# On-Time Public Comment List
# Kodiak Finfish
# January 7–10, 2014

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The following Public Comments and Record Copies were received at Chignik Finfish and Lower Cook Inlet Meetings Regarding Proposals 43, 44, and 45

December 2, 2013

Boards Support Section
Alaska Department of Fish and Game
P.O. Box 115526
Juneau, AK 99811-5526
**Attn: BOF Comments**

Re: Proposal 98, to allow Kodiak Area CFEC seine salmon permit holders to operate additional gear under a dual permit or joint venture.

To whom it may concern:

We support the adoption of proposal 98 and moving it forward into regulation, with option 1 (allowing dual permit holders) being the preferred option.

There are currently about 376 permits annually issued in the Kodiak area purse seine salmon fishery. In the 2012 fishery, the most recent for which the data are available, only 166 of the available permits were actively fished. This means that there are over 200 latent permits out there, which we would argue is an excessive amount given the characteristics of this fishery. Although the Kodiak area is relatively large, boats tend to concentrate in certain locations at certain times during the season due to the vagaries of geography and the timing of the salmon runs, such that overcrowding becomes a problem. Indeed, at certain sites the lineup can be such that boats may only make 3 or 4 sets in an entire day. If a significant number of these latent permits become active, which is a distinct possibility given the current renewed interest in the Alaska salmon fisheries, overcrowding in the fishing grounds may become a serious problem moving forward into the future. Also, during peak pink salmon years, the processors sometimes institute a daily catch limit, as happened recently in the 2013 season. An excessive increase in active permits would likely lead to more days of catch limits. And with the market being as fickle as it is (surely many remember when pinks were less than 10 cents a pound), the case of overcrowding on the grounds, more daily catch limits, and a low price would diminish the economic viability of the Kodiak salmon fishery for the active participants.

We see this proposal as a means to incentivize current permit holders to acquire a second permit (either themselves under option 1 or to have a crewman with a permit under option 2), thus reducing the potential of harm from excessive latent entry in the future. The proposal would help provide long-term stability for the current active participants that depend on the fishery. Allowing a 20% increase in seine length to 300 fathoms seems a reasonable incentive that shouldn't create any problems on the fishing grounds, and shouldn't harm those fishing with the current 250 fathom net. There is a precedent for this model; such a situation already exists in the Bristol Bay drift gillnet fishery (5 AAC 06.333), where joint operations, with two permits on board, are allowed a longer gillnet. Kodiak area purse seine permit prices are relatively low because there are so many of them. The cost of acquiring a second permit would not be excessive when compared to the overall costs involved in the fishery. Thus, we would argue that this proposal represents a reasonable way to achieve the goal of reducing the number of latent permits in the Kodiak Area purse seine salmon fishery.

Thank you for your consideration.

Sincerely,
(all of the undersigned are Kodiak area purse seine permit holders)

| Signature | Printed name |
| --- | --- |
| [signature] | Robert K. McDaniel |
| [signature] | Robert M Funkhouser |
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Submitted By Robert Funkhouser
Affiliation Kodiak Salmon Seiner

I have been a Kodiak Salmon Seiner for over 30 years. I Oppose Proposal 90. Fisheries Managers already close Cape Alitak Section If Upper Station Sockeye is not meeting escapement levels. It would be difficult for managers to manage Humpy-Deadman if this Proposal is confirmed. Purse Seiners would suffer with this proposal.

I Oppose Proposal 92. It would be very hard to manage the Cape Igvak Fishery under this proposal. Kodiak Seiners don't exceed 15% of the total havest very often. The Kodiak area managers do a great job keeping us under 15% year after year. Over the years the Chignik fleet has become more efficient at fishing the outer capes. I believe at many times during the season Chignik Seiners target & catch many Sockeye headed for Kodiak Rivers. Loosing the ability to manage the Cape Igvak Section by never being able to exceed 15% would be difficult for managers, and a hardship on Kodiak Seiners.

I Oppose Proposal 93. It would be a hardship on Kodiak Seiners. We are supposed to get the opprortunity to catch 15% of the total run. We are always shut down during the overlap period from June 28th to July 8th. If managers don't have the ability to go over 15% early, it would be hard to catch up after July 8th.

I Oppose Proposal 94. Having to check in and check out would be very difficult for area managers to work with. The company i fish for requires me to deliver every day when fishing Cape Igvak. As do most processors in Kodiak. We also are required to list where all fish have been caught on our fish tickets at all times. Crossing the Shelikof with a full tank of water is something most fisherman avoid doing. Its a safety issue, the weather is very difficult at times. Transporting fish accross Shelikof is not good for the fish, so we don't do it. Kodiak Seiners and Managers woud suffer with this Proposal.

I Oppose Proposal 95. Having a Setnet only opening on the Westside of Kodiak is allocative. Westside setneters already catch a much larger portion of all Kodiak Sockeye Salmon. We cannot let this happen. As it stands now 60% of Telrod bound fish are caught outside of Telrod Cove. Of those fish 75% are caught by westside setnetters. I have been fishing primarily on the westside of Kodiak Island for over 30 years. We now only have a minimal amout of Purse Seine sets we can make, without a setnet right in front of our nets in the Northwest Kodiak District. Once we start having Setnet only openings. Then the Setnetters will want Setnet only openings all the time. 500,000 lbs of Sockeye have been harvested in Telrod Cove for cost recovery in recent years. Every Kodiak salmon fisher benefits from this money. Please do not consider this Proposal. Its just a fishgrab by the Setnetters.

I Oppose Proposal 96. Would be a huge gear type conflict. Difficult to manage.

I Oppose Proposal 97. Delaying a Closure would mess with any set fishing periods. If the weather is coming, then pull your nets early. Thats what the Seiners have to do.

I Support Proposal 98. I would like to see this proposal ammended to read. That seines could be 250 fathoms with or without leadweb. Without permit stacking.

I Oppose Proposal 99. I oppose allowing anyone person to fish two pemits at the same time.

Thank You

Rob Funkhouser

F/V Kipper

PC 2
1 of 1

Dear Mr. Chairman and Members of the Board,

I would like to show my **SUPPORT** for proposal **99**.

My name is John A. CRATTY

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K 61828

I fish in the N W District.

I support proposal 99 because:

it makes sense, for all the reasons noted.

12.17.13

Dear Mr. Chairman and Members of the Board,

I would like to show my **SUPPORT** for proposal **99.** #89 and #90

My name is Rita Dieters Rita Dieters

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K60486

I fish in the Alitak District.

I support proposal 99 because:

Our family uses 4 Limited Entry permits that our Salmon business needs to be successful.

S04K57516 Eric Dieters
S04K57515 Janelle Soman (2013)
S04K57739 Ryan Throop
S04K60486 Rita Dieters

Our family has fished these same locations for 39 years. We are 100 percent in favor of proposal #99. Also #89 and #90

Please Vote these in as permanent new regulations for the upcoming 2014 Season.

Sincerely,
Rita Dieters

I have submitted the proposals 89 and 90 in reference to the protection of Late Upper Station Sockeye Run.

In my recent research I have found major problems with **ALL** of the sockeye runs in the Alitak District.

A massive decline of production of Sockeye for the district is being caused by a combination of issues.

Lake Ecosystems are at risk

Traditional harvest areas are at risk.

We need to look at the big picture of Kodiak Island Sockeye Migratory Pathways to solve this dilemma.

Eric Dieters, permit # SO4K 57516

Family business, 39 seasons, 4 permits

I support proposal 99.

# Topics of Concern for the Alitak District.

Lack of protection of sockeye escapement has put Alitak District runs at risk.

Escapement goals are too low.
Why escapement goals have been recently lowered to the levels they are at now is a big question and needs to be reviewed.

Escapement trends are nearly half what they used to be. What kind of future return size can we expect from low escapement in the lakes?

Escapement should be the top priority of ADF&G, fishermen, and processors. Surplus harvest should come second to the protection of salmon runs.

Fishing pressure is too intense island wide.
Leaving harvest areas open "extended until further notice" is not good for salmon ecosystems. Alitak district is the only area with a mandatory pulse cycle.

Migratory pathways of sockeye are known, but are not being protected.
Interception harvest issues need to be addressed.

Placing the burden of conservation solely on the Alitak end user group is putting fishermen out of business. Traditional harvest areas are no longer profitable.

When ADF&G is trying to obtain escapement, more than one Section/ District should be able to be closed for the protection of that respective run.

Alitak District sockeye fishermen are "closed until further notice", while surrounding sections and districts are often kept "open until further notice".

Keeping the sockeye section of the Alitak District closed has proven to be not enough protection for the runs. Minimum escapement is not always achieved.

Alitak District has some of the Islands largest salmon runs, but receives the least amount of attention via research and protection.

New styles of harvesting, and advanced gear technology have emerged making harvest more efficient. ADF&G has not implemented any new protective measures to counter balance the fleet pressure and or gear type harvest shift.

Pulse Fishing management style needs to be extended out beyond the boundaries of the Alitak District.

Pulse open/closures are a simple management tool that should overrule District by District management plans when minimum escapement is needed.

Migration pathways and run timing always need to be considered for the health of the South Olga lakes.

Alitak District is a complex area to manage because of the geographic location and multiple choke points that salmon must migrate past.

This area requires more attention from both the research and management departments of ADF&G.

## Commercial Salmon Fishing Regulations

**Migratory Habitats and Pathways should be protected**
-5AAC 39.222 ( c) (A) (iv) page 68

"Escapement Protection and **Precautionary** Conservation of salmon."
-5AAC 39.222 (c) (2) (D,E,F,H) Page 69

"Primary goal to **protect sustained yield**, while at the same time providing an **equitable distribution of harvest** between various users."
-5AAC 39.200 (a) page 65

Mixed Stock Fisheries. 5AAC39.220 (b) page 67
**-Burden of conservation** should be shared respective to their harvest on the stock of concern.

High Impact **Emerging** Commercial Fisheries
-5AAC 39.210. (a)

# Pulse Fishing

-Allows "Traditional Harvest Areas" for both **subsistence** and commercial to remain in place.

-Allows runs to stay strong for future returns and large surplus harvest **opportunities for all fishermen.**

-Ensures a "precautionary approach" to keeping an ecosystem/industry relationship at a healthy balance.

-Is a natural way for **systems to rebuild** via escapement, without man made enhancement/ fertilization projects etc.

-Gives ADF&G the power to manage an **Island migratory ecosystem** more effectively than a district by district policy with political boundaries.

-Allows the "Mixed Stock" and "Sustainable Salmon fisheries" to function as **conservation tools** as they were intended.

Effects of Pulse Fishing.
-Fisherman will not get to harvest to the maximum extent they are currently accustom to. Example, extended until further notice.

-The *"Burden of Conservation"* will be shared more by the *entire* migratory pathway harvest user group rather than just the *end* harvest user group.

- Potential over-escapement of some runs **to protect** others that require conservation efforts.

Dear Mr. Chairman and Members of the Board,



I would like to show my **SUPPORT** for proposal **99**.

My name is Mark Larsen

I set net for salmon on Kodiak Island.

I hold limited entry permit number 61168

I fish in the N West District.

I support proposal 99 because:

I see only advantages to this proposal.

Concerns about this proposal consolidating permits in fewer hands are, I believe, unfounded. It will just allow those who own permits to fish them in a way that is more efficient.

Mark Larsen

Dear Mr. Chairman and Members of the Board,

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BOARDS

I would like to show my **SUPPORT** for proposal **99**.

My name is Annika Jensen

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K59185Z

I fish in the North West District.

I support proposal 99 because: It will allow me to leave in the summer and further my music education which I can not do under the currant law

annika Jensen

Dear Mr. Chairman and Members of the Board,



I would like to show my **SUPPORT** for proposal **99**.

My name is Gordon L. Jensen JR,

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K61825L

I fish in the North West District.

I support proposal 99 because: As a Kodiak Island Setnetter 99% of my family's Income is made from Setnetting Kodiak Island. I'm a alaskan native that has held on to a traditional life style. I support proposal 99 because of my Children's Education to better them Selfs in a ever changing Global Economy. Proposal 99 would alow them to go and get advanced Education in the Summer with out lowering our Income.

Sincerely Gordon L Jensen JR.

1

Dear Mr. Chairman and Members of the Board,

I would like to show my **SUPPORT** for proposal **99**.

My name is Theodore SQUARTSOFF

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K 61615V

I fish in the KODIAK District.

I support proposal 99 because:

Please see attached

2

I Theodore Squartsoff Have worked long and Hard To Aquire a Salmon Setnet Permit for myself and my Son. And Due to Age and Health I'm unable to work my Permit but would like to Keep the permit in the family. To Reinstate Proposal 99 would Allow My Son to Run the Operation. So All my grandchildren can participate in the fisheries.

Theodore SQUARTSOFF

My name is Pete Hannah a 35yr Kodiak resident fisherman. I would like to comment on a few proposals.

**Proposal 45** - Kodiak Area Groundfish

I am in favor of this proposal. It is obvious that we need 100% observer coverage to make any scientific rational decision. Without this we will just prolong being able to make any scientific justifiable decision, which seems to be some groups strategy. Just get the facts, so we can do what is best for the health of the fishery.

**Proposal 99** – Permit Stacking

I am opposed to this proposal. Kodiak has very few latent permits and the price of these permits are some of the highest set net permits in the state. I understand the financial advantages of permit stacking and maybe there is some other way to make transferring permits differently that might work, but I don't think permit stacking with the potential of reducing ownership by 50% is the answer. As we have seen, consolidation has resulted in drastic reduction of active participants, and very high costs to enter the fisheries. The one thing CFEC and the Board of Fish has done well and different from the feds, is to keep lots of permits available, therefore keeping some reasonable opportunities for new entrants. CFEC's Nov 2012 report highlights most of the problems that we have already seen in other fisheries.

Thanks. Pete Hannah

**Kodiak Finfish Proposal #91**

James Pryor | Pryor Fish Camp | Alitak Set net Assoc.

907-539-7434 | jlpryor@gci.net

1012 Steller Way
Kodiak, AK 99615

Contact information may be included on comment section

We support Kodiak finfish proposal #91. Sockeye production, commercial harvest and escapements have been on a steady decline in the Alitak District for over a decade. In 1994 the Alaska Department of Fish and Game adopted an aggressive "strong" stock management plan that that emphasized the harvest of the man-made sockeye run in the Frazer Lake system. (map #2) This strong stock management plan did not adequately manage for the natural occurring sockeye runs that originate in Olga Bay. (map #2) The largest natural run in the Alitak District is Upper Station also called South Olga Lakes. This sockeye run is of prehistoric origin and is as historically and culturally significant as Karluk. Upper Station has two genetically distinct sockeye runs that have and early June and mid August return timing. When ADFG adopted the strong stock management plan it reduced the emphasis on managing this run. The early Upper Station run, although smaller than Frazer, is still an economically, subsistence, and genetically important sockeye run. Unfortunately, the early run timing is very close to the Frazer sockeye run and a decision was made to sacrifice the potential of the early Upper Station run and manage for the stronger Frazer fish.

The early Upper Station run was escaping over 70,000 sockeyes in the 1980's. (chart #1) As commercial harvest pressure increased on the Frazer sockeye system, the Board of Fish made a disastrous decision in 1998 to manage Upper Station early sockeye run on an Optimum Escapement Goal (OEG) which reduced the previous Biological Escapement Goal (BEG) of 43,000 – 93,000 to a target of 25,000 fish. It did not take long for the newly instituted OEG to make its presence felt. Early run sockeye escapements have been on a precipitous decline in the Upper Station system since 2006, and have barely made the Board mandated OEG the last 3 seasons. (chart #1) Add to the declining escapements of the early Upper Station run there is a parallel decline in escapement numbers in the late sockeye run. (chart #2) Escapement for both runs have plunged almost 150,000 fish since the 1980's. There is strong evidence that the early run escapement is crucial to the health of the later sockeye run. Along with the decline in sockeye escapement there is a dramatic decline in sockeye production and commercial harvest. (chart #3a,3b) From a high in the 1990's Catch Per Unit (CPU) of 7,872 to a steep decline in the years 2000-2013 to a CPU of 3,574. The Alitak District has experienced multiple seasons that have brought a once prosperous fishery to one that has fishing families on the brink of financial ruin. (chart #7a,7b)

There are more problems in the Alitak district than just declining escapement and production in the Upper Station system. The strong stock management plan, through its focus on the Frazer system has destroyed other commercially important natural sockeye runs in Olga Bay. (map#2) Sockeye runs at Horsemarine and Silver Salmon are not longer viable sockeye producing systems. The most important of the smaller natural systems that have been destroyed is at Akalura. (map#2) This is a system that a cannery constructed on its mouth in 1898 and may have been the 4th largest sockeye run on Kodiak Island but has disappeared. In 2003 ADFG discontinued any weir counts on the Akalura system even when only a few years before it was still producing commercially important sockeye production numbers.

(chart #4) Any questions to ADFG as to what has happened to this system are met with shrugs. Akalura, another loss of genetic diversity in what was a dynamic sockeye producing Olga Bay.

All is not well even with the Frazer system as the sockeye harvest numbers also reflect a steep decline in productivity. (chart #7a,7b) The Frazer system has a very serious, ongoing problem with large percentages of immature "jack" sockeyes returning, and the numbers are truly alarming. (chart #5) Frazer cannot be considered a healthy system if some return years have over 70% escapement of immature "jack" salmon.

What are some solutions for the sockeye declines in the Alitak District and Olga Bay systems. Proposal #91 just touches on a possible solution to the early Upper Station run and perhaps will help some with the late run as well. The proposal mandates ADFG manages Alitak for Upper Station early run escapement until June 15th and a return to a higher Biological Escapement Goal of 40,000 sockeye. One reason we have pushed for a change from the lower OEG to a BEG is that ADFG will approve no enhancement projects in the system until the biological goal is re-instituted. This is a bitter pill for Alitak fishermen as we would bear the full burden of conservation for rehabilitation of Upper Station as terminal fishers. This is not fair as fishing time could be curtailed in the Alitak District for set-net family operations . The escapement for the early run has reached the biological goal only once in the last 7 years. (chart #1) All fishermen who benefit from the run must share the burden of conservation for the Upper Station sockeye run. The Olga Bay bound sockeyes are not only caught by the Alitak District fishermen but are intercepted heavily by the North West District fishermen as well. (map #1) In 1981 the ADFG undertook a tagging study to document sockeye migration patterns around Kodiak Island. (chart #6a, 6b) The tagging study showed that at least 26% of sockeyes caught in the NW District were Olga Bay bound. This percentage is low as ADFG survey conductors noted the seine fleet purposely withheld sockeye tags to affect study conclusions. (chart #6c) With substantial sockeye interception in the NW District of Olga Bay bound fish it would be reasonable to pulse openings to help allow escapement numbers to reach target goals. Expecting terminal fishers in the Alitak District to shoulder the entire burden of conservation for sockeye runs in decline when other districts continue to fish and intercept those fish is not fair and also not sound management policy. It has been shown that extended closures in the Alitak District do not insure adequate escapement and the mixed stock fishery in the North West District has a big impact on Olga Bay bound sockeyes. One clear indication of the interception impact, or lack of it, would be to look at the Alitak catch records when the NW District was not fishing. In 1989 the Exxon Valdez disaster closed all Kodiak waters to salmon fishing except for the Olga Bay terminal area, and there was a harvest of 1,284,067 sockeyes. (chart #7a, 7b) In 2008, and 2009 due to poor sockeye returns to Karluk, openings were curtailed and the percentage of sockeyes harvested in the Alitak District shot back to historical levels for those two seasons.

In conclusion, proposal #91 only begins a natural rehabilitation of the Upper Station sockeye stocks. Management needs to treat sockeye returns on Kodiak not only district-by-district but island wide with an eye to sockeye migration patterns and timing. Heavy fishing in the NW District does negatively impact sockeye returns to

the Alitak District. A pulse fishery in the NW District similar to that currently being managed in the Alitak District would allow systems to have a chance to recover which in turn would benefit all fishermen on Kodiak Island. It would be beneficial for ADFG to have a more complete understanding of sockeye migration patterns, run timing, and genetic diversity if an island wide genetic testing program was instituted for Kodiak sockeye. Genetic testing of Kodiak sockeye would allow ADFG a better understanding of sockeye and allow for management beneficial to all sockeye systems natural and man-made. If systems like Upper Station are meeting lower escapement goals, but not producing commercial harvest numbers then ADFG is not doing its job. Sockeye production in the Olga Bay systems are not at viable commercial levels at this point. Olga Bay is a potential economic powerhouse of sockeye production that has fallen to levels of the 1970's when Alaskan salmon fisheries were in a statewide crisis. This can be turned around but we need help from the State Board of Fish, ADFG, and our local aquaculture association.

## Map #1

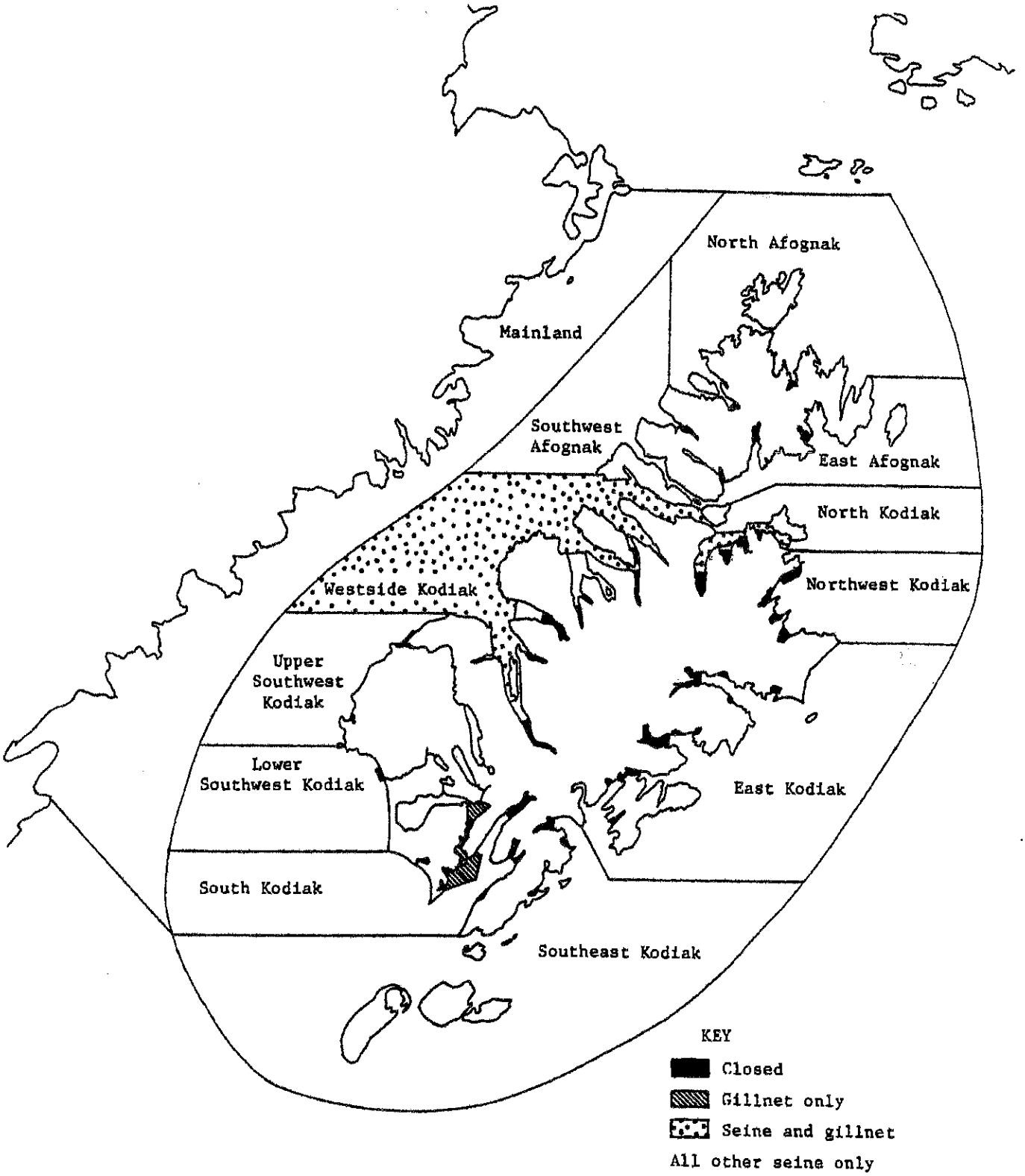


Figure 2. Definition of coastal unit boundaries referenced in this report and areas of commercial fishing restrictions.

# Map #2

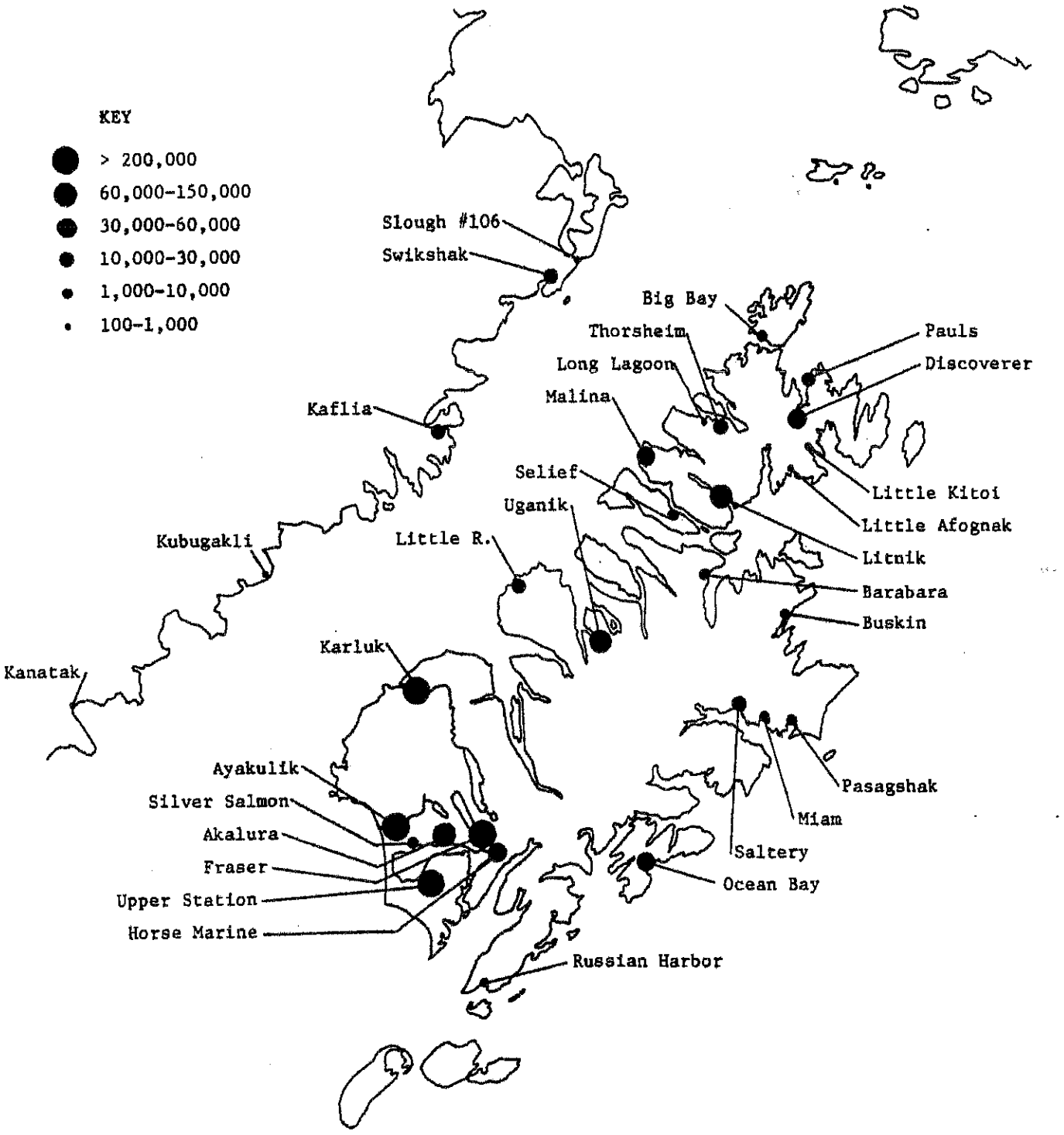


Figure 4. Kodiak area sockeye salmon streams and estimated production capabilities.

## Upper Station Sockeye Escapement – Early Run

| Date | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 | 2002 | 2001 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Jul | 25487 | 28759 | 42060 | 34585 | 38800 | 31895 | 24997 | 60349 | 78487 | 76175 | 36802 | 66794 | 55760 |

| 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 | 1989 | 1988 | 1987 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36521 | 30713 | 47655 | 58662 | 41492 | 37645 | 30490 | 17818 | 49725 | 54153 | 62770 | 56716 | 73634 | 99895 |

| 1985 | 1984 | 1983 | 1982 | 1981 | 1980 | 1979 | 1978 | 1977 | 1976 | 1975 | 1974 | 1972 | 1971 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22361 | 67575 | 105981 | 164450 | 57442 | 22584 | 39656 | 52423 | 20770 | 10249 | 7122 | 32088 | 26665 | 5873 |

**Sockeye Early Run Escapement Averages**

| | |
|---|---|
| **2006-2013** | **26,937** |
| **2000-2005** | **62,395** |
| **1990's** | **40,487** |
| **1980's** | **73,341** |
| **1970's** | **22,991** |

Fishery Management Report No, 11-73 Kodiak Management Area Weir

## Upper Station Sockeye Escapement – Late Run

| Date | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 | 2002 | 2001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Oct | 149325 | 101893 | 141139 | 161736 | 184856 | 149709 | 153153 | 156401 | 177108 | 200894 | 150349 | 74407 |

| 2000 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 | 1989 | 1988 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 176783 | 210016 | 171214 | 230793 | 244385 | 203659 | 221675 | 191891 | 200325 | 243161 | 200293 | 223518 | 249844 |

| 1987 | 1986 | 1985 | 1984 | 1983 | 1982 | 1981 | 1980 | 1979 | 1978 | 1977 | 1976 | 1975 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 158561 | 366490 | 413456 | 251651 | 183269 | 306282 | 124136 | 87435 | 135401 | 62539 | 50687 | 52656 | 75851 |

| 1974 | 1972 | 1971 | 1970 | 1969 | 1968 | 1967 | 1966 | 1965 | 1964 | 1963 | 1962 | 1960 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 253227 | 70071 | 98936 | 42927 | 74157 | 16967 | 70909 | 40252 | 15289 | 25695 | 8370 | 281 | 29472 |

**Sockeye Late Run Escapement Average by Decade**

| | |
|---|---|
| **2000-2013** | **152,135** |
| **1990's** | **211,741** |
| **1980's** | **236,464** |
| **1970's** | **84,230** |
| **1960's** | **39,599** |

The chart showing sockeye percentages of set-net catch by area includes the two districts on Kodiak Island that have stationary set-net gear. The chart uses the abbreviation NW to show the Northwest District that is noted on Map #1 as Westside District. There are two significant natural sockeye runs in the Northwest District, Uganik and Karluk. There is one man-made run in Spiridon Bay. The Alitak District has four natural sockeye runs; all of them originate in Olga Bay. Upper Station is the largest of the natural runs and Fraser is a man-made run that has been in existence from the 1950's.
I have broken down the sockeye catches by decades for both NW District and Alitak. The total sockeye catch is noted for a ten-year period and then an average catch for each year. The permits fished in area has fluctuated somewhat and I have taken an average of permits fished and divided that in to the average yearly catch to reach a Catch Per Unit or CPU to show how many sockeyes were caught by an average permit in each District.

**1980-1988** (1989 has been excluded as the EXXON Valdez oil spill made Olga Bay the only section open to salmon fishing that year.)

**NW District total sockeye catch - 1,865,644**
**NW District yearly average catch - 207,294**
**NW District average permits fished - 104**
**NW District CPU - 1,993**

**Alitak District total sockeye catch - 3,492,259**
**Alitak District yearly average catch - 388,029**
**Alitak District average permits fished - 71**
**Alitak District CPU - 5,465**

**1990-1999**
**NW District total sockeye catch - 7,066,474**
**NW District yearly average catch - 706,647**
**NW District average permits fished - 100**
**NW District CPU 7,067**

**Alitak District total sockeye catch - 6,219,019**
**Alitak District yearly average catch - 621,902**
**Alitak District average permits fished - 79**
**Alitak District CPU - 7,872**

**2000-2012**
**NW District total sockeye catch – 7,963,239**
**NW District yearly average catch - 612,557**
**NW District average permits fished - 93**
**NW District CPU - 6,587**

Sockeye catch information provided by Kodiak ADFG

**Alitak District total sockeye catch - 3,066,857**
**Alitak District yearly average catch - 235,912**
**Alitak District average permits fished - 66**
**Alitak District CPU - 3,574**

- **Note: This includes 2002 that has 0 sockeye catch in the Alitak District as 66 permits were ready to fish but due to disastrous returns there were no open days for commercial fishing.**

The data shows very clearly that the Alitak District has a history of dynamic sockeye production, but the trend for the last decade has been a steady decline. In the 1980's the Alitak District consistently caught 60% of island sockeye with 30% fewer permits. In the 1990's sockeye production remained consistent with a CPU that was equivalent to the NW District, the 2000's brought precipitous drops in sockeye production. In 2002 there was no commercial salmon set-net harvest of any kind in the Alitak District, a disaster that forced some families to the brink of ruin. In the last decade there have been only two seasons, 2008, and 2009 that approached a sockeye catch close to the historical percentages in Alitak. In 2008 and 2009 the NW District was closed due to low escapements in the Karluk system suggesting very strongly the impact interception fishery on Kodiak's west side has on the sockeye runs in the Alitak District.

**Akalura Sockeye Escapement**
***Note: After 2003 there has been no weir installed at Akalura**

| Date | 2003 | 2002 | 2001 | 2000 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Nov | 7220 | 7635 | 13772 | 12425 | 18140 | 7898 | 2010 | 13681 | 30692 | 63296 | 44189 | 47181 |

| 1989 | 1988 | 1987 | 1986 |
|---|---|---|---|
| 116029 | 38618 | 6116 | 9800 |

# Frazer Fish Pass Escapement of Mature and Immature (Jack Sockeye



Frazer Fishpass sockeye salmon escapement

| Year | jacks | adults |
|---|---|---|
| 1986 | 293 | 126,236 |
| 1987 | 8,322 | 32,222 |
| 1988 | 22,052 | 224,652 |
| 1989 | 9,960 | 350,413 |
| 1990 | 10,612 | 216,348 |
| 1991 | 16,562 | 173,796 |
| 1992 | 24,243 | 161,582 |
| 1993 | 16,967 | 161,424 |
| 1994 | 16,601 | 189,470 |
| 1995 | 41,321 | 155,041 |
| 1996 | 76,246 | 122,449 |
| 1997 | 26,768 | 178,496 |
| 1998 | 38,366 | 195,389 |
| 1999 | 68,320 | 148,245 |
| 2000 | 24,529 | 133,515 |
| 2001 | 1,969 | 152,380 |
| 2002 | 21,907 | 63,410 |
| 2003 | 141,449 | 60,230 |
| 2004 | 8,366 | 112,298 |
| 2005 | 624 | 136,324 |
| 2006 | 33,650 | 55,866 |
| 2007 | 70,482 | 49,704 |
| 2008 | 11,376 | 93,987 |
| 2009 | 4,636 | 97,209 |
| 2010 | 49,546 | 45,134 |
| 2011 | 57,177 | 77,465 |
| 2012 | 2,789 | 146,095 |
| 2013 | 4,045 | 132,014 |

**Excerpts from: Information Leaflet #254 Migration of Sock Salmon in the Kodiak Archipelago 1981 Tagging Study ADFG**



Summary of Migration Characteristics in 1981 and Comparison with Characteristics Observed in Past Tagging

Westside Area:

The 1981 tagging in the westside area between Noisy Island and Cape Karluk showed a strong southward movement to the Karluk River, Red River, Fraser Lake, and Upper Station. Most returns were from the local Karluk District; however, in some experiments more than half the recoveries were from the Red River and Alitak Districts. The occurrence of Red River and Alitak stocks was much greater than that found before 1950 by Rich and Morton (1929), and by Bevan (1959), and was similar to that reported by ADF&G during the period 1969-1978 (Nicholson 1978).

Bevan reported that only 2.5% of sockeye salmon tagged on the northwest coast were recovered from other districts. More recent tagging by ADF&G on the northwest coast (Westside Kodiak) resulted in 15.8 and 26.5% recovery rates from Red River and Alitak Bay, respectively. In 1981, 30.8% of all weir recoveries of sockeye salmon tagged on westside Kodiak were recovered from Alitak Bay weirs (Table 8). The difference between the early and recent tagging results undoubtedly reflects changed stock sizes, i.e., smaller in the Karluk River, and increased in the Red River, Fraser Lake, and Upper Station.

Southwest Kodiak:

The principal direction of migration of sockeye salmon on the southwest coast between Sturgeon Head and Cape Ikolik was south to Red River and Olga Bay. Relatively few tags were returned from locations north of tagging.

Olga Bay stocks were abundant, and at times predominant, in experiments in the southwest Kodiak area in which returns from Alitak Bay averaged 57.3% of total returns (Table 9).

Table 9. Percentage of Alitak-Moser-Olga Bay recoveries among total recoveries from tagging along the northwest, west, and south coasts of the Kodiak archipelago in 1981.

| Tagging area | Tagging date | Total recoveries from known locations (A) | Recoveries from Alitak-Moser-Olga Bay | |
|---|---|---|---|---|
| | | | Number (B) | Percent of total [(B/A) x 100] |
| Southwest Afognak and Westside Kodiak | | | | |
| NW Raspberry I. | 6/20 | 30 | 7 | 23.3 |
| Raspberry Cape | 6/24 | 27 | 1 | 3.7 |
| Noisy Island | | | | |
| Miners Point | 6/6 | 39 | 19 | 48.7 |
| Miners Point | 6/7 | 97 | 14 | 14.4 |
| Bear Island | 6/26 | 6 | 5 | 83.3 |
| Rocky Point | 6/26 | 4 | 0 | 0 |
| Total | | 203 | 46 | 22.7 |
| Southwest Kodiak | | | | |
| Sturgeon Head | 6/26 | 39 | 21 | 53.8 |
| Middle Cape | 6/27 | 46 | 31 | 67.4 |
| Cape Ikolik | 6/8 | 46 | 23 | 50.0 |
| Total | | 131 | 75 | 57.3 |
| Red River District | | | | |
| Bumble Cape | 6/8 | 32 | 5 | 15.6 |
| W. Old Red R. | 6/6 | 2 | 1 | 50.0 |
| W. Old Red R. | 6/15 | 32 | 12 | 37.5 |
| S. Old Red R. | 6/7 | 33 | 6 | 18.2 |
| S. Old Red R. | 6/16 | 26 | 19 | 73.1 |
| N. Red R. Marker | 6/7 | 113 | 4 | 3.5 |
| S. Red R. Marker | 6/7 | 92 | 5 | 5.4 |
| Gold Beach | 6/6 | 9 | 2 | 22.2 |
| Total | | 339 | 54 | 15.9 |
| Alitak Bay District | | | | |
| Cape Alitak | 6/13 | 243 | 238 | 97.9 |
| Cape Alitak | 6/28 | 164 | 148 | 90.2 |
| Moser Peninsula | 6/14 | 204 | 203 | 99.5 |
| Total | | 611 | 589 | 96.4 |

the tagged sample was of Fraser Lake origin. Fraser Lake stock also dominated the sample at Moser Peninsula on 14 June. Even though many of the fish tagged in these experiments were intercepted by the Moser-Olga Bay gillnet fishery, their destination can be inferred reliably because of the highly terminal nature of the Moser-Olga Bay fishery on Olga Bay stocks. Tag returns from a terminal fishery such as this have nearly the same conclusive value as do stream recoveries in identifying the destinations of the fish.

Scale pattern analysis appears to offer the best potential for determining stock composition in the Kodiak area fishery because the results can be quantified and are not influenced by tag loss and selective predation, as are the results from tagging. This is potentially advantageous in evaluating the extent of interception by the fishery of stocks originating from distant areas such as Cook Inlet and Chignik.

Some of the results of the scale pattern analysis were questionable, such as the identification of the 1.3 age class[1] samples from Uyak Bay as consisting of 80% Afognak River stock and the identification of more than 50% of the samples from Ugak Bay (Saltery Cove), as consisting of Chignik stocks. These apparent anomalies may be clarified once the minor Kodiak stocks are included in the classification model (Conrad 1984).

If information about migration rates is important to any future investigations, then tagging or other means of marking will be necessary. Only by tagging may individual fish be tracked throughout the experiment.

## SUMMARY AND CONCLUSIONS

1. During June 1981, 3,109 maturing sockeye salmon were tagged at 20 locations along the northeast, west, and south coastlines of Kodiak Island and from southeast and southwest Afognak Island with one-inch diameter Peterson disc tags in various color combinations, each specific to a date and place of tagging. In all, 177 tags were recovered from the seine fishery, 597 from the gillnet fishery, and 576 were identified as they passed the counting weirs at the five major sockeye salmon streams in the Kodiak area. The large number of sight recoveries from the weirs resulted from the use of highly visible, large-diameter tags and from low, clear water conditions which added visibility.

2. The relatively small number of returns from the seine fishery was partly due to withholding of tags by fishermen, possibly in order to influence the results. The large number of returns from the gillnet fishery may also represent an effort to influence the results.

3. Sockeye salmon tagged along the northwest and west coasts showed strong southward movement to the systems supporting the largest sockeye salmon runs which were the Karluk, Red, Fraser, and Upper Station Lakes. The

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[1] One year in freshwater, three-plus years in salt water.

occurrence of Red River stocks along the northwest coast was considerably greater than reported from tagging before 1950. This difference probably reflects changed stock sizes, i.e., smaller in Karluk River and larger in Red River, Fraser Lake, and Upper Station.

4. The recovery of tagged sockeye salmon in Olga Bay from tagging along the southwest coast between Sturgeon Head and Cape Ikolik averaged 57%. The recovery of Olga Bay stocks from tagging in the Red River area between Bumble Bay and Gold Beach averaged 16%. Recoveries in Olga Bay represented only 5% of tagged samples within two miles of Red River and 37% of samples 2-15 miles from Red River. The Olga Bay percentages would have been reduced for the Red River area if seiners had not purposefully retained tags.

5. Olga Bay stocks composed 96% of sockeye salmon tagged at Cape Alitak and Moser Peninsula, which is about the same rate reported from all previous tagging.

6. Olga Bay stocks migrated principally down the west coast of Kodiak Island.

7. The estimated catch of Fraser Lake sockeye salmon during June was 151,571. The catch composed 29% of the total Fraser run of 529,287.

8. Karluk River stocks approached mainly from the north and did not occur in appreciable numbers south of Halibut Bay.

9. Sockeye salmon stocks from Cook Inlet and Chignik were mixed with Kodiak area stocks primarily at the north end and secondarily at the south end of Kodiak Island. The percentage of outside stocks in recoveries from all sockeye salmon tagged in 1981 was low, but from individual experiments in the Marmot Bay - Raspberry Island area the percentage was substantial, 27-73%.

## RECOMMENDATION FOR FURTHER SOCKEYE SALMON TAGGING

The composition of Alitak stocks should continue to be monitored by tagging and scale pattern analysis if the stocks increase appreciably or if commercial fishing is allowed in the lower southwest Kodiak or southwest Afognak management units.

Additional tagging and scale pattern analysis should be done to determine the composition of stocks in the east Afognak management unit as it is likely that Cook Inlet and Chignik stocks would be abundant there during June-July. It should be noted that in the east Afognak unit a June fishery has not been allowed since 1970 and the incidental harvest of sockeye salmon during the June-August pink salmon fishery has averaged 8,360 in the past decade.

| Year/District | Permits | Sockeye | % of catch by area |
|---|---|---|---|
| 1980 | | | |
| NW | 97 | 87,185 | 35.0 |
| Alitak | 64 | 161,676 | 65.0 |
| Total | 161 | 248,861 | 100.0 |
| 1981 | | | |
| NW | 100 | 166,189 | 39.5 |
| Alitak | 64 | 254,548 | 60.5 |
| Total | 164 | 420,737 | 100.0 |
| 1982 | | | |
| NW | 108 | 197,616 | 32.5 |
| Alitak | 66 | 409,694 | 67.5 |
| Total | 174 | 607,310 | 100.0 |
| 1983 | | | |
| NW | 107 | 170,809 | 38.8 |
| Alitak | 68 | 269,311 | 61.2 |
| Total | 175 | 440,120 | 100.0 |
| 1984 | | | |
| NW | 105 | 177,048 | 40.9 |
| Alitak | 70 | 256,214 | 59.1 |
| Total | 175 | 433,262 | 100.0 |
| 1985 | | | |
| NW | 102 | 197,280 | 30.9 |
| Alitak | 75 | 440,311 | 69.1 |
| Total | 177 | 637,591 | 100.0 |
| 1986 | | | |
| NW | 110 | 449,294 | 38.3 |
| Alitak | 79 | 724,983 | 61.7 |
| Total | 189 | 1,174,277 | 100.0 |
| 1987 | | | |
| NW | 102 | 216,968 | 40.2 |
| Alitak | 73 | 322,204 | 59.8 |
| Total | 175 | 539,172 | 100.0 |
| 1988 | | | |
| NW | 104 | 203,255 | 23.7 |
| Alitak | 81 | 653,318 | 76.3 |
| Total | 185 | 856,573 | 100.0 |
| 1989 | | | |
| NW | 0 | 0 | 0.0 |
| Alitak | 87 | 1,284,067 | 100.0 |
| Total | 87 | 1,284,067 | 100.0 |
| 1990 | | | |
| NW | 105 | 624,401 | 45.6 |
| Alitak | 91 | 744,643 | 54.4 |
| Total | 196 | 1,369,044 | 100.0 |
| 1991 | | | |
| NW | 101 | 680,816 | 36.2 |
| Alitak | 86 | 1,197,774 | 63.8 |
| Total | 187 | 1,878,590 | 100.0 |
| 1992 | | | |
| NW | 103 | 567,405 | 67.2 |
| Alitak | 79 | 276,459 | 32.8 |
| Total | 182 | 843,864 | 100.0 |
| 1993 | | | |
| NW | 102 | 878,581 | 62.6 |
| Alitak | 76 | 524,655 | 37.4 |
| Total | 178 | 1,403,236 | 100.0 |
| 1994 | | | |
| NW | 98 | 495,287 | 49.7 |
| Alitak | 74 | 500,866 | 50.3 |
| Total | 172 | 996,153 | 100.0 |
| 1995 | | | |
| NW | 99 | 733,960 | 48.4 |
| Alitak | 75 | 782,998 | 51.6 |
| Total | 174 | 1,516,958 | 100.0 |
| 1996 | | | |
| NW | 94 | 875,220 | 52.8 |
| Alitak | 80 | 782,204 | 47.2 |
| Total | 174 | 1,657,424 | 100.0 |
| 1997 | | | |
| NW | 98 | 626,361 | 60.8 |
| Alitak | 78 | 403,588 | 39.2 |
| Total | 176 | 1,029,949 | 100.0 |
| 1998 | | | |
| NW | 96 | 507,171 | 47.2 |
| Alitak | 77 | 567,572 | 52.8 |
| Total | 173 | 1,074,743 | 100.0 |
| 1999 | | | |
| NW | 101 | 1,077,275 | 71.1 |
| Alitak | 76 | 438,260 | 28.9 |
| Total | 177 | 1,515,535 | 100.0 |

Sockeye catch information provided by Kodiak ADFG

| Year/District | Permits | Sockeye | %of catch by area |
|---|---|---|---|
| 2000 | | | |
| NW | 98 | 712,911 | 68.9 |
| Alitak | 77 | 321,060 | 31.1 |
| Total | 175 | 1,033,971 | 100.0 |
| 2001 | | | |
| NW | 96 | 682,381 | 69.8 |
| Alitak | 77 | 295,235 | 30.2 |
| Total | 173 | 977,616 | 100.0 |
| 2002 | | | |
| NW | 93 | 590,860 | 100.0 |
| Alitak | 0 | 0 | 0.0 |
| Total | 93 | 590,860 | 100.0 |
| 2003 | | | |
| NW | 96 | 1,299,876 | 85.0 |
| Alitak | 65 | 229,947 | 15.0 |
| Total | 161 | 1,529,823 | 100.0 |
| 2004 | | | |
| NW | 93 | 1,034,551 | 59.4 |
| Alitak | 71 | 708,411 | 40.6 |
| Total | 164 | 1,742,962 | 100.0 |
| 2005 | | | |
| NW | 93 | 879,994 | 65.2 |
| Alitak | 72 | 469,511 | 34.8 |
| Total | 165 | 1,349,505 | 100.0 |
| 2006 | | | |
| NW | 93 | 584,721 | 90.0 |
| Alitak | 60 | 65,322 | 10.0 |
| Total | 153 | 650,043 | 100.0 |
| 2007 | | | |
| NW | 99 | 706,738 | 91.1 |
| Alitak | 58 | 68,640 | 8.9 |
| Total | 157 | 775,378 | 100.0 |
| 2008 | | | |
| NW | 87 | 285,986 | 38.1 |
| Alitak | 61 | 465,314 | 61.9 |
| Total | 148 | 751,300 | 100.0 |
| 2009 | | | |
| NW | 78 | 334,190 | 45.4 |
| Alitak | 54 | 402,400 | 54.6 |
| Total | 132 | 736,590 | 100.0 |
| 2010 | | | |
| NW | 92 | 214,701 | 70.1 |
| Alitak | 67 | 91,397 | 29.9 |
| Total | 159 | 306,098 | 100.0 |
| 2011 | | | |
| NW | 91 | 241,362 | 57.5 |
| Alitak | 66 | 178,186 | 42.5 |
| Total | 157 | 419,548 | 100.0 |
| 2012 | | | |
| NW | 99 | 394,968 | 67.1 |
| Alitak | 65 | 193,994 | 32.9 |
| Total | 164 | 588,962 | 100.0 |

Sockeye catch information provided by Kodiak ADFG

Submitted By james pryor
Affiliation member Alitak Set Net Assoc.
Phone 9075397434
Email jlpryor@gci.net
Address 1012 steller way
kodiak, Alaska 99615

These comments will address several proposals put forward to the Board of Fish for Kodiak finfish. The first proposal I wish to address is #88 the change in the staggered openings for the Alitak District. Our family opposes a change in the current staggered openings for the Alitak District. We have had a family set-net operation in Olga Bay since 1994 and would not be able to economically survive if staggered openings are curtailed. We rely very heavily on the opening 6 hours of the stagger that can produce 75% of our entire catch.

Proposal #89 We support an earlier management date for the late Upper Station run. The current ADFG mangement plan does not manage for the late sockeye run into Upper Station until August 15th. The late run has already began by the 15th and escapement into the system is often behind the mangement curve that is established for a commercial fishery. We lose fishing time with extended closures waiting for escapement levels to reach the level that ADFG is comfortable for a commercial harvest. If sockeye management for the late Upper Station run were to begin August 1st, escapement numbers would improve and commercial harvests would be allowed without extended closures that are an economic strain on all stationary gear in the Alitak District.

Proposal #90 We support this proposal allowing more flexibilty in managing the Humpy-Deadman section in the Alitak District. There is a substantial odd-year pink salmon return to the Humpy-Deadman section and there are extended fishing periods to target these fish, but there have been weak returns for the late Upper Station sockeye. What has happened with these weak sockeye returns are extended closures for the Alitak, Moser and Olga Bay sections while salmon fishing has continued in the Humpy-Deadman section with several seining haul sites yielding high percentages of sockeyes. Having the Alitak sections closed waiting on escapement, while seining continues across the bay targeting sockeyes puts the burden of conservation solely on the stationary gear in the terminal areas. It would be equitable to share the burden of conservation by allowing sockeye to move through the area with a pulse fishery while still allowing harvest of dthe surplus pink salmon.

Proposal #97 We strongly oppose this proposal as unenforcable and arbitrary. If the writer of this proposal is concerned about safety in the gill net fishery, then gear can be pulled early to avoid gale warning weather. On the flip side of this proposal would it be proper to delay openings because of gale warnings? This is not addressed as fishermen always have the option to delay setting gear if the weather is dangerous. Who is to determine if the weather is "dangerous"? Weather is often localized in nature and one area or bay may experience high winds while another does not. This would only serve to give cover to unscrupulous fishermen looking to extend openings when fishing is good.

Proposal #98 We strongly oppose this proposal as completey changing the nature of the seine fishery by extending nets and taking available permits off the market. Extended seines would negatively impact stationary gear that is not allowed to extend their gill nets making seiners more efficient and widening the discrepancy between those larger boats that have the platform and equpment to handle the longer gear, plus the capital, and the smaller boats in the fleet that have neither the boat nor the capital to keep up with the big boys. In addition all this proposal would do would be to limit opportunities for young, under-capitalized fishermen looking to start seining. It would concentrate wealth in those few boats and owners reducing the small operations and the number of crew positions available in the Kodiak fleet.

Proposal #99 We are a family set-net operation in Olga Bay with two permits. One permit is owned by my son, the other by myself. We cannot financially survive on a single permit. We have had to invest in another permit and site to keep our operation as a viable financial business. The process of transferring permits between family members to keep our gear in the water is difficult and convoluted. The limited entry commision does not allow owners of a permit to treat their permit as a normal business asset but puts Byzantine restrictions on what would be a traditonal method of fishing. The family set-net operation is exactlly that. Family run and owned, family members coming and going to the site. The Kodiak salmon season is almost four months long and sometimes permit holders have other obligations. Without both permits in camp we couldn't survive. Stacking permits does not change the nature of the set-net fishery. There is not additional gear that will appear if permits are stacked, it would allow family operations to continue when a family member has to leave the camp ie. school, taking care of an aging family member or any such common obligation that we all have in our daily lives. If people are concerned that the fishery will expand, a simple solution would be to have stacked permits tied to state leased sites. That way the permits would not move and gear would not expand.

Comment to the Board of Fisheries IN FAVOR of Proposal 99, Kodiak Setnet Permit Stacking.

Daniel Earle SO4K59415P

Sandra Earle SO4K61139R

This proposal provides a needed convenience and protection for multiple permit sites to avoid complicated and time-consuming transfers, with potential permit ownership vulnerability, when family members leave for school or unanticipated obligations during the salmon season. It poses no threat to the resource by over-harvesting, nor does it favor one user group over another.

Opponents of SO4K stacking argue that the proposal will increase the exclusionary nature of this fishery by reducing future opportunities for new entrants. In most cases, a natural consolidation began in this fishery with the introduction of limited entry, and continues today with second and third generation family members participating and providing continuity despite the economic ups-and-downs. This unique, traditional and well-managed small boat fishery bears no comparison to some Alaskan quota-imposed fisheries, where the negative effects of stacking may have been far-reaching.

We urge the Board to approve this proposal.

Daniel Earle

Sandra L. Earle

Dear Mr. Chairman and Members of the Board,

I would like to show my **SUPPORT** for proposal **99**.

My name is Sandra Earle

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K61139R

I fish in the NorthWestern District.

I support proposal 99 because:

- Limits one individual to hold only 2 permits - unlike the I.F.Q. consolidation possibilities.
- Allows the permit holder full gear utilization and avoids the complex and insecure permit transfer process in case of a medical emergency or younger family members leaving for school.
- Increased income enables reinvestment and innovations in gear and fish quality.

Thank you for your consideration,

Sandra Earle

5642 40th Ave. W.
Seattle, WA 98199

Dec. 16. 2013

Dear Mr. Chairman and Members of the Board,

I would like to show my **SUPPORT** for proposal **99**.

My name is Daniel Earle

I set net for salmon on Kodiak Island.

I hold limited entry permit number S04K59415P (since 1975)

I fish in the northwest District.

I support proposal 99 because:

- approval will not impact the resource negatively
- proposal approval will not pit one user group over another
- approval will simply provide a convenient means for families owning multiple permits to avoid complicated transfer arrangements that can potentially jeopardize permit ownership.
- The proposal is a mere convenience for permit holders in a fishery that has been consolidated since the introduction of limited entry in the 70's.

Alaska Groundfish Data Bank
P.O. Box 788
Kodiak, AK 99615

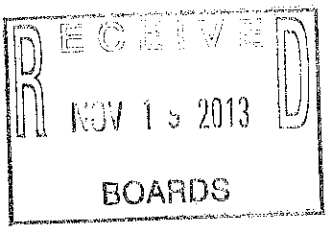
Alaska Whitefish Trawlers Association
P.O. Box
Kodiak, AK 99615

Cape Barnabas, Inc.
P.O. Box 445
Old Harbor, AK 99643

Ouzinkie Community Holding, Inc.
P.O Box 71
Ouzinkie, AK 99644

November 19, 2013

Alaska Board of Fisheries
Alaska Department of Fish and Game
P.O. Box 115526
Juneau, AK 99611-5526
Fax: 907 465-6094




Re: Follow up to 2011 Board of Fisheries Direction regarding trawl Closures in Marmot Bay and Sitkalidak Straits

Dear Chairman Johnstone and members of the Board of Fisheries (BOF),

The Kodiak trawlers and the Community Quota Entity (CQE) members of Old Harbor and Ouzinkie wanted to update you regarding commitments made during the 2011 Kodiak finfish cycle. During this cycle there were two proposals submitted that would have closed areas close to the communities of Old Harbor and Ouzinkie to pelagic pollock fishing. The Board chose not to close these areas. During the BOF decision making process, community members of these rural communities and the Kodiak trawlers agreed to meet outside the BOF regulatory process to discuss and understand each other's concerns.

While there was a sincere effort to have formal meetings regarding trawling in these two areas, it was difficult to find a date that worked for all the varied fishermen and community members. However, both trawlers and community members have had a chance to dialog informally in and around Kodiak as well as various regulatory and fishery meetings. Both parties are aware that the North Pacific Fishery Management Council (NPFMC) has moved forward on several fronts towards reducing trawl related bycatch and improving observer coverage as well as working to further regulate the Gulf of Alaska (GOA) trawl industry through catch shares. Additionally, trawl vessel operators have been sensitized to the community concerns and have worked over the past three years towards being responsive to these concerns while fishing in these areas. Between the informal dialogs, changes in vessel operations, the NPFMC regulatory process and their ongoing development of a GOA trawl bycatch management program there is a better understanding and improved relationship between our two constituents groups illustrated by the fact that neither the Marmot Bay nor the Sitkalidak Straits closure proposals have been resubmitted for the Board's consideration.

Both our constituency groups look forward to seeing all of you during your upcoming BOF meeting here in Kodiak, January 7th to 11th and will be available if you need further clarifications or have questions.

Sincerely,

Julie Bonney
Alaska Groundfish Data Bank

Bob Krueger
Alaska Whitefish Trawlers Association

Rick Berns
Cape Barnabas, Inc.

Herman Squartsoff
Ouzinkie Community Holding, Inc.

Submitted By David Bayes, President
Affiliation Alaska Charter Association
Phone 907-299-0695
Email info@alaskacharter.org
Address P.O. Box 478
Homer, Alaska 99603

December 22, 2013

Boards Support Section

Alaska Department of Fish and Game

P.O. Box 115526

Juneau, AK 99811-5526

ATTN: BOF COMMENTS

Re: Proposal #45

Dear Sir or Madam:

The Alaska Charter Association (ACA) is a statewide organization representing over 150 charter and associated businesses. Its mission is to preserve and protect the fishing rights and resources necessary for the Alaska charter fleet to best serve the recreational fishery.

The ACA in keeping with our mission statement, supports proposal number 45 advocating the requirement of 100% observer coverage on the groundfish trawl vessels within State waters of the Cook Inlet, Kodiak, and Chignik management areas. As it stands now there is inadequate information available as to the impact these trawl fisheries are making upon bycatch species caught and killed in their operations. Observer coverage whether by electronic/video means or otherwise will provide facts that will aid resource managers in the decision making process. The economic impact of the trawl bycatch problem cannot be assessed without this valuable information. Considerable public outcry has been heard and industry support has been strong for better bycatch controls and more extensive observer programs. Please respond to their concerns by requiring the full observer coverage.

Sincerely yours,

David I Bayes

President

Alaska Charter Association

P.O. Box 478

Homer, AK 99603

Submitted By Leigh Gorman-Thomet
Affiliation

December 6, 2013

Boards Supports Section

Alaska Department of Fish and Game

PO Box 115526

Juneau, Alaska 99811-5526

ATTN: BOF COMMENTS

My name is Leigh Gorman-Thomet. I reside in Kodiak and have been involved in various commercial fisheries for 30 years. I'm writing in opposition to proposals 98 and 99 and my support for Proposal 45.

I started setnetting in 1990. My family and I have owned and operated our two permit site for 16 years. Although permit stacking would benefit us financially, I do not see it as a healthy fit for the Kodiak setnet fishery. It contributes to the consolidation of permit ownership and loss of opportunity for new entrants. It will negatively impact smaller, rural communities by pulling out permits from villages like that of Larsen Bay. There are 188 setnet permits in Kodiak. During the years between 2008 to 2010, when the 'Sunset Clause' for permit stacking in the Kodiak setnet fishery was allowed, permits were stacked by 25% at the end of the clause. (15% in 2008, 22% in 2009 and 25.3% by 2010). That is a significant rate within that period of three years! Do we want to eventually see only 94 permit holders participating?

In 2002, House Bills 286 and 251 were the enabling bills for permit stacking. The original intent of these bills was to reduce the amount gear in the water for the participants of the Bristol Bay salmon fishery. There were too many boats, too many people, and too much expense for that fishery. Competition of farmed fish and drastically low market values were also contributors. An Optimum Permit study was conducted to find what number of permits would keep a viable fishery there. It concluded that measures should be taken to reduce the amount of gear in the water by one third.

Those problems did not exist in the Kodiak setnet fishery and they do not exist today. The fishery here is fully utilized with few latent permits. There has been no Optimum Permit study conducted. There are no conservation concerns that would be alleviated by permit stacking. The markets have been on the rise. Last summer we benefitted from sockeye prices at $1.91 and .40 for pinks. Kodiak's setnet fishery is the 2nd highest grossing among the setnet fisheries in the State on a per permit basis.

In Article VIII, Section 15 in the Alaska State Constitution it reads: " This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood, and to promote the efficient development of aquaculture in the State."

According to my readings, the original intent of permit stacking has taken a monumental shift from resource conservation and economical distress to a mechanism for convenience, absenteeism and entitlement. Permits have been bought and transferred to EXPAND multiple site permits. This was not the original intent of permit stacking, but has been a documented outcome. Interest to own and operate two permits has quickly spread to other Alaska salmon fisheries as seen in Proposal 98 for the Kodiak seine fleet.

In CFEC's Report No. 12-02-N, November 2012: Bristol Bay Set Gillnet Permit Stacking Conclusion, pg.17 reads: "Permit stacking from 2010 to 2012 in the Bristol Bay salmon set gillnet fishery has brought about many changes. Nonlocals and nonresidents have a higher rate of participation in permit stacking operations than locals. Permit stacking brings permits out of latency, thus increasing the number of permits used; however, the number of individuals has substantially decreased with the exception of local fishermen. Limited data suggests that stacked permit operations reallocate harvests across residency classes in Bristol Bay. Since the implementation of permit stacking, the number of new entrants into the SO4T fishery has declined. The estimated value for the SO4T permit has significantly increased as a result of permit stacking."

For the last 130 plus years of the Alaska salmon fishery and since the inception of Limited Entry in 1975, salmo and the people that participate in the fishery have fluctuated. Permits have cycled into new hands. There are n when deriving income from natural resources. It's a natural cycle we all accept. How do we want our fisheries to look in 10, 20 or 30 years from now? Who gets to fish? Over time, changes in limited entry, like permit stacking, will be increasingly difficult to change, even if it can be proven that alternative options may be more efficient. In the end we will wind up with solutions that are 'locked in' and those unforeseen negative consequences become permanent.

Regarding Proposal 98: Seine specifications and operations. I am against this proposal for many of the reasons mentioned above. There are 376 seine permits for Kodiak. 170 of those were fished during the 2013 salmon season. Are 376 seine permits for this fishery too many? What is an optimum amount? Before stacking is permitted data should be collected by an Optimum Permit Study and then take measures to determine what a viable fishery would be. To change a fishery due to "…fishing grounds are crowded right now with long waits at many of the historical fishing sites" is not a valid reason to change the Kodiak seine fishery (as stated in Proposal 98). Stacking permits in this fishery will be a great disadvantage to the smaller boat fleet by lacking capacity to add more gear. They would be forced to buy another permit and a larger boat to remain competitive. This would be a definite game changer.

As a setnetter, having a vessel with an extra 50 fahtoms of gear fishing in front of their net will be a formidable disadvantage as well.

Last, I support Proposal 45: Requiring 100% observer coverage on groundfish trawl vessels in State waters. The trawl fishery by volume is the greatest contributor to the bycatch of halibut, Chinook and tanner crab. With the current observer coverage at 13% to 15%, how can management and policy makers make informed, reliable decisions? 13% to 15% data is an atrocity and inimical to those fish stocks and how they're managed.

I wish you all the best in your careful considerations of these proposals.

Thank you for your time.

Leigh Gorman-Thomet

Submitted By Margaret Bosworth
Affiliation Permit Holder

I oppose **proposal 99** - permit stacking

My name is Margaret Bosworth. I am a Kodiak setnet permit holder and have been involved in Kodiak fisheries since 1984. I have seen the Kodiak community evolve away from a healthy accessible environment for individuals and fishing families. This is a proposal of convenience only, that further limits opportunity for new entrants and does not benefit our community or the fishery itself.

Gmail by Google

Chris Berns <chrisberns@gmail.com>

# Kodiak fin fish proposal 95

1 message

**Chris Berns** <chrisberns@gmail.com> Thu, Dec 19, 2013 at 10:11 AM
To: Chris Berns <chrisberns@gmail.com>

Board of Fish members

I am writing concerning Kodiak fin fish proposal 95. I will include documents drawn off of ADFG data requests, an economic impact report concerning Karluk lake sockeye stocks from the McDowell Group and other information for you to consider.

The time period for the exclusive set net salmon fishery I am proposing in the central section of the NW Kodiak district is just before the fixed general opening on July 6th and after the majority of the early run Karluk sockeye have passed the weir. ADFG estimates by July 28, 88% of the run has passed the weir. What was left out is that the remainder of the run may be holding in the lagoon ready to pass the weir and safe from commercial harvest. Obviously there may be a few Karluk sockeye harvested in the proposed fishery but not enough to impact the escapement a great deal on years of low abundance.

As the proposal states the inside/outside harvest of Spiridon bound sockeye shifts from 40% inside to 60% inside in years of low abundance of early run sockeye due to reduced fishing time in the Central section. The inside harvest of Spiridon bound sockeye is unencumbered as the fishery is prosecuted in an area that is free of Karluk sockeye. The inside area is seine only. In the central section, there is a combined set net and seine fishery, same time period openings and area. Reduced fishing time in the central section has reallocated Spiridon fish to the inside seine only fishery removing the opportunity from the set net fleet to harvest the Spiridon sockeye. On July 6th there is a fixed general pink opening that runs from 57 hrs in years of low pink salmon predictions to 104 hrs in years of high pink salmon predictions. The July fixed openings also affect the opportunity for set net fishermen to harvest Spiridon bound sockeye as the main body of the run passes through the central section late June-mid July.

The reallocation's practical effect is to take 20% of the shared set net/seine harvest from the central section and move it to the inside seine only area, at the same time, the harvest in the central section is still shared, meaning that the pie is 20% smaller with the set net fleet taking 100% of the hit.

I need to explain the Spiridon sockeye run. This run of reds is a very successful barren lake enhancement project that was started in the early 1990s by the Kodiak Regional Aquaculture Association. It is paid for by a 2% enhancement tax off of the gross proceeds of the commercial salmon fishery implemented in 1988. This is the sole project from the tax revenues that has a direct benefit to the central section set net fishery. The intent of the project was to provide more salmon to the fishermen to augment wild stock harvest. This concept is important to remember, the reason for projects like this is to mitigate the boom & bust cycles of natural production and smooth out the economic hills & valleys of the commercial fishery. The set net fleet is being denied this safety net that we helped create through our participation with KRRA and the salmon enhancement tax we pay. For my immediate family in the fishery over the last 25 yrs we have paid in excess of $75,000 to fund the Spiridon project. The same holds true for the set net fleet in general 2% of their gross harvest over the last 25 yrs. adds up. We are asking for access to harvest the return of sockeye that we have paid for.

At the Kodiak Advisory Committee meeting an amendment to proposal 95 was passed and adopted. The amendment reduced the fishing time to 81hrs moved the opening date to July 3rd (closer to the July 6th fixed general opening) with the trigger to open, being, meeting the minimum escapement for Karluk early run sockeye(1110,000 fish). This amendment is a reasonable attempt to address the problem.

Page 7 of the McDowell report and the report documents the impact of low Karluk returns on the economics of the set net fleet and west side harvesters in general. The seine/gill net average ex vessel value from 2003-2013 is seine $149,845 set net $37,674. 2013 the seine average was$304,105, the set net average was $55,672.

The fact that the seine fleet is mobile means there is more economic opportunity in areas that are exclusive to seine,which is the entire management area minus the Alitak bay section which is the only set net exclusive area.The economic impact on set net operators in years when there is limited access to the Spiridon run is substantial. In the years of low Karluk sockeye abundance access to Spiridon sockeye can be the difference between profit and loss to a set net operation.

The problem is with Karluk but the economics for the set net fleet can be mitigated by access to Spiridon bay sockeye.I appreciate you reading the material I am presenting and am looking forward to discussing proposal 95 with you in Kodiak at the BoF meeting.

Chris Berns

CENTRAL Section in bold

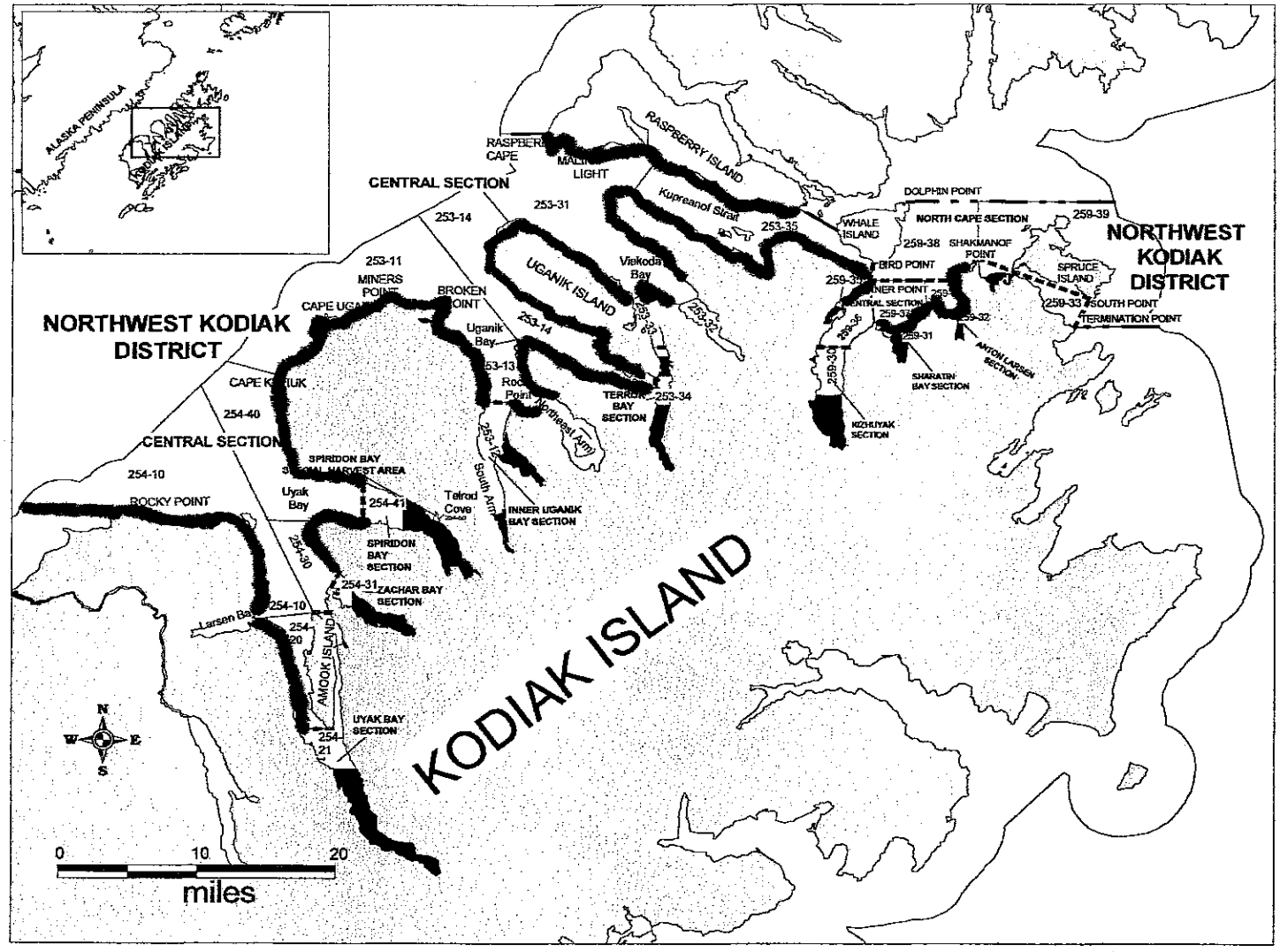



Figure 6.–Map of the Northwest Kodiak District identifying commercial salmon fishing sections and statistical areas

Spiridon Harvest % by area



Spiridon Inside/outside percentage numbers since projects inception

| Inside % harvest | Outside % harvest |
|---|---|
| 94- 48.19% | 94-51.81% |
| 95- 32.74% | 95-67.26% |
| 96-41.88% | 96-58.12% |
| 97-43.79% | 97-56.21% |
| 98-41.04% | 98-58.96% |
| 99-40.74% | 99-59.26% |
| 00-40.47% | 00-59.53% |
| 01-40.55% | 01-59.45% |
| 02-40.59% | 02-59.41% |
| 03-40.82% | 03-59.18% |
| 04-40.34% | 04-59.66% |
| 05-38.66% | 05-61.34% |
| 06-40.96% | 06-59.04% |
| 07-41% | 07-59% |
| 08-63.82% | 08-36.18% |
| 09-52.72% | 09-47.28% |
| 10-57.73% | 10-42.27% |
| 11-66.63% | 11-33.37% |
| 12-45.48% | 12-54.52% |
| 13-38.9% | 13-61.1% |

| Year | Spiridon THA sockeye harvest | Spiridon bound sockeye harvest in NW Kod and SW Afog | Total Spiridon sockeye run | Karluk early run sockeye salmon escapement |
|---|---|---|---|---|
| 1994 | 128,897 | 138,567 | 267,464 | 260,771 |
| 1995 | 31,692 | 64,929 | 96,621 | 238,079 |
| 1996 | 162,118 | 224,944 | 387,062 | 250,357 |
| 1997 | 64,483 | 82,762 | 147,245 | 252,859 |
| 1998 | 88,449 | 127,065 | 215,514 | 252,298 |
| 1999 | 190,774 | 277,446 | 468,220 | 392,419 |
| 2000 | 81,931 | 120,541 | 202,472 | 291,351 |
| 2001 | 59,733 | 87,562 | 147,295 | 338,799 |
| 2002 | 199,532 | 292,097 | 491,629 | 456,842 |
| 2003 | 258,564 | 374,885 | 633,449 | 451,856 |
| 2004 | 75,009 | 110,952 | 185,961 | 393,468 |
| 2005 | 55,997 | 88,860 | 144,857 | 283,860 |
| 2006 | 36,435 | 52,510 | 88,945 | 202,366 |
| 2007 | 70,250 | 101,091 | 171,341 | 294,740 |
| 2008 | 155,981 | 88,433 | 244,414 | 82,191 |
| 2009 | 81,725 | 73,300 | 155,025 | 52,798 |
| 2010 | 100,727 | 73,745 | 174,472 | 71,453 |
| 2011 | 111,459 | 55,834 | 167,293 | 87,049 |
| 2012 | 77,934 | 93,410 | 171,344 | 188,085 |
| 2013 | 129,024 | 201,807 | 330,831 | 234,880 |

Note: citation below covers Karluk escapement and Spiridon total run numbers from 1994 to 2011. 2012 and 2013 numbers are not citable yet.

*Moore, M. L. 2012. Kodiak management area salmon escapement and catch sampling results, 2011. Alaska Department of Fish and Game, Fishery Data Series No. 12- 0, An*

Spiridon Bay Sockeye Salmon Fishery
years 2008 - 2011



2008

2008 Spiridon Bay Sockeye Salmon Fishery

A return of approximately 226,000 Spiridon Lake sockeye salmon was expected in 2008 (Nelson et al. 2008). On June 23, the SBSHA in Telrod Cove was opened until further notice to allow harvest of enhancement project sockeye salmon. Twenty seiners harvested 11 Chinook, 155,981 sockeye, 33 coho, 67,869 pink, and 7,742 chum salmon from the SBSHA (Appendix H3). Commercial fishing in the SBSHA was closed after the sockeye salmon run had subsided on August 13. In 2008, salmon purse seine and set gillnet permit holders had a reduced fishing schedule along the west side of Kodiak in traditional fishing areas during fisheries directed at west side pink, chum, and late-run Karluk sockeye salmon due to weak runs. Some Spiridon-bound sockeye salmon were harvested in those fisheries. The total contribution of sockeye salmon by the Spiridon enhancement project to the common property fishery was estimated based on analyses of samples of commercial catch from Uganik, Viekoda, And Uyak bays and Kupreanof Straits (Appendix H4). The total 2008 harvest of Spiridon enhancement project sockeye salmon was estimated at 244,000 fish, with approximately 64% (155,981) harvested within the SBSHA and 36% (88,019) harvested in the Southwest Afognak Section and Central and North Cape sections of the Northwest Kodiak District (Appendix H5). The proportion of fish harvested in the SBSHA was larger than normal due to the unusually small amount of fishing time allowed in the Westside fishery in June and July.

REFERENCES CITED

2009

INTRODUCTION

Adult sockeye salmon return each year to Telrod Cove in Spiridon Bay as a result of a juvenile stocking program of Spiridon Lake conducted by Kodiak Regional Aquaculture Association (Appendix H2). Some of these fish are harvested in Westside Kodiak commercial fisheries and the remainder are harvested in a terminal fishery in the Spiridon Bay Special Harvest Area (SBSHA) in Telrod Cove. A total return of approximately 183,000 Spiridon Lake sockeye salmon was expected in 2009 (Volk et al. 2009). Sockeye salmon stocked into Spiridon Lake were from Saltery Lake stocks. Spiridon Lake sockeye salmon are expected to return in late June to early July, peak in mid to late July, and end by mid-August. This run timing should follow the Saltery Lake sockeye salmon stock.

2009 Spiridon Bay sockeye salmon fishery

On June 21 the SBSHA in Telrod Cove was opened until further notice to allow harvest of enhancement project sockeye salmon. Thirty-two seiners harvested 81,725 sockeye, 48,921 pink, and 6,081 chum salmon in the SBSHA (Appendix H3). Fishing in the SBSHA was closed after the sockeye salmon run had subsided on August 12.

In 2009, salmon purse seine and set gillnet permit holders had a liberal fishing schedule in July and early August along the west side of Kodiak Island in traditional fishing areas during fisheries directed at strong west side pink and chum salmon runs. A higher percentage of Spiridon-bound sockeye salmon were harvested in those fisheries than in 2008, when the local pink and Karluk sockeye salmon runs were weak and fishing time was relatively short. The total contribution of sockeye salmon by the Spiridon enhancement project to the common property fishery was estimated at 155,025 fish, with approximately 53% (81,725 fish) harvested within the SBSHA and 47% (73,300 fish) harvested in the Southwest Afognak Section and Central and North Cape sections of the Northwest Kodiak District (Appendix H4). These estimates were based on analyses of commercial catch samples collected in season from the Westside Kodiak fisheries in 2009 (Matt Foster, personal communication), using the same

2010

INTRODUCTION

Adult sockeye salmon return each year to Telrod Cove in Spiridon Bay as a result of a juve program of Spiridon Lake conducted by Kodiak Regional Aquaculture Association (KRAA; Some of these fish are harvested in Westside Kodiak commercial fisheries and the remainder were harvested in a terminal fishery in the Spiridon Bay Special Harvest Area (SBSHA) in Telrod Cove. A total return of approximately 176,000 Spiridon Lake sockeye salmon was expected in 2010 (Eggers et al. 2010). Sockeye salmon stocked into Spiridon Lake were from Saltery Lake stocks. Spiridon Lake sockeye salmon are expected to return in late June to early July, peak in mid-to-late July, and end by mid-August. This run timing should follow the Saltery Lake sockeye salmon stock.

2010 Spiridon Bay sockeye salmon fishery

For the first time, KRAA conducted a cost recovery harvest to defray costs of this project. The cost recovery harvest began on June 22 and continued until June 30, and harvested 10,840 sockeye, 2 pink and 11 chum salmon. With the conclusion of the cost recovery harvest, the common property fishery was opened on July 2 and remained open through August 14 after the sockeye salmon run had subsided. Twenty-five seiners harvested 1 Chinook; 89,887 sockeye; 36 coho; 53,514 pink; and 5,876 chum salmon in the common property fishery in the SBSHA (Appendix H3). The total number of sockeye salmon harvested in Telrod Cove was 100,727 fish, 11% (10,840 fish) of which was harvested for cost recovery (Appendix H4). In 2010, salmon purse seine and set gillnet permit holders had a relatively restrictive fishing schedule in July and early August along the west side of Kodiak Island in traditional fishing areas during fisheries directed at weak west side pink and chum salmon runs. A lower percentage of Spiridon-bound sockeye salmon were harvested in those fisheries than in 2009, when the local pink and chum salmon runs were strong and fishing time was relatively liberal. The total return of sockeye salmon to the Spiridon enhancement project in 2010 was estimated at 174,473 fish, with approximately 58% (100,727 fish) harvested within the SBSHA and an estimated 42% (73,746 fish) harvested in the Southwest Afognak Section and Central and North Cape sections of the Northwest Kodiak District (Appendix H4). This estimate was based on analyses of commercial catch samples collected inseason from the Westside Kodiak fisheries in 2010 (Matt Foster, personal communication), using the same analytical protocols used in 2008 and 2009 (Dinnocenzo 2010).

REFERENCES CITED

Dinnocenzo, J. 2010. Kodiak Management Area commercial salmon annual management report, 2009. Alaska Department of Fish and Game, Fishery Management Report No. 10-22, Anchorage.

Eggers, D. M., M. D. Plotnick, and A. M. Carroll. 2010. Run forecasts and harvest projections for the 2010 Alaska salmon fisheries and review of the 2009 season. Alaska

2011

INTRODUCTION

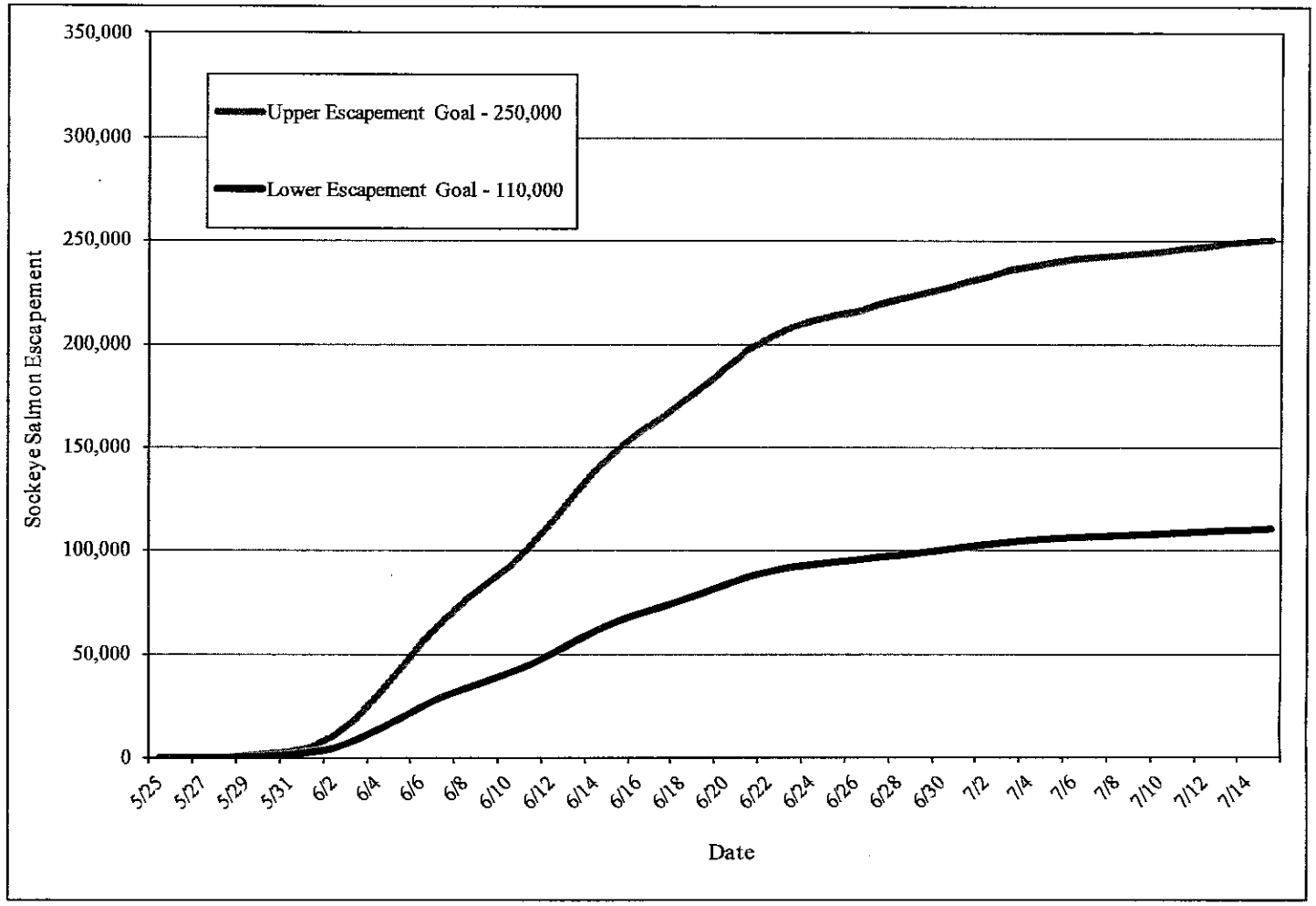
Adult sockeye salmon return each year to Telrod Cove in Spiridon Bay as a result of a juvenile stocking program of Spiridon Lake conducted by Kodiak Regional Aquaculture Association (KRAA; Appendix H2). Some of these fish were harvested in Westside Kodiak commercial fisheries and the remainder were harvested in a terminal fishery in the Spiridon Bay Special Harvest Area (SBSHA) in Telrod Cove. A total return of approximately 176,000 Spiridon Lake sockeye salmon was expected in 2011 (Eggers and Carroll 2011). Sockeye salmon stocked into Spiridon Lake were from Saltery Lake stocks. Spiridon Lake sockeye salmon are expected to return in late June to early July, peak in mid-to-late July, and end by mid-August. This run timing should follow the Saltery Lake sockeye salmon stock.

2011 Spiridon Bay sockeye salmon fishery

For the second year, KRAA conducted a cost recovery harvest to defray costs of this project. The cost recovery harvest began on June 21 and continued until June 30, and harvested 20,241 sockeye, and 5 chum salmon. With the conclusion of the cost recovery harvest, the common property fishery was opened on July 2 and remained open through August 15 after the sockeye salmon run had subsided. Twenty-six seiners harvested 2 Chinook; 91,218 sockeye; 8 coho; 12,178 pink; and 1,633 chum salmon in the common property fishery in the SBSHA (Appendix H3). The total number of sockeye salmon harvested in Telrod Cove was 111,459 fish, 18% (20,241 fish) of which was harvested for cost recovery (Appendix H4).

In 2011, salmon purse seine and set gillnet permit holders were allowed to fish a relatively liberal fishing schedule in July along the west side of Kodiak Island in anticipation of a strong pink salmon run. In early August the fishing schedule was reduced when it became apparent that the Westside pink salmon run was weaker than forecast. As a result of the long fishing periods in July, the percentage of Spiridon-bound sockeye salmon harvested in those fisheries was higher than the previous year, when the pink salmon run was forecasted to be weak and fishing time was relatively restrictive. The total number of sockeye salmon returning to the Spiridon enhancement project that were sold in 2011 was estimated at 167,248 fish, with approximately 67% (111,459 fish) harvested within the SBSHA and an estimated 33% (55,789 fish) harvested in the Southwest Afognak Section and Central and North Cape sections of the Northwest Kodiak District (Appendix H4). This estimate was based on analyses of commercial catch samples collected inseason from the Westside Kodiak fisheries in 2011 (Moore 2012), using the same analytical protocols used in 2008 through 2010.

Appendix A2.–Average run timing relative to lower and upper escapement goals for early-run sockeye salmon into the Karluk system.




*Note:* This chart does not represent interim escapement goals.

Smolt Out migration numbers



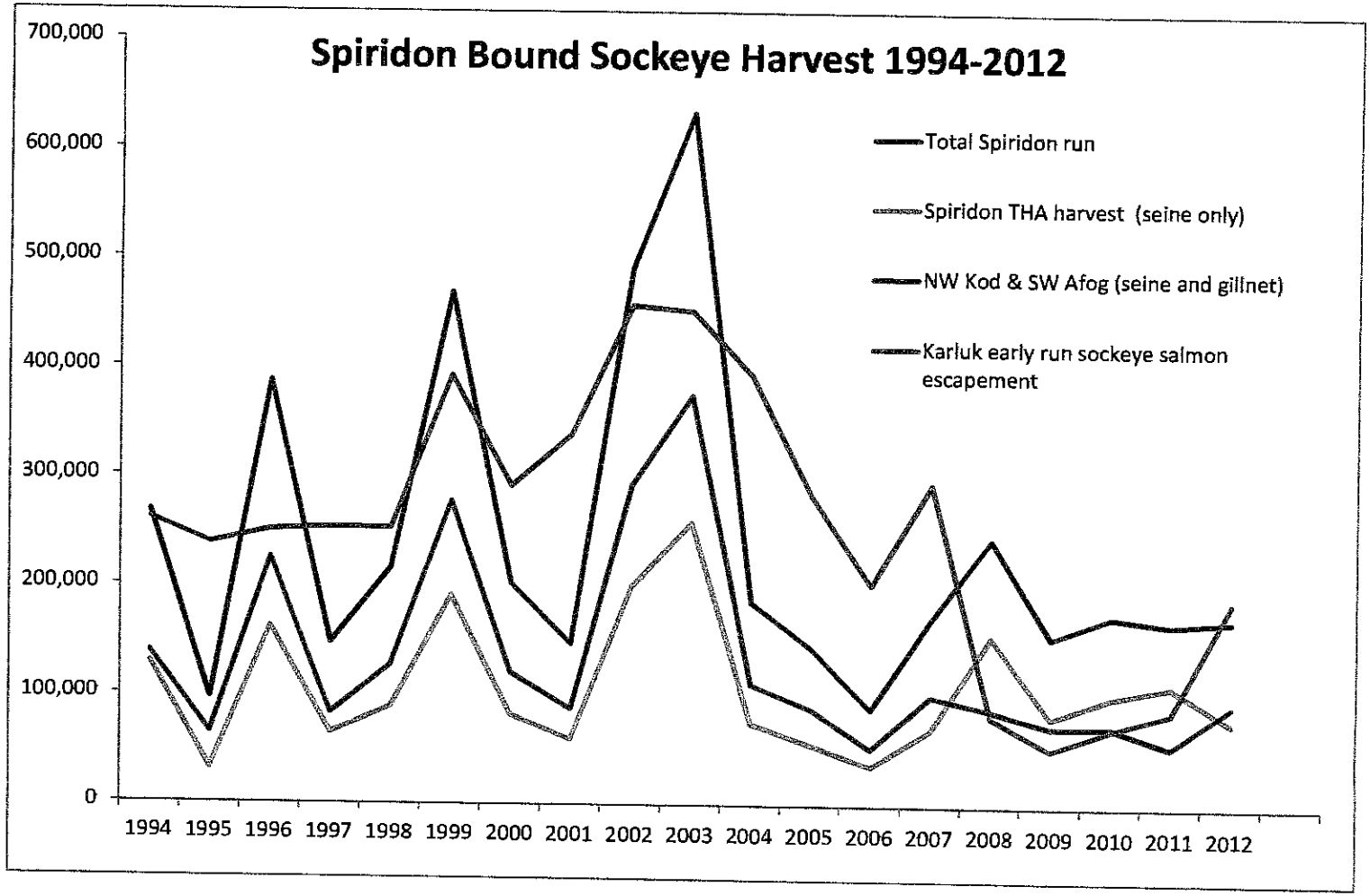
Karluk River sockeye salmon smolt population estimates, by age class, 1991-2013.

| Year | Number of Smolt | | | | | | 95% C.I. | |
|---|---|---|---|---|---|---|---|---|
| | Age 0 | Age 1 | Age 2 | Age 3 | Age 4 | Total | Lower | Upper |
| 1991 | 0 | 108,123 | 2,392,324 | 1,640,374 | 0 | 4,140,821 | 2,809,914 | 5,471,727 |
| 1992 | 0 | 28,189 | 2,039,222 | 1,415,788 | 10,797 | 3,493,996 | 2,780,674 | 4,207,319 |
| | | | | | | | | |
| 1999 | 0 | 35,196 | 531,134 | 487,406 | 12,798 | 1,066,534 | 717,152 | 1,415,915 |
| 2000 | 0 | 9,441 | 1,263,785 | 402,919 | 0 | 1,676,502 | 1,328,451 | 2,024,553 |
| 2001 | 2,838 | 238,271 | 3,062,597 | 436,469 | 80 | 3,740,255 | 3,136,398 | 4,344,111 |
| 2002 | 791 | 11,482 | 1,072,906 | 195,323 | 1,468 | 1,281,971 | 1,130,721 | 1,433,221 |
| 2003 | 0 | 16,445 | 1,712,969 | 501,816 | 4,205 | 2,235,435 | 1,673,898 | 2,796,972 |
| 2004 | 533 | 26,479 | 1,420,076 | 633,039 | 186 | 2,080,339 | 1,764,223 | 2,396,454 |
| 2005 | 0 | 47,834 | 1,227,246 | 218,243 | 2,264 | 1,494,818 | 725,956 | 2,263,680 |
| 2006 | 0 | 0 | 393,039 | 773,173 | 6,906 | 1,173,252 | 965,308 | 1,381,196 |
| | | | | | | | | |
| 2012 | 0 | 26,611 | 753,793 | 108,219 | 35 | 888,658 | 730,373 | 1,046,941 |
| 2013 | 0 | 44,834 | 204,760 | 20,250 | 29 | 269,873 | 212,131 | 327,615 |

Karluk on average gets 30-35% smolt to Adult return.

# Spiridon Bound Sockeye Harvests 1994-2012

| | Total Spiridon run | Spiridon THA harvest (seine only) | Spiridon bound sockeye harvest NW Kod & SW Afog (seine and gillnet) | Karluk early run sockeye salmon escapement | Spiridon THA sockeye harvest (seine only) | Spiridon bound sockeye harvest NW Kod & SW Afog (seine and gillnet) |
|---|---|---|---|---|---|---|
| 1994 | 267,464 | 128,897 | 138,567 | 260,771 | 48.19% | 51.81% |
| 1995 | 96,621 | 31,692 | 64,929 | 238,079 | 32.80% | 67.20% |
| 1996 | 387,062 | 162,118 | 224,944 | 250,357 | 41.88% | 58.12% |
| 1997 | 147,245 | 64,483 | 82,762 | 252,859 | 43.79% | 56.21% |
| 1998 | 215,514 | 88,449 | 127,065 | 252,298 | 41.04% | 58.96% |
| 1999 | 468,220 | 190,774 | 277,446 | 392,419 | 40.74% | 59.26% |
| 2000 | 202,472 | 81,931 | 120,541 | 291,351 | 40.47% | 59.53% |
| 2001 | 147,295 | 59,733 | 87,562 | 338,799 | 40.55% | 59.45% |
| 2002 | 491,629 | 199,532 | 292,097 | 456,842 | 40.59% | 59.41% |
| 2003 | 633,449 | 258,564 | 374,885 | 451,856 | 40.82% | 59.18% |
| 2004 | 185,961 | 75,009 | 110,952 | 393,468 | 40.34% | 59.66% |
| 2005 | 144,857 | 55,997 | 88,860 | 283,860 | 38.66% | 61.34% |
| 2006 | 88,945 | 36,435 | 52,510 | 202,366 | 40.96% | 59.04% |
| 2007 | 171,341 | 70,250 | 101,091 | 294,740 | 41.00% | 59.00% |
| 2008 | 244,414 | 155,981 | 88,433 | 82,191 | 63.82% | 36.18% |
| 2009 | 155,025 | 81,725 | 73,300 | 52,798 | 52.72% | 47.28% |
| 2010 | 174,472 | 100,727 | 73,745 | 71,453 | 57.73% | 42.27% |
| 2011 | 167,293 | 111,459 | 55,834 | 87,049 | 66.63% | 33.37% |
| 2012 | 171,344 | 77,934 | 93,410 | 188,085 | 45.48% | 54.52% |


Spiridon Bound Sockeye Harvest 1994-2012
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Total Spiridon run
Spiridon THA harvest (seine only)
NW Kod & SW Afog (seine and gillnet)
Karluk early run sockeye salmon escapement

Pg 7 McDowell Report



Based on this analysis, restoration of the Karluk sockeye resource, and the resulting increase in fishing effort in Karluk-affected areas, would have an annual benefit of $13.3 million in ex-vessel income for fishermen. It would also provide a total annual first wholesale value of $21.3 million, net of payments to fishermen. In other words, restoration of the Karluk sockeye resource has a potential benefit of $34.5 million annually in terms of direct economic output. Total annual output, including all direct, indirect, and induced effects, is estimated at $45.8 million.

Poor Karluk sockeye runs have hit setnet fishermen particularly hard. Unlike seine boats, setnet fishermen "set" their nets along the same stretch of beach each year and cannot easily move to other areas. Many setnet fishermen continue to fish their permit hoping for an unexpected surge of salmon, but landing records and anecdotal evidence suggest setnetter revenues in Karluk-affected areas are at unsustainably low levels. Setnet fisheries are typically small, family-operated businesses which are less capitalized than other gear types.

ADFG Comments at AC with graphs on SBSHA



**PROPOSAL 95 – 5 AAC 18.362. Westside Kodiak Salmon Management Plan and 5 AAC 18.366. Spiridon Bay Sockeye Salmon Management Plan.**

**PROPOSED BY:** Chris Berns.

**WHAT WOULD THE PROPOSAL DO?** This proposal would require the department to open the Central Section of the Northwest Kodiak District (Figure 95-1) on June 28 for one, set gillnet-only, 114-hour fishing period.

**WHAT ARE THE CURRENT REGULATIONS?** Under the *Westside Kodiak Salmon Management Plan,* 5 AAC 18.362(b), the Central and North Cape sections must be managed, approximately June 16 through July 5, based on early-run sockeye salmon returning to the Karluk system.

Under the *Spiridon Bay Sockeye Salmon Management Plan*, 5 AAC 18.366(b), the purpose of the Spiridon Bay harvest strategy is to allow the orderly harvest of sockeye salmon returning to Telrod Cove (Figure 95-2) from the Spiridon Lake enhancement project while providing adequate protection of local natural salmon stocks returning to other streams of the bay. The intent of the enhancement project is for harvest of returning enhanced salmon to occur in traditional commercial fishing areas of the Northwest Kodiak District during openings directed at harvesting Karluk sockeye salmon and Westside Kodiak pink and chum salmon stocks.

**WHAT WOULD BE THE EFFECT IF THE PROPOSAL IS ADOPTED?** This proposal would require the department to open the Central Section of the Northwest Kodiak District regardless of the strength of the Karluk Lake sockeye salmon run. In the event of a weak run, a mandatory opening during this time period would harvest sockeye salmon bound for Karluk Lake, possibly impacting achievement of the Karluk Lake early-run escapement goal.

**BACKGROUND**: The *Westside Kodiak Salmon Management Plan* is the achievement of long-term management strategies initially implemented in 1971 and placed into regulation in 1990. Placing the management plan in regulation clarified the management strategy and helped maintain the biological integrity of local salmon stocks, while alleviating allocative concerns of local fishermen.

The intent of this management plan is to harvest salmon bound to local systems in traditional fisheries. Due to the mixing of various local salmon stocks during inshore migration, the plan is complex, but provides a predictable framework for harvest of major sockeye, pink, chum, and coho salmon stocks transiting the west side of Kodiak Island. The plan is in effect for the entire salmon season and covers the Southwest and Northwest Kodiak districts, as well as the Southwest Afognak Section (Figure 90-1). The management plan guides prosecution of early- and late-run sockeye salmon fisheries, including those targeting the major systems of Karluk, Ayakulik, and other minor sockeye salmon systems, as well as local pink, chum, and coho salmon fisheries.

The Spiridon Lake Enhancement Project, located on the west side of Kodiak Island, is one of the most successful sockeye salmon stocking programs in the state. The intent of the project was to

provide adult sockeye salmon returns for harvest in the traditional fisheries of the Northwest Kodiak District (figures 95-1 and 95-2). The Spiridon Bay Special Harvest Area (SBSHA) was created to harvest excess fish not harvested in the traditional fisheries as they return to Telrod Cove (Figure 95-2).

Initially, the SBSHA was much larger than the current special harvest area (SHA) and the lake was stocked with late-run Upper Station sockeye salmon. Late-run Upper Station stock was selected to allow the maximum harvest opportunity during the prosecution of the pink salmon fishery on the west side of Kodiak Island. However, due to incidental harvest of other local salmon, the SHA was reduced in size in 1995. The SBSHA now only includes Telrod Cove (Figure 95-2). To further reduce incidental harvest of other local salmon, the broodstock was changed to Saltery Lake sockeye salmon, which has an earlier run timing (peaking ~ July 8; Figure 95-3).

Spiridon Lake sockeye salmon scales display unique freshwater growth characteristics. This identifying mark has been used for Spiridon Lake run reconstructions. These run reconstructions are also used to differentiate harvests between SBSHA and Westside Kodiak.

Currently, the majority of Spiridon Lake sockeye salmon are harvested in June and July. In June, the Central Section of the Northwest Kodiak District is managed based on early Karluk Lake sockeye salmon, and in July, is managed based on weekly pink salmon openings. On average, the SBSHA opens on approximately June 21.

From 1992 through 2007, the early Karluk Lake sockeye salmon runs were strong and Westside Kodiak was open to continuous fishing. On average, approximately 40% of the Spiridon sockeye salmon run was harvested in the SBSHA (Figure 95-4). However, from 2008 through 2011, there were significant declines in the early Karluk Lake sockeye salmon run and fishing periods in Westside Kodiak were restricted. During these years, on average, approximately 60% of the Spiridon sockeye salmon run was harvested in the SBSHA (Figure 95-4).

During the past two seasons (2012 and 2013), the early Karluk Lake sockeye salmon runs were strong and the percentage of Spiridon Lake sockeye salmon harvested in Westside Kodiak has returned to approximately 40% in the SBSHA and 60% in Westside Kodiak.

**DEPARTMENT COMMENTS:** The department is **NEUTRAL** on the allocative aspects of this proposal. The department is **OPPOSED** to this proposal based on concerns for early-run Karluk Lake sockeye salmon; specifically, that the escapement goal may be not be achieved. On June 21, approximately 88% of early run Karluk Lake sockeye salmon has escaped past the weir (Figure 95-3). The current plan allows managers to protect early-run Karluk Lake sockeye salmon while allowing the orderly harvest of sockeye salmon returning to Telrod Cove from the Spiridon Lake enhancement project. The Rest are in the Lagoon -

**COST ANALYSIS:** Approval of this proposal is not expected to result in an additional direct cost for a private person to participate in this fishery.

Projects & minimum Escapment



$75,000 ~~est~~ Invested into project

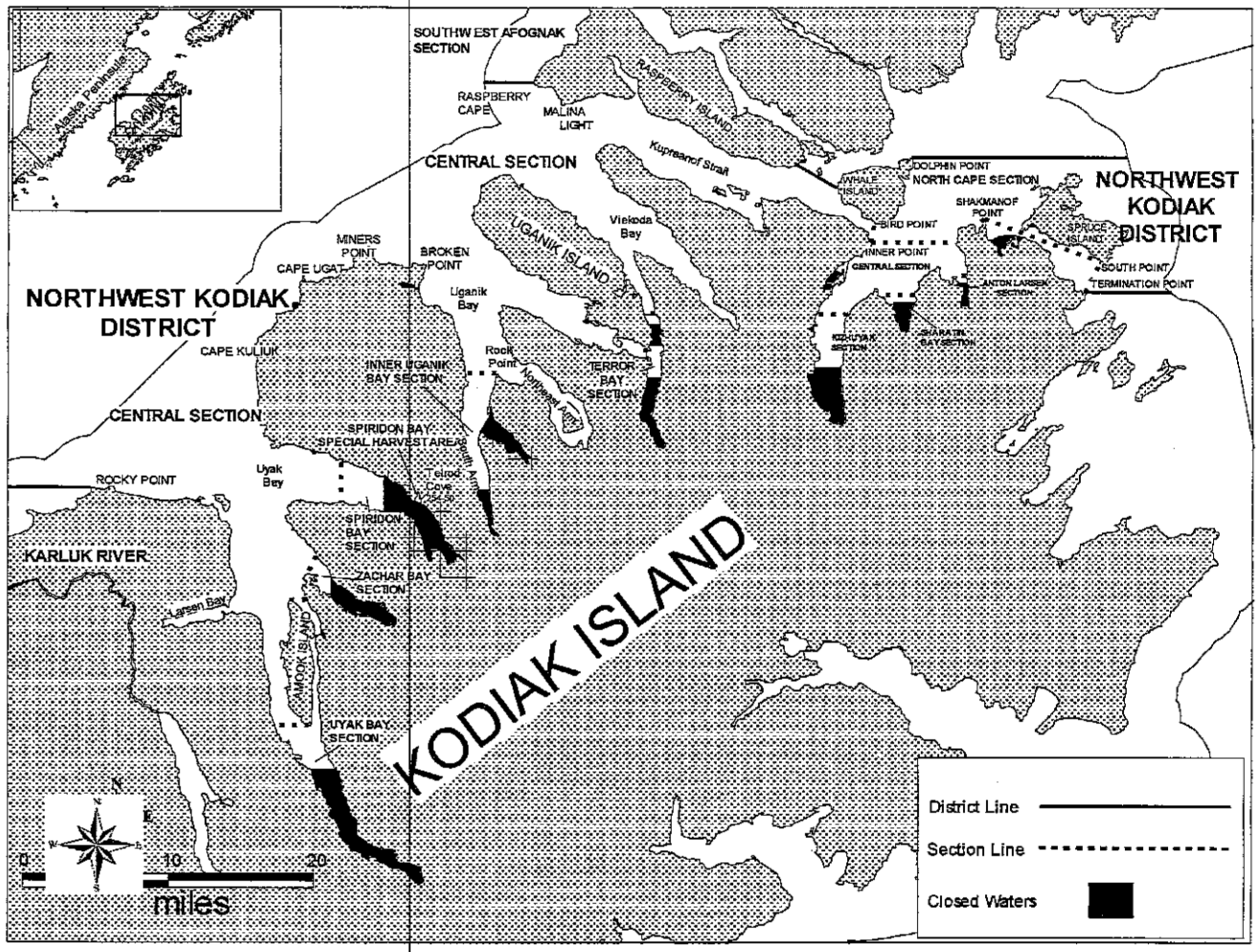



Figure 95-1.–Map of the Northwest Kodiak District identifying commercial salmon fishing sections and statistical areas.

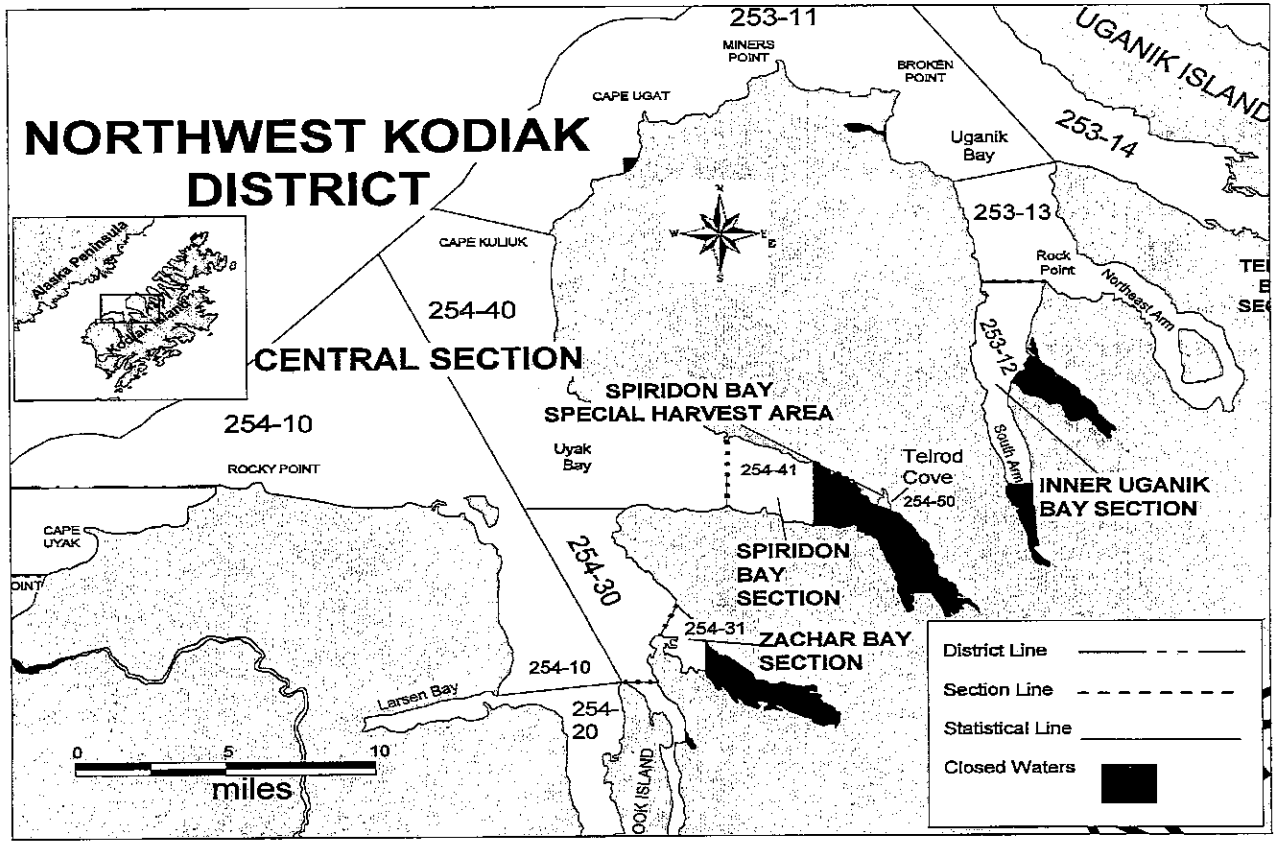



Figure 95-2.–Map of the Spiridon Bay Special Harvest Area in the Northwest Kodiak District.

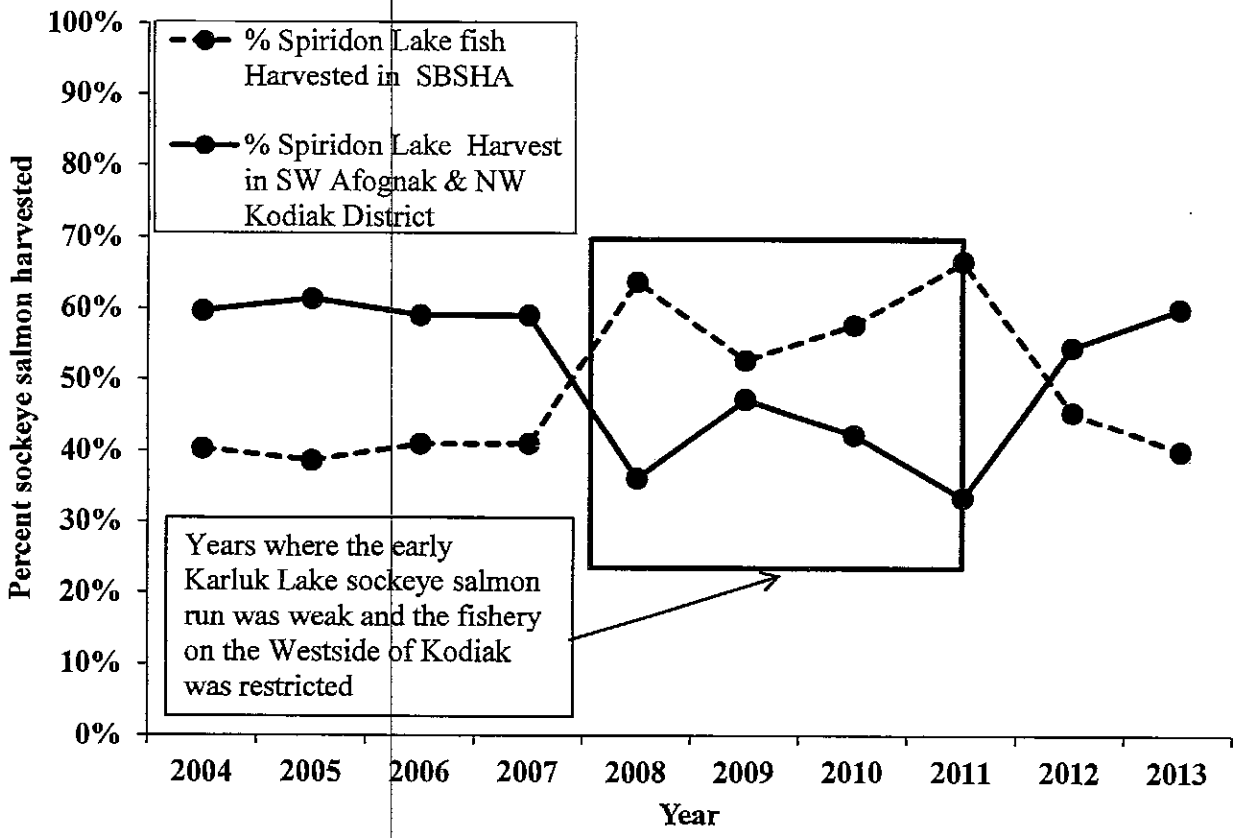



Figure 95-3.–Percent of Spiridon Lake sockeye salmon harvested in the Spiridon Bay Special Harvest Area (SBSHA) and in the Southwest Afognak Section of the Afognak District and the Northwest Kodiak District, 2004–2013.

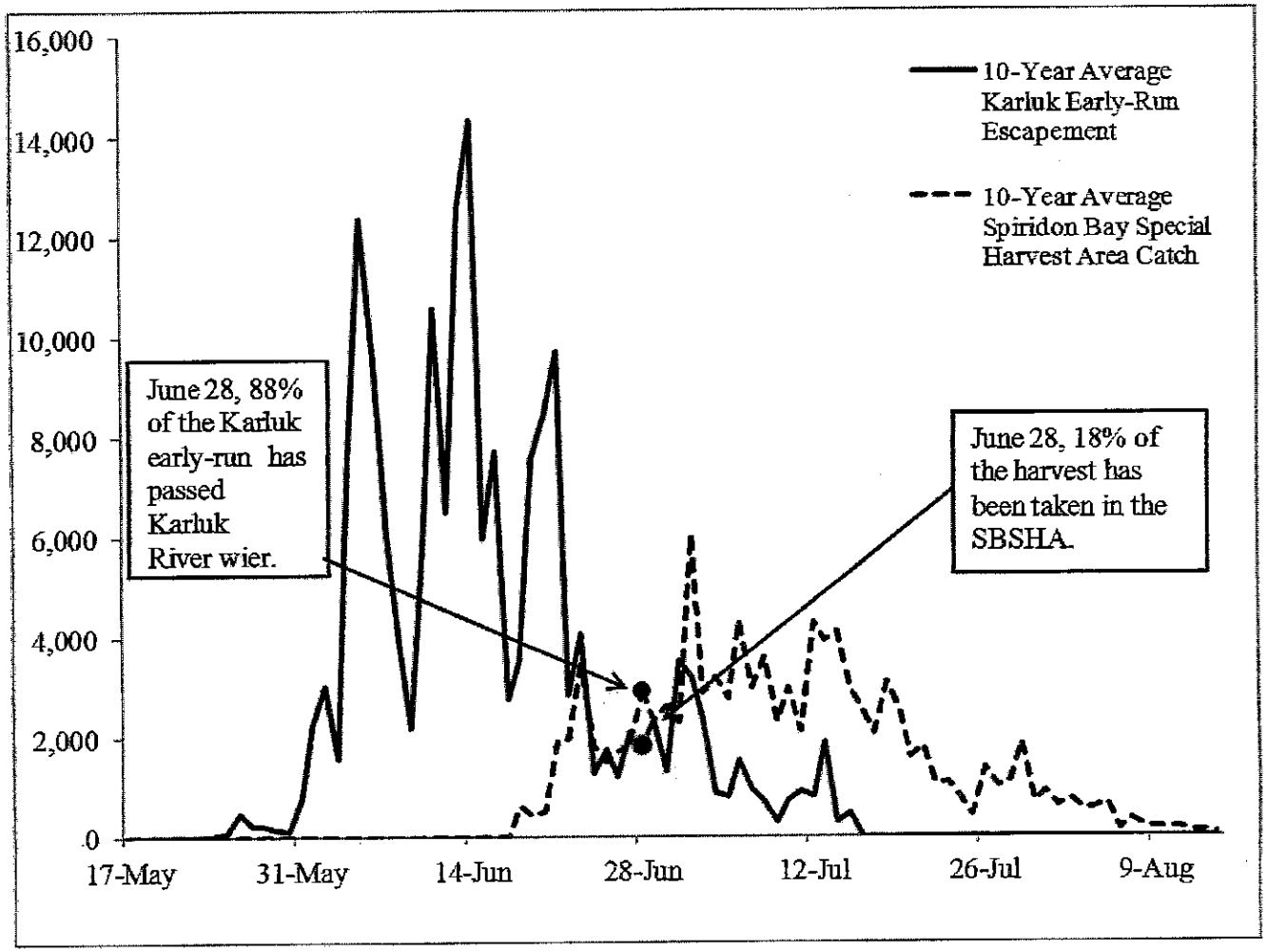



Figure 95-4.–Average early Karluk Lake sockeye salmon escapement and average sockeye salmon harvest in the SBSHA.

# *Economic Impact of the Decline in Karluk Lake Sockeye Salmon Production and the Benefit of Rehabilitation: The Karluk Lake Enrichment Project*

*Prepared for:*
**Kodiak Regional Aquaculture Association**

McDowell GROUP
Research-Based Consulting
Juneau
Anchorage

*April 2012*

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# Executive Summary

## Statement of the Situation

The number of sockeye salmon returning to the Karluk River system of Kodiak, Alaska has declined precipitously since 2007. A commonly held theory suggests that over-escapement of sockeye salmon in the early 2000s may have led to the current situation. Large numbers of sockeye salmon entered the lake during consecutive years from 2001 to 2003. The large number of juvenile sockeye salmon then could have overgrazed the lake's zooplankton, reducing the food base. In subsequent years, this led to poor juvenile sockeye growth and higher smolt mortality. Ultimately, fewer adult sockeye returned to the Karluk system (lake and river). Karluk Lake relies heavily upon sockeye salmon carcasses to provide nutrients for phytoplankton and zooplankton, the organisms lowest on the food chain. But with declining Karluk sockeye runs and escapement, the number of carcasses feeding into the system has declined significantly. This has effectively lowered the lake's nutrient base, rendering the lake incapable of supporting the numbers of sockeye salmon it has in past years.

The Kodiak Regional Aquaculture Association (KRAA) proposes that a rehabilitation program be conducted, to increase Karluk sockeye salmon runs to their prior levels. KRAA has developed a proposal to implement a lake enrichment program (Appendix A), similar to a project carried out at Karluk Lake in the late 1980s, to rehabilitate depressed Karluk sockeye salmon runs. KRAA commissioned McDowell Group, Inc. to provide an economic impact assessment of the proposed lake enrichment program. McDowell Group used data from the Alaska Department of Fish and Game (ADFG), Alaska Department of Labor and Workforce Development (DOLWD), KRAA, and other sources to estimate the income and employment benefits associated with restoring the Karluk Lake sockeye resource.

This report seeks to quantify the economic scope of the Karluk salmon resource, provide an assessment of the negative economic impacts associated with the system's recent productivity declines, and an assessment of the economic benefits of restoring Karluk sockeye salmon run strength. Using ADFG data and information gained from interviews, the study team estimated impacts on jobs, income, and other economic activity. Specific calculations for these impacts are presented in this report.

Karluk salmon have been an important subsistence resource for many centuries and Karluk has a long history of supporting large-scale commercial fisheries. Recreational activities associated with Karluk salmon production include sport fishing and bear viewing. The restoration of Karluk sockeye salmon runs would be beneficial for subsistence users, sport fishermen, and bear populations; however, the quantifiable impacts are difficult to predict. Therefore, the study team focused on definable economic impacts to the commercial seafood industry.

The importance of Karluk sockeye runs is evident on a national scale. Kodiak is the third largest commercial fishing port in the US, measured by both value and volume. While other species are caught in waters surrounding the island, salmon is one of the island's principal resources. Historically, the Karluk system has been a key producer in the Kodiak salmon fishery.

# Summary of Findings

### Direct Benefits Associated with Increased Harvest of Karluk Sockeye Salmon

From 1987 to 2007, commercial fishermen caught an average of 621,000 Karluk sockeye.[1] After 2007, Karluk sockeye runs decreased substantially and have remained very low the past three seasons. From 2009 through 2011, the commercial harvest averaged just 54,000 sockeye.

If Karluk would have yielded its baseline average of 621,000 sockeye in 2011, the commercial fleet could have earned $5.1 million in ex-vessel value,[2] while Kodiak processors could have grossed $4.6 million (less payments to fishermen). Instead, commercial fishermen and seafood processors as a group grossed less than $800,000 from selling Karluk sockeye in 2011. The proposed enrichment program is expected to cost $300,000 to $500,000 per year during the height of the project.

### Benefits Associated with Increased Commercial Harvest from Karluk-Affected Areas

Clearly the direct economic benefits associated with restoring Karluk sockeye runs are substantial and far exceed the cost of the proposed KRAA enhancement program. However, these direct benefits are a relatively small portion of the total economic benefit of restoring Karluk sockeye salmon.

Low sockeye returns to Karluk have limited commercial fishing for all salmon species in many areas around Kodiak Island. These "Karluk-affected" areas are managed to assure that Karluk sockeye salmon return to the system in sufficient numbers to sustain and maximize subsequent production (escapement). Although other local stocks may be healthy, fishing effort is curtailed in much of Kodiak's west side fisheries to protect Karluk sockeye (see map on page 4). The result has been, since 2008, substantial lost fishing opportunity and under-utilization of surplus Kodiak area salmon resources. Karluk sockeye restoration, through a program such as the proposed KRAA lake enrichment program, would allow for much greater utilization of the Kodiak salmon resource than is possible while measures are taken to protect weak Karluk sockeye runs.

Substantial "opportunity costs" are associated with management measures aimed at protecting Karluk sockeye salmon. These costs include the income fishermen and processors could have earned if not for Karluk-related commercial fishery closures. Opportunity costs also include all of the indirect and induced economic impacts associated with re-spending of the income that fishermen and processors could have earned.

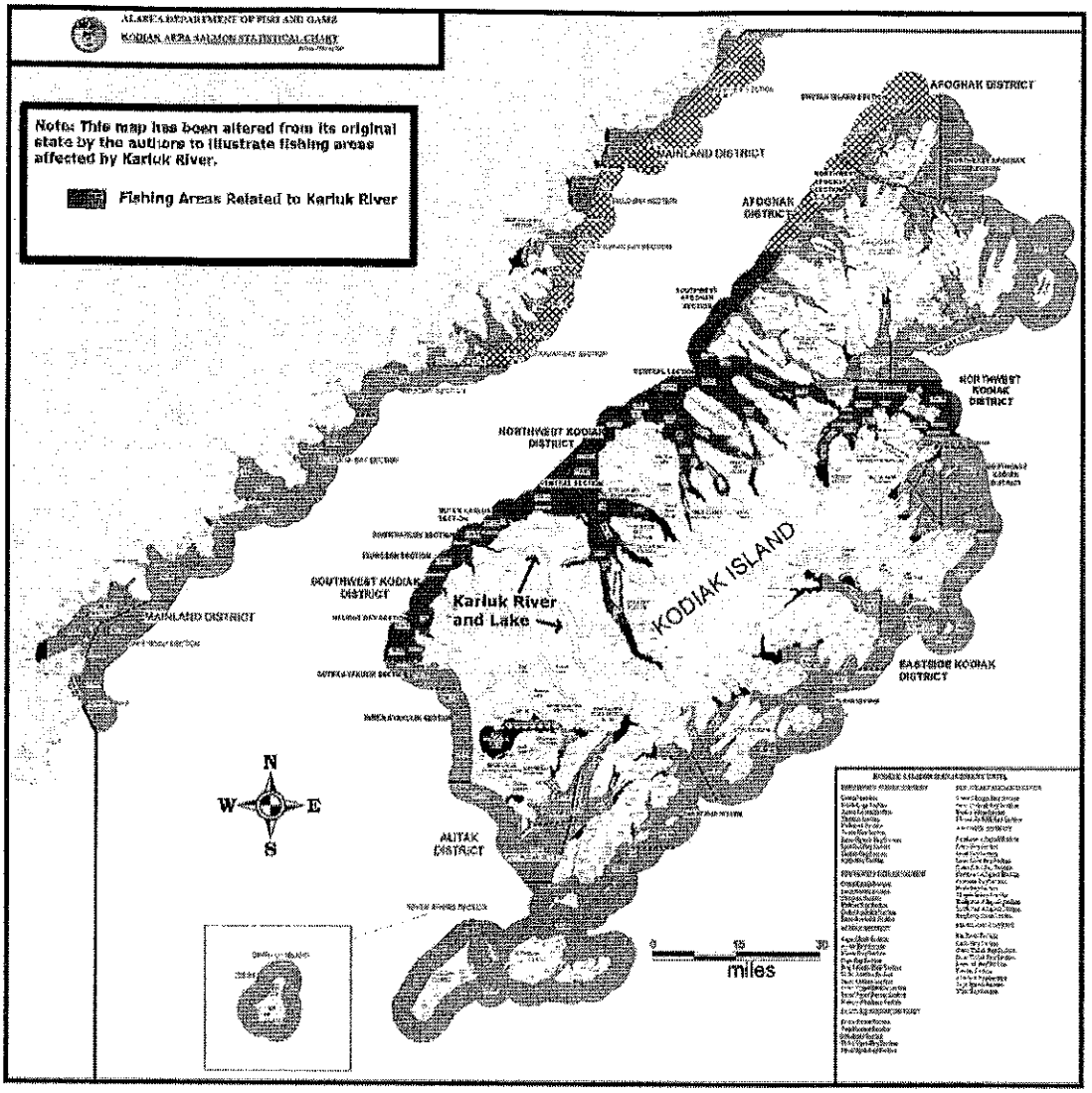
The methodological approach used to quantify these opportunity costs began by quantifying the Kodiak salmon industry's economic potential, given an increase in harvest from Karluk-affected areas at recent prices. The next step was to measure the actual economic situation of the Kodiak salmon industry from 2008 to 2011, when harvests in Karluk-affected areas declined substantially. The difference between the economic impact of potential utilization of the salmon resource and its actual utilization is the opportunity cost. It is also a measure of the economic benefit of any Karluk salmon rehabilitation or enhancement program, as it is

[1] Baseline averages in this report do not include the 1989 season. The commercial harvest was essentially zero in 1989, due to the Exxon-Valdez oil spill.

[2] Ex-vessel value refers to the landed value of seafood products.

assumed that such a program would eventually restore the sockeye run to a healthy level and eliminate or reduce the need for protective fishery closures in Karluk-affected areas.

**Kodiak Salmon Fishing Areas Affected by Karluk Sockeye**

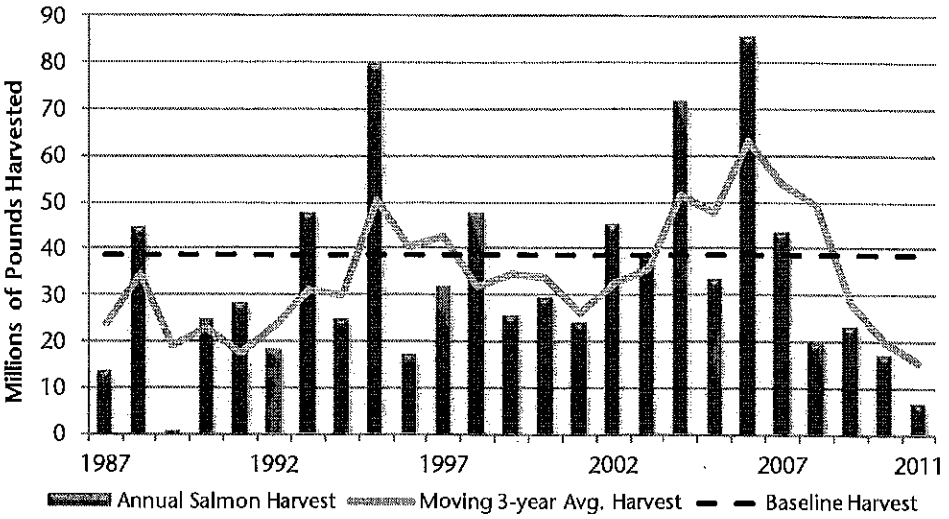



Source: ADFG Map, altered by McDowell Group.

To determine a baseline harvest volume associated with Karluk-affected areas, the average salmon harvest was calculated for these areas over the 1987 to 2007 period. This 20-year period includes the first returning group of sockeye that benefitted from the late 1980s Karluk Lake enrichment program, and also includes the last substantial Karluk sockeye run in 2007. From 1987 to 2007, these Karluk-affected areas averaged salmon harvests of 38.4 million pounds (all species).

The average harvest for the 2008 to 2011 time period is by far the lowest in recent history (see chart on page 5). The 2011 season was particularly poor, with just 6.4 million pounds caught in Karluk-affected areas – an 83 percent decline from the baseline harvest volume (38.4 million pounds).

**Commercial Salmon Harvest in Karluk-Affected Areas, 1987 - 2011**




Source: ADFG.

Economic modeling conducted for purposes of this study suggests that, based on recent prices and participation, a harvest of 38.4 million pounds of salmon in 2011 would produce 739 direct, indirect, and induced jobs (this includes fishermen, processors and jobs throughout the support sector) and $82 million in economic activity within the Kodiak economy. Nationally, this volume of salmon would create 1,088 jobs[3] and $146 million in economic activity (Kodiak impacts included in these figures). These figures represent the economic impacts (current and potential) associated with baseline salmon production from Karluk-affected areas.

**Total Economic Impact of Baseline Salmon Harvest from Karluk-Affected Areas**

| Effects on Kodiak Regional Economy | Direct Effects | Indirect and Induced Effects | Total Economic Impact |
|---|---|---|---|
| Number of Jobs (annual avg. basis) | 568 | 171 | 739 |
| Estimated Labor Income (in millions) | $26.5 | $8.0 | $34.5 |
| Estimated Revenue (in millions) | $63.7 | $18.7 | $82.3 |
| **Effects on U.S. Economy** | **Direct Effects** | **Indirect and Induced Effects** | **Total Economic Impact** |
| Number of Jobs (annual avg. basis) | 568 | 520 | 1,088 |
| Estimated Labor Income (in millions) | $26.5 | $40.2 | $66.6 |
| Estimated Revenue (in millions) | $63.7 | $81.9 | $145.6 |

Note: Totals may not sum due to rounding.
Source: McDowell Group calculations using ADFG, DOLWD, and IMPLAN data.

[3] Job totals associated with the baseline harvest volume and those related to recent poor harvest years represent long-term average employment levels the resource is capable of supporting, given today's market environment. To date, employment losses resulting from smaller harvests have been partly offset by better prices, fishermen/processors accepting small incomes, and fishermen/processors moving to other areas. Similarly, employment gains may take years to materialize after returns improve; however, over the long-term the market will reach equilibrium and new jobs would be created to capitalize on growing revenues.

## Missed Economic Opportunities

The average salmon harvest in Karluk-affected areas during the last four seasons was 58 percent lower than the 1987 to 2007 baseline harvest volume. As a result, fishermen have lost or forgone a total of $53 million in ex-vessel earnings while processors have lost or forgone $85 million in revenue (net of payments to fishermen) over this time period.

**Estimated Economic Impact of Lower Harvest Volumes in Karluk-Affected Areas, 2008 - 2011**

| | |
|---|---|
| **Loss of Harvest Volume and Income (in Millions)** | |
| Average Baseline Harvest Volume (1987-2007) in lbs. | 38.4 |
| Actual Average Harvest Volume (2008-2011) in lbs. | 16.3 |
| Average Annual Ex-vessel Earnings Lost (2008-2011) | $13.3 |
| Total Cumulative Ex-vessel Earnings Lost (2008-2011) | $53.2 |
| Average Annual Net Processing Revenue[1] Lost (2008-2011) | $21.3 |
| Total Cumulative Net Processing Revenue[1] Lost (2008-2011) | $85.3 |
| **Employment Impacts of Lost Harvest Volume on Kodiak Economy** | |
| Direct Fishing Jobs Foregone Due to Lower Harvests[2] (No. skippers and crew) | 232 |
| Direct Fishing Jobs Foregone Due to Lower Harvests[3] (annual avg. basis) | 155 |
| Indirect and Induced Employment Foregone Due to Lower Harvests (annual avg. basis) | 99 |
| Total Employment Foregone Due to Lower Harvests (annual avg. basis) | 255 |
| **Financial Impacts of Lost Harvest Volume on Kodiak Economy (Annual Average, in Millions)** | |
| Direct Fishing and Processing Revenue Loss Due to Lower Harvests | $34.6 |
| Indirect and Induced Financial Loss Due to Lower Harvests | $11.2 |
| Total Financial Loss Due to Lower Harvests | $45.8 |

[1] Equal to first wholesale value less payments to fishermen.

[2] Employment estimate includes skipper and crew positions.

[3] Job figures are adjusted to an annual average basis because many fishermen derive income from other jobs or other fisheries.

Note: 2008-2011 does not include harvest or participation by beach seine fishermen, which are very small relative to purse seine and setnet gear types.

Source: McDowell Group calculations using ADFG data.

Potential employment benefits of Karluk restoration are more difficult to measure. Conceptually, it is clear the more permit holders and crew would be fishing in the Karluk-affected areas and earning more income if not for fisheries management measures implemented to protect Karluk sockeye. Similarly, processors would be earning additional revenue, hiring more workers, and paying greater wages, if not for Karluk-related salmon fishery closures. Further, with increased income for fishermen and processors, more spending would be occurring in the Kodiak economy (and elsewhere), creating jobs throughout the support sector. While very difficult to measure precisely, modeling conducted for this study suggests that total direct, indirect, and induced employment-related benefits associated with Karluk restoration are the equivalent of 255 jobs, measured on an annual average basis.

Based on this analysis, restoration of the Karluk sockeye resource, and the resulting increase in fishing effort in Karluk-affected areas, would have an annual benefit of $13.3 million in ex-vessel income for fishermen. It would also provide a total annual first wholesale value of $21.3 million, net of payments to fishermen. In other words, restoration of the Karluk sockeye resource has a potential benefit of $34.5 million annually in terms of direct economic output. Total annual output, including all direct, indirect, and induced effects, is estimated at $45.8 million.

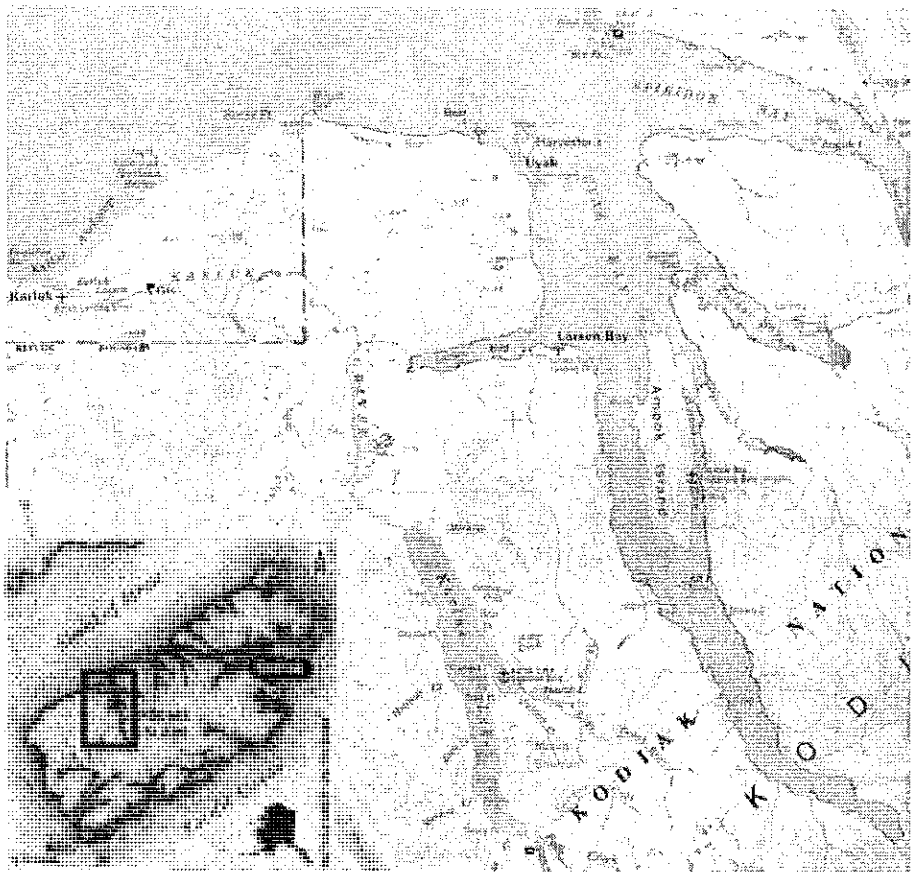
Poor Karluk sockeye runs have hit setnet fishermen particularly hard. Unlike seine boats, setnet fishermen "set" their nets along the same stretch of beach each year and cannot easily move to other areas. Many setnet fishermen continue to fish their permit hoping for an unexpected surge of salmon, but landing records and anecdotal evidence suggest setnetter revenues in Karluk-affected areas are at unsustainably low levels. Setnet fisheries are typically small, family-operated businesses which are less capitalized than other gear types.

## Statement of the Situation

The number of sockeye salmon *(Oncorhynchus nerka)* returning to the Karluk system on Kodiak Island, Alaska has declined precipitously since 2007. The smaller runs have negatively impacted the entire Karluk ecosystem, as well as the subsistence, recreational, and commercial users of this important salmon resource. Negative impacts on the commercial fishing and seafood processing industries of the area are quantified in this report. Historically, the Karluk system was one of the most productive sockeye systems in the world, and has the distinction of being among the first systems to support a commercial fishery in Alaska (Appendix B).

The Kodiak Regional Aquaculture Association (KRAA) proposes that a rehabilitation program be conducted, to increase Karluk sockeye salmon runs to their prior levels. KRAA has developed a proposal to implement a lake enrichment program, similar to a project carried out at Karluk Lake in the late 1980s, to rehabilitate sockeye salmon runs (discussed later in this report and in Appendix A). KRAA commissioned McDowell Group, Inc. to provide an economic impact assessment of the recent declines in Karluk sockeye production and the potential benefits of their proposed lake enrichment program.

**Map of Karluk Watershed and Surrounding Area**



## Land Ownership

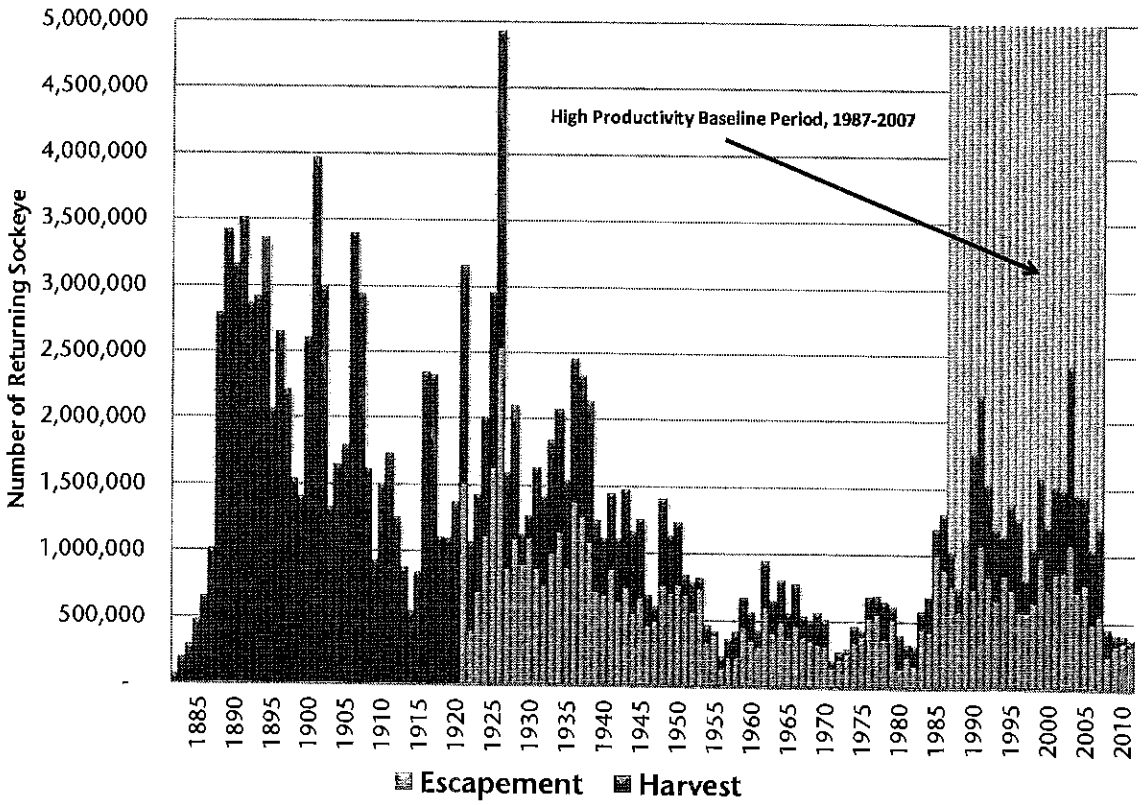
Karluk Lake is the largest lake on Kodiak Island, and drains a watershed of approximately 275 km$^2$. The lake, located on Kodiak Island's west side, is surrounded by Kodiak National Wildlife Refuge lands, which are administered by the U.S. Fish and Wildlife Service (USFWS), and private lands owned by Koniag, Inc. (an Alaska Native Regional Corporation).

## Background

Kodiak provides fertile habitat for all five Pacific salmon species and is famous for its red (sockeye) salmon. Relative to its size, Karluk Lake is one of the most productive sockeye systems anywhere in the world. Native peoples used the Karluk salmon runs long before Russian explorers came to Alaska. The community of Karluk sits near the original Native village site, and the area is dotted with traditional Native fishing camps.

The Karluk system has supported many centuries of subsistence use and has a long history of supporting large-scale commercial fisheries. Historical data for Karluk sockeye production (escapement and harvest) dates from 1882 (Appendix B). While early data (prior to 1985) may not be considered as accurate as more contemporary data, it is clear the Karluk River has long been a prolific sockeye producer.

**Historical Karluk Sockeye Escapement and Commercial Harvest, 1882 - 2011**




Sources: 1882-1936, Barnaby 1944; for 1937-1959, USFWS weir reports & agents' reports, ADFG, Kodiak; for 1960-1980, ADFG, Commercial Fisheries Division Area Annual Reports, Kodiak; for 1981-2011 harvest, Foster 2010 and Foster 2012; for 2011 escapement, Jackson 2011.

The Karluk sockeye salmon runs were once prolific but have changed over time. Prior to 1940, fishermen routinely harvested more than 1 million Karluk sockeye annually. However, since that time, commercial fishermen have exceeded the 1 million fish mark just three times. From 1940 to the mid 1980s the Karluk system experienced a period of reduced productivity. In the mid 1980s, productivity rebounded. This rebound was partly due to lake nutrient enrichment (fertilization) and other direct sockeye salmon enhancement efforts conducted by the Alaska Department of Fish and Game, with support from USFWS and KRAA. Since 2007, Karluk returns have declined significantly.

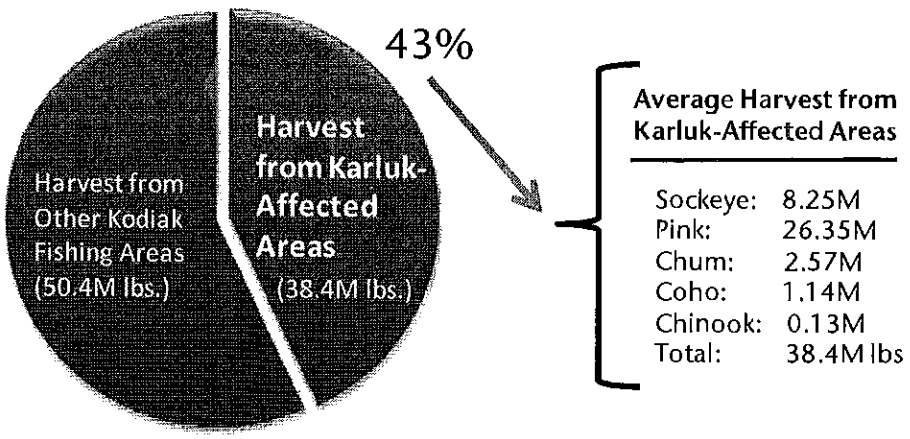
For purposes of this report, 1987 to 2007 is used as the high productivity baseline period. This reflects modern data collection practices for the commercial fishery and allows for use of recent commercial harvest data in Karluk-related fisheries. Calculations or references to the baseline period refer to these years or an average of data from this period.

## Karluk Lake Sockeye: A Key Stock in Kodiak's Fisheries

The Karluk system is a vital part of the fisheries in Kodiak's west side management areas. Most salmon fisheries in Kodiak are managed on a mixed stock basis with the dominant or major producing salmon systems driving fishing time in affected areas. Therefore, efforts to protect escapement in a normally dominant, major system can lead to fishery closures in widespread and relatively distant areas, to help protect escapement to the system of concern. In this way, the Karluk sockeye runs directly affect a wide range of Kodiak fishery "statistical areas" (see map in Appendix E), referred to in this report as "Karluk-affected areas." Fishing time in these affected areas is managed by ADFG to ensure escapement goals for Karluk sockeye salmon are met.

When the Karluk system was more productive - from 1987 to 2007 - salmon from these affected statistical areas accounted for 43 percent of Kodiak's total salmon harvest, on average. Weak returns of Karluk sockeye have forced closures in recent years and reduced overall harvest in the affected west side areas.

**Average Kodiak Salmon Harvest from Karluk-Affected Areas, 1987-2007**




Note: Averages exclude 1989 data, as there was little harvest due to the Exxon-Valdez oil spill.
Source: McDowell Group calculations using ADFG data.

During the 2008 to 2011 period, the average volume of all salmon species harvested in Karluk-affected areas fell by 58 percent compared to the average harvest during the 1987 to 2007 baseline period.

Karluk sockeye used to make up a substantial portion of the total value of salmon harvested in Karluk-affected areas. On average, from 1987 to 2007, Karluk sockeye represented 22 percent of the total ex-vessel value in these areas, or $3.4 million per year. Since 2007, Karluk sockeye have accounted for just 7 percent of the ex-vessel value of the salmon caught in Karluk-affected areas.

The percentage share of Kodiak salmon harvests coming from Karluk-affected areas has fallen significantly in recent years. Pink salmon harvested from other fishing areas has made up most of the difference (pink salmon have a rigid two-year return cycle, and the odd-even pink cycle can be observed in the data since 2007). Based on forecasts made by ADFG biologists, the 2012 Kodiak salmon harvest should be in the range of 50 to 60 million pounds. This would be an improvement over 2010, but significantly less than the 83 million pounds the Kodiak commercial salmon fisheries averaged from 1987 to 2007.

Although 2011 was below-average in terms of harvest volume, the total value of the 2011 Kodiak commercial salmon harvest was greater than any since 1995 - when over 180 million pounds were caught – due to higher prices.

## Methodology

In order to quantify the economic impact of low sockeye production from Karluk Lake, a baseline time period, as well as a baseline study area, was established. The years 1987 to 2007 were selected as the baseline period because they represent a substantial length of time during which the Karluk system was relatively productive. The volume of production during the established baseline period is assumed to provide an estimate of what the system is capable of sustainably producing today.

Karluk sockeye runs pass through, and therefore affect fishing time, in a wide range of fishing areas. In an effort to meet Karluk sockeye escapement goals, fishing effort and harvest of all salmon species is constrained near Karluk and in other areas that Karluk sockeye salmon transit. As a result of these Kodiak salmon management policies, the baseline study area must encompass all areas and salmon stocks that may be affected by Karluk sockeye run strength.

Karluk sockeye run strength influences commercial fishing opportunities for much of Kodiak's west side. Karluk sockeye affect fishing opportunity in the following statistical areas: 25930-25934, 25936-25939, 25110, 25120, 25311-25441, 25510, 25520, 25625, 25630, and 25640. A map of these areas, in relation to other fishing areas in Kodiak, can be found on page 4.

The Alaska Department of Fish and Game provided data for this report from season summaries, fish tickets, and the Commercial Operators Annual Report. Information from the Alaska Department of Labor and Workforce Development (DOLWD) was also utilized. In addition, interviews were conducted with high-level employees of local stakeholder organizations, including: Koniag, Karluk Wilderness Adventures (a subsidiary of Koniag, which operates bear-viewing tours in the area), Larsen Bay Lodge, Zachar Bay Lodge, Icicle Seafoods, and several fishermen. After conducting these interviews and researching Karluk sport fishing data; the study team decided against including the economic impacts of the Karluk salmon sport fishery in the economic baseline for Karluk sockeye. Sport fishing lodges and guides would likely benefit from more sockeye in the

river, but it was not possible to determine how much sales would improve due to better Karluk sockeye production. Also, while Kodiak brown bear populations in the Karluk watershed would likely benefit from improved sockeye runs, it was not possible to forecast what sort of bear population change would be required to affect the number of tourism dollars spent viewing those bears. Strong Karluk sockeye salmon runs would be beneficial for both sport fisheries and bear populations, and therefore benefit associated local businesses to some degree.

Multiplier impacts occurring within the Kodiak economy and U.S. economy were estimated using IMPLAN, an economic modeling software package. IMPLAN is an input-output model that is widely used to forecast secondary impacts associated with changes to an economy.

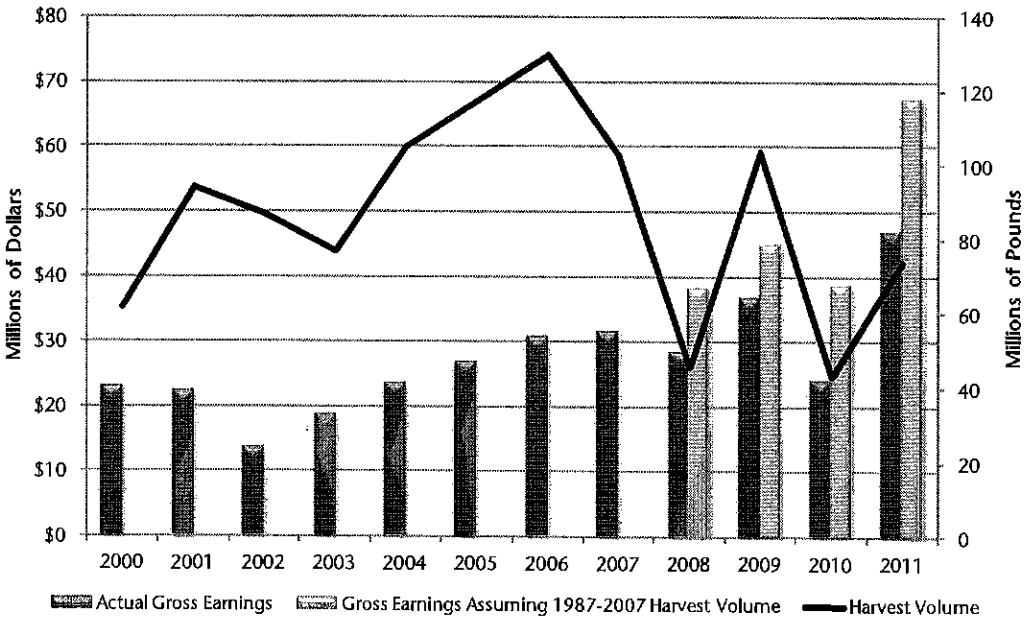
# Karluk and the Kodiak Salmon Fisheries

## Kodiak Commercial Salmon Fisheries

Kodiak salmon fisheries employ just over 1,000 fishermen and is a crucial part of Kodiak's seafood industry.[4] Roughly one-third of all Kodiak fishermen target salmon[5]. All five species of salmon are harvested in Kodiak, using three different gear types: purse seine, beach seine, and setnets (gillnets).

Total harvest values have increased in recent years despite declining harvest volumes. Total 2011 ex-vessel value was 53 percent higher than 2006, even though the 2011 harvest volume was 43 percent lower than the 2006 harvest. The graph below shows actual salmon harvest ex-vessel value from 2000 to 2011 and the potential harvest value if Karluk-affected areas had produced their historical average harvest volume since 2007. The salmon fishery has been operating below its potential since 2008.

**Kodiak Salmon Harvest Volume and Ex-Vessel Value, 2000 - 2011**




Note: 2011 data is preliminary and subject to change.
Source: ADFG, Division of Commercial Fisheries.

Earnings and employment increased slightly during the past several years, but not to the extent possible. Prices increased substantially since 2003. This has lured some latent seine permits back into the fishery, but low harvests limit the fishery's potential.

[4] McDowell Group estimate based on CFEC permit data and fishermen interviews.
[5] According to 2009 DOLWD data.

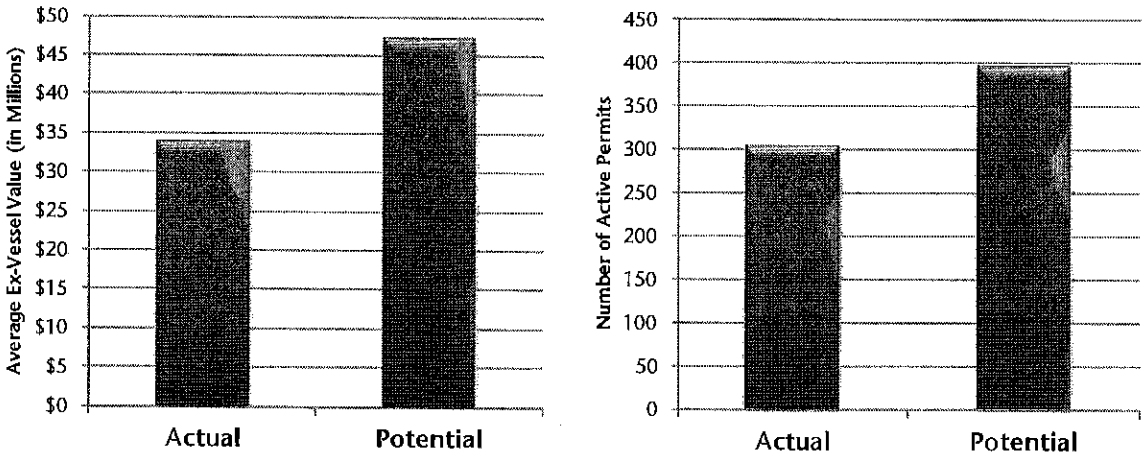
From 2008 to 2011, the average price of Kodiak salmon increased 118 percent (compared to the 2004-2007 average), but total gross earnings only increased by 21 percent. This is because the average harvest volume declined 41 percent between the two periods.

Low harvest figures in recent years are due to a number of factors, the weakness of the Karluk system being one of the most significant. Many fishing areas have been closed at some point in recent years in an effort to secure Karluk sockeye escapement. Thus, while the salmon industry has been relatively lucrative for other Alaska fishermen in recent years, Kodiak fishermen have not reaped the same benefits associated with high salmon prices, due to reduced harvest volume.

The weakness of the Karluk sockeye return, and corresponding reduction in salmon harvest from Karluk-affected areas, translates to a substantial lost opportunity for the Kodiak-area industry. While seine fleet participation has increased slightly in recent years (due to higher salmon prices), participation by Kodiak seine permit holders remains among the lowest in the state; only about half of Kodiak's seine permits were actually fished in 2011.

If not for the weak Karluk sockeye runs, Kodiak fishermen could access the full harvestable surplus of salmon in the Karluk-affected areas - on the order of 30 to 40 million additional pounds annually. This would almost certainly drive higher participation among Kodiak salmon permit holders, higher production for Kodiak processors, and increases in associated economic activity throughout the Kodiak economy.

**Actual and Potential Number of Active Kodiak Salmon Permits and Ex-Vessel Value, 2008-2011**




Note: Actual data refer to 2008-2011 averages for seine and setnet fishermen only; beach seine activity is not included here.

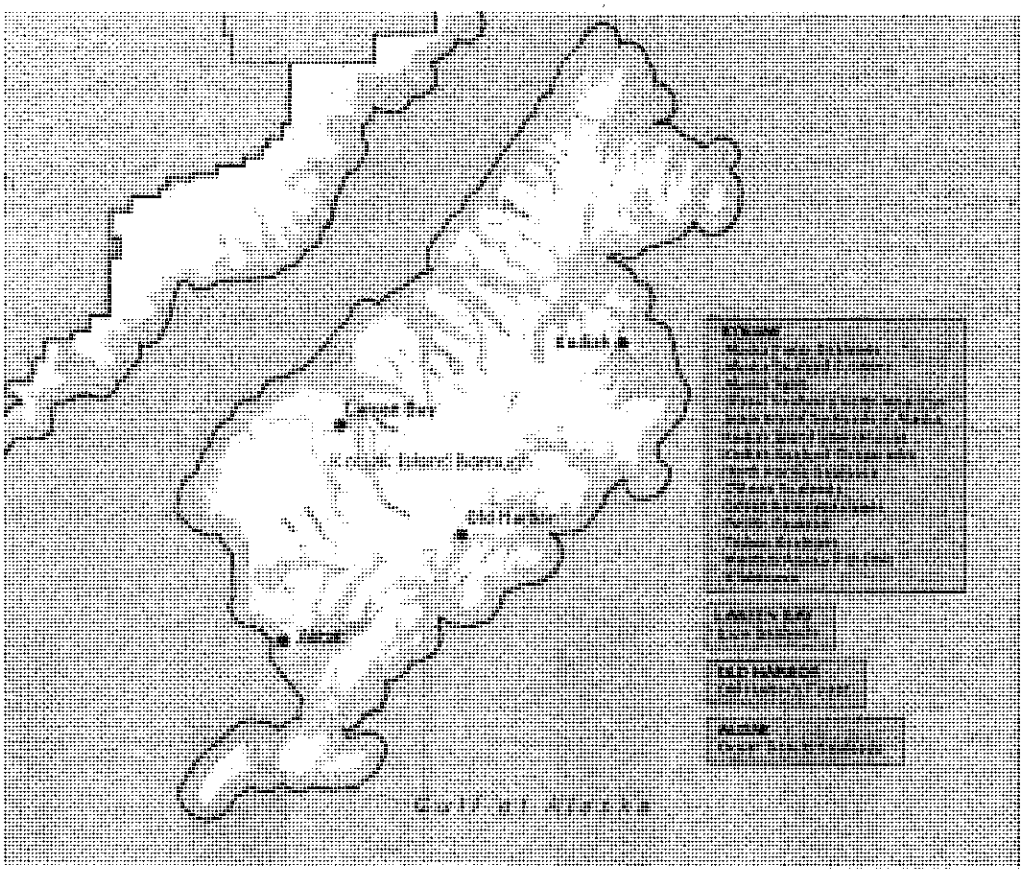
Source: McDowell Group calculations using ADFG data.

Potential ex-vessel earnings and employment are calculated using a methodology described on pages 29-30. Ex-vessel prices for Alaska sockeye, pink, and chum salmon are correlated with global supply and demand for those species/markets, and the volumes associated with Kodiak fisheries would not significantly affect supply-related market performance. It is likely that ex-vessel prices paid to Kodiak fishermen from 2007 to 2011 would not have been affected even with larger harvest volumes.

# Kodiak Salmon Processing Industry

Kodiak Island supports nine shore-based processors, as well as dozens more direct marketers. Salmon is a key species for almost all the plants and direct marketers on the island. From June through September, the Kodiak processing industry employs nearly 2,000 workers annually. In 2010, companies paid $68.5 million in wages.

**Kodiak Seafood Processing Plants**



Source: DOLWD Map, altered by McDowell Group.

Kodiak is somewhat unique in the seafood processing industry. Because of the island's diverse portfolio of commercial species (salmon, crab, pacific cod, yellowfin sole, and halibut), seafood processing plants have longer operating seasons. As a result, the majority of the Kodiak processing labor force is made up of Alaska residents, and over 40 percent of Kodiak's processing workers have worked in the industry for more than four years. This compares with seafood processing operations in more remote areas of Alaska, where it is not uncommon for out-of-state residents to make up over 80 percent of the workforce.

The Karluk River impacts almost all of the island's processors to some extent, but the Icicle Seafoods plant at Larsen Bay relies most heavily upon Karluk salmon. In 2007, the plant sourced 85 percent of its pack from the Karluk system. Since that season, the volume of salmon run through the plant has declined significantly. The

Larsen Bay plant employs roughly 240 workers seasonally and typically buys fish from a group of 20 seiners and 18 setnetters.

Clearly, the processing sector would also benefit from a lake enrichment program at Karluk. Processing employment may rise slightly, but the primary benefits would be longer hours, and therefore more income, for the existing workforce. Indirect and induced effects of processing operations would also grow, as processors and their employees spend more money in the local economy.

## Favorable Conditions for Wild Alaska Salmon Markets

High prices have allowed Kodiak fishermen to stay in business while catching fewer fish than they used to. However, if prices fall and Karluk runs continue to languish, some fishermen may exit the fishery.

Alaska's commercial salmon industry dates to the late 1800s and is twice as old as the state itself (Appendix B). From the 1890s through the 1990s, Alaska was the salmon capital of the world. Prices generally fluctuated based on what was happening with Alaska salmon production. Since the early 2000s, farmed salmon have overtaken wild salmon to become the dominant source of world supply.

In 2002, the salmon value crisis hit Alaska. Farmed salmon supplies had flooded the market, and prices for Alaska salmon dropped quickly whilst harvest volumes also declined in some major areas. The impact was devastating for Alaska's seafood industry and the local economies that depend on it.

Since 2002, a number of efforts have been made to improve the quality of wild Alaska salmon, create new products/markets, and to market the intrinsic qualities of Alaska salmon. As a result, prices for Alaska salmon have improved, so much so that frozen Alaska sockeye often sells at a premium to fresh farmed Atlantic salmon.

Salmon prices for wild and farmed species were at historically high levels coming into 2011. However, during the early summer, farmed salmon prices collapsed as Chile began supplying the market in greater quantities. Prices for Alaska salmon appear firm at the moment, but the current wholesale price spread has not yet hit the retail market.

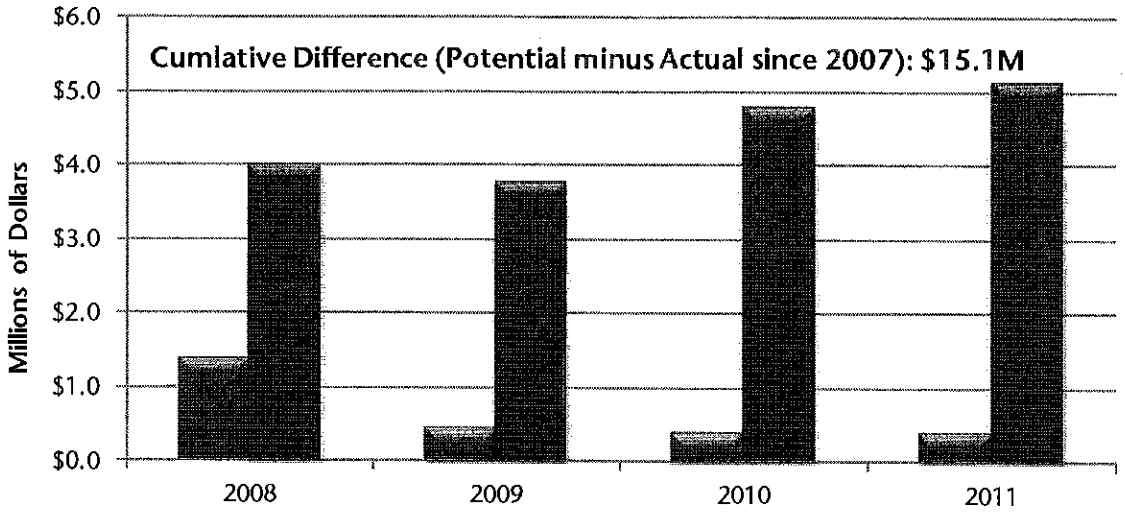
A declining sockeye price - in response to lower farmed salmon prices – coupled with continuing weak runs, would have major implications for the Kodiak salmon fishery. Setnet fishermen would be hit especially hard. Setnetters rely on catching higher-value sockeye salmon more than seiners and cannot move their operations to follow the fish or avoid area closures.

# Economic Benefit of Increased Karluk Lake Sockeye Production

From 1987 to 2007, commercial fishermen caught an average of 621,000 Karluk Lake sockeye salmon. Since 2007, improving prices for all Alaska salmon have increased the value of that resource, but poor harvests have prevented Kodiak fishermen and processors from realizing the unit-value gains.

If Karluk sockeye harvests had remained at their recent historical average, Kodiak fishermen would have earned a total of $17.6 million in ex-vessel earnings since 2008. Instead these fishermen have earned $2.5 million, meager earnings considering Karluk sockeye are harvested by hundreds of fishermen.

**Actual and Potential Karluk Sockeye Salmon Harvest Value, 2008 - 2011**




Note: 2011 data is preliminary and subject to change. Data pertains only to Karluk sockeye.
Source: McDowell Group calculation based on ADFG data.

The proposed KRAA Karluk Lake enrichment project is aimed at restoring sockeye runs back to the recent baseline level. If successful, rehabilitating Karluk Lake would provide more than 600,000 sockeye for the commercial seafood industry; or 577,000 more Karluk sockeye than were harvested in 2011.

Estimating the number of jobs related only to returning Karluk sockeye is a tenuous calculation because fishermen operating in Karluk-affected areas harvest all five salmon species from a variety of stocks. However, historical harvest data and contemporary price data suggest fishermen have lost $15.1 million since 2007, related specifically to harvesting fewer Karluk sockeye. Kodiak fishermen and processors have lost many millions more as a result of management actions taken to curtail fishing effort in Karluk-affected areas, in order to protect the weak Karluk sockeye runs. These impacts are addressed in the following section.

# Economic Benefit of Increased Harvest of All Salmon Species from Karluk Affected Areas

According to KRAA, the lake enrichment project proposed for Karluk Lake is not intended to increase returns beyond the productive capacity of the local ecosystem. The project is essentially an attempt to repair poor rearing conditions within the lake and thereby increase salmon production to levels the lake has sustained in the recent past. This would allow the Kodiak salmon fishery to operate closer to its potential.

The entire Kodiak salmon fishery is operating below its economic potential. Quantifying the number of jobs at stake, the income that has been lost already, and the economic value associated with returning runs to their prior levels requires a biological and economic baseline associated with the resource. Once the baseline is known, the size of the potential Kodiak salmon industry can be estimated.

## Economic Impact of Fisheries Affected by Karluk Sockeye

### Baseline Commercial Harvests

The baseline period for this study was chosen to reflect a fairly long, recent period of high productivity. The 20-year period from 1987 to 2007 presents a data-rich and relevant baseline period. The 1987 season represents the first year adult sockeye salmon returned to the Karluk after the lake nutrient enrichment program began in the spring of 1986. The 2007 season marks the last substantial Karluk sockeye run, which has been followed by four years of poor runs.

From 1987 to 2007, the average commercial harvest of Karluk sockeye and other salmon species from areas affected by Karluk-driven management decisions is shown below. These average harvest volumes are used as the biological baseline in order to establish what can be expected as a sustainable harvest given a healthy Karluk return.

**Baseline Commercial Harvest of Kodiak Salmon from Karluk-Affected Areas, 1987 - 2007**

| Salmon Species | Average Harvest (lbs.) |
|---|---|
| Pink | 26,350,000 |
| Sockeye | 8,250,000 |
| Chum | 2,570,000 |
| Coho | 1,140,000 |
| Chinook | 130,000 |
| **All Salmon Species** | **38,430,000** |
| **Harvest in Affected Areas, as a Percent of Average Kodiak Salmon Harvest** | **43%** |

Note: Averages do not include 1989 season, when the Exxon-Valdez oil spill essentially closed the fisheries. Totals may not sum due to rounding.
Source: McDowell Group calculations using ADFG data.

## Calculating the Economic Baseline

In order to establish an economic baseline, the harvest baseline must be converted to economic terms: jobs, wages, and revenues. In essence, the question is: how many jobs are created or sustained for every million pounds of salmon harvested? After the harvest baseline has been converted to economic terms, the baseline can be compared to contemporary harvest data from Karluk-affected areas to assess what has been lost with declining returns and reduced harvest opportunities.

The relationship between the size of the resource and the number of jobs it creates is not static - the ratio changes based on market prices, regulatory changes, and structural changes within the industry. A million pounds of salmon sold into the U.S. market probably would have created more U.S. jobs in 1988 than the same million pounds harvested today. This is because in 1988 salmon prices were higher (on an inflation-adjusted basis), fishing costs were lower, and the retail industry was less consolidated than it is today. More fishermen and more retail jobs would have been created based on the same resource. However, a million pounds of salmon caught in 2011 would likely employ more people than the same volume caught in 2002 because those fish in 2011 were much more economically valuable due to higher market prices.

Estimating the direct economic impacts that could have reasonably accrued had the Karluk-affected areas produced biological baseline volumes of salmon involves the following calculations: [6]

**COMMERCIAL FISHING:**

***Revenue***

*Karluk-Affected Area Harvest by Species from Baseline Period (in lbs.)*

*x Current Year (2011) Ex-vessel Prices by Species*

*Estimated Ex-vessel Earnings Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught at 2011 Prices*

...

***Jobs***[7]

*Average Ex-vessel Earnings for Seiners + Additional Ex-Vessel Earnings Had Seiners harvested their Historical Share of the Baseline Volume (average of past two years, 2010-2011)*

*/ Average Ex-Vessel Earnings per Seiner from Last Two Years*[8]

*Estimated Number of Active Kodiak Seine Permits Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught*

...

[6] Direct impacts refer to the effect on just the primary industry, not the secondary jobs created in other support industries or jobs created by household spending.

[7] The number of permits outstanding is a limiting factor for potential employment. In the event the baseline harvest volume suggests a number of active permits above the number of total number of permits available, the latter is used to calculate employment.

[8] The seine fleet is growing in Kodiak, and it is obvious that fishermen are willing to enter the fishery at recent earnings levels. If more harvest volume was available, as it was from 1987-2007, at today's prices, it is very likely that more seine permits would become active. Two-year average revenue is used in the case of the seine fleet because earnings tend to rise and fall with the two-year pink salmon abundance cycle.

*Current[9] Year (2011) Ex-vessel Earnings for Setnetters + Additional Ex-vessel Earnings Had Setnetters Harvested their Historical Share of the Baseline Harvest Volume*

*/ Target Ex-vessel Earnings per Setnetter from Current Year[10]*

*Estimated Number of Active Kodiak Setnet Permits Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught*

...

*Estimate of Active Seine Permits from Above x 4 (Skipper + Crew)*

*+ Estimate of Active Setnet Permits from Above x 1.5 (Skipper + Crew)*

*Estimated Number of Kodiak Fishermen Employed in 2011 Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught*

*x Historical percentage of Harvest Caught in Karluk-Affected Areas During Baseline Period (43%)*
*Estimated Number of Commercial Fishing Jobs Created in 2011 by Baseline Harvest Volume*

***Income[11]***

*Prior 5-year Average Ex-vessel Earnings for all Kodiak Salmon Fishermen*

*x 0.55 (to Estimate Operational Costs Paid by Fishermen, not Including Crew Labor)*

*Estimated Annual Salmon Fishing Expense*

*/ Number of Salmon Permits Fished (Prior 5-year Average)*

*Estimated Annual Salmon Fishing Expense per Permit*

...

*Estimated Ex-vessel Earnings Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught at 2011 Prices (from above)*

*- (Estimated Salmon Fishing Expense per Permit * Estimated Number of Active 2011 Salmon Permits assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught)*

*Estimated Commercial Salmon Fishing Income Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught*

## Seafood Processing:

***Jobs***

*(Estimated Ex-vessel Earnings relating to Baseline Harvest Volume in Karluk-Affected Areas at 2011 Prices /Total Ex-Vessel Value of All Kodiak Seafood in 2011)*

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[9] Setnet jobs are estimated using current year earnings because earnings and participation in that fishery have been much more consistent in recent years than the seine fishery. Two year averages were used with the seine fishery because the seine fishery is largely impacted by the two year pink salmon abundance cycle. This can cause harvests to fluctuate greatly from year to year in the seine fishery.

[10] The setnet fleet is shrinking, and based on interviews with local fishermen and processors, it is obvious that the current level of average earnings per permit is not sufficient to attract fishermen into the fishery. Therefore, in order to estimate the size of the fleet if we incorporate the 1987-2007 baseline harvest volume, we must establish what level of earnings per permit would be acceptable. After discussions with local experts, the study team chose $45,000 for year 2011. According to CFEC, the average earnings per set gillnet permit in Kodiak from 2007-2010 was $41,925. The average earnings per permit in 2011 were $31,137 (preliminary figures). These dollar figures represent gross revenues from fishing, and do not indicate the level of actual profit.

[11] If the composition of the fleet changes drastically, additional steps would be required to estimate the costs and profits associated with each gear type. Thus far, changes in the makeup of the Kodiak fleet have not been large enough to significantly effect this calculation.

*x Seafood Processing Jobs in Kodiak*

*Estimated Number of Seafood Processing Jobs Created by Baseline Harvest Volume*

***Revenue***

*Karluk-Affected Area Harvest by Species from Baseline Period (in lbs.)*

*x Current Year (2011) First Wholesale Prices by Species*

*Estimated First Wholesale Revenue Assuming Baseline Harvest Volume in Karluk-Affected Areas Had Been Caught at 2011 Prices*

***Income***

*Average Income per Seafood Processing Job for Current Year (2011)*

*x Number of Seafood Processing Jobs Created by Baseline Harvest Volume*

*Estimated Processing Income Created by Baseline Harvest Volume in 2011*

## Economic Baseline Results

It is necessary to perform these calculations each time an assessment is performed, because the economic impact of the biological resource changes over time. In a few cases, data for 2011 did not exist.[12] In these cases, data from the most recent year was used as a proxy.

Employing contemporary data to perform the calculations results in the following estimates of the baseline economic impact of salmon harvests in areas affected by the Karluk sockeye system.

**Economic Baseline Related to Salmon Harvests in Karluk-Affected Areas, 2011**

| | |
|---|---|
| **Commercial Fishing** | |
| Number of Workers (skippers and crew) | 480 |
| Number of Jobs (annual avg. basis) | 322 |
| Estimated Labor Income (in millions) | $16.0 |
| Estimated Gross Revenue (in millions) | $25.8 |
| **Seafood Processing** | |
| Number of Workers (peak employment) | 447 |
| Number of Jobs (annual avg. basis) | 246 |
| Estimated Labor Income (in millions) | $10.4 |
| Estimated Gross Revenue (in millions)[1] | $37.9 |
| **Direct Economic Baseline (Not Including Multiplier Effects)** | |
| Number of Workers (total participation) | 928 |
| Number of Jobs (annual avg. basis) | 568 |
| Estimated Labor Income (in millions) | $26.5 |
| Estimated Gross Revenue (in millions) | $63.7 |

[1] Gross processing revenue is calculated net of payments made to fishermen.
Note: Totals may not sum due to rounding.
Source: McDowell Group calculations using ADFG and DOLWD data.

[12] Labor data for 2011 was not readily available, but the number of processing jobs and the resulting income are relatively stable. Data from the most recent year available was used, if necessary.

These impacts have secondary effects on Kodiak's economy as well as ripple effects in the national economy. Secondary impacts of these direct effects can be modeled using input-output modeling software such as IMPLAN. The IMPLAN model measures employment on an annual average basis, therefore, the seasonal jobs figures calculated above have been converted to an annual average-basis. Multiplier effects of these jobs are shown on the following page.

**Total 2011 Economic Impact of Karluk-Affected Areas Assuming Baseline Harvest Volume**

| Effects on Kodiak Regional Economy | Direct Effects | Indirect and Induced Effects | Total Economic Impact |
|---|---|---|---|
| **Commercial Fishing** | | | |
| Number of Jobs (annual avg. basis)[1] | 322 | 129 | 451 |
| Estimated Labor Income (in millions) | $16.0 | $5.6 | $21.7 |
| Estimated Revenue (in millions) | $25.8 | $11.6 | $37.4 |
| **Seafood Processing** | | | |
| Number of Jobs (annual avg. basis)[1] | 246 | 42 | 288 |
| Estimated Labor Income (in millions) | $10.4 | $2.4 | $12.8 |
| Estimated Value-Added (in millions)[2] | $37.9 | $7.1 | $44.9 |
| **Total Seafood Industry** | | | |
| Number of Jobs (annual avg. basis)[1] | 568 | 171 | 739 |
| Estimated Labor Income (in millions) | $26.5 | $8.0 | $34.5 |
| Estimated Output (in millions)[3] | $63.7 | $18.7 | $82.3 |
| **Effects on U.S. Economy** | **Direct Effects** | **Indirect and Induced Effects** | **Total Economic Impact** |
| **Commercial Fishing** | | | |
| Number of Jobs (annual avg. basis)[1] | 322 | 232 | 554 |
| Estimated Labor Income (in millions) | $16.0 | $15.6 | $31.6 |
| Estimated Revenue (in millions) | $25.8 | $38.4 | $64.2 |
| **Seafood Processing** | | | |
| Number of Jobs (annual avg. basis)[1] | 246 | 289 | 535 |
| Estimated Labor Income (in millions) | $10.4 | $24.6 | $35.0 |
| Estimated Value-Added (in millions)[2] | $37.9 | $43.5 | $81.4 |
| **Total Seafood Industry** | | | |
| Number of Jobs (annual avg. basis)[1] | 568 | 520 | 1,088 |
| Estimated Labor Income (in millions) | $26.5 | $40.2 | $66.6 |
| Estimated Revenue (in millions)[3] | $63.7 | $81.9 | $145.6 |

[1] Prior job figures have been converted to an annual average basis using data available from DOLWD.

[2] Value-added figures for the processing industry are equal to the total first wholesale value ($63.7 million) less the cost of that fish ($25.8 million).

Note: Totals may not sum due to rounding. Effects on the US economy are inclusive of effects on the Kodiak economy.

Source: McDowell Group calculations using ADFG, DOLWD, and IMPLAN data.

These data suggest that if 38.4 million pounds of salmon are harvested from the areas impacted by the Karluk system, 1,088 jobs and $145.6 million in output are generated in the U.S. economy, given current market conditions. It is estimated the baseline harvest volume directly creates 568 jobs (annual average basis) in the commercial seafood industry, while multiplier impacts create an additional 520 jobs in the US and Kodiak economy.

If prices remained static, and commercial salmon harvests in Karluk-affected areas go to zero, it is estimated that the Kodiak seafood industry would eventually lose or forgo jobs for 928 workers. In addition, it is projected the Kodiak economy would lose or forgo another 171 jobs (annual average basis), which are created indirectly.

### Interpreting Economic Impact Analysis

Economic impact analysis of this type comes with a few caveats. Employment changes are instantaneous in the model, but rarely so in real-life. Improving or declining conditions within an industry can take time to impact employment. Fishing and processing jobs are what economists sometimes call "sticky." Fishermen may go fishing regardless of a poor forecast because that is their livelihood. Likewise, a processing plant may decide to open with the hope that the poor forecast is wrong. As such, even if no salmon were harvested from these areas in 2012, and prices stayed the same, the commercial fishing industry would not immediately lose 480 (seasonal) jobs. The loss would occur gradually, depending on a variety of factors. Over time a competitive industry must reach equilibrium. If lower revenues persist, it will eventually lead to lower employment and smaller secondary impacts both in the regional and national economy.

If the volume of salmon caught in these Karluk-affected areas is down nearly 60 percent, why is participation and earnings up in the salmon fishing and processing industries? The answer is rising prices for fishermen and favorable market conditions for processors. Further, purse seiners are able to move to other areas not affected by the poor Karluk runs (employment in the [mobile] purse seine fleet has grown, while participation in the [immobile] setnet fishery has fallen).

Higher prices for salmon and other commercial species have offset smaller salmon harvests in Kodiak, so the industry has registered modest employment gains in recent years. However, if fishermen were still able to harvest the 1987-2007 baseline from Karluk-affected areas at today's prices, employment figures and permit values would be growing at a faster rate.

## Negative Impacts of Poor Salmon Returns in Recent Years

Poor Karluk sockeye returns have had a measureable negative impact on Kodiak salmon fishermen. Setnet fishermen continue to show up at their beach sites, hoping the forecast will be wrong and they will be allowed to catch more fish. A large number of purse seiners have moved to other areas, where they may be less accustomed to fishing and the fishing is more crowded. Salmon processors, including the Icicle Seafoods plant at Larsen Bay, continue to operate, but at lower volumes.

Using available data, the study team estimates Kodiak's commercial fishing industry loss includes the equivalent of as many as 232 jobs[13] and up to $53.3 million[14] in gross earnings due to poor harvest conditions in Karluk-related areas from 2008 to 2011. These estimates represent the additional amount of economic activity that could have reasonably occurred if harvest volumes in 2008-2011 had come in at baseline (1987-2011) levels in Karluk-related areas.

Thus far, poor Karluk sockeye runs have not had a large impact on employment in the island's seafood processing industry. However, if salmon values retreat and harvest figures do not improve, it is possible one or more of the island's plants could close.

**Economic Impact of Lower Harvest Volumes in Karluk-Affected Areas, 2008 - 2011**

| | |
|---|---|
| **Purse Seine** | |
| Average Baseline Harvest Volume (1987-2007) in lbs. | 27,080,000 |
| Actual Average Harvest Volume (2008-2011) in lbs. | 10,460,000 |
| Average Annual Ex-vessel Earnings Lost (2008-2011) | $9,320,000 |
| Total Ex-vessel Earnings Lost (2008-2011) | $37,260,000 |
| Average Number of Kodiak Seine Permits Fished (2010-2011)[1] | 165 |
| Projected Number of Kodiak Seine Permits Fished with Additional Baseline Harvest Volume[2] | 208 |
| Estimated Seine Employment Lost Due to Lower Harvests[2] | 173 |
| **Set Gillnet** | |
| Baseline Harvest Volume (1987-2007) in lbs. | 11,240,000 |
| Actual Average Harvest Volume (2008-2011) in lbs. | 5,860,000 |
| Average Annual Ex-vessel Earnings Lost (2008-2011) | $4,000,000 |
| Total Ex-vessel Earnings Lost (2008-2011) | $15,990,000 |
| Average Number of Kodiak Setnet Permits Fished (2008-2011) | 149 |
| Projected Number of Kodiak Setnet Permits Fished with Additional Baseline Harvest Volume[1] | 188 |
| Estimated Setnet Employment Lost Due to Lower Harvests[2] | 59 |
| **Total Estimated Employment Lost Due to Lower Harvests** | **232** |
| **Average Ex-vessel Earnings Lost (2008-2011)** | **$13,310,000** |
| **Total Estimated Ex-vessel Earnings Lost (2008-2011)** | **$53,250,000** |

[1] Due to differences in the seine fishery, using the 2008-2011 average number of active permits would have overestimated the amount of employment lost. Therefore the average number of active permits from 2010-2011 was utilized.

[2] Employment figures are not presented on an annual average basis.

Source: McDowell Group estimates using ADFG data.

With each consecutive poor season, there are likely to be more fishermen, and perhaps a few processing plants, who consider exiting the business or moving to other fisheries outside the region.

[13] These jobs refer to commercial fishing jobs in Kodiak's seine and set gillnet fisheries. These jobs are not presented on an annual average basis here, and would not be comparable to jobs presented on an annual average basis elsewhere. Although seasonal in nature, many fishermen do earn the majority of their income in these summer fisheries.

[14] Estimated cumulative lost gross earnings from 2008-2011.

## Projected Economic Benefit of the Karluk Lake Enrichment Program

If Karluk sockeye returns are restored, it is likely jobs which have not materialized due to small harvests would appear in the fishery. This can be looked at as the difference between where the Kodiak salmon industry is currently, and where it could potentially be with additional harvest volume.

It is estimated that 232 commercial salmon fishing jobs have been lost or forgone due to lower harvest volume in Karluk-affected areas. These figures represent the difference between employment in Kodiak fisheries now and the projected employment which would likely have occurred if baseline harvest levels would have continued through 2011. These jobs could be restored by a Karluk rehabilitation project.

**Projected Economic Benefit of Successful Karluk Lake Rehabilitation, at 2011 Values**

| | |
|---|---|
| Number of Workers Restored (skippers and crew) | 232 |
| Number of Jobs Restored (annual avg. basis) | 155 |
| Number of Indirect and Induced Jobs Restored (annual avg. basis) | 99 |
| Total Number of Jobs Restored (annual avg. basis) | 255 |
| Estimated Additional Ex-vessel Value for Fishermen (in millions) | $13.3 |
| Estimated Additional Net Processing Revenue[1] (in millions) | $21.3 |

[1] Equal to first wholesale value less payments to fishermen.
Note: Totals may not sum due to rounding.
Source: McDowell Group estimates.

Even if poor Karluk sockeye runs persist, salmon harvests in Karluk-affected areas will not go to zero. However, the quality of jobs which rely on salmon from those areas will be negatively impacted. Based on this analysis, poor Karluk sockeye runs impact as many as 928 commercial fishing and seafood processing jobs to some extent. Some of these jobs have been lost, some have not materialized due to the poor harvests, and some jobs continue to earn some income by utilizing the resources still available in Karluk-affected areas.

It is important to note that these impacts would vary with fluctuations in prices, conditions in the industry (consolidation/etc), and the harvest of fish in Karluk-related areas, regardless of whether an enrichment program is carried out. Given the number of salmon stocks that are present in affected areas, it is unlikely that they would ever be completely closed down by conditions at Karluk. However, we also cannot forecast how much further harvests in affected areas can fall due to poor sockeye runs to Karluk. Regardless of whether harvests continue to decline in these areas, the negative shock has already taken place, and its effects are still rippling through the seafood industry.

# The Proposed 2012 Karluk Lake Enrichment Plan

KRAA proposes a three-phase lake enrichment program extending for a period of no less than seven years. No State or federal document outlining best practices for lake enrichment projects has been produced since ADFG's "Policy and Guidelines for Lake Enrichment Projects" (ADFG 1979). Lake enrichment is not new or

unusual in Alaska, a total of 27 Alaska lakes have undergone enrichment programs since 1950. The latest Kodiak area enrichment project took place at Little Kitoi Lake and ended in 2001. Nutrient enrichment programs are currently ongoing at several lakes in Alaska. In lieu of any contemporary guidelines, KRAA used the 1979 document as a frame of reference and retained Dr. Dana Schmidt, a former ADFG Kodiak research biologist and the former ADFG principal limnologist[15], to consult and advise on the project.

The Karluk Lake Enrichment Plan suggests applying a nitrogen/phosphorus solution to the lake surface over a period of no less than five years via fixed-wing aircraft during the active enrichment phase. A monitoring program has been proposed that establishes protocol for determining baseline nutrient levels for the lake, nutrient targets, and data collection efforts that would extend at least two years beyond the active enrichment phase. These processes are consistent with past and current lake enrichment projects in Alaska and British Columbia.

Data is currently being collected for the pre-enrichment phase of the project. KRAA has published a proposal for the Karluk Lake Enrichment Project which includes a proposed enrichment regimen, a monitoring program for all three phases, and a summary of research carried out on the system since the late 1800s.

*Note: KRAA's proposal for the 2012 Karluk Lake Enrichment Project provides greater detail on the topics summarized in this section. A copy of the Karluk Lake Enrichment Project Proposal (KRAA 2012) can be found on the KRAA website (www.kraakodiak.org).*

## Projected Cost of Karluk Lake Enrichment

The enrichment project is expected to cost roughly $300,000 to $500,000 per year during a five-year active enrichment phase. Pre-enrichment study and permitting costs have been borne by KRAA or funded through a State of Alaska Designated Legislative Grant, with some portions funded by ADFG. Following the active enrichment phase, KRAA expects ongoing sampling and analysis to cost $90,000 per year for at least two years.

## Karluk Lake Landowners and Current Status

The U.S. Fish and Wildlife Service (USFWS) and Koniag, Inc. manage all the land surrounding Karluk Lake. As a result, KRAA will need to obtain permission from both entities to proceed with the project. Interviews with key staff employed by Koniag, Inc., an Alaska Native Regional Corporation, suggest the company does not object to the project and recognizes its potential benefit. However, Koniag, Inc. has not yet officially endorsed the project. USFWS has not yet approved the proposal, and is requiring that the plan meet requirements of the National Environmental Policy Act (NEPA). The Alaska Region USFWS informed KRAA that a categorical

[15] Dr. Schmidt has 35 years of experience as a limnologist and quantitative fisheries biologist. He has also served as the senior reviewer of British Columbia lake enrichment programs targeting Kokanee, and his research on the ecology of Karluk Lake sockeye salmon on Kodiak Island, Alaska, entitled "Influence of Carcass-derived Nutrients on Sockeye Salmon Productivity of Karluk Lake, Alaska: Importance in the assessment of an escapement goal," was named "Most Significant Paper" by the North American Journal of Fisheries Management

exclusion (CE) would not apply in this case. KRAA submitted a project proposal to USFWS in February 2012. At the time of this report, KRAA is waiting on USFWS internal review and compatibility determination.

## Acknowledgements

The authors would like to thank the Alaska Department of Fish and Game for providing data and counsel relating to this report. Specifically, James Jackson and M. Birch Foster were very helpful. Ed Ward and Fred Katelnikoff from Koniag, Inc. provided candid answers to difficult questions, and their input is much appreciated. Finally, we wish to recognize the dozens of biologists whose names appear in the reference section. Because of their research, we have an incredibly deep historical record for this important ecosystem - a record that can be used to make sound decisions going forward.

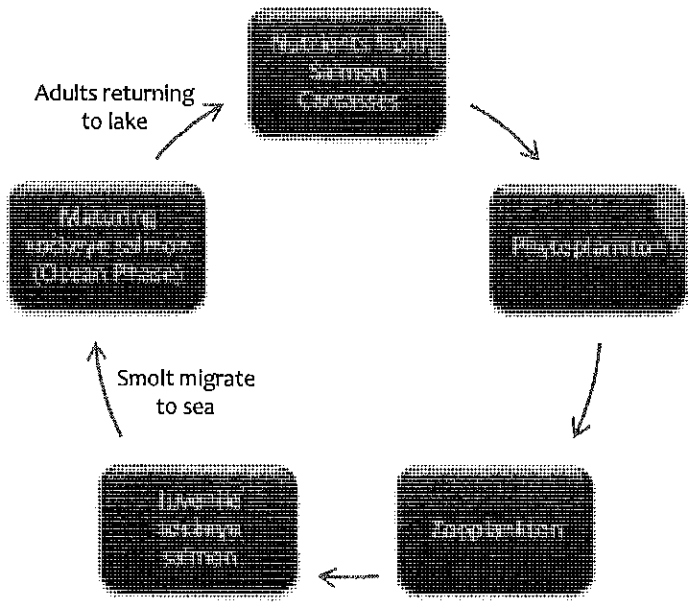
# Appendix A: The KRAA Karluk Lake Nutrient Enrichment Proposal, 2012

***Note: KRAA's full proposal for the 2012 Karluk Lake Enrichment Project provides greater detail on the topics summarized in this section. To provide the reader with the most direct information, some passages in this section have been quoted from the proposal. The proposal is available on the KRAA website (http://kraakodiak.org).***

## Background

Knowledge of the sockeye salmon life cycle is helpful in understanding the Karluk Lake enrichment project. Like all salmon, sockeye salmon hatch as alevins in freshwater riverbeds and lakeshores. After several months, alevins grow to become fry (averaging 1 inch) and stay in freshwater lakes for up to three years. After grazing in freshwater for one to three years, the juvenile salmon migrate towards the ocean in large groups as smolt. Sockeye salmon mature in the ocean for one to four years before returning to their original spawning ground to spawn and die. Large numbers of salmon carcasses provide essential nutrients for plant and animal life in rivers and lakes.

**Nutrient Cycling by Sockeye Salmon**




A spawning female salmon may release over 4,000 eggs, but only a few eggs will survive to become spawning adults. At Karluk Lake, the number of returning sockeye salmon has fallen precipitously. For every five fish that spawned in 2004, only two returned in 2009 (see Appendix C for historical return per spawner data). The declining returns have an ongoing biological effect on the Karluk Lake ecosystem and economic ramifications for Kodiak Island residents.

## Lake Enrichment and How It Works

Lake enrichment refers to the process of supplementing freshwater lakes with basic nutrients such as nitrogen and phosphorus, in an effort to promote biological productivity within the local food chain. Abundant levels of phytoplankton and zooplankton are key requirements for the growth of healthy juvenile sockeye salmon during the one to three years they spend in freshwater lakes. Lake enrichment adds nutrients to the lake, stimulating the growth of phytoplankton, which are consumed by small aquatic animals called zooplankton. The small zooplankton are the primary food source for juvenile sockeye.

A lack of food in the freshwater lake environment can result in higher juvenile salmon mortality, and lower growth rates for those that do survive. Small outmigrating sockeye smolts in poor condition are less likely to survive the one to three years they spend in the ocean than larger, healthy smolt emerging from a lake with an adequate food source. Edmundson and Mazumder (2001) found that zooplankton population density explained 52 percent of the variation in smolt length between various lake/river systems.

Lake enrichment projects, similar to the proposed project for Karluk Lake, typically span five to eight years, and not all are intended to be implemented on an ongoing basis. As mortality rates decline and runs improve, increasing numbers of salmon returning to their natal system will provide a naturally sustainable source of nutrients.

In order to achieve a uniform application of the nitrogen and phosphorus, fishery managers typically utilize fixed-wing aircraft to apply the nutrient mixture over the lake surface several times during the phytoplankton growing season.

## Why Natural Ecosystems May Benefit from Enrichment

Boom and bust cycles are common in many ecosystems. Phytoplankton levels fluctuate due to environmental pressures within a lake. These levels often have significant ramifications for larger species, which are connected to the phytoplankton through the food chain.

A number of factors can account for a lack of nutrients and, hence, primary productivity in a lake. Events or factors that can cause phytoplankton levels to decline include:

- Declining numbers of returning salmon and a corresponding reduction in the number of decomposing carcasses, reducing the natural source of phosphorous, nitrogen, and other essential nutrients.
- Low lake water temperatures.
- Changing climatological conditions (such as the Pacific Decadal Oscillation).[16]

[16] This factor is not thought to be the primary cause of sockeye salmon declines in the Karluk Lake system, because as a group other systems historically correlated to Karluk have not witnessed similar productivity declines.

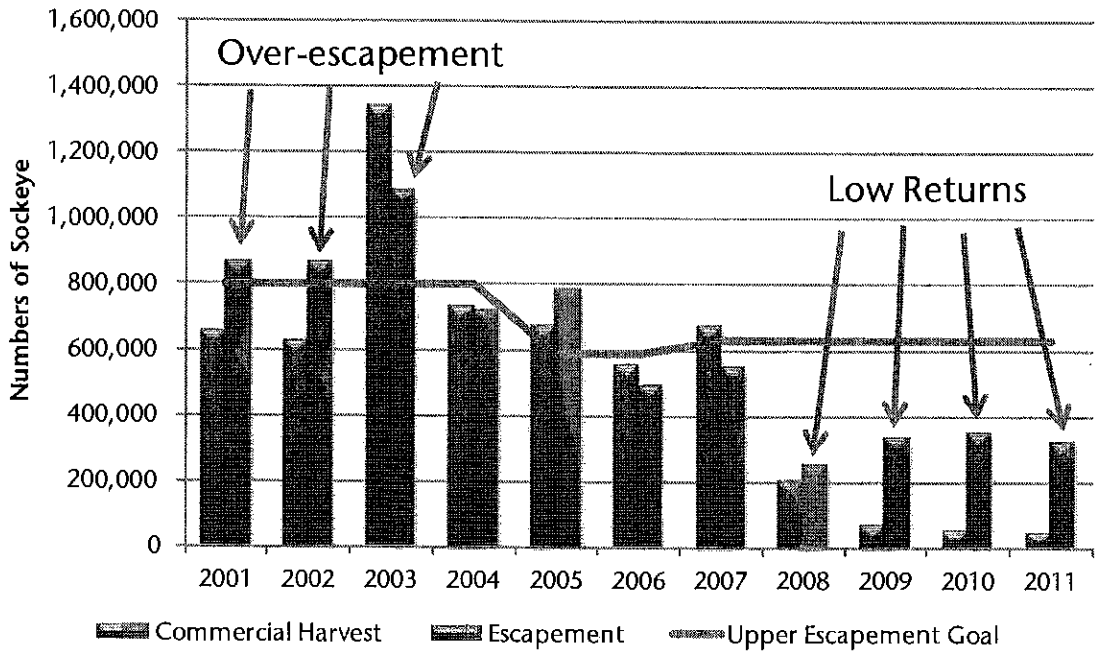
# The Need for a Karluk Lake Enrichment Program

Beginning in 2008, Karluk sockeye salmon returns dropped significantly. Karluk has historically been one of the largest producers of sockeye salmon in the world. From 1987 to 2007, Karluk sockeye runs averaged 1.36 million fish. Since 2008, sockeye runs have averaged just 415,000 and, in an attempt to meet escapement goals, harvests have been severely curtailed.

From 1987 to 2007, commercial fishermen harvested 621,000 Karluk sockeye on average each year. In the last three seasons, commercial fishermen have only averaged 54,000 Karluk sockeye per year.

Repeated over-escapements in the early 2000s (relatively large escapements over and above the current goals) may have resulted in high densities of juvenile sockeye salmon present in Karluk Lake and overgrazing of zooplankton populations in the lake. Overgrazing of available food sources in the early 2000s may have resulted in reduced food supply and more competition for food; leading to poor growth and high mortality in subsequent years (cf., ADFG 2009, 2010).

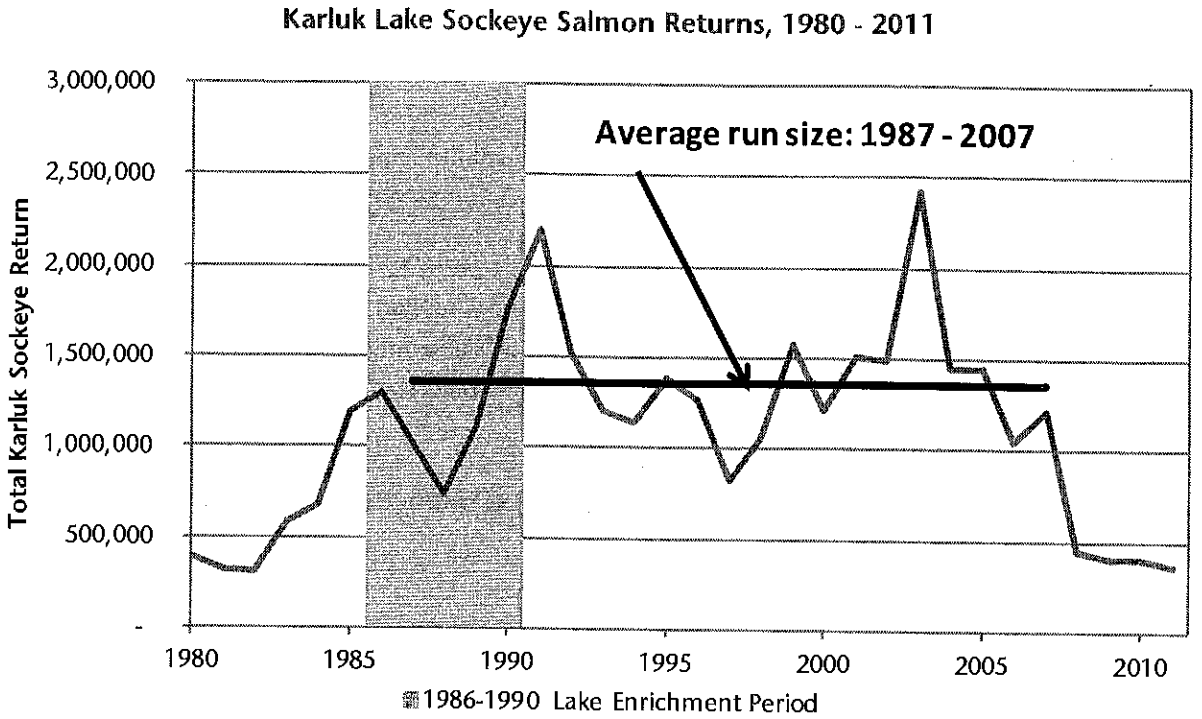
**Karluk Sockeye Harvest and Escapement, 2001 - 2011**




Source: ADFG data with McDowell Group notations.

Recent years of depressed runs and low escapement have diminished the flow of marine-derived nutrients delivered to the system by decomposing salmon carcasses. Low returns beget future low returns, which

continually limits the growth of zooplankton in Karluk Lake.[17] Without intervention, it is likely the system will remain in a persistent low-productive state, as was the case from the 1940s to the mid 1980s.




Source: ADFG.

Currently, sockeye salmon escapement, lake nutrient concentrations, and primary productivity are at or near all-time lows identified in the 130-year historic record, and inferred in the 2,200-year paleolimnological record (KRAA 2012).

Fishery managers and KRAA biologists have noted five trends which suggest the lake's diminished nutrient base is associated with low returns:

1. Zooplankton biomass levels fell sharply from 1,671 mg/m$^2$ in 2003, to just 269 mg/m$^2$ in 2005. These negative trends in productivity followed several years of large escapements of adult sockeye salmon to the Karluk system, between 1999 and 2003.

2. Samples of out-migrating smolt in 2006 revealed several concerns. The number of outmigrating smolt was small, relative to previous years and their parental numbers. An unusually high percentage of the fish were three-year old smolt, suggesting they stayed in the lake because their development was relatively slow. Finally, the average weight of both two-year and three-year smolt was roughly half the historic averages. This suggests juvenile sockeye salmon rearing in Karluk Lake were not able to find sufficient sources of food.

[17] The reduced grazing pressure from low numbers of juvenile sockeye produced by low escapements may allow an increase in zooplankton for a short time. However, zooplankton will decline in the longer term due to reduced marine-derived nutrients resulting from smaller returns.

3. Marine survival is positively correlated with outmigrating smolt size (e.g., Ricker 1962, Kyle et al. 1997). Poor returns beginning in 2008 are consistent with the negative conditions associated with the 2006 smolt class. Their small size likely resulted in higher marine mortality.

4. The concentration of the essential nutrient phosphorus in the lake was found to be low relative to both recent and long-term historic levels; and in 2010, phosphorus concentration declined further. Since decomposing salmon carcasses are a major contributor to phosphorus levels in Karluk Lake (Barnaby 1944; Koenings and Burkett 1987; Schmidt et al 2011), it is likely that nutrient levels in coming years will be commensurate with the small returns seen in recent years. Recent nutrient levels were found to be near a historic low, when compared to sediment samples encompassing a period of more than 2,000 years (Gregory-Eaves, et al 2003).

5. The 2010 mean chlorophyll *a* concentrations were more than 55 percent below the 1989 to 2008 period (Schmidt 2011). Essentially, this means levels of phytoplankton, which serve as a food source for the important zooplankton biomass, have been greatly diminished.

## Karluk Lake Enrichment Project 1986 – 1990

Lake enrichment projects have been used in many places over the past four decades to both enhance and rehabilitate the productivity of sockeye salmon nursery systems. Nutrient enrichment projects have been implemented in 27 Alaska lakes, including Karluk Lake from 1986 to 1990.

Heading into the 1980s, Karluk sockeye escapements were among the lowest on record, as were harvest levels. However, a rehabilitation program was conducted by ADFG from 1978-1984, consisting of taking and fertilizing Karluk sockeye eggs, and planting eyed eggs or back-stocking resulting fry (White, 1986). Two years of extremely large pink salmon escapements in the early 1980s provided a boost to the nutrient base in the lake. Given the conditions, fishery managers predicted a big run in 1985 and were right. Nearly a million sockeye escaped to spawn in 1985, the largest number since the 1930s.

However, the lake's productivity was declining and the growth of juvenile salmon in the lake in 1985 was found to be poor. Therefore, an enrichment program was proposed to increase forage available for the offspring of the large 1985 run. A five-year enrichment plan was approved by the U.S. Department of Fish and Wildlife, which would span one generation of Karluk sockeye salmon.

The 1986-1990 Karluk Lake enrichment project was considered by many to be successful in rehabilitating, or at least contributing to the rehabilitation, of system productivity. Data regarding nutrient levels is generally supportive, but no formal evaluation of the project was ever completed. The historical record appears to validate the program, as the system averaged runs of 1.36 million sockeye from 1987 to 2007 – levels not seen in over 50 years.

# The Proposed 2012 Karluk Lake Enrichment Plan

In 1979, the Alaska Department of Fish and Game released a publication outlining policy and guidelines for lake enrichment projects (ADFG 1979). It remains the only written guidance from ADFG regarding lake enrichment projects. No federal or other State document outlining lake fertilization best practices has been produced since 1979.

In the absence of further guidance, ADFG and KRAA reviewed the original 1979 Policy and Guidelines document for relevance and adequacy, and as a frame of reference for existing physical, chemical, and biological sampling practices. In many cases, certain parameters in the guidelines suggested tests that are obsolete or that have been determined to not be required. In some cases, sufficient data have been collected to render further sampling unnecessary.

KRAA has produced a proposal for the new Karluk Lake Enrichment Project (KRAA 2012), in conjunction with limnology consultant Dana Schmidt, Ph.D.[18]

The proposed project has three phases (pre-enrichment, enrichment, and post-enrichment); each phase calls for measurement of specific metrics at all trophic levels. ADFG, with support from KRAA, will sample chlorophyll *a* concentration, algal community composition, zooplankton biomass/size/composition, and various parameters of fish abundance and production in order to determine whether objectives are being met and assess the systems response to additional nutrients.

## Pre-enrichment Phase

During the current pre-enrichment phase, which is currently underway, a variety of data are collected to establish a baseline. The sampling strategy will draw from all trophic levels of Karluk Lake, and biomass data will be collected on juvenile sockeye salmon and zooplankton. These data will determine the amount of nutrient-loading suitable for the project, and can be compared to future data to measure the project's success.

## Enrichment Phase

ADFG and KRAA would continue to monitor water chemistry, limnological parameters, and system productivity (primary, secondary, and tertiary) through the active enrichment phase of the proposed project. However, in this phase, several parameters would be closely observed to ascertain the effectiveness of the program in the mostly timely manner possible. By closely monitoring how the system is responding to additional nutrients, managers can be responsive and adjust the nutrient-loading strategy. KRAA would generate an annual report for each year during the active enrichment phase, including data on outcomes, limnological data, program actions, objective reviews, and program status.

[18] Dr. Schmidt has 35 years of experience as a limnologist and quantitative fisheries biologist. He has served as the senior reviewer of British Columbia lake enrichment programs targeting Kokanee, and his research on the ecology of Karluk Lake sockeye salmon on Kodiak Island, Alaska entitled "Influence of Carcass-derived Nutrients on Sockeye Salmon Productivity of Karluk Lake, Alaska: Importance in the assessment of an escapement goal" was named "Most Significant Paper" by the North American Journal of Fisheries Management

Nutrients would be applied to the lake via fixed wing aircraft, approximately fourteen times during the spring and summer. The application will consist of an aqueous solution containing nitrogen (in the form of nitrate) and phosphorus. KRAA proposes a "front end loading" concept. In essence, spring-time applications will contain higher phosphorus content in the spring and more nitrogen during the summer. This is done to stimulate growing conditions for phytoplankton and prevent nitrogen deficiency later in the season.

Nutrient formulations proposed by KRAA are commonly used in present-day enrichment projects in Alaska and British Columbia. The 2012 project differs from the prior Karluk enrichment project in that applications would be "front end loaded" and KRAA proposes to apply nutrient solution to all three of the lake's basins. The prior enrichment project used a "flat-loading" strategy, which did not adjust nitrogen/phosphorus concentrations, and targeted only one of the lake's three basins.

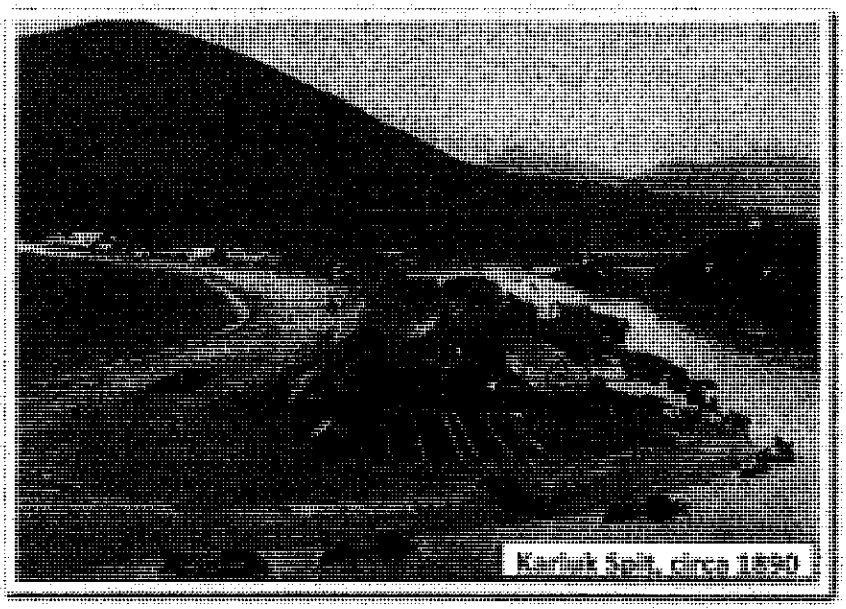
KRAA proposes to apply nutrients to Karluk Lake for a period of at least five years. In later years, KRAA would use collected data to measure the system response to determine if the nutrient enrichment program should be extended.

## Post-enrichment Phase

During the post-enrichment phase, sampling programs would remain generally consistent with those of the active enrichment phase of the project. At a minimum, data would continue to be collected for two years following the active enrichment phase. At this point, a final program analysis would be conducted to assess whether program objectives are met, whether earlier estimates and projections of system productivity are valid, and whether there is a need for additional action to achieve sustained system productivity.

# Appendix B: Historical Importance of Karluk Salmon

The commercial salmon fishing industry in Kodiak stretches all the way back to the early 1800s when the Russian American Company erected drying barns to prepare dried salmon for their sea otter hunters. Towards the end of Russia's occupation in the mid 1800s, they were exporting modest quantities of salted red salmon from Karluk packed into barrels.



Oliver Smith and Charles Hirsch established the first cannery on Kodiak Island on the Karluk spit in 1882, financed by the Alaska Commercial Company. With this first pack, Alaska's output of canned salmon doubled. Soon, other companies were jockeying for space on the beach and on the spit near the mouth of the Karluk River. By 1889, Karluk's five canneries packed over 350,000 cases of red salmon; equivalent to roughly four million fish.

The rapid expansion of canneries seen in Kodiak during the 1880s was also playing out elsewhere in Alaska. By 1890, the young industry had experienced its first production glut. Companies quickly consolidated or formed co-ops to control production volume and cut operational costs. In 1892, the Alaska Packing Association (APA) was formed, essentially consolidating all the island's canneries into one company (save for one). Over the next twenty years, APA canneries (in Kodiak and other areas) accounted for over half of the total Alaska pack.

Returning Karluk salmon were typically harvested using beach seines, a gear type which would be widely used in the region over the next several decades. The gear type is still in use today in Kodiak commercial fisheries, as the state's only remaining permitted beach seine fishery. In the early years, beach seines were hauled in by teams of men numbering 14 or more. Although the introduction of steam-powered devices in 1896 reduced the amount of manpower needed by roughly half, crews of six to eight men were still needed to set the net and ensure the lead line did not snag on boulders as it was hauled in toward the beach. Hauls of 25,000 to 30,000 fish in one set were not uncommon, and in 1896 several hauls exceeding 75,000 fish were noted. By comparison, the total Karluk sockeye harvest in 2010 was just over 49,000 fish.


Beach Seine Crew at Karluk River

Companies without beach seine sites attempted to purse seine in waters farther out, much to the dismay of the beach seiners. The contentious situation came to a head in 1894, when the Hume Canning and Trading Company, operating out of Tanglefoot Bay, just west of the Karluk Spit, ignored threats from the "Fishermen of Karluk" and had their nets destroyed by beach seiners. The problem was resolved the following year when the APA purchased the Tanglefoot Bay operation, but it would not be the last time the two gear types would compete for fish.

By 1889 there were six canneries operating on the Karluk Spit and the company fishing gangs, as they were known, numbered 550 men. These fishermen were mostly transient immigrants from San Francisco of Scandinavian, Danish, German, and Italian descent.

After 1896, the salmon runs declined significantly and many worried that the system had been overfished. The 1901 season began with meager catches, and it appeared as if the downward trend would continue. However, late in the season a huge sockeye salmon surge descended on the river and the 1901 harvest ended up being the largest harvest ever recorded for the Karluk – just shy of 4 million fish. A single set of 210,000 fish was noted, and the supply of fish was so abundant that neighboring canneries in Uyak, Alitak, and Chignik were used to process the surplus.

The first salmon hatchery in Alaska was established on the south bank of the Karluk River in 1896 by the APA. At the time, little was known about the life cycle of sockeye salmon. The facility collected broodstock, hatched eggs, and released them in the brackish water of the Karluk Lagoon. These early hatchery pioneers did not know that sockeye salmon need to spend their first few years in freshwater lakes before migrating to the ocean, and the practice of releasing fry into the lagoon continued until 1916.

Karluk's prominent sockeye salmon run and important economic value in these early years led to it becoming one of the most heavily researched salmon ecosystems in the world. As early as 1896, an amendment to the Alaska Fisheries Act authorized a group of scientists to travel to Alaska to study the natural condition of salmon.

In 1900, the federal government passed an initiative requiring canneries to build and operate salmon hatcheries. Unfortunately, due to a lack of knowledge and poor hatchery practices, the efforts were largely unsuccessful and most hatcheries were closed by 1915.

After 1920, runs on the Karluk generally declined yet by 1922 the number of canneries operating in the Kodiak region had increased to nine. Small salmon runs enticed new comers to once again head to Karluk with purse seine boats. APA beach seine fishermen reportedly attempted to encircle the purse seine boats and drag them to the beach.

Government officials worried the increased competition for fish would threaten salmon stocks and after considerable political jockeying, the White Act of 1924 was passed. The new legislation made purse seining illegal in the Kodiak-Afognak district, a rule that remained in effect until 1933. It also provided for recommended escapement levels. In general, canneries were expected to harvest only 50 percent of the run while allowing the other 50 percent to continue onto spawning grounds.

Alaska's congressional delegate, Dan Sutherland, introduced an amendment that would ban fishing traps and purse seine gear in all of Alaska. Outside of Karluk's beach seine's, fish traps were the predominant gear used by canneries to harvest salmon. The industry fought the amendment, and was able to keep their fish traps, claiming such a rule would cause financial disaster within the industry.

From 1926 to 1929, a total of five new shore-based canneries opened on Kodiak along with one floating cannery. By 1930, the region counted 15 canneries but poor salmon runs and the Great Depression led to several cannery closures in the early 1930s. In 1932, the canned salmon market collapsed as wholesale prices declined 40 to 50 percent below the pre-depression peak. Only nine canneries operated in 1932, as some operators bowed out and others were unable to secure financing.

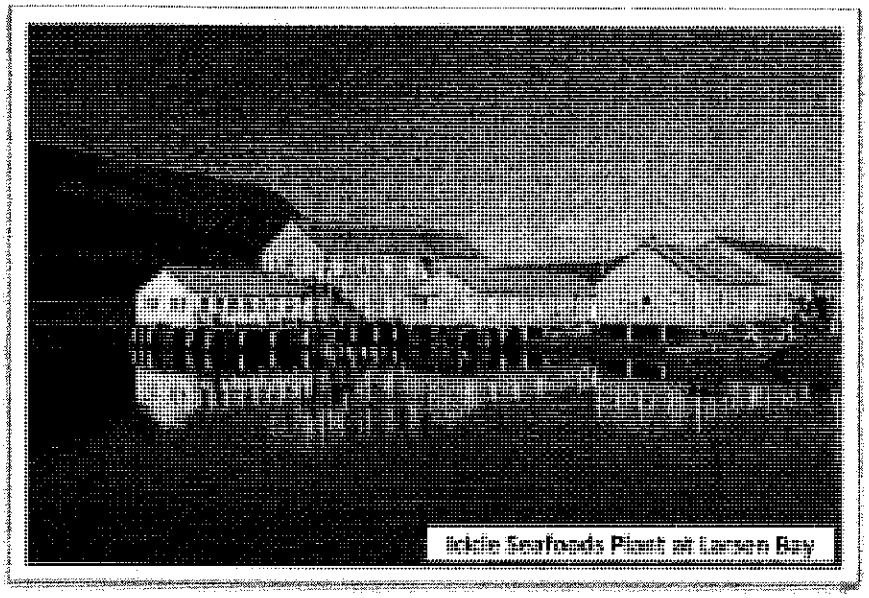
The 1930s also saw more changes in the regulatory environment, which curtailed fishing effort. The new Commissioner of Fisheries, Frank T. Bell, endeavored to ease the imbalance which existed in the industry. Bell's policy sought to "give operators of smaller types of gear better opportunity both for fishing and for

profitable disposal of their catch." Purse seining with nets less than 125 fathoms in length was permitted and the number of permitted fish traps was reduced.

The new regulations and smaller salmon runs eventually forced larger canneries to develop their own fleets in order to secure fish supplies for their plants. Purse seining effort increased quickly and changed the dynamic of the industry in Kodiak forever. By the late 1930s, labor unions joined and formed to negotiate better prices for fishermen and better terms for cannery workers. During these years, cannery wages increased and workers received extra pay for overtime.

From the mid-1940s to the mid-1980s, Karluk sockeye runs declined to a fraction of their former size. Kodiak fishermen and processors further developed fisheries in other areas, as well as fisheries for other species such as crab, shrimp, pacific cod, and halibut.

Today there are no more canneries on the Karluk Spit. A storm breached the spit in 1980 and during the last 30 years the river has eroded much of the spit. The nearest processing plant is operated by Icicle Seafoods in nearby Larsen Bay.


Icicle Seafoods Plant at Larsen Bay

Although the once-famous Karluk system is no longer the center of the Alaska salmon industry, as it was in the 1880s, those formative years are a testament to the system's incredible productivity. Even after canneries began extracting 2 to 4 million fish beginning in the late 1880s, the system produced runs generally in excess of 2 million fish for more than 40 years.

# Appendix C: Commercial Fishing Data

Kodiak Common Property Commercial Salmon Harvest by Gear Type, 1985 - 2011

| Year | Seine Permits Fished | Seine Pounds Landed | Seine Ex-Vessel Value | Setnet Permits Fished | Setnet Pounds Landed | Setnet Ex-Vessel Value |
|---|---|---|---|---|---|---|
| 1987 | 297 | 28,988,728 | 23,702,188 | 173 | 6,606,148 | 7,121,132 |
| 1988 | 323 | 69,249,929 | 81,526,188 | 179 | 14,663,819 | 21,303,397 |
| 1989 | 4 | 40,046 | 56,422 | 87 | 7,939,440 | 13,051,018 |
| 1990 | 354 | 42,598,763 | 40,117,467 | 184 | 10,395,196 | 12,275,540 |
| 1991 | 348 | 71,595,473 | 26,973,828 | 185 | 15,438,784 | 9,956,102 |
| 1992 | 335 | 35,321,130 | 32,960,017 | 178 | 8,126,859 | 7,473,098 |
| 1993 | 324 | 117,723,913 | 30,756,924 | 176 | 16,841,088 | 7,724,543 |
| 1994 | 285 | 42,502,786 | 19,250,419 | 169 | 11,236,789 | 7,805,959 |
| 1995 | 312 | 160,194,850 | 42,359,845 | 173 | 26,691,266 | 11,446,588 |
| 1996 | 261 | 32,962,614 | 18,551,849 | 172 | 13,581,062 | 9,052,730 |
| 1997 | 261 | 45,375,982 | 14,339,237 | 174 | 12,240,912 | 6,635,516 |
| 1998 | 217 | 86,375,226 | 25,898,030 | 171 | 19,175,868 | 8,900,235 |
| 1999 | 220 | 57,080,958 | 23,971,102 | 173 | 13,382,560 | 9,989,759 |
| 2000 | 223 | 49,917,005 | 16,714,285 | 172 | 11,800,575 | 6,350,831 |
| 2001 | 182 | 81,678,742 | 17,058,329 | 172 | 12,528,856 | 5,076,627 |
| 2002 | 149 | 74,367,756 | 10,710,425 | 93 | 12,519,507 | 2,903,734 |
| 2003 | 143 | 62,302,020 | 13,267,251 | 161 | 14,430,510 | 5,459,822 |
| 2004 | 140 | 83,610,274 | 16,283,559 | 164 | 21,348,879 | 7,167,694 |
| 2005 | 135 | 101,108,669 | 19,242,761 | 165 | 16,028,482 | 7,465,694 |
| 2006 | 130 | 111,940,643 | 24,895,666 | 153 | 17,915,785 | 5,655,915 |
| 2007 | 140 | 88,288,785 | 24,357,780 | 157 | 14,659,998 | 6,932,622 |
| 2008 | 128 | 36,279,552 | 21,343,868 | 148 | 9,583,425 | 6,969,122 |
| 2009 | 157 | 92,642,064 | 29,954,846 | 132 | 10,937,863 | 6,694,638 |
| 2010 | 154 | 36,760,460 | 19,883,848 | 158 | 6,393,794 | 4,066,301 |
| 2011 | 175 | N/A | 39,261,075 | 157 | N/A | 4,888,509 |

Note: 2011 data from Kodiak Commercial Salmon Season Summary, these data are preliminary.
Source: ADFG, Commercial Fisheries Entry Commission.

## Kodiak Ex-vessel Salmon Price per Pound, 1987 - 2011

| Year | Chinook | Sockeye | Coho | Pink | Chum |
|---|---|---|---|---|---|
| 1987 | $1.12 | $1.74 | $0.82 | $0.43 | $0.43 |
| 1988 | 1.45 | 2.71 | 1.28 | 0.81 | 1.13 |
| 1989 | 1.17 | 1.79 | 0.65 | 0.55 | 0.39 |
| 1990 | 1.06 | 1.54 | 0.75 | 0.34 | 0.50 |
| 1991 | 0.72 | 0.92 | 0.57 | 0.14 | 0.35 |
| 1992 | 1.02 | 1.47 | 0.57 | 0.18 | 0.38 |
| 1993 | 0.77 | 0.87 | 0.46 | 0.16 | 0.29 |
| 1994 | 0.73 | 1.28 | 0.67 | 0.18 | 0.23 |
| 1995 | 0.69 | 1.05 | 0.40 | 0.17 | 0.27 |
| 1996 | 0.65 | 0.90 | 0.42 | 0.07 | 0.15 |
| 1997 | 0.64 | 0.96 | 0.56 | 0.15 | 0.19 |
| 1998 | 0.71 | 1.19 | 0.37 | 0.15 | 0.19 |
| 1999 | 0.68 | 1.08 | 0.41 | 0.14 | 0.19 |
| 2000 | 0.66 | 0.89 | 0.49 | 0.14 | 0.22 |
| 2001 | 0.72 | 0.70 | 0.24 | 0.12 | 0.32 |
| 2002 | 0.37 | 0.61 | 0.18 | 0.09 | 0.16 |
| 2003 | 0.35 | 0.60 | 0.20 | 0.09 | 0.14 |
| 2004 | 0.51 | 0.65 | 0.27 | 0.10 | 0.12 |
| 2005 | 0.76 | 0.80 | 0.42 | 0.12 | 0.20 |
| 2006 | 0.94 | 0.84 | 0.66 | 0.16 | 0.33 |
| 2007 | 0.89 | 1.00 | 0.60 | 0.18 | 0.35 |
| 2008 | 1.00 | 1.19 | 1.20 | 0.37 | 0.50 |
| 2009 | 0.68 | 1.12 | 0.61 | 0.26 | 0.44 |
| 2010 | 0.64 | 1.42 | 0.80 | 0.44 | 0.56 |
| 2011 | 1.22 | 1.52 | 0.66 | 0.41 | 0.61 |

Note: 2011 data are preliminary.
Source: ADFG.

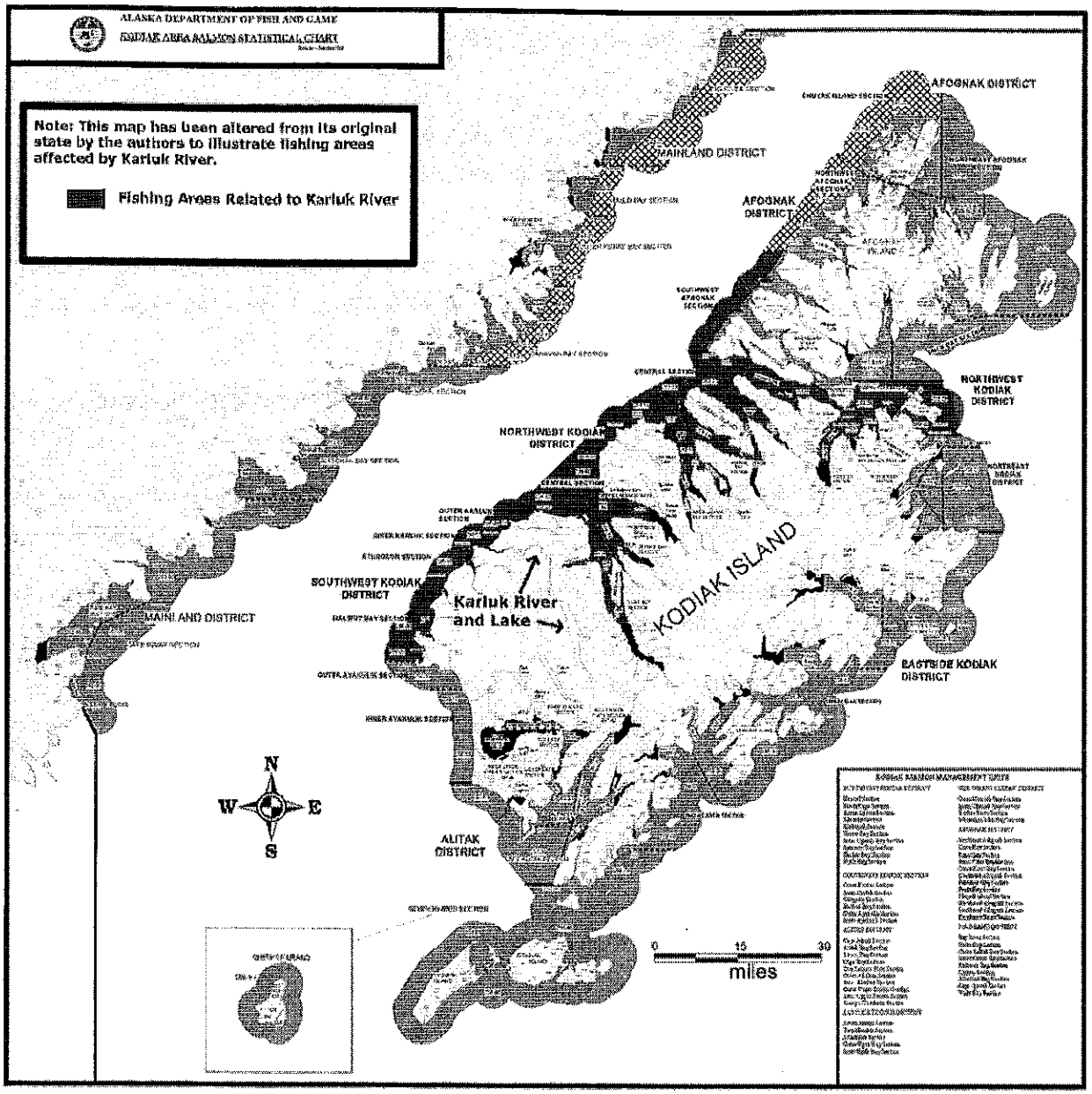
# Appendix D: Karluk Lake Productivity

Historic Karluk Sockeye Escapement and Return Data, 1985 - 2007

| Year | Escapement (Number of Fish) | Resulting Adult Return from Brood Year | Return/Spawner Ratio |
|---|---|---|---|
| 1985 | 995,948 | 2,114,121 | 2.1 |
| 1986 | 887,171 | 2,215,407 | 2.5 |
| 1987 | 766,251 | 1,275,984 | 1.7 |
| 1988 | 578,816 | 947,433 | 1.6 |
| 1989 | 1,108,646 | 1,210,493 | 1.1 |
| 1990 | 738,088 | 1,160,579 | 1.6 |
| 1991 | 1,075,039 | 1,357,833 | 1.3 |
| 1992 | 831,414 | 574,152 | 0.7 |
| 1993 | 657,457 | 1,220,845 | 1.9 |
| 1994 | 848,029 | 1,605,867 | 1.9 |
| 1995 | 743,056 | 1,663,181 | 2.2 |
| 1996 | 574,326 | 1,273,479 | 2.2 |
| 1997 | 564,761 | 1,534,893 | 2.7 |
| 1998 | 637,146 | 2,058,758 | 3.2 |
| 1999 | 981,538 | 1,754,732 | 1.8 |
| 2000 | 736,744 | 1,514,190 | 2.1 |
| 2001 | 863,538 | 1,223,779 | 1.4 |
| 2002 | 865,576 | 584,186 | 0.7 |
| 2003 | 1,078,710 | 431,949 | 0.4 |
| 2004 | 719,934 | 321,719 | 0.4 |
| 2005 | 781,962 | 99,270 | - |
| 2006 | 490,373 | 24,175 | - |
| 2007 | 546,575 | - | - |
| 2008 | 246,490 | - | - |
| 2009 | 330,077 | - | - |
| 2010 | 348,102 | - | - |

Source: Schmidt 2011.

# Appendix E: Map of Karluk-Affected Areas




Source: ADFG Map, altered by McDowell Group.

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Monday, December 23, 2013

Alaska Board of Fish Members,

My name is Jonathan Edwards, and I have been involved in the Northwest Kodiak salmon set net fishery for the last 34 years.

I would like to ask for your support for Kodiak fin fish proposal 95. This proposal would allow kodiak set netters some opportunity in the harvest of Spiridon Bay Sockeye Project run. As it stands now, on weak early run sockeye for the Karluk system, the Spiridon Bay bound sockeye are harvested exclusively by the seine fleet. We, as set netters, contribute to all the Kodiak Aquaculture projects, but this is the only one we directly can benefit from. The time period for fishing in prop 95 is long after the early run Karluk has tapered off. Even on robust early Karluk sockeye runs, most of the the sockeye for that system are either in the Karluk River or in that vicinity in the June 20-25 time. Also, prop 95 allows that there must be a Karluk early run sockeye escape of 110,000 in order to have fishing time for set netters harvesting the Spiridon sockeye.

In closing, this proposal would go a long ways to help Kodiak set netters reap the rewards of their contributions to the aquaculture association, and at the same time, making sure that the early Karluk run is protected.

Thanks for your consideration,

Jonathan Edwards

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. Tudor Road
Anchorage, Alaska 99503-6199

IN REPLY REFER TO:

FWS/OSM 13089.GP

20 DEC 2013

Mr. Karl Johnstone, Chair
Alaska Board of Fisheries
Alaska Department of Fish and Game
P.O. Box 115526
Juneau, Alaska 99811-5526

Dear Chairman Johnstone:

The Alaska Board of Fisheries will consider 19 proposals, among other issues, at its Kodiak Area Finfish meeting beginning January 7, 2014.

The U.S. Fish and Wildlife Service, Office of Subsistence Management, working with other Federal agencies, reviewed the proposals and does not believe that adoption of any of these proposals will have any significant impacts on Federal subsistence users or fisheries. During the meeting, we may wish to comment on other agenda items if issues arise, which may have an impact on Federal subsistence users or fisheries.

We appreciate the opportunity to comment on these important regulatory matters and look forward to working with the Board and the Alaska Department of Fish and Game on these issues.

Sincerely,

Eugene R. Peltola Jr.
Assistant Regional Director, OSM

cc: Cora Campbell, ADF&G ,
Tim Towarak, Chair FSB
Lisa Olson, ADF&G, Anchorage
Hazel Nelson, ADF&G, Anchorage
Jeff Regnart, ADF&G, Anchorage
Charles Swanton, ADF&G, Juneau
Glenn Haight, ADF&G, Juneau
Drew Crawford, ADF&G, Anchorage
Kathleen M. O'Reily-Doyle, DARD, OSM
Jennifer Yuhas, ADF&G, Fairbanks
Interagency Staff Committee
Administrative Record

Dear Mr. Chairman and board members,

We would like to register our **SUPPORT for** proposal **99.**

We fish in the Alitak District. We have been involved in the fishery since 1992.

We support proposal 99 because:

Our son, daughter, son-in-law, and us (Edwin and Judy) are the permit holders and the crew of our operation.

Proposal 99 would allow our family fish camp to operate as normal in the case of an illness or injury to any of us. Twice this proposal would have helped our operation as once our son was injured and had to leave camp for several weeks and another time Ed had open heart surgery and had to spend an extra month recuperating before he could go to camp. We lost valuable fishing time not being able to use their permits.

When the stacking was in force for 3 years we were able to stack our daughter's permit when she was in Kodiak having a baby.

Most of the set net sites are family operations and feel this will help our fellow fisherman be able to keep their camps afloat because the runs have depleted so much that you can't catch enough fish to remain in the fishery without using all your permits.

It has proved to be helpful in the past to maintain family operations in times of emergency and slow seasons. We strongly urge passage of proposal 99.

Sincerely,

Ed and Judy Fisher

Dear Mr. Chairman and Members of the Board

I would like to show my **SUPPORT** for proposal **99**.

My name is Kevin Fisher. I have gillnet fished every summer for salmon on Kodiak Island starting in 1989. I have held a limited entry permit number S04K 59401X since 1990. I fish in the Alitak District.

I support proposal 99 because:

Our family operation is as efficient as can be. We rarely are able to hire crew, as our sites don't catch enough to afford crew. All of us hold permits and work the sites together. My Mother, Father, Sister, Brother-in-law and my self are the permit holders and crew of our operation.

Proposal 99 would allow my family fish camp to operate as normal in the case of an illness or injury to my self or one of my family members.

I believe it will help my fellow salmon fishermen keep their fishing operations viable. Many of Kodiak set net sites are duel permit camps. It is vital that both permits fish together to catch enough fish to maintain a level of efficiency needed to stay in the fishery. It would be impossible to maintain our family operation with a single permit.

In the three years that it was legal to own and use two permits we were able to transfer my sister's permit to my mother. My sister was then able to go Kodiak for doctor appointments and birth of her child. The benefit was that we did not loose the opportunity to fish while she was away from fish camp.

During the 2005 season I had a serious fishing accident and was flown to Anchorage for operations to save my eye. At that time I was not able to stack my permit. I was not able to transfer my permit to family and keep the permit fishing. Our whole operation was out the income and opportunity my permit would have afforded while I was away. When I was flown by medivac from fish camp, my mother went with me taking another permit. After my operations she was forced to leave me in Anchorage to recover on my own because we could not afford loosing half of our opportunity to fish. We consequently lost out on some of the best fishing days of the summer. If stacking had been allowed in 2005 we could have transferred our permits to my sister and brother-in-law, and continued fishing.

I feel that stacking permits in the set gillnet fishery is different than any other fishery. It proved in the past to help family operations like ours maintain in times of emergency and slow seasons. I did not see where it hurt our neighbors or gave some camps advantage over others.

Kevin A Fish