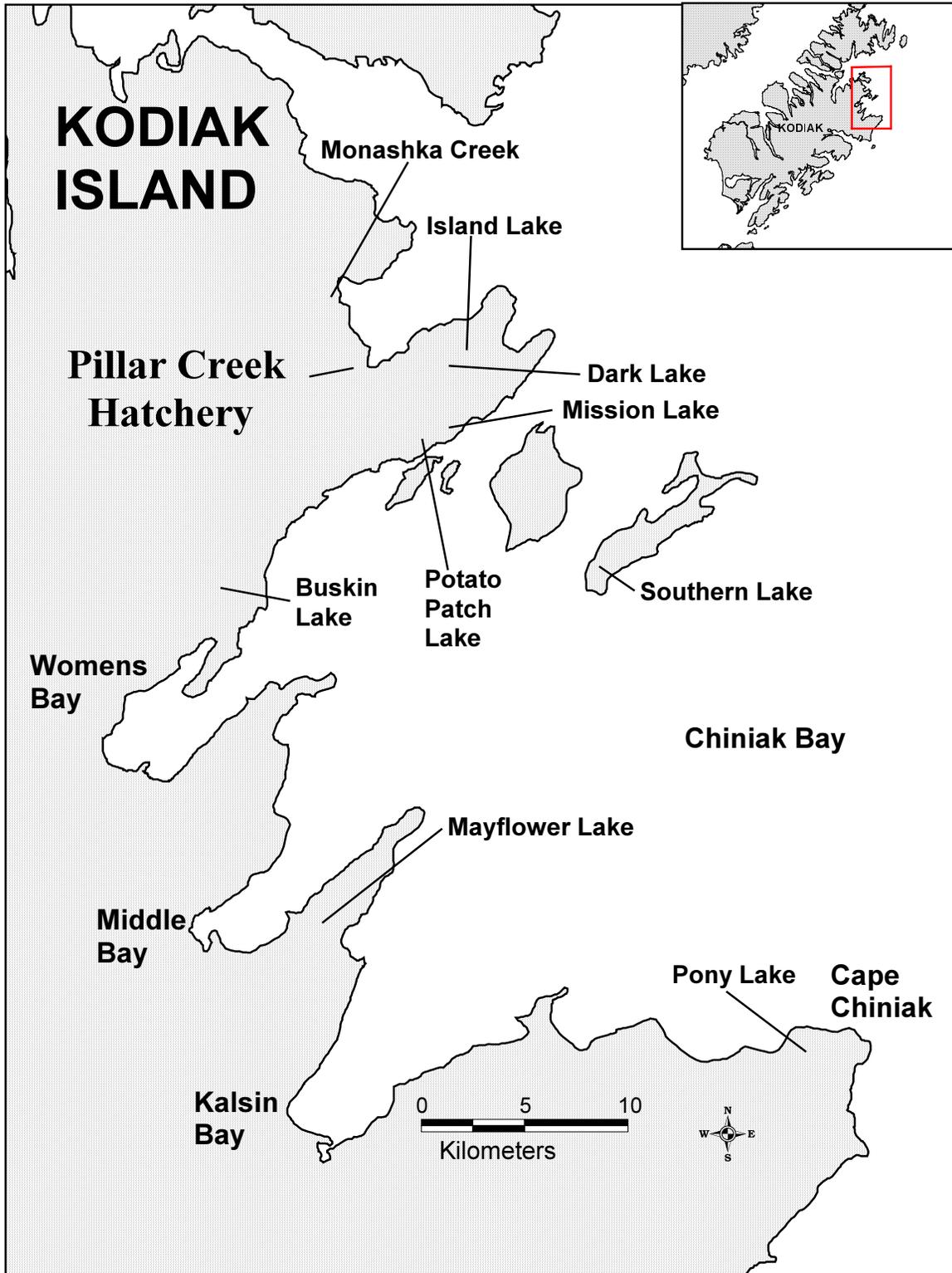


Figure 2. Locations of Kodiak Island road system lakes stocked with coho and chinook (Monashka Creek) salmon.

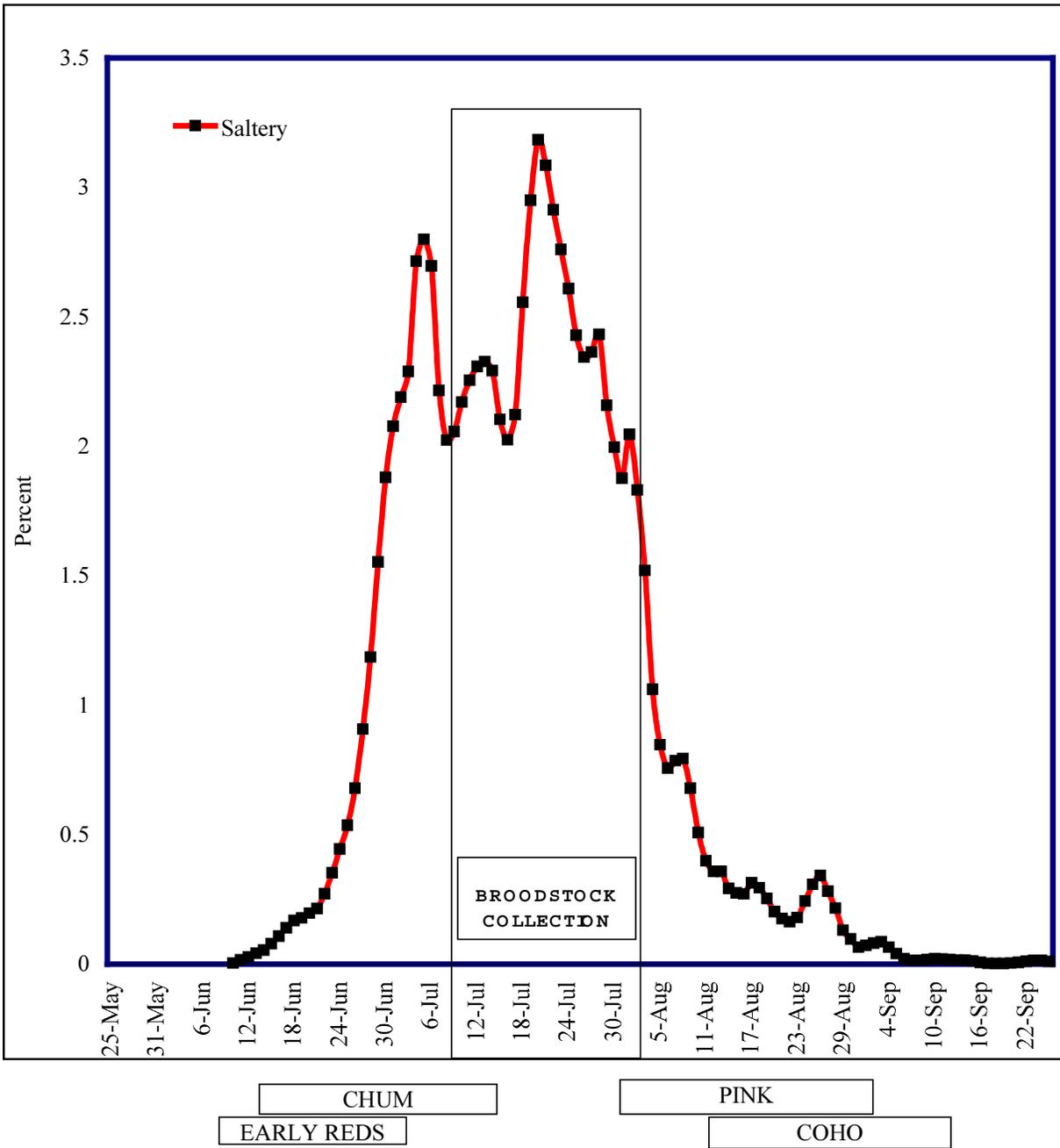


Figure 3. The run timing of salmon stocks returning to the Kitoi Bay Hatchery compared to the late-run Saltery sockeye salmon broodstock collection.

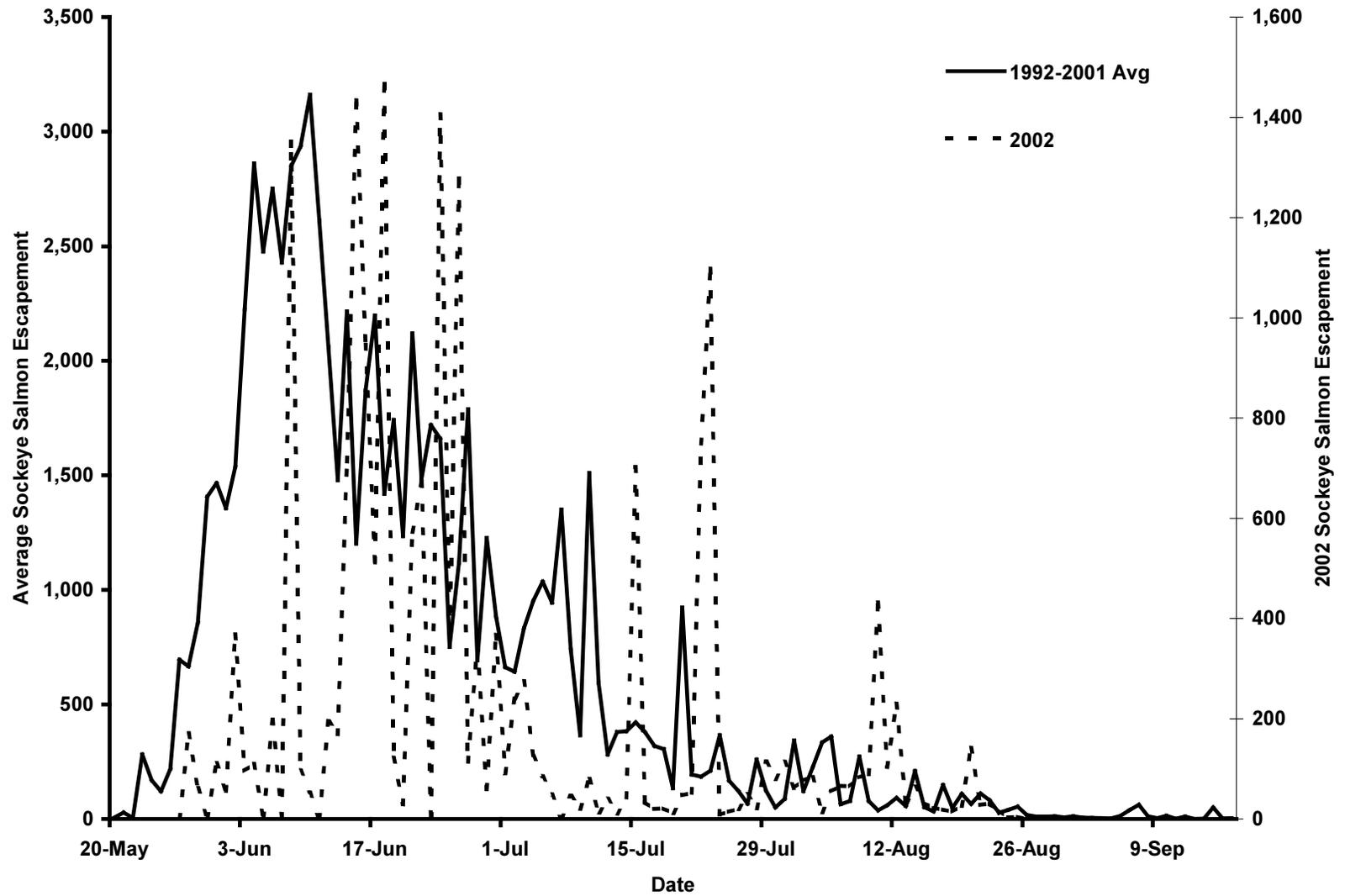


Figure 4. Afognak Lake (Litnik) sockeye salmon average escapement (1992-2001) compared to the 2002 escapement.

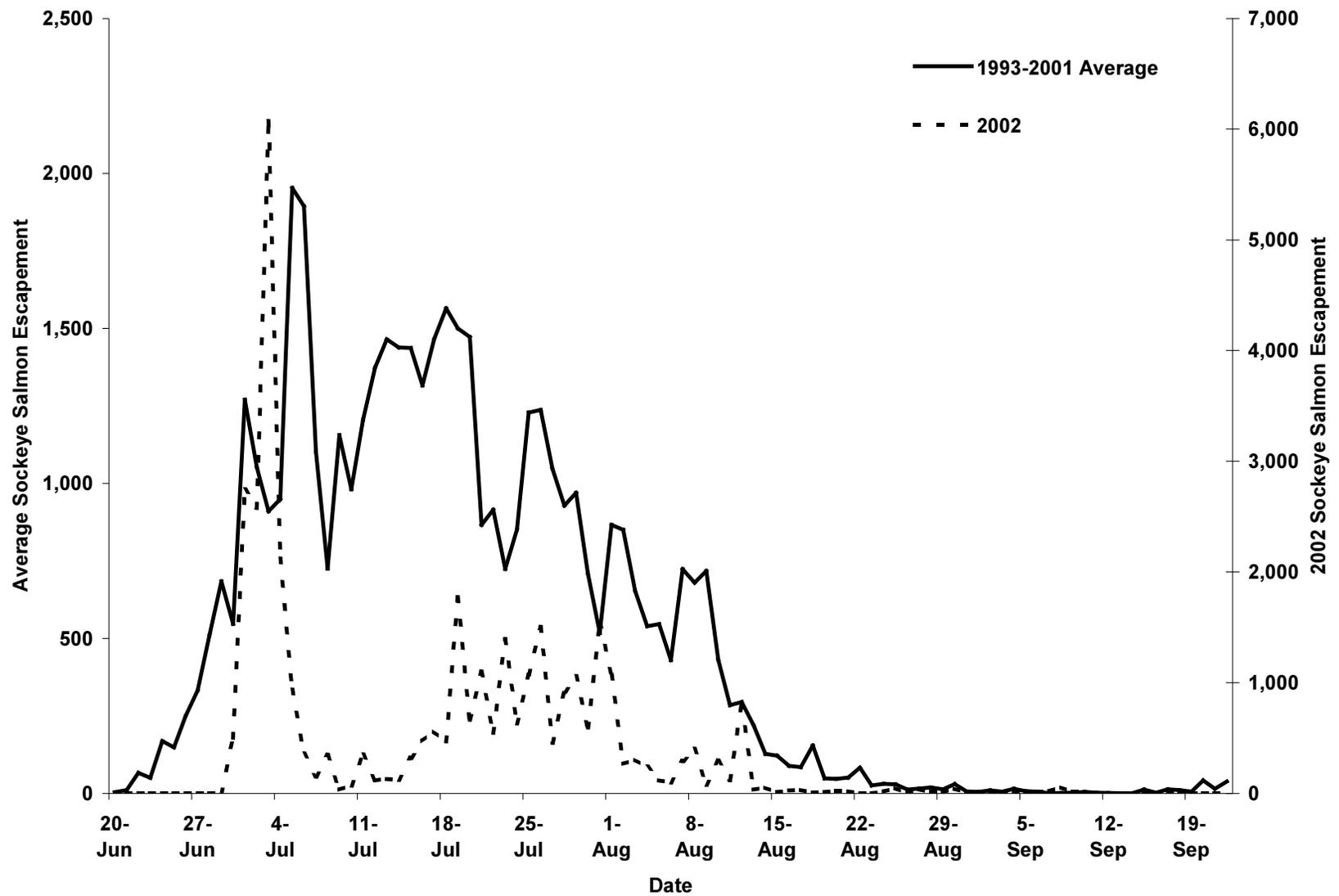


Figure 5. Saltery Lake sockeye salmon average escapement (1993-2001) compared to the 2002 escapement.

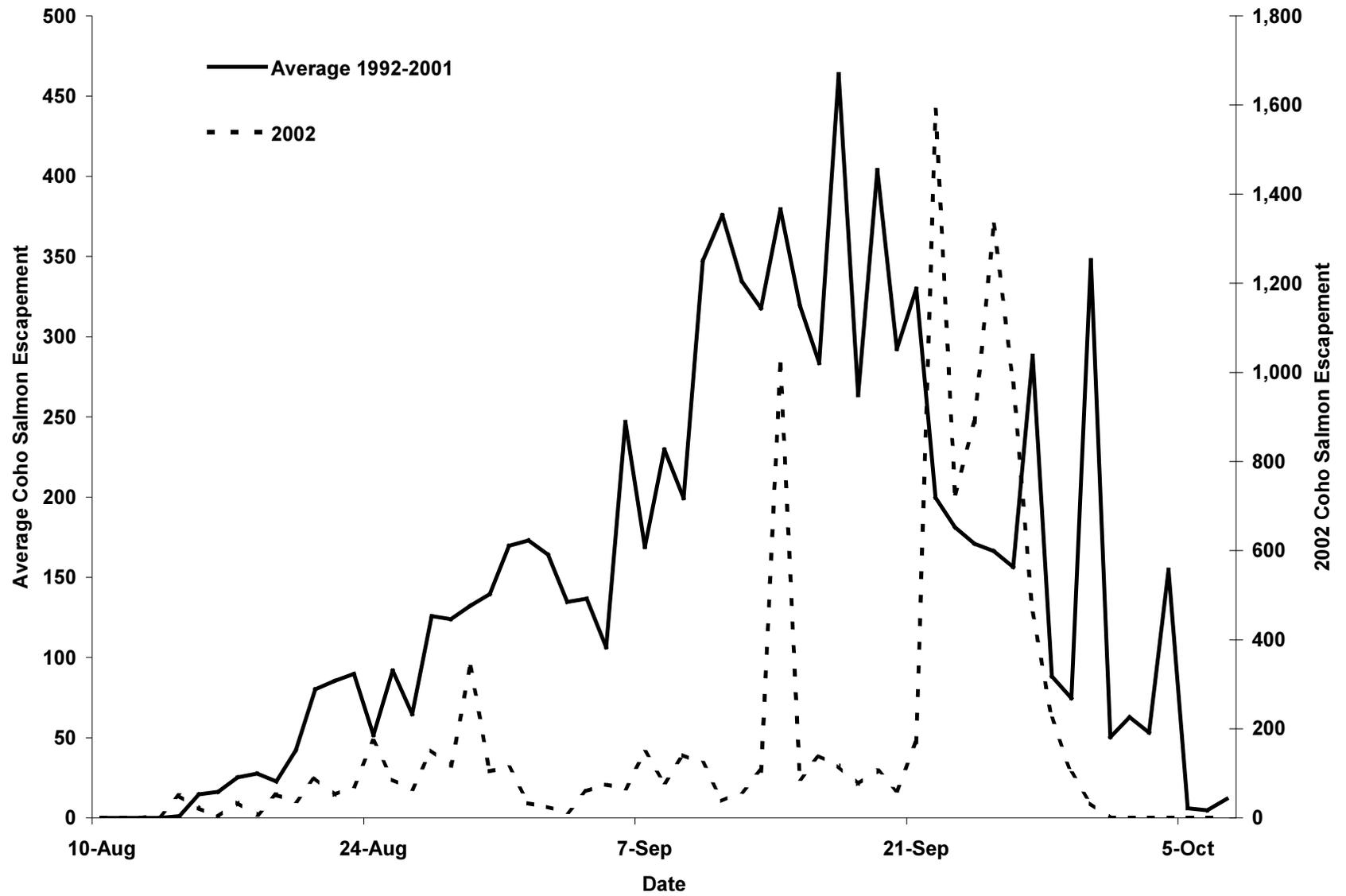


Figure 6. Buskin River coho salmon average escapement (1992-2001) compared to the 2002 escapement.

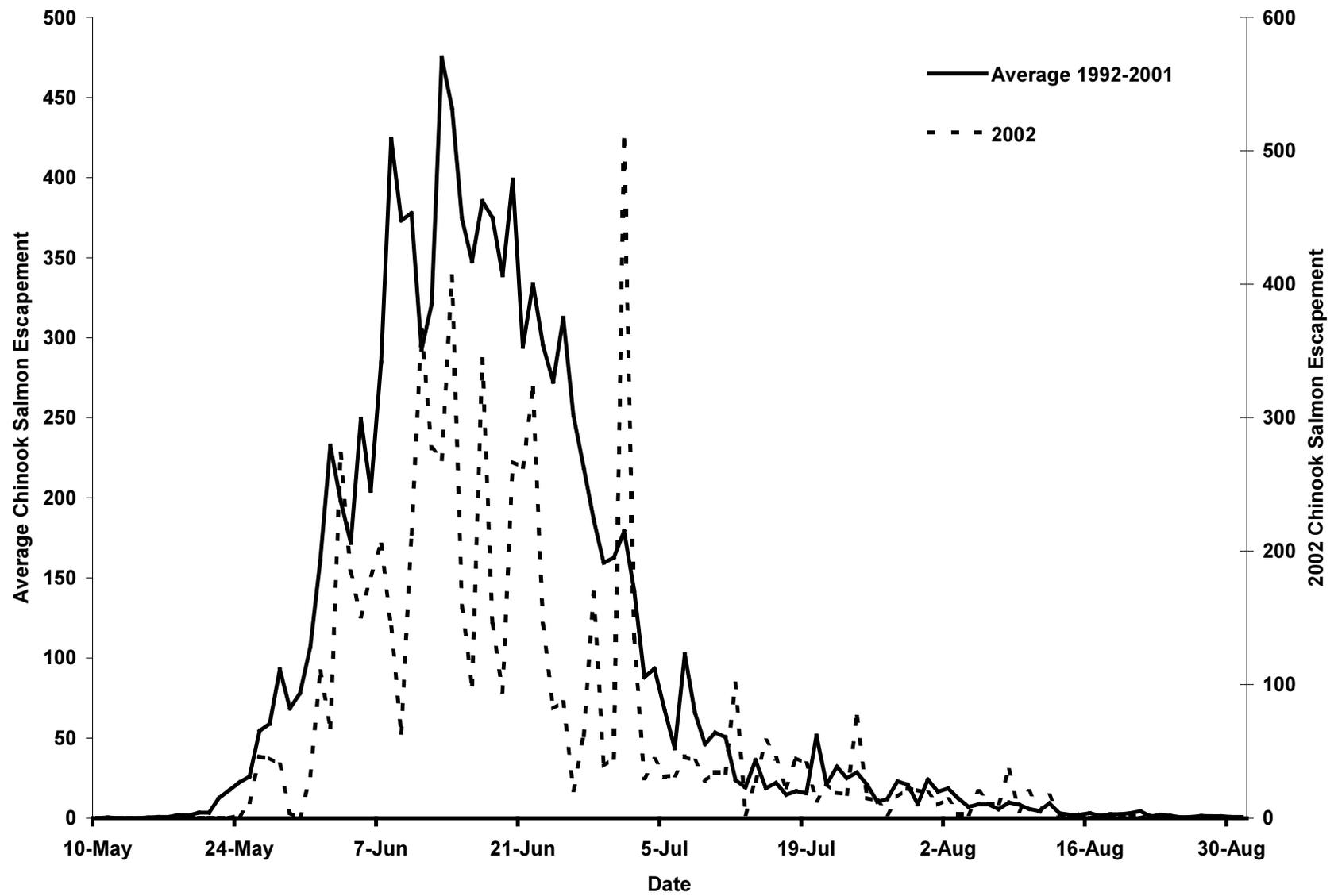


Figure 7. Karluk River chinook salmon average escapement (1992-2001) compared to the 2002 escapement.

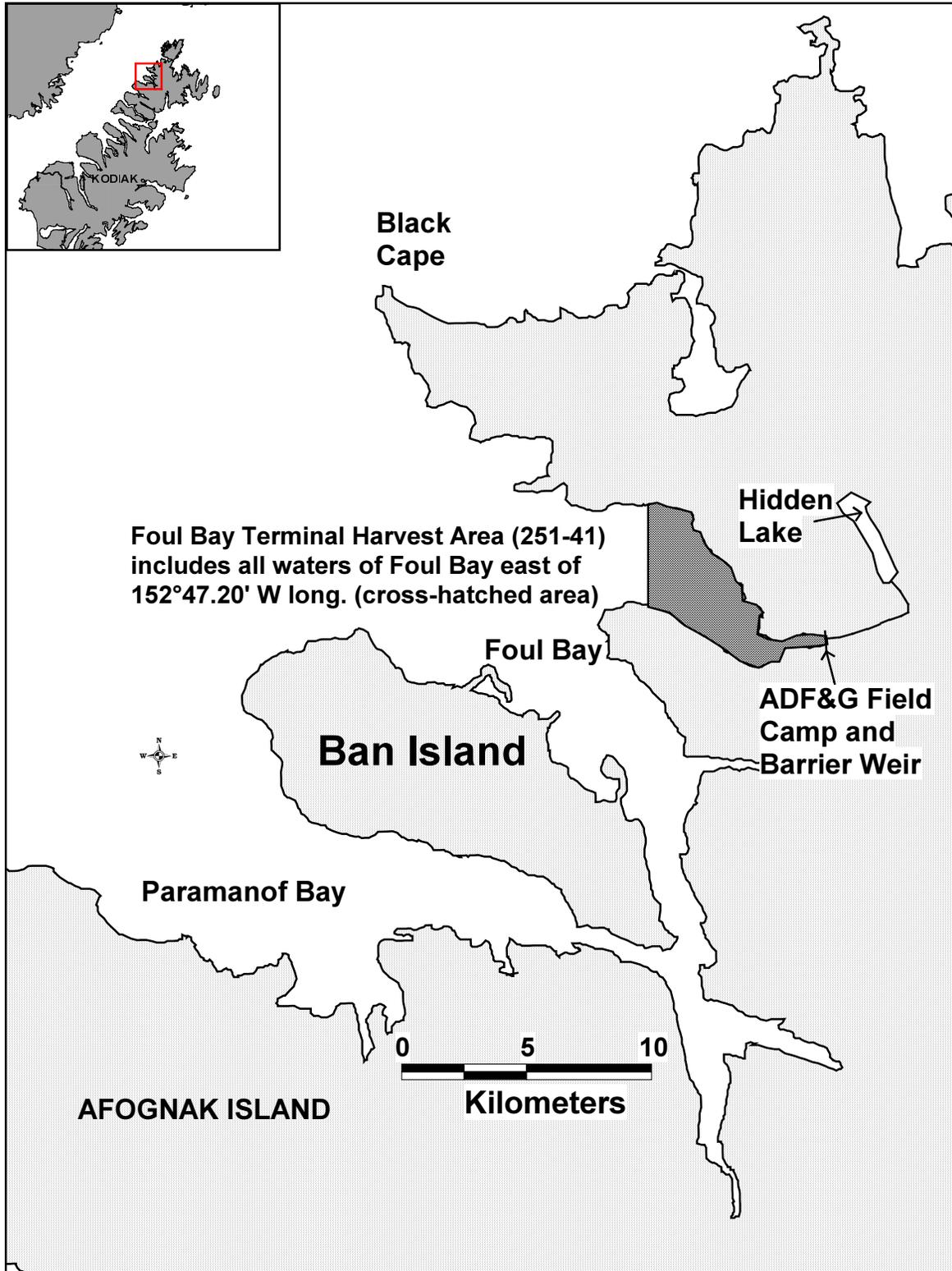


Figure 8. Location of the Foul Bay terminal harvest area, ADF&G field camp and fish weir at Hidden Creek.

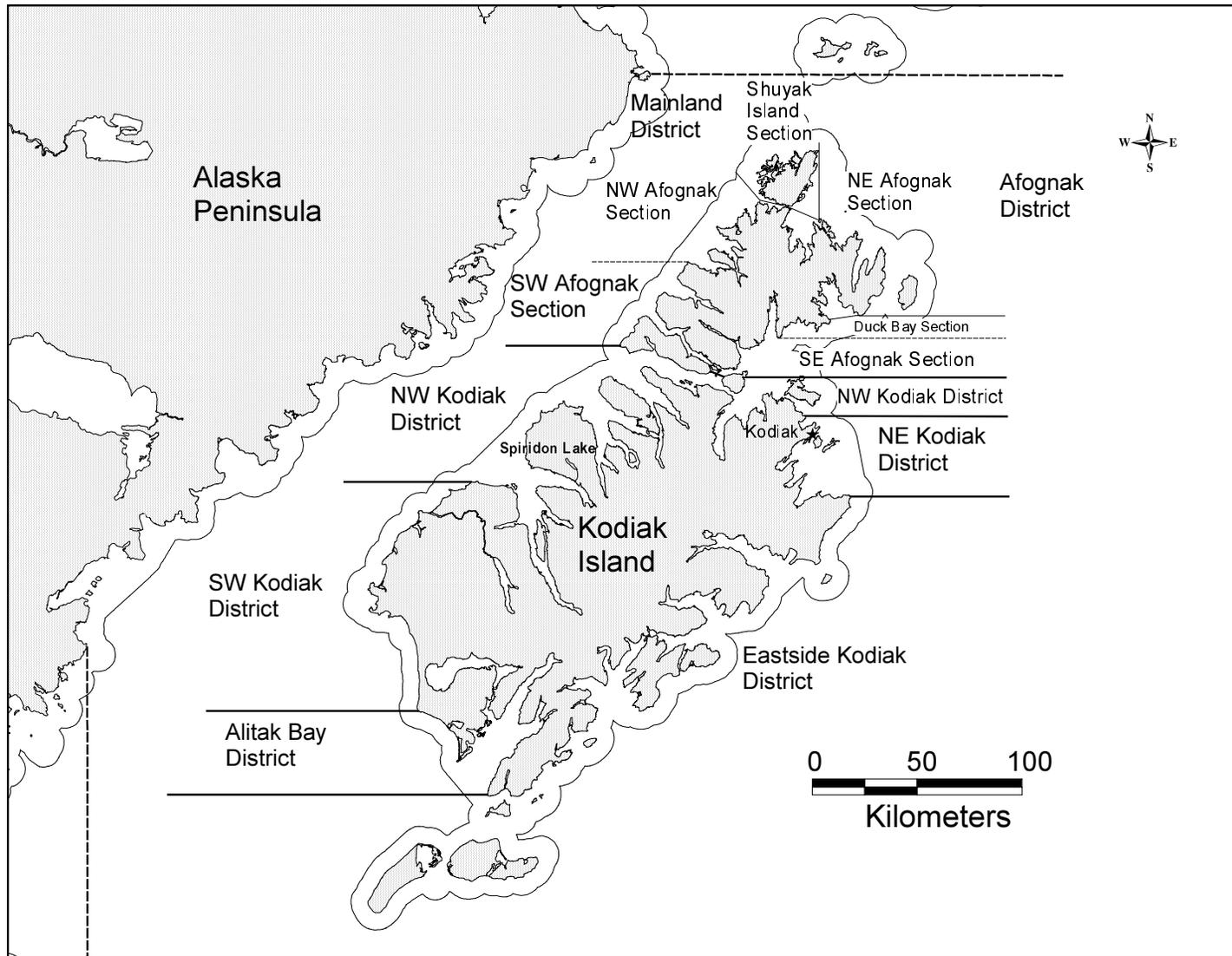


Figure 9. Map of the Kodiak Management Area depicting commercial fishing districts and selected sections.

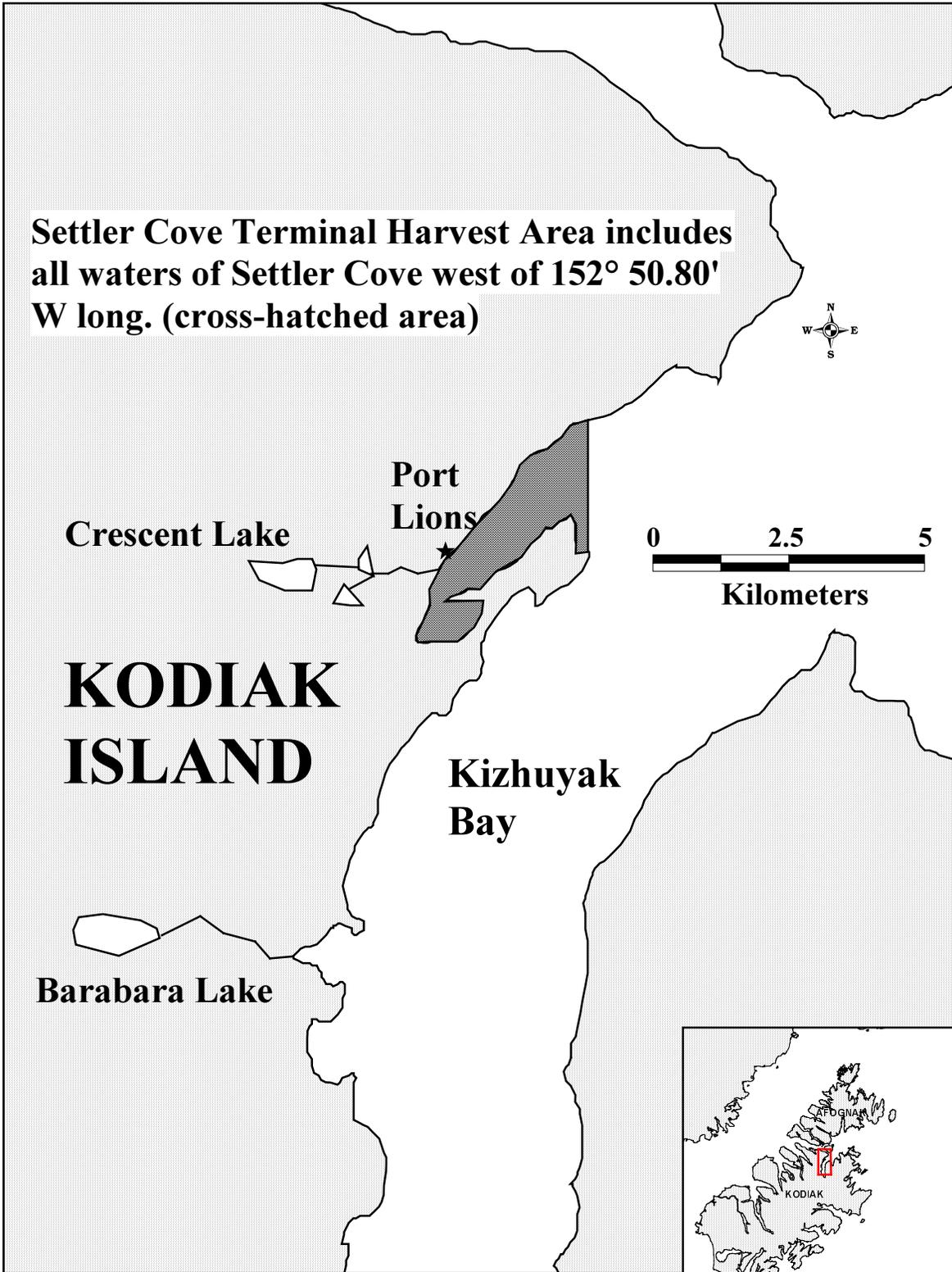


Figure 10. Settler Cove (Crescent Lake) terminal harvest area boundaries in Kizhuyak Bay.

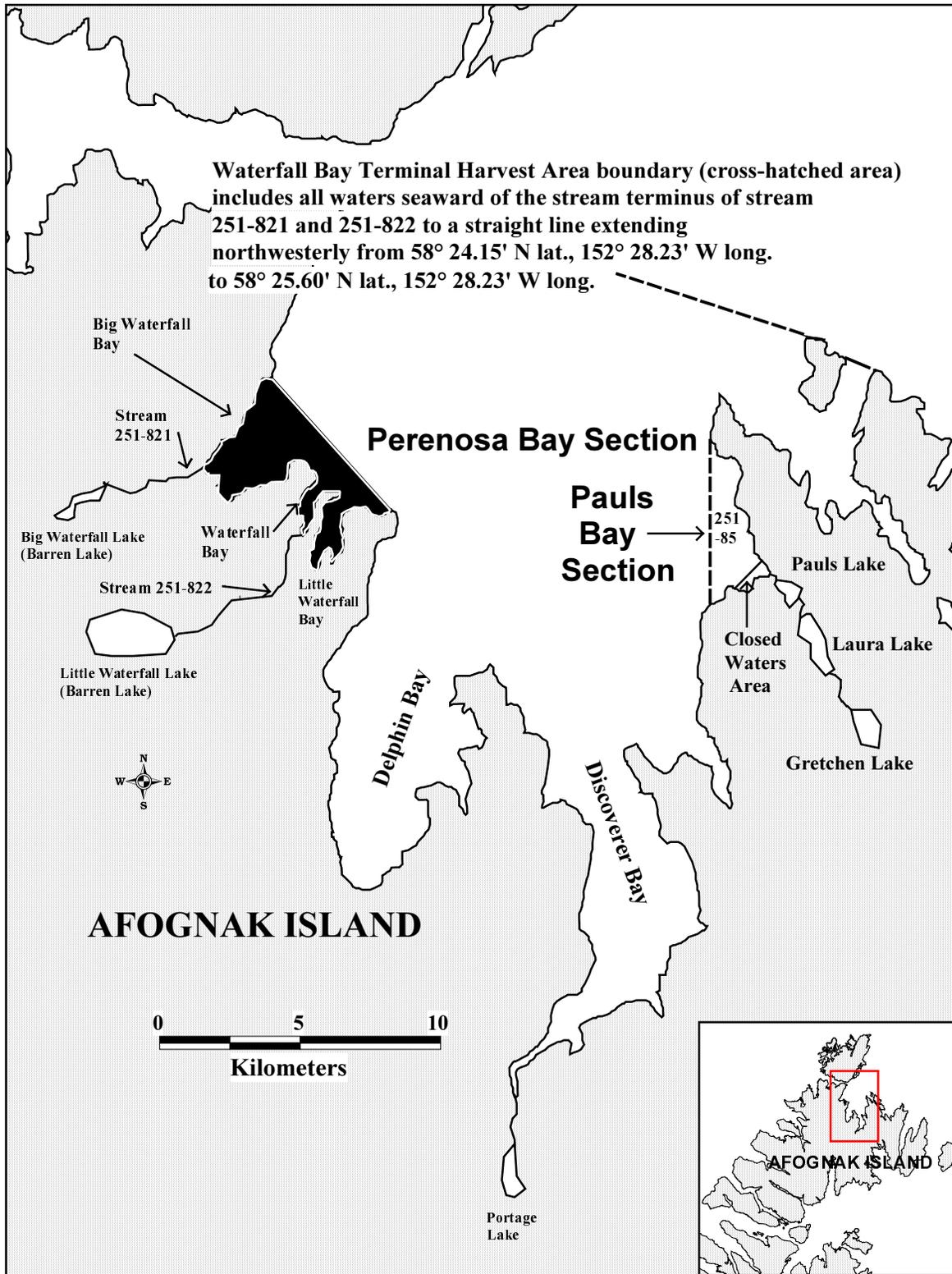


Figure 11. Waterfall Bay (Little and Big Waterfall Lakes) terminal harvest area and rehabilitation systems and the Pauls Bay Section in Perenosa Bay.

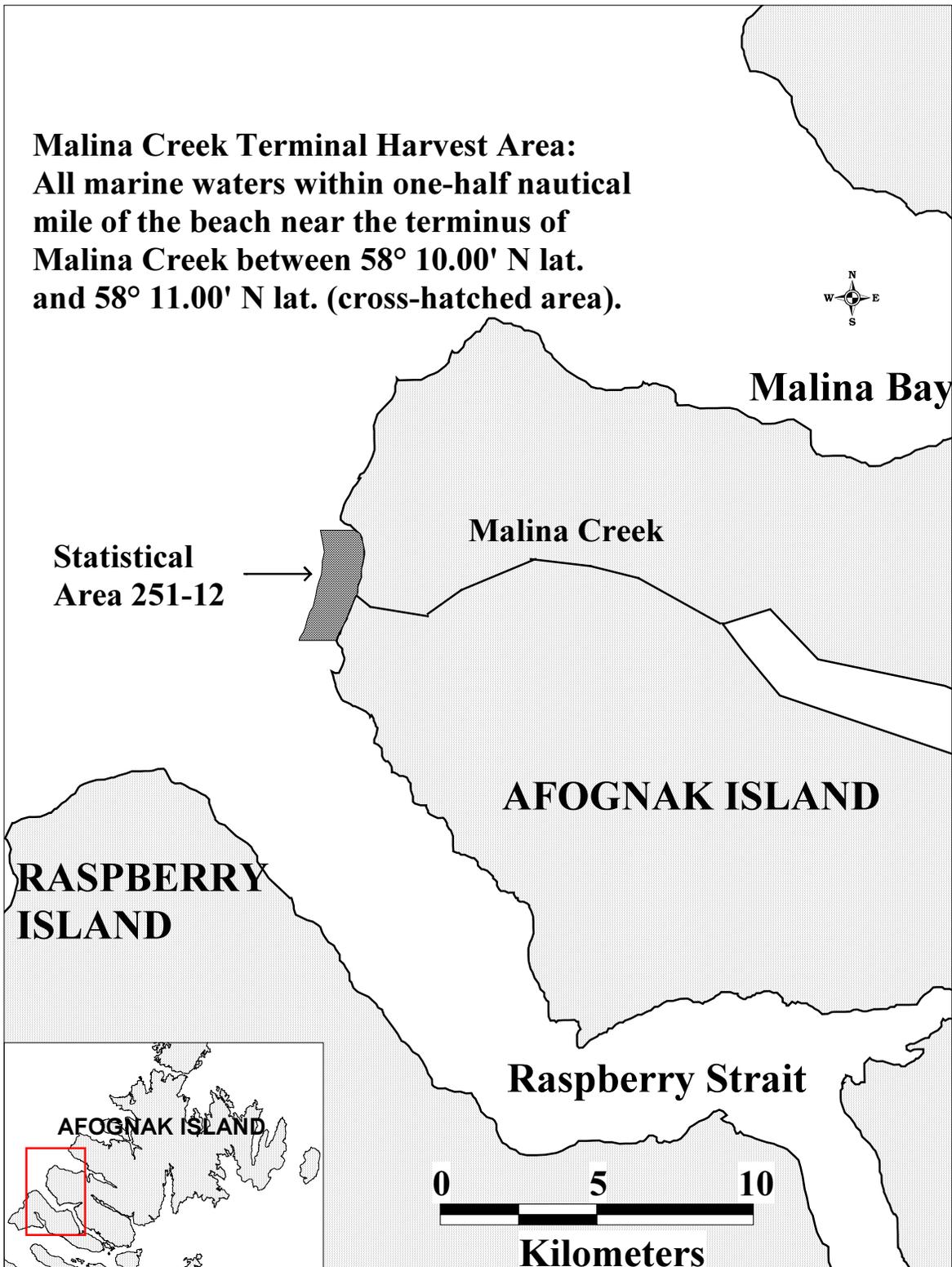


Figure 12. Location of the Malina Creek terminal harvest area.

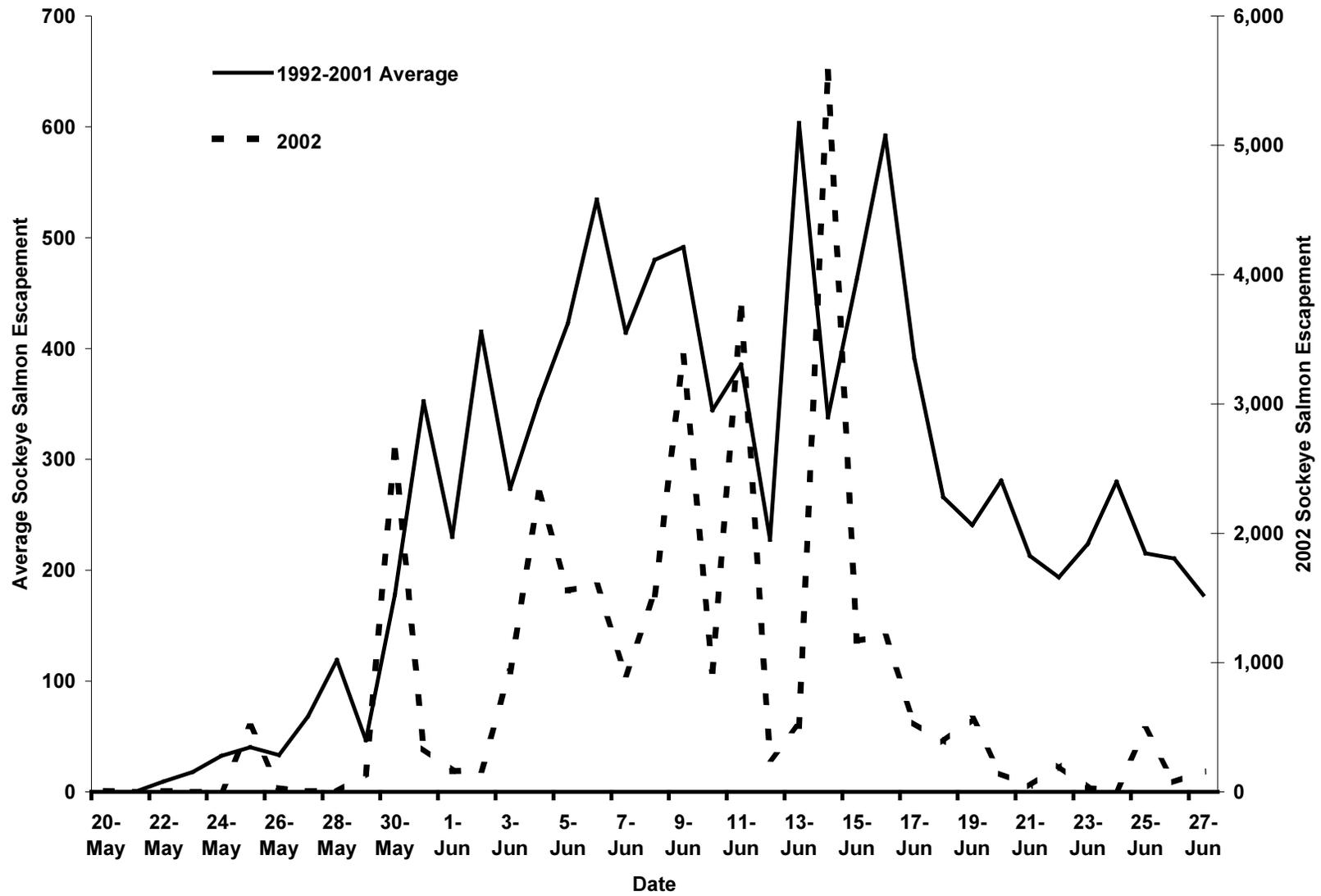


Figure 13. Malina Lake sockeye salmon average escapement (1992-2001) compared to the 2002 escapement.

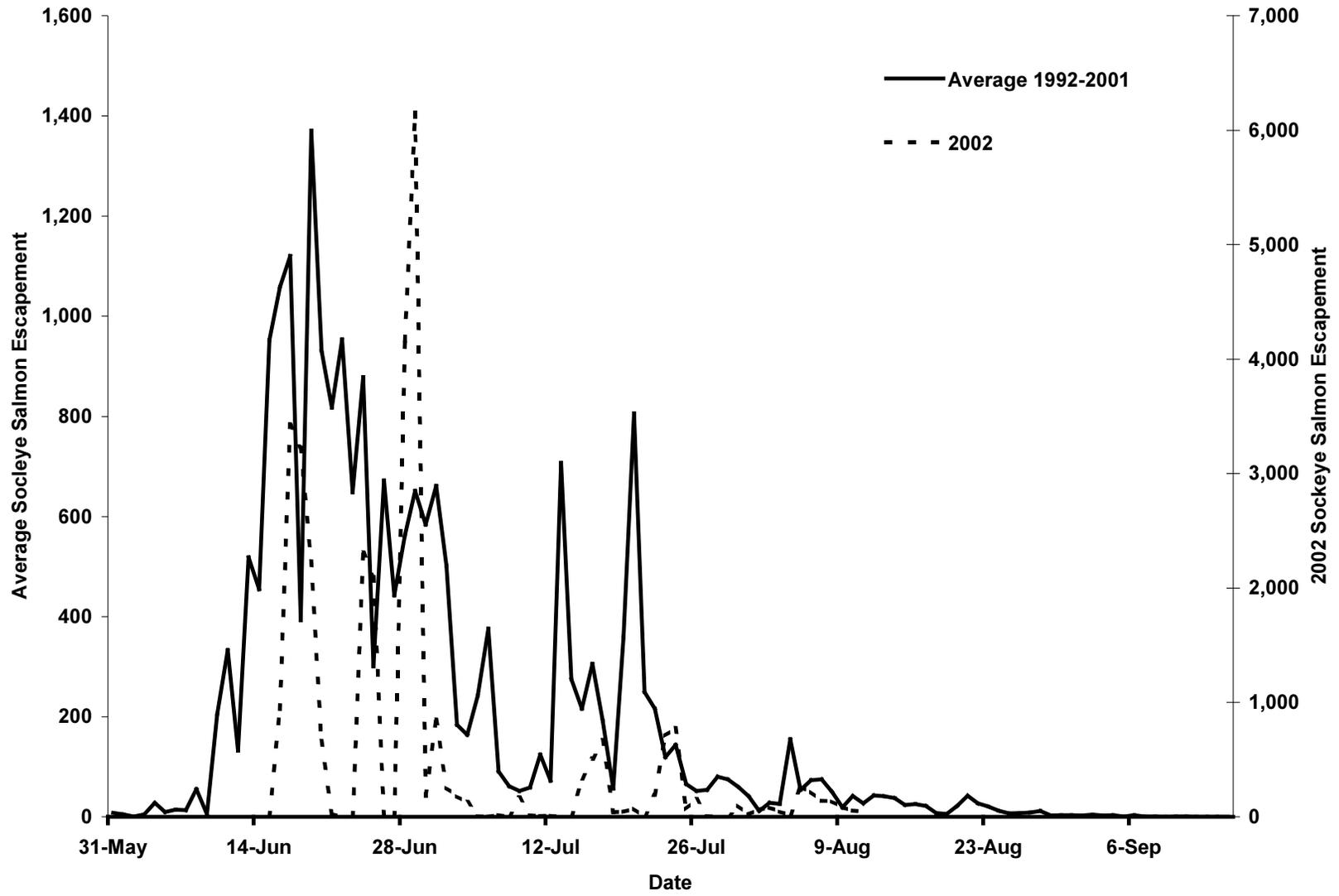


Figure 14. Laura (Pauls) Lake sockeye salmon average escapement (1992-2001) compared to the 2002 escapement.

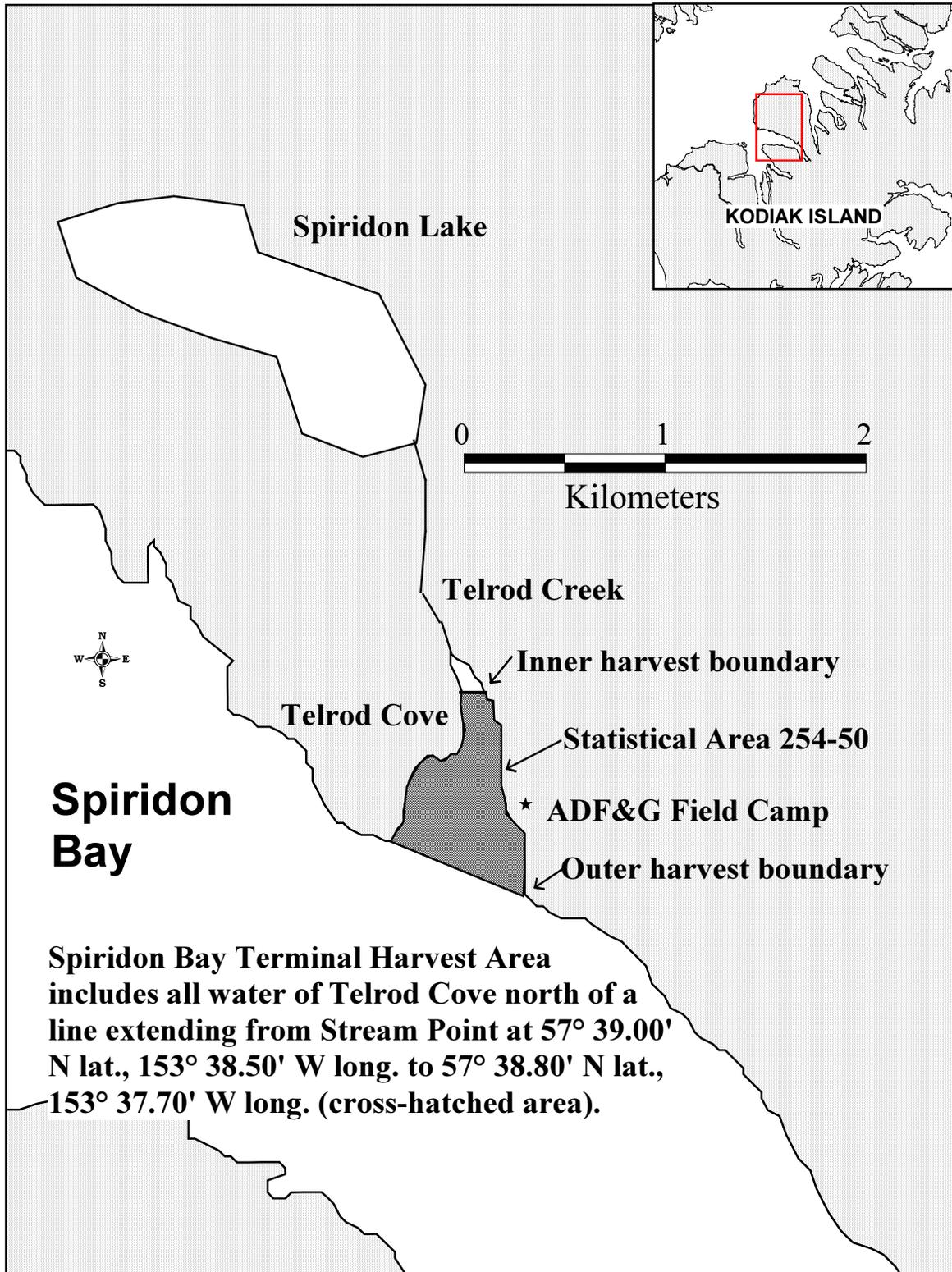


Figure 15. Spiridon Lake (Telrod Cove) terminal harvest area boundaries, and ADF&G camp location in Telrod Cove.

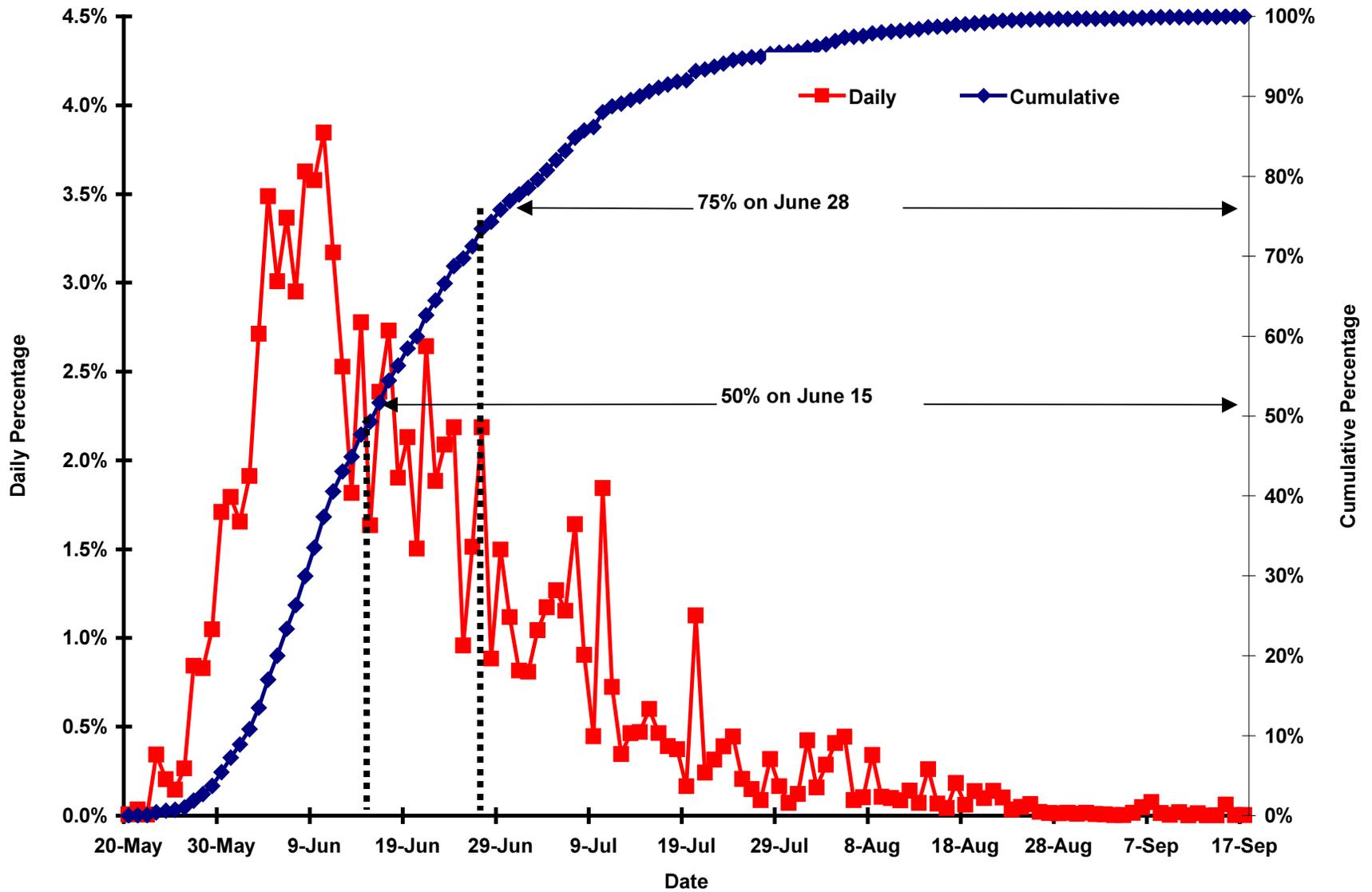


Figure 16. Average daily and cumulative sockeye salmon escapement percentages, 1992-2001.

## **APPENDIX**

Appendix A. Upper Station sockeye salmon egg takes, 1988-1996.<sup>a</sup>

Brood Year	Adult Salmon	Eggs (millions)	Hatchery <sup>d</sup>	Number Stocked	Year Stocked	Stocking Location
1988	120	0.2	KBH	143,725	1989	Kitoi Bay
1989	3,000	5.0	PCH & KBH	249,346	1990	Spiridon Lake
				1,312,728	1990	Little Kitoi Bay
				578,932	1990	Little Kitoi Lake
1990	3,700	4.5	PCH	3,480,000	1991	Spiridon Lake
		1.5	KBH	1,250,000	1991	Little Kitoi Bay
1991	3,800	4.3	PCH	2,200,000	1992	Spiridon Lake
		2.3	KBH	1,463,000 <sup>c</sup>	1992	Little Kitoi Bay
1992	6,816	9.8	PCH	4,246,000	1993	Spiridon Lake
		1.9	KBH	52,418	1993	Little Kitoi Lake
				326,500	1994	Little Kitoi Bay
				180,000	1993	Jennifer Lake
1993	5,551	7.8	PCH	5,676,000	1994	Spiridon Lake
				370,000	1994	Jennifer Lake
		2.0	KBH	1,672,710	1994	Little Kitoi Bay
1994	200	0.3	PCH	200,000	1995	Jennifer Lake
	200	0.3	KBH	266,952	1995	Little Kitoi Lake
1995	3,668	6.2	PCH	4,844,000	1996	Spiridon Lake
		0.7	KBH	587,435	1997	Little Kitoi Bay
1996	4,810	9.8	PCH	6,700,000	1997	Spiridon Lake
				458,000	1997	Jennifer Lake

<sup>a</sup> Additional egg-takes are not planned.

<sup>b</sup> Pillar Creek Hatchery (PCH) and Kitoi Bay Hatchery (KBH).

<sup>c</sup> An additional 182,000 fry of Afognak Lake stock were stocked into Little Kitoi Bay from Kitoi Bay Hatchery.

Appendix B. Pillar Creek Hatchery Afognak Lake sockeye salmon egg takes, 1991-2003.

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
1992	1,890	2.7	182,000	1992	Little Kitoi Bay
			554,600	1993	Hidden Lake
			202,000	1993	Crescent Lake
			205,000	1993	Little Waterfall Lake
			1993	2,169	3.4
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

-Continued-

Appendix B. (page 2 of 2)

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	50,000	2003	Hidden Lake
			50,000	2003	Little Waterfall Lake
			25,000	2003	Big Waterfall Lake
			25,000	2003	Crescent Lake
2003	240	0.3 <sup>a</sup>	55,000	2004	Hidden Lake
			55,000	2004	Little Waterfall Lake
			55,000	2004	Big Waterfall Lake
			55,000	2004	Crescent Lake

<sup>a</sup> Egg-take to be determined no later than August 1, 2003, pending limnology evaluation and escapement level.

Appendix C. Pillar Creek Hatchery Malina Lake sockeye salmon egg takes, 1991-1998.

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 <sup>a</sup>	550	0.710	406,000	1999	Malina Lake

<sup>a</sup> Escapement goal was achieved from 1999 to 2002 and no additional egg-takes are planned.

Appendix D. Pillar Creek Hatchery Laura Lake sockeye salmon egg takes, 1993-1998.

Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1993	218	0.30	117,000	1994	Laura Lake
1994	53	0.06	16,000	1995	Laura Lake
1995	170	0.20	182,000	1996	Laura Lake
1996 <sup>a</sup>	0	0.00	0	1997	Laura Lake
1997 <sup>a</sup>	0	0.00	0	1998	Laura Lake
1998 <sup>b</sup>	251	0.35	172,000	1999	Laura Lake

<sup>a</sup> Escapement goal was achieved.

<sup>b</sup> Escapement goal was achieved from 1999 to 2002 and no additional egg-takes are planned.

Appendix E. Saltery Lake sockeye salmon egg takes, 1994-2003.

Brood Year	Adult Salmon	Eggs (millions)	Hatchery <sup>a</sup>	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	106,658	1999	Little Kitoi Lake
1998	2,560	4.30	PCH	3,564,000	1999	Spiridon Lake
			PCH	66,500	1999	Ruth Lake
			KBH	98,737	1999	Little Kitoi Lake
			KBH	74,463	2000	Little Kitoi Lake
			KBH	23,756	2000	Little Kitoi Bay
1999	4,318	6.80	PCH	4,397,100	2000	Spiridon Lake
			PCH	78,700	2000	Ruth Lake
			KBH	154,039	2000	Little Kitoi Lake
2000	2,582	4.80	PCH	1,700,600	2001	Spiridon Lake
			PCH	0	2001	Ruth Lake
			KBH	282,089	2001	Little Kitoi Lake
2001	845	1.57	PCH	1,182,000	2002	Spiridon Lake
			PCH	0	2002	Ruth Lake
			KBH	250,000	2002	Little Kitoi Lake
2002	2,000	3.30	PCH	1,400,000	2003	Spiridon Lake
			PCH	0	2003	Ruth Lake
			KBH	250,000	2003	Little Kitoi Lake
2003 <sup>b</sup>	2,500	4.00	PCH	2,700,000	2003	Spiridon Lake
			PCH	0	2003	Ruth Lake
			KBH	250,000	2003	Little Kitoi Lake

<sup>a</sup> Pillar Creek Hatchery (PCH), Kitoi Bay Hatchery (KBH).

<sup>b</sup> Egg-take goal to be determined after inseason limnology evaluation and escapement results.

Appendix F. Sockeye, coho, and chinook salmon survival assumptions used to estimate adult returns for Pillar Creek Hatchery.

Life History Stage Size (g)	Adult Return System	
	Barren	Anadromous
Sockeye:		
fry 0.25 g	5.0%	2.0%
fingerling 1.5 g	8.0%	
pre-smolt 5.0 - 12.5 g	12.5%	
Coho:		
fry	NA	1.5%
fingerling 3.0 - 5.0 g	NA	6.5%
smolt 20 g		12.5%
Chinook:		
smolt	NA	1.0 - 3.0%

Appendix G. Pillar Creek Hatchery coho salmon egg takes, 1991-2003.

Brood Year	Adult Salmon	Green Eggs	Number Stocked	Year Stocked	Stocking Location
Monashka Creek stock:					
1991	25	60,100	52,000	1992	Monashka Creek
1992	6	10,500	9,000	1993	Monashka Creek
Buskin River stock:					
1993 <sup>a</sup>	78	156,000	136,200	1994	Kodiak Road System Lakes <sup>b</sup>
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	75	101,000	72,000	2003, 2004 <sup>c</sup>	"
2003	80	101,000	64,100	2004, 2005 <sup>c</sup>	"

<sup>a</sup> Prior to 1993, Kitoi Bay Hatchery supplied juvenile coho salmon for stocking the road systems.

<sup>b</sup> Road system lakes includes Southern Lake on Long Island.

<sup>c</sup> 40,000 smolt releases in 2004 and potential for smolt releases in 2005.

Appendix H. Pillar Creek Hatchery Karluk River chinook salmon egg takes, 2000-2003.

Brood Year	Adult Salmon	Green Eggs	Number Stocked	Year Stocked	Stocking Location
2000	48	124,818	60,400	2002	Monashka Creek
2001	34	86,120	34,000	2003	Monashka Creek
2002	59	147,000	10,000	2004	Monashka Creek
2003	120	300,000	75,000	2005	Monashka Creek

## Appendix I. Unplanned Cost Recovery General Operational Plan.

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A management strategy targeting unharvested enhanced production is required by ADFG to insure compliance with 5AAC 40.005.(f). This strategy, as drafted here by KRAA, represents a pre-Program Alteration Request (PAR) effort to address ADFG PNP permitting requirements for salmon straying concerns. Identified below is a proposed procedure detailing actions required when harvest of enhanced production is delayed or abandoned:

PCH Basic Management Plan: (proposed [deletions] and *additions*)

Sec. 4.02 Management Strategies For [potential hatchery production] Enhanced Production:

*c. When events result in enhanced salmon production remaining unharvested, a Regional Planning Team (RPT) approved management strategy, in the form of an 'unplanned' cost recovery operational plan (UCROP) will be implemented. A UCROP identifies that:*

- i. Enhanced production should be harvested annually in common property fisheries (CPF) at a rate consistent with the average harvest timing, and the range thereof, for site-specific THA/SHA production;*
- ii. Historical harvest data will provide a guide to site-specific timing per donor stock used and related harvest rates;*
- iii. When such events as price disputes, ADEC-defined unfishable waters, etc. preclude the occurrence of normal common property harvest patterns associated with specific enhanced production, implementation of a UCROP will be considered;*
- iv. Resulting salmon build-ups will be identified by ADFG and, per established UCROP parameters, a site-specific unplanned cost recovery fishery (UCRF) will be initiated by KRAA;*
- v. These parameters include, but are not limited to, donor stock run timing per ADFG weir escapement data, average fishery time-of-entry (TOE) patterns per ADFG harvest data, and ADFG in-season estimates of salmon build-up magnitude and duration;*
- vi. UCRF will occur when, as a result of delayed CPF's, build-ups are estimated at 10%, 40%, and 50% of pre-season expectations for late-run sockeye, early-run sockeye and chums, and all pink and coho production, respectively;*
- vii. Alternatively, a UCRF will occur on unharvested enhanced production at the donor stock's 50% TOE pattern for each enhancement site's THA/SHA;*
- viii. Applying percentages to build-up numbers for triggering UCRF's, addresses straying concerns related to build-up duration and also facilitates pre-season planning for UCRF;*
- ix. All UCRF will commence within 72 hours of the pertinent percentages being achieved and will occur per each site's normal CPF harvest patterns;*
- x. KRAA will be responsible for administrative compliance with the intent of each system's UCROP. All costs for and proceeds from UCRF will belong to KRAA.*
- xi. Site-specific UCROP's will be developed by KRAA for the following non-anadromous enhancement projects:*
  - Kitoi Bay Hatchery (KBH) juvenile releases:*
    - \* Chum @KBH; Pinks @KBH; Coho @KBH, @Jennifer Lks., @Ruth Lk., @Crescent Lk.,*
    - Pillar Creek Hatchery (PCH) juvenile releases:*
      - \*Sockeye @Crescent Lk., @Hidden Lk., @Waterfall Lks., @Spiridon Lk., @Ruth Lk.*

**d.** Failure to comply with the requirements identified in (c.) may result in the voiding of pertinent PNP permits.

*Note: the percentages used above reflect thresholds of concern initially identified during the 2002 price dispute.*

SIGN-OFF

Chris Clevenger 6/9/03  
Chris Clevenger: Pillar Creek Hatchery Manager Date

Steve Honnold 6/9/03  
Steve Honnold: Regional Resource Development Biologist, CFD Date

Patti Nelson 6/9/03  
Patti Nelson: Regional Finfish Research Supervisor, CFD Date

Kevin Brennan 6-9-03  
Kevin Brennan: Area Finfish Management Biologist, CFD Date

Jim McCullough for 6/9/03  
Jim McCullough: Regional Finfish Management Supervisor, CFD Date

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Len Schwarz 6/9/03  
Len Schwarz: Area Biologist, Sport Fish Date

Barry Stratton <sup>by Len Schwarz</sup> 6/10/03  
Barry Stratton: Sport Fish Regional Supervisor Date

Larry Malloy 06-09-03  
Larry Malloy: Executive Director, KRAA Date

**The 2003 Hatchery Management Plan for PCH is hereby approved:**

David G Bedford 6/17/2003  
Kevin Duffy: Commissioner, ADF&G Date  
David Bedford Deputy

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