Alaska Marine Conservation Council

February 23, 2009

Mr. Doug Mecum
Acting Regional Administrator
National Marine Fisheries Service
P.O. Box 21668
Juneau, AK 99802

RE: Comments on the December 2008 Bering Sea Chinook Bycatch Management Draft EIS/RIR/IRFA

Dear Mr. Mecum,

Thank you for the opportunity to submit comments on the Chinook Salmon Bycatch Management Draft EIS. We appreciate the agency's pursuit of measures to reduce salmon bycatch. The following comments address primary concerns of the Alaska Marine Conservation Council presented on behalf of our members. We are a community-based organization dedicated to protecting the long-term health of Alaska's oceans and sustaining the working waterfronts of our coastal communities. Our 800 Alaskan members include fishermen, subsistence harvesters, marine scientists, small business owners and families. Our ways of life, livelihoods and local economies depend on productive oceans. AMCC advances conservation solutions that address the interdependence between healthy marine ecosystems, strong local economies and coastal traditions.

1. Salmon-dependent communities on the Bering Sea coast and along the rivers are experiencing dire circumstances as a result of low chinook salmon returns and high fuel prices.

   Chinook salmon returns are low in western Alaska. This is causing tremendous stress throughout the region where people are unable to harvest enough fish for subsistence and some commercial fisheries are closed. The U.S. commitment is not being met to ensure sufficient escapement of Yukon River chinook salmon into Canada. Federal fishery managers have taken several actions over the years to control chinook bycatch usually in response to extremely high bycatch numbers or crisis situations in western Alaska. In 1980 foreign trawl vessels intercepted approximately 115,000 chinook salmon. The federal government imposed a bycatch reduction schedule reducing the allowable bycatch level from 65,000 fish in 1981 to 16,500 fish in 1986. After that

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chinook bycatch increased again with the domestic fleet. In 1995 a cap was set at 48,000 but it only applied to the first three months of the year so more salmon could and were taken as bycatch during the rest of the year. In 1999 federal fishery managers set a chinook salmon bycatch cap for the pollock fleet at 48,000 declining to 29,000 over four years in response to low salmon returns .

Today serious circumstances prevail in the region at the same time that bycatch has once again escalated to unacceptable levels. In 2007 bycatch sky rocketed to an all time high of 122,000 fish. Maximizing the number of chinook salmon that can return to western Alaska rivers is of great importance. Indeed every fish counts toward achieving escapement, successful spawning, and harvest by local people for subsistence or small-scale commercial fisheries.

2. The DEIS is inexplicably missing discussion of National Standard 8, which provides that conservation and management measures should provide for the sustained participation of fishing communities, and minimize adverse economic impacts on such communities.

   National Standard 8 is one of the standards that federal fishery managers are obligated to balance. In the purpose and need statement the Draft EIS explicitly describes National Standard 1 (optimum yield) and National Standard 9 (bycatch) but is not specific about National Standard 8 (communities). While communities are discussed in the document, the omission of National Standard 8 is conspicuous in its absence as a legal requirement. National Standard 8 should be given equal status with the others and should affect the balance that is sought in management decisions.

3. A high chinook salmon bycatch cap is not practicable for salmon-dependent communities.

   The Magnuson-Stevens Act requires that management "minimize bycatch to the extent practicable." The Draft EIS focuses on what is practicable for the pollock sector. The document considers the cost to the pollock fleet if a bycatch cap causes the pollock fleet to forego some of the pollock allowable catch. But there is a stark contrast between wealth in the pollock fleet and small village economies. Little consideration is given in the document to what is practicable for salmon-dependent villages. Enduring a situation in which there is not enough salmon for subsistence or small-scale commercial harvest, or failure to even meet Yukon River escapement to Canada, is not practicable for the villages.

   The cultural and economic costs are high to all people living a subsistence way of life along the rivers and especially the Yupik, Inupiaq and Athabaskan peoples who have thrived on the land for thousands of years in ways that are inseparable from natural resources including chinook salmon. That this cannot be measured in monetary terms is not a reason to bypass the effect of continued interception of chinook salmon in the pollock fishery. Any salmon that is allowed to be taken as bycatch at sea is a reallocation of those fish away from the rivers and the people who historically rely on them.

4. The chinook salmon bycatch cap should not be higher than the area cap established in 1999.

In 1999 the North Pacific Fishery Management Council adopted a management measure that established a 48,000 chinook salmon cap with a step down over four years to 29,000. (BSAI Amendment 58; NMFS Final Rule published 10/12/00) The cap applied to the Chinook Salmon Savings Area such that when the cap was reached the fleet had to move out of the savings area. At the time, "regardless of season or year, the majority of chinook salmon were intercepted in the Chinook Salmon Savings Area." (Amendment 58 EA/RIR/IRFA, Draft for Council Review, 1998) The expectation was that 29,000 fish would approximate the total amount of chinook bycatch for the whole Bering Sea because the majority of salmon were anticipated to be within the savings area and only small numbers would be encountered outside. However in subsequent years, chinook salmon distribution changed such that more and more fish were encountered outside of the savings area. This meant that closing the savings area was no longer a functional mechanism to avoid salmon bycatch.

Now federal fishery managers are considering a hard cap which if reached would close the pollock fishery. We acknowledge the hard cap represents a much more serious consequence to reaching the bycatch limit. However, no other options appear to be available. Nonetheless, it is important for the conservation of chinook salmon and the welfare of salmon-dependent villages that the cap is set no higher than 30,000 to keep the total amount of chinook bycatch from exceeding the level selected in 1999.

The preliminary preferred alternative annual scenario 1 specifying a cap of 68,392 chinook far exceeds what is reasonable. First, that number is too high for conservation reasons. Increasing encounters at sea do not correlate to large returns to the rivers. Indeed as bycatch has increased, returns have declined. Second, the industry has only hit that amount twice in 30 years so it would not stimulate avoidance of salmon bycatch in most years.

If the 47,591 cap is selected (preliminary preferred alternative annual scenario 2), bycatch will not be minimized but that number would basically sanction average years as acceptable. Also selecting this number rolls back the effect of the 1999 action which was expected to reduce bycatch from 48,000 to 29,000 chinook. Federal fishery managers should not start over but rather continue a rigorous program that improves fishery performance to *minimize* salmon bycatch.

5. The incentive program conceptually included in the preliminary preferred alternative does not ensure that bycatch will be held at levels significantly below the 68,392 cap.

We appreciate the Council's pursuit of a hard bycatch cap but we do not believe the preliminary preferred alternative is an acceptable way forward. A 68,392 chinook cap is excessive as explained above. Furthermore, after listening to the pollock industry's presentation on incentive programs, we are not at all confident that the plans will

successfully drive down salmon bycatch to low levels. The incentive programs contemplated are interesting creative approaches but as long as the cap is high and the direction to industry is unspecified, what motivation does the industry have to challenge themselves? The alternative only says that bycatch reduction below the cap should be "as far as practicable." The industry will define what is practicable for them based on how much they are willing to sacrifice. What is practicable for villages and their success at harvesting enough salmon for their needs will be ignored.

We are especially concerned that if the preliminary preferred alternative is selected the performance of the incentive programs would not be subject to an objective evaluation. We are supportive of rewarding clean fishing and allowing industry room to apply innovative mechanisms to change behavior. However, leaving evaluation of the results up to vested parties does not serve the public interest. Furthermore the alternative does not require that the industry implement the same incentive program that has been presented. This irregular management approach presents serious problems from the standpoint of public policy and transparency.

The Alaska Marine Conservation Council joins the tribes and community organizations in urging federal fishery managers to take progressive action to minimize chinook salmon bycatch. The only viable choice from the standpoint of salmon conservation and salmon-dependent villages is to set a 30,000 cap followed by progressive declines in the cap.

Sincerely,

Dorothy Childers
Fisheries Program Director

cc: Governor Sarah Palin
Senator Mark Begich
Senator Lisa Murkowski
David Bill, Sr., Bering Sea Elders Advisory Group
Myron Naneng, Association of Village Council Presidents
Loretta Bullard, Kawerak
Jerry Isaac, Tanana Chiefs Conference
Yukon River Drainage Fisheries Association
Bering Sea Fishermen's Association

C42

From ViedeF97@aol.com
Sent Monday, February 23, 2009 12:53 pm
To salmonbycatcheis@noaa.gov
Cc stan.lee16@yahoo.com , nunamiquayouth@yahoo.com
Subject Salmon Bycatch EIS

Subject- Salmon Bycatch EIS
From: Ann Strongheart, Nunam Iqua-YK Delta area, and Victoria Briggs, Ugashik - Bristol Bay area

We are commenting on the proposed cap limit for the Chinook By-catch and specifically to the Alternative 4 - the "preferred one".
The use of a cap set based on the history of what has already hurt us does not show good judgement. To use a method that has no history or is expected to be successful is to doom the Western Chinook Salmon fishery.
A science based method of using either a percent of the bio mass or based off a projected return, as are other AK salmon fisheries, would use a much better method.
The huge increases in the by-catch seen since 2002 and the effects we are seeing in our villages should be reason enough to changed what is happening.
When the environmental study shows the catch is higher outside of the set aside areas than in them tells us the old ways MUST be changed.
Do not bow to the trawler companies and those that SHOULD be watching our backs, but look at the impact of the method on the returns and villages.

We are two women in two different villages in Western Alaska. We have seen the devastating effects of the lack of Chinook runs in the last few years.
In Bristol Bay the Chinook not only serve as some of the earliest subsistence food we gather but also as a growing money maker for our households.
With the lack of returns this last 3 years especially we have been stretched to the limits on having enough food to support our families in the early summer before our Sockeye runs start.
On top of this not having this run of fish, that has been steady for many previous years, to allow us an early market has hit our family incomes dramatically.
The YK Delta has seen an even more families hurt by the lack of this fishery as it is the main money maker for approximately 300 boats.
The lack of returns in the YK Delta alone created an effect where over 80% of the fishermen lost money this past year.
This happened on top of a restricted subsistence access so that we now have families that can't feed theme selves.
If you are not already aware of the issue, food drives and NATIONAL attention to the effects of these by-catch limits on the families of Western Alaska please familiarize yourselves. If this continues, as it might well given the ocean return rates expected , you will see even more negative news coverage in the months to come.
We have faith in your ability to manage this fisheries correctly and to continue to assist us in maintaining our way of life.
Please, Please use GOOD, SOUND science to set these caps.
Sincerely,
Ann Strongheart
Victoria Briggs

TRUSTEES FOR ALASKA

A Nonprofit Public Interest Law Firm Providing Counsel to Protect and Sustain Alaska's Environment

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February 23, 2009

Robert D. Mecum
Acting Administrator
Alaska Region – National Marine Fisheries Service
National Oceanic and Atmospheric Administration
PO Box 21668
Juneau, Alaska 99802

Re: Bering Sea Chinook Salmon Bycatch Management Draft Environmental Impact Statement/Regulatory Impact Review/Initial Regulatory Flexibility Analysis

Dear Mr. Mecum:

On behalf of the Association of Village Council Presidents (AVCP), Trustees for Alaska submits the following comments on the North Pacific Fishery Management Council (NPFMC) Draft Environmental Impact Statement (DEIS) for Bering Sea Chinook Salmon Bycatch Management. AVCP is the regional native non-profit organization working for and representing 56 Tribes in the Yukon-Kuskokwim Delta. AVCP appreciates the NPFMC's efforts to reduce salmon bycatch, but more needs to be done.

AVCP has grave concerns about the declining Chinook salmon runs. Timothy Andrew, Director of AVCP Department of Natural Resources, has highlighted some basic tenants and principal beliefs of AVCP that serve as the underlying foundation for this request that the NPFMC do more to limit the salmon bycatch beyond what is identified in the DEIS preferred alternative. These principals are:

(1) We all have an obligation to get as much fish to the spawning grounds to ensure that our future generations will be able to live the quality of life and culture that we have today.
(2) We have an obligation to our ancestors, people of today and to the future generations to continue our way life by having access to the resources we depend on today which includes salmon. Our ancestors, like the saints of

the Church, sacrificed their lives so that we can live the way of life we live today. Not to be destroyed by an alien system that destroys the resources then moves on to other areas. This generation and future generations, like us today, deserves the inheritance that we enjoy in our small communities, fish camps, the sharing, harvesting, education, etc.

(3) Have I done everything I could to earn my grandchild's fondness? We will be known by the tracks we leave behind. I do not want to leave a legacy of defeat and despair for our children and their future generations. I want them to know that I have done everything that I can to earn their fondness and be known for the tracks I left behind and I hope and pray that they are good tracks.

A healthy and thriving salmon fishery is vital to the Native communities of the Yukon and Kuskokwim Rivers' traditional subsistence way of life. Chinook salmon is the major harvested fish for people on the Yukon and Kuskokwim Rivers. The Native villages of the area are among the poorest in the United States as measured by monetary income and jobs. The Lower Yukon and Lower Kuskokwim Rivers also support a small commercial salmon fishery that serves as a crucial income source for the people who live there. However, Chinook and other salmon fisheries are in decline on the Yukon River and the State has shut down the commercial fishery due to poor runs. *See* Wolfe, R.J., *People and Salmon of the Arctic, Yukon, and Kuskokwim Regions in Alaska – Socioeconomic Dimensions: Fishery Harvests, Culture Change, and Local Knowledge Systems* (*People and Salmon*), pp. 4-9 (attached as Exhibit A); Wolfe, R.J., *Human Systems and Sustainable Salmon: Social, Economic and Cultural Linkages* (*Human Systems*), pp. 3-8 (attached as Exhibit B). As a result, the Yukon River communities have lost a major income source from commercial salmon fisheries.

The incredibly high bycatch numbers associated with the Pollock fishery in recent years is alarming to say the least. Bycatch of Chinook salmon threatens the Western Alaska salmon populations and those that depend on these salmon to maintain their subsistence way of life as well as commercial harvests. *See People and Salmon*, pp. 4-9; *Human Systems*, pp. 3-8. Those in the Western Alaskan villages are witnessing a troublesome decline in what was once a sustainable subsistence harvest. *See e.g.*, Alaska Dept. of Fish & Game, Division of Commercial Fisheries, *2008 Preliminary Yukon River Summer Season Summary*, Oct. 20, 2008 (attached as Exhibit C) and Alaska Dept. of Fish & Game, Division of Commercial Fisheries, *2008 Yukon River Fall Season Summary*, Jan. 21, 2009 (attached as Exhibit D). Additionally, because of the decline, regulation of subsistence fisheries continues to tighten, increasing the difficulty for families to harvest salmon, especially in upriver villages. The continued interception of Chinook salmon in the Bering Sea will continue to keep these traditional fisheries depressed. Significant reduction in bycatch is necessary to preserve the subsistence way of life.

To ensure that the subsistence way of life for Western and Interior Alaska Native villages is not further threatened, we recommend the following issues and measures be addressed and adopted into the Final Environmental Impact Statement.[1] They include:

- Abandon the preliminary preferred alternative (PPA) and adopt the lower hardcap of 32,482 identified in suboption vii of Alternative 2. The PPA does little more than preserve the status quo, which continues to threaten the subsistence way of life for Western and Interior Native villages by allowing the continuing decline of Chinook salmon in the Yukon and Kuskokwim Rivers;
- Include in the newly-identified preferred alternative a declining hardcap overtime from the initial hardcap of 32,482 to less than 10,000 over a few years;
- Present the information and analysis in a manner that is easily understood by the public;
- Adequately assess the full direct, indirect and cumulative impacts to the subsistence way of life for Western and Interior Alaska villages.

1. **The NPFMC should adopt a declining hard cap of not more than 32,482 (from Suboption vii of Alternative 2) to ensure that the subsistence way of life is adequately protected.**

The NPFMC's PPA allows for an unacceptable level of bycatch that will have significant adverse impacts on the Western and Interior Alaska subsistence way of life as well as the regional commercial salmon fishery. Specifically, the PPA allows for a dual cap system with a high limit of 68,392 Chinook salmon, if those participating in the Pollock fishery participate in a voluntary intercooperative agreement (ICA). DEIS at 57. This would replace the current Chinook Salmon Savings Area and voluntary rolling hotspot system intercooperative agreement. *Id.* at 2. The limit of 68,392 is not a hard cap, however, because it is voluntary and there is no mechanism to require hard cap management when vessels opt out of the ICA and fish under the backstop cap of 32,482, after already reaching the higher limit. *Id.* at 59. In other words, salmon bycatch by any vessels fishing under the backstop cap would be in addition to bycatch under the high cap. *Id.* NPFMC acknowledges that this may result in bycatch exceedances of the high cap of 68,392 cap. *Id.*

Despite that acknowledgment, the PPA analysis does not adequately address the likelihood of exceedances or what the impact on subsistence and commercial fisheries would be should bycatch exceed the high cap. Further, the PPA analysis is inadequate because the NPFMC has not evaluated the effectiveness of the ICA. *See Id.* at 94 (stating that the agency would not judge the effectiveness of industry measures). Thus, the entire premise of the PPA is that bycatch will be reduced through the voluntary participation in the ICA. Reduction via the ICA is illusory and there is no analysis within the DEIS that support its effectiveness.

[1] Trustees for Alaska also agrees with and incorporates the comments on the DEIS submitted by the Yukon River Drainage Fisheries Association, Alaska Marine Conservation Council, the Bering Sea Elders Group, Tanana Chiefs Conference, and Oceana. We reiterate and adopt the arguments made in those comments.

Further, the PPA's proposed ICA is flawed on several accounts. The ICA suffers from a failure of transparency, public participation, scientific rigor and management oversight and offers no assurance that salmon bycatch will be reduced.

Bycatch of Chinook salmon in the BSAI Pollock fishery must be reduced to a small number, far below 30,000, to ensure healthy Chinook salmon runs, and to protect the lives and lifeways of Alaska Natives and other subsistence users that depend upon them. We propose an initial hard cap of up to 32,482, reduced over time to increase the return of Chinook salmon to the rivers and escapement to spawning redds (while also allowing the Pollock fleets time to adjust their catch methods). The bycatch limit of 32,482 represents the average Chinook salmon bycatch for 1992 (the first year with reliable bycatch estimates) through 2001. This timeframe is the most appropriate upon which to base the hard cap for two significant reasons: (1) the Yukon River Salmon Agreement, which was ratified by the United States in 2002, pledged to increase the in-river run of Yukon River-origin salmon by reducing marine catches and bycatches of Yukon River salmon; and (2) in 2000, Chinook salmon bycatch in the Pollock fishery reached an all-time low of 4,961 but has steadily increased every year with the bycatch being 67,363 in 2005, 82,647 in 2006, and in 2007, an all-time high Chinook salmon bycatch of 121,638 fish occurred. DEIS at 251. The bycatch dropped inexplicably in 2008, but based on early reports from the 2009 season which started just a few weeks ago, the bycatch rates are alarmingly high and similar to what occurred in 2007.

Due to the alarmingly high bycatch in 2007, the Alaska Federation of Natives passed Resolution 08-17:

> The 2008 Chinook salmon returns on many rivers in Alaska, including the AVCP Region were far below the number necessary for conservation, to meet international treaty requirements to provide for the needs of the Indigenous people in Canada, and far below the number of Chinook salmon necessary to meet the subsistence needs of Alaska Native families and to provide for commercial opportunities essential to meet the financial needs of the Alaska Native families.

See Alaska Federation of Natives, Inc., 2008 Annual Convention, Resolution 08-17, *Requesting the North Pacific Fishery Management Council and the National Marine Fisheries Service to Take Emergency and Permanent Action to Regulate Salmon Bycatch in the Bering Sea Pollock Fishery* (attached as exhibit E).[2] With a low and slow salmon run, significant restrictions were put in place for fear that the "run abundance would not support the customary subsistence harvests and meet escapement goals in Alaska and meet the interim management escapement goal ... into Canada." Id. By the end of 2008,

[2] A similar resolution was passed by the AVCP in October of 2008. *See* AVCP, 44th Annual Convention, Resolution 08-10-14, *Requesting the North Pacific Fishery Management Council and the National Marine Fisheries Service to Take Emergency and Permanent Action to Regulate Salmon Bycatch in the Bering Sea Pollock Fishery* (attached as exhibit F).

it was determined that there were not enough salmon to satisfy historic needs including subsistence. Id. The Resolution therefore called for a hard cap of no more than 30,000 Chinook salmon. Id.

To those in the villages of Western and Interior Alaska, every salmon that makes it upstream counts. The PPA allows for an unacceptable and unenforceable level of bycatch that will have significant adverse impacts on the Western and Interior Alaska subsistence way of life as well as the commercial salmon fishery. NPFMC should abandon the PPA and adopt Suboption vii of Alternative 2, with additional modifications identified in the next section, to ensure that the subsistence way of life is protected.

2. The range of alternatives.

As stated in the Council on Environmental Quality (CEQ) regulations implementing NEPA, the consideration of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. The regulations require that the EIS "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." 40 C.F.R. § 1502.14(a). It is "absolutely essential to the NEPA process that the decisionmaker be provided with a detailed and careful analysis of the relative environmental merits and demerits of the proposed action and possible alternatives, a requirement that we have characterized as 'the linchpin of the entire impact statement.'" *NRDC v. Callaway*, 524 F.2d 79, 92 (2nd Cir. 1975) (citation omitted). "The 'existence of a viable but unexamined alternative renders an environmental impact statement inadequate.'" *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1993) (*quoting Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1519 (9th Cir. 1992)).

The DEIS cites two National Standards (#1 & #9) to be met which require the council to (1) minimize salmon bycatch to extent practicable, while (2) achieving, on a continuing basis, the optimum yield from each fishery. DEIS at ES-1. The range of alternatives presented, however, fails to explore, in a serious manner, reasonable alternatives to address this obligation to reduce bycatch. Indeed, the effect of approving either of the preferred alternatives would serve to institutionalize historically high bycatch levels to the detriment of Alaska Native fishermen and communities, and of the escapement needed to ensure the future viability of Chinook salmon in the Yukon and other drainages. The unacceptably high bycatch recognized in the PPA is further improperly justified by basing the bycatch analysis on the period of 2002-2007, when bycatch far exceeded historic rates. *See* DEIS at 250 (chart indicating dramatic increase since 2000).

It is also important to note that Chinook salmon were already in trouble on the Yukon by 2000, and that the run has not met its escapement goals. In recognition of the need to reduce bycatch, the NPFMC had instituted a plan (BSAI FMP Amendment 58) that was not successful. At that time the 10-year average by-catch was about 32,500. To meaningfully address the National Standard on bycatch, NPFMC should analyze a range of alternatives that include options that will reduce by-catch below this historical average

to a more biological and culturally sustainable level.

Amongst the hardcaps or highcaps identified in the DEIS, the NPFMC should have considered a declining cap over time, adjusted on an annual basis. For example, recognizing that the goal is to reduce bycatch, the FEIS should consider including a declining hardcarp from the 32,500 hard cap, that would be reduced on an annual basis to a cap of 10,000.

Further, the DEIS should have considered, as an additional option to be added to all the alternatives, establishing a comprehensive gravel-to-gravel salmon research and monitoring plan to manage salmon at all life-stages. In addition, the DEIS should have considered an alternative in which fishing vessels would be required to pay a set amount for each salmon caught. Such a system would create an incentive to fish below the cap and could generate revenue for the necessary research.[3]

3. The cumulative impacts analysis.

An EIS "shall provide full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. These include all direct, indirect, and cumulative impacts of the proposed action. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8, 1508.25(c). A cumulative impact is defined in NEPA's implementing regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.... Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7. The Ninth Circuit has held that:

> [a] proper consideration of the cumulative impacts of a project requires some quantified or detailed information; *general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided.*" *Klamath-Siskiyou Wildlands Ctr.*, 387 F.3d at 993 (emphasis added) (internal quotations and citations omitted). "The analysis must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects." *Id.* at 994 (internal quotations and citations omitted).

Great Basin Mine Watch v. Hankins, 456 F.3d 955, 971-972 (9th Cir. 2006).

Instead of providing a review of the associated cumulative impacts, the DEIS lists a variety of impacts with no analysis of what the actual cumulative impact is. So, while the DEIS acknowledges potential impacts, there is no way to gauge the impact, taking all these different actions into account, on salmon runs. *See e.g.*, DEIS at 141 to 156 (where

[3] These funds would support further Chinook research and restoration, and local tribes would be involved through comanagement in the decision-making about the funding of research and restoration programs. Research and restoration projects would employ local people to the maximum extent possible.

the cumulative effects are considered in Section 3.4 but there is no conclusion which assesses the cumulative impact of all the past, present and reasonably foreseeable actions identified in subsections 3.4.1 to 3.4.4); DEIS at 324-325 (no detailed information or conclusions about what the cumulative impact is for Chinook salmon). While a list of other potential contributing impacts may be helpful, the DEIS must analyze what those impacts, in total, mean to the salmon runs and how those actions further exacerbate or contribute to the bycatch problem.

4. The DEIS fails to present the information in a manner that is readily understandable to the public.

To fulfill NEPA's purposes, an "EIS's form, content and preparation [must] foster both informed decision-making and informed public participation." *Animal Def. Council v. Hodel*, 840 F.2d 1432, 1436 (9th Cir. 1988) (quoting *California v. Block*, 690 F.2d 753, 761 (9th Cir. 1982)). The NEPA regulations note that:

> Environmental impact statements shall be written in plain language and may use appropriate graphics so that decisionmakers and the public can readily understand them. Agencies should employ writers of clear prose or editors to write, review, or edit statements, which will be based upon the analysis and supporting data from the natural and social sciences and the environmental design arts.

40 C.F.R. § 1502.8. The Ninth Circuit has held that this provision:

> imposes a requirement that an EIS must be organized and written so as to be readily understandable by governmental decisionmakers and by interested non-professional laypersons likely to be affected by actions taken under the EIS. The main text of an EIS will routinely include some scientific data and reasoning necessary to apprise decisionmakers and the public of potential environmental consequences. The more complicated the science underlying those consequences is, the more challenging the preparer's task will be to convey the information clearly. Overly technical material and supporting data, however, should ordinarily appear in appendices.

Oregon Envtl. Council v. Kunzman, 817 F.2d 484, 494 (9th Cir. 1987). The presentation of this information in the DEIS makes it challenging for the public to understand all the associated impacts and how each alternative differs. An EIS is often a cumbersome read for members of the general public. *See e.g.* Gallagher, T.J. and Patrick-Riley, K, 1989. *The readability of federal agency land management plans. Environmental Management* 13(1):85-90. The result of this may limit or bias those who can meaningfully participate in agency planning. The FEIS therefore should be organized and written in a clear manner that allows for meaningful public participation, especially for those whose first language is not English. Gallagher, T. J. 1992. *Language, Native people, and land management in Alaska.* Arctic 45(2):145-149.

The DEIS presents the associated impacts of each alternative on minority and low income communities through a series of Tables. *See* DEIS at 475 ("[t]he analysis is presented below in Table 9-8 through Table 9-13 below. These tables summarize the impacts on low income or minority populations associated with one of these three classes of impacts."). For many readers, it is difficult to understand the scope of impacts when presented in tables. Thus, the Final EIS should highlight in a clear and descriptive fashion what the impacts are for each alternative.

5. The DEIS fails to adequately address impacts to the thousands of commercial and subsistence-dependent Western and Interior Alaska fishermen.

The DEIS also, inexplicably, minimizes discussion of National Standard #8, which provides that conservation and management measures should provide for the sustained participation of fishing communities, and minimize adverse economic impacts on such communities. Salmon dependent coastal and riverine communities have been devastated by the decline of Chinook salmon, especially along the Yukon. Subsistence fishing families report serious difficulties getting the fish they need for a decade now, and the small-scale commercial fisheries on the lower river may be closed for the third year in a row in 2009.

The DEIS provides an environmental justice analysis of the salmon bycatch problem in Chapter 9. While the chapter addresses subsistence and commercial use it fails to provide a meaningful analysis of the impacts to the Western Alaska and Interior Alaska communities. First, the DEIS limits its focus to the direct economic impact and nourishment losses. However, there are impacts beyond these that must be considered. For example, there is no analysis of the impact of bycatch loss of salmon on the culture and traditions of the villages throughout Western and Interior Alaska, especially the subsistence way of life and the economic viability and cultural integrity of small communities.

In the past, Chinook salmon provided not only for summer and fall subsistence harvest, but also as a source for jobs for many of the youth in villages in the region. Members of AVCP attest that this is no longer the case. According to members of AVCP, the Chinook salmon never did recover from the significant decline in 1998.

The effects of the salmon loss from bycatch reach far beyond the fishermen and the dining table; the loss affects families throughout the region, impacting family unity fostered through the work of harvesting, cutting, smoking and sharing the fish. Additionally, with lower harvest numbers, communities may be forced to spend more time, if possible, harvesting salmon to meet their subsistence needs. Some may not extend the time they spend harvesting salmon because a longer season fails to allow for adequate drying or prevents having enough time to pick berries. These indirect impacts are not addressed in the DEIS. What are the impacts to villages along the Yukon and

Kuskokwim? The DEIS fails to address this important question in a manner that provides decision makers with enough information to determine whether one alternative is more beneficial than another.

In addition, those working in the commercial fishery are seeing similar problems. Previous to 1998, commercial fishermen had harvest guidelines up to 225,000 Chinook. Last year, there was no Chinook fishery. Commercial fishermen harvested approximately 4,000 Chinook only in incidental catches to the chum fishery. Western Alaska subsistence fishermen have been subjected to "windows regulation" in which the harvest season has become more and more limited. Before 1998, the subsistence fishermen would achieve their goals relatively quickly after the arrival of the Chinook salmon. Now, it takes longer due to the harvest windows and area restrictions, which limits time available to pursue other critical activities essential to a subsistence based life today.

The DEIS also fails to provide a meaningful analysis of how each alternative impacts the subsistence harvest and commercial salmon uses. A table highlighting impacts is not an analysis. Nor is a table an adequate means of detailing how each alternative will affect Western and Interior Native communities. Further, there is no meaningful discussion and analysis in the DEIS of how the regulated subsistence harvest, limited to narrow windows of time in which communities can harvest fish, are affected by the different alternatives.

6. The methodology applied to "foregone Pollock harvest."

By assuming no change in behavior on the part of the Pollock fleet in response to possible closure before the TAC is harvested, the methodology is patently false, and this is explicitly recognized in the DEIS. *See e.g.* DEIS at ES-26 to ES-30. Citing a lack of good data, however, the DEIS refuse to explore the impacts of a reasonable range of increased costs of the fleet of catching all or most of the TAC. Instead, the DEIS offers an approach that systematically exaggerates the costs of bycatch reduction by a very large, but indeterminate amount, and ultimately misleads any effort to understand the impacts of the alternatives.

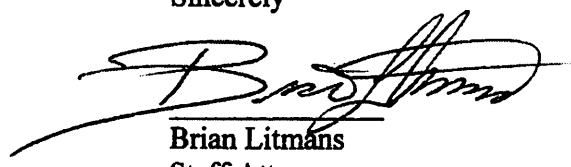
7. Conclusion

The PPA identified in the DEIS must be abandoned in favor of a hardcap no greater than 32,482 Chinook salmon, including an annual declining cap over time. The preferred alternative in the Final EIS cannot rely upon a voluntary program that has received no substantive review of its environmental and human health impacts in the EIS.

In sum, AVCP supports the establishment of a bycatch hardcap no greater than 32,482 Chinook salmon, and preferably as low or lower than the AFN Resolution 08-17 bycatch hardcap of no more than 30,000 Chinook salmon for the Bering Sea Pollock fishery, with a declining cap that is adjusted annually.

Thank you for your attention to these comments. If you have any questions, please feel free to contact me at (907) 276-4244, ext. 107.

Sincerely



Brian Litmans
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Trustees for Alaska

EXHIBIT A

People and Salmon of the Arctic, Yukon, and Kuskokwim Regions in Alaska

Socioeconomic Dimensions: Fishery Harvests, Culture Change, and Local Knowledge Systems

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Abstract

Salmon is a staple food for Native villages of the Arctic, Yukon, and Kuskokwim regions in Alaska. The economy of this area is characterized by high production of wild foods for local use and low per capita monetary incomes. Traditional subsistence activities form the cores of village economies. Subsistence salmon harvests, the priority use under law, have displayed variable trends, primarily linked to local environmental factors and the food needs of people and sled dogs. Commercial fishing of western Alaska salmon stocks intensified during the early 1970s through 1980s, providing income to small-scale fishers selling to export markets. During the 1990s, commercial salmon harvests collapsed resulting in substantial decreases of income to villages. In the Yukon drainage, families have culled dog teams in response to lower subsistence salmon harvests for dog food, impacting cultural traditions involving sled dogs. Declines in subsistence salmon harvests for food may lead to increased harvests of other wild food species or out-migration from villages, however, no programs are currently in place to monitor such effects. Historic trends and patterns in local fisheries are described in the report, including harvests for human food, dog food, and commercial sale by area. The report also describes formal co-management partnerships and studies designed to include traditional ecological knowledge of villages in fishery management, research, and stock enhancement efforts.

KEY WORDS: Salmon, subsistence, commercial fisheries, traditional economies, culture change, Alaska Natives, co-management, TEK

Introduction

This report describes trends in the commercial and subsistence salmon fisheries in western Alaska from the early 20th century to the present, including the fisheries of the Kuskokwim, Yukon, and Norton Sound drainages. It documents declines in the fisheries within each region and economic and cultural impacts to local communities. In addition, the paper summarizes recent efforts to incorporate traditional ecological knowledge (TEK) into salmon research, fishery management, and stock enhancement programs. The paper was written at the request of the Bering Sea Fishermen's Association for the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYK-SSI), a program examining the declines in western Alaska stocks during the 1990s.

Subsistence salmon fisheries have been major sources of food for Alaska Native groups in western Alaska for centuries. Commercial fishing of western Alaska salmon stocks were developed early in the 20th century and intensified after the early 1970s. In western Alaska, commercial salmon fisheries offered special benefits to Alaska Native villages. Selling fish was an income source for cash-poor villagers, an income source that potentially was renewable and sustainable. Commercial fishing drew on traditional fishing skills. It used boats, motors, and nets already owned by families for subsistence fishing. For local families, commercial fishing income was used to purchase equipment for traditional fishing and hunting. The industry helped reduce the balance of trade deficits of rural areas, paying for imported manufactured goods with fish exports. From the early 1970s into the 1990s, commercial fishing strengthened the economies and cultures of many western Alaska villages. Fishing labor was kept local, technology small scale, and risks low to fishers. Core village subsistence activities were not eroded but reinforced with earnings of commercial fishers.

However, by the turn of the 21st century, the socioeconomic system combining commercial and subsistence fishing was fraying. Some might say, it was collapsing. There were two primary forces at work. The first was new competition from fish farms outside the United States – a glut of farmed salmon depressed world market prices and strained the economic viability of wild stock fisheries in western Alaska. The second forces were the fish stocks themselves – declining salmon runs in western Alaska during the 1990s threatened commercial and subsistence fisheries, forcing significant restrictions and closures. The relationships between salmon and people were rapidly changing, globally and locally. The purpose of this report is to describe social, economic, and cultural dimensions of these events in western Alaska.

Regional Socioeconomic Patterns

Three large geographic regions comprise the area of the AYK-SSI program – the Kuskokwim drainage, the Yukon drainage, and the Norton Sound drainage (Fig. 1). In this area, settlements are small, generally less than 500 people, geographically dispersed, and remote from trade centers. Disastrous epidemics of smallpox, influenza, measles, and tuberculosis devastated Alaska Native populations in this area from the early 19th century into the early 20th century. However, by the mid-20th century Alaska Native populations turned a demographic corner in western Alaska, beginning a half-century of rapid growth and socioeconomic gains. Village populations have grown substantially during the last half century (1950-2000) (Table 1). In the Kuskokwim River drainage, village populations increased from 3,569 to 11,083 people in 36 villages, while Bethel, the regional center, grew from 651 to 5,471 people. In the Yukon drainage, village populations grew from 4,316 to 12,248 people in 42 villages. In the Norton Sound drainage, village populations grew from 2,450 to 4,983 people in 14 villages, while Nome, the regional center, grew from 1,876 to 3,505 people (however, Nome did not grow between 1990 and 2000). While substantial, village growth rates were far exceeded by Alaska's urban centers. Since 1950, the Anchorage area grew from 35,021 to 319,240 people, primarily by in-migration from outside Alaska. Fairbanks, the major urban center in the Yukon drainage, increased from 18,129 to 82,840 people. In 2000, the total population of the AYK-SSI area (37,290 people) was about half the size of Fairbanks and a tenth of the Anchorage area. Alongside people, dogs comprise another major segment of the area's demographic profile with significance to salmon. Historically, there probably were as many dogs consuming salmon as people in the AYK-SSI area, as discussed below. In 2002, there were half as many dogs as people in Yukon River villages (5,345 dogs) (Brase and Hamner 2003), and their proportions in other areas were probably less.

The AYK-SSI area is the traditional homeland of several Alaska Native groups. The villages of coastal and lower river areas are primarily occupied by the Yup'ik and Inupiat. Athapaskans live in the upriver villages, including the Deg Hit'an and Upper Kuskokwim in the Kuskokwim drainage and the Deg Hit'an, Holikachuk, Koyukon, Tanana, Gwich'in, and Han groups in the Yukon drainage. In 2000, Alaska Natives were the predominate population in the villages – Yukon villages (89% Alaska Native), Kuskokwim villages (93%), and Norton Sound villages (93%) (Table 2). Two regional centers at Nome (59% Alaska Native) and Bethel (68%) showed more cultural mix with significant non-Native populations. By comparison, Fairbanks and Anchorage were predominately non-Native (10% Alaska Native). The patterns of use of salmon as human food and dog food are directly related to the cultural composition of

communities. Cultural composition has been found to be the strongest predictor of wild food harvest levels in Alaskan communities (Wolfe and Walker 1987).

The economies of AYK-SSI villages are distinct from those of urban Alaska. Comparatively, urban Alaska areas have relatively high monetary incomes and low wild food harvests, while villages have low incomes and high wild food harvests (Table 2). Based on the 2000 federal census, mean per capita incomes in AYK-SSI villages ($9,087-$10,382) were about half the incomes in Fairbanks ($20,166) and Anchorage ($24,525) (Table 2; Alaska Department of Community and Economic Development 2003). Low incomes reflect relatively weak cash sectors in local village economies. The higher costs of imported goods sold in villages further increases the economic disparity between village and city. When adjusted by the cost of store food, village per capita incomes ($4,408-$5,397) were a fifth of those in urban areas, with regional centers intermediate (Table 2). Because western Alaska is a cash-poor area, subsistence harvests and income from sustainable industries like commercial salmon fishing take on particular importance for families.

Wild food harvests comprised the core sector of village economies in western Alaska in the late 20th century. Based on surveys conducted during the 1980s-90s, annual wild food harvests for human consumption ranged between 601-739 lbs per person in AYK-SSI villages, about two lbs per person per day (Table 2; Wolfe and Utermohle 2000). In contrast, wild food harvests were low in Anchorage (19 lbs) and Fairbanks (21 lbs) where most food is imported from the south. Wild food harvests at Bethel and Nome are probably intermediate, but estimates are guesswork without comprehensive household surveys. By adding in the monetary value of wild foods, village per capita incomes rise to about $15,000-$20,000 annually, closer to incomes in urban areas. This calculation assumes a replacement value of $20 per lb for finished subsistence products, an estimate between the market price of traditional Alaska Native cold-smoked salmon in Anchorage ($24 per lb) and $14 per lb of subsistence foods used for the Exxon Valdez settlement in the Gulf of Alaska (Duffield 1997).

General Commercial and Subsistence Relationships

The basic core of the local village economy is subsistence production, depicted as four doubled lined boxes in Fig. 2 (general descriptions of subsistence-based economies can be found in Wolfe 2001; Wolfe et al 1984; Langdon 1986; and Schroeder et al 1987). Fish runs are harvested by family groups (a domestic mode of production), frequently working from seasonal fish camps. The salmon catch is processed by family members (air dried, cold smoked, frozen, salted, canned, or fermented) into products that are consumed throughout the year. As a rule, a

third of village households produce most of the subsistence foods consumed locally (Andrews 1988; Sumida 1986; Sumida and Alexander 1986; Sumida and Andersen 1990). The products are shared to other households, most frequently among extended family networks. Some subsistence products are shared or traded for small amounts of money. In addition, in many communities salmon is processed for dog food, supporting the cultural institutions dependent on sled dogs. Salmon production is part of a larger annual cycle of subsistence activities in which families participate. In general, salmon is a staple in most AYK-SSI communities, ranked among the top ten resources produced by weight. However, the types and proportions of wild resources vary substantially between villages.

In communities where commercial fisheries have developed, commercial fishing has become an adjunct to this set of core subsistence activities, as shown as the two boxes with solid borders in Fig. 2 (Wolfe 1984). Commercial fishers commonly work within traditional fishing areas with gear used for subsistence fishing. Raw fish or roe is sold to licensed buyers, providing a flow of money to families. Some local jobs also are created in processing fish as frozen, canned, or dried products. Buyer-processors usually are business interests headquartered outside the region, but also include joint ventures, cooperatives, and businesses linked to Native corporations. The commercial products are distributed to markets in Japan, the United States, and elsewhere. In addition, commercial buyer-processors pay some local and state taxes. During the most recent decade, jobs created by local governments have become the primary source of wage income to extended families in villages. In this socioeconomic system, commercial fishing and wage employment are integrated by families into the traditional domestic mode of production of subsistence foods. Salmon have value as both a subsistence product and as a source of monetary income within communities with commercial fisheries.

During the 1980s-1990s, a number of community studies were conducted within the Alaska Department of Fish and Game, Division of Subsistence documenting the general pattern of subsistence and employment for villages described above. For the Kuskokwim area, these include Chuathbaluk and Sleetmute (Charnley 1984); Kwethluk (Coffing 1992); Lime Village (Kari 1983); Nunapitchuk (Andrews 1989); Stony River (Kari 1985); Tuluksak (Andrews and Peterson 1983); central Kuskokwim communities of Aniak, Crooked Creek, and Red Devil (Charnley 1982; Brelsford, Peterson, and Haynes 1986; Stickney 1981); and upper Kuskokwim communities of McGrath, Nikolai, Takotna, and Telida (Stickney 1980; Stickney 1981; Stokes 1984). For the Yukon drainage, these include Beaver (Sumida and Alexaner 1986); Galena (Marcotte 1990); Kaltag (Wheeler 1987); Minto (Andrews 1988); Nenana (Shinkwin and Case 1984); Russian Mission (Pete 1991); Stevens Village (Sumida 1986); Tanana (Case and Halpin

1990); lower Yukon communities of Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins (Pete and Wolfe 1991; Wolfe 1981); Koyukuk River communities of Allakaket, Alatna, Bettles, Evansville, and Hughes (Marcotte and Haynes 1984; Marcotte 1986; also Nelson, Mautner and Bane 1982 from the National Parks Service); and upper Yukon-Porcupine communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie (Caulfield 1983; Caulfield, Peter, and Alexander 1983; Sumida and Andersen 1990). For the Norton Sound area these include Brevig Mission and Golovin (Conger and Magdanz 1990); Gambell and Savoonga (Ellanna 1983); Nome (Magdanz and Olanna 1984; Magdanz and Olanna 1986); and Shaktoolik (Thomas 1982). For the Yukon-Kuskokwim coastal area, these include Hooper Bay and Kwigillingok (Stickney 1984) and Goodnews Bay and Quinhagak (Wolfe et al. 1984; Wolfe 1989).

In addition to the fisheries descriptions in community studies listed above, there are several other reports describing subsistence salmon fisheries in the AYK-SSI area, including for the Kuskokwim fisheries Andrews and Coffing (1986), Stokes (1982), and Walker and Coffing (1993); for the Yukon fisheries Andrews (1986), Caulfield (1981), Huntington (1981), Marcotte (1982), and Wolfe (1982); and for the Norton Sound fisheries Bue and Lean (1999), Magdanz (1992), Magdanz and Punguk (1981), Magdanz et al (2002), Thomas (1980a), and Thomas (1980b). Annual subsistence salmon harvest statistics are found in several sources, including for the Kuskokwim drainage Alaska Department of Fish and Game (2003a), Alaska Department of Fish and Game (2003b), and Burkey et al (2002); and for the Yukon drainage Borba and Hamner (2000), Borba and Hamner (2001), Brase and Hamner (2002), Brase and Hamner (2003), and McNeil (2002).

Trends in Fisheries

General trends in commercial and subsistence fisheries are similar for the Kuskokwim, Yukon, and Norton Sound areas, depicted in Figs. 3-5. The Yukon drainage has the most complete historic information, so this area will be discussed in greatest detail (Gilbert and O'Malley 1921; Pennoyer, Middleton, and Morris 1965; Wolfe 1984; McNeil 2002). Along the Yukon River, the first attempt to commercialize salmon was short-lived, from 1918 to 1924. The 1919 salmon season was considered a disaster by subsistence fishers, and event that triggered a federal investigation (reported in Gilbert and O'Malley 1921). The federal government eventually closed commercial fishing to protect upriver subsistence fisheries, families, trappers, and miners with dog teams, and winter mail contracts. That 1919 disaster year offers an interesting historic case, as it represents the first documented failure of king and chum runs along

the Yukon River, perhaps from natural factors coupled with increased fishing for federal mail contracts and export commercial fisheries. Why this failure occurred and whether the case is useful for understanding the 1990s declines may be relevant lines of inquiry. In 1919, about 104,822 chinook and 738,790 chum and coho were harvested in the commercial and subsistence fisheries.

Commercial fishing harvest trends in the Yukon drainage are clearly seen in Fig. 3. After reopening at relatively modest levels during the 1930s-60s, the commercial salmon fisheries intensified after 1970 with annual catches of about 1.0 to 1.5 million fish from 1978 to 1989, followed by steep declines during the 1990s. The fishing power of small-scale net gear by local fishers is notable – Yukon River fishers have met or exceeded all commercial harvest guideline ranges set by state management. The efficiency of the commercial fishery has increased over time with greater use of drift nets instead of set nets and greater mobility of fishers using higher horsepower outboards. This has required state management to shorten fishing periods to provide for escapement. Similar increases in efficiency in subsistence fishing methods have also occurred (Wolfe 1982; Wolfe 1984).

Subsistence salmon trends in the Yukon drainage are also shown in Fig. 3. Subsistence harvests grew between the mid-1960s to the early 1990s, a function of increased food needs of growing villages and of dog populations. Unlike commercial harvests, there have been no state-imposed guideline caps for subsistence salmon harvests. Subsistence production levels have been essentially self-limiting because production is for local use rather than for sale, and up until recently, local demand has been substantially below harvestable surplus levels. However, with declining salmon runs, subsistence harvests saw a steady decline during the 1990s, primarily representing declines in harvests for dog food, discussed later in this paper.

Similar general trends are seen for the commercial salmon fisheries of the Kuskokwim drainage (Fig. 4) and the Norton Sound-Port Clarence district (Fig. 5). In the Kuskokwim and Norton Sound-Port Clarence areas, the commercial salmon fisheries intensified, peaked, and fell, much like the Yukon area. Trends for the Norton Sound-Port Clarence are shown without pink salmon to remove the effects of their odd and even year cycle. It is difficult to depict longer-term subsistence trends in the Kuskokwim and Norton Sound-Port Clarence areas because of incomplete historic catch information.

Declines in commercial salmon fisheries represent major reductions of income for families in western Alaska villages. The declines of income to fishers (ex-vessel values) are summarized in Table 3 for the Yukon, Kuskokwim, and Norton Sound-Port Clarence areas from

1977 to 2002. The total value of the three fisheries to commercial fishers fell from about $15.7 million in 1989 to about $2.0 million in 2002 (Table 3).

Management responses to declining runs during the 1990s have followed state mandates that require management for sustainability, conservation of fish stocks, and subsistence priorities. Commercial fisheries have been restricted first by regulations, followed by subsistence fisheries. State law requires that fishing regulations provide a reasonable opportunity for subsistence uses when harvestable surpluses are sufficient (AS 16.05.258). To meet this requirement in the AYK-SSI area, the Alaska Board of Fisheries have established subsistence harvest thresholds for eleven western Alaska salmon stocks that represent reasonable opportunity standards for subsistence, shown in Table 4. Trends these subsistence salmon stocks are discussed below.

At Nome (Norton Sound Subdistrict 1) subsistence chum salmon harvests consistently fell below the amount necessary for subsistence uses during the 1990s (Fig. 6, originally from James Magdanz; Bue and Lean 1999). This required the Alaska Board of Fisheries to establish the first "Tier II" subsistence salmon fishery in Alaska, a management system that limits subsistence participants to those with the greatest dependency and fewest alternatives to fishing salmon. The subsistence restrictions in this area have created substantial hardships for Nome. Local fish camps have been idled. Traditional fishing areas have been closed, forcing shifts away from rivers to marine harvest areas and to more distant fishing locations, creating competition with neighboring village-based fisheries. Costly and contentious legal suits arose over state management of Alaska Peninsula commercial salmon fisheries that intercept western Alaska stocks. Even with the Tier II permit system in place, there has been little opportunity to fish. The absence of salmon drying on racks during summer at local fish camps creates a depressive mood. New management plans have focused on better in-season monitoring and ways to restore runs in individual stream systems in the Nome area. Co-management partnerships have brought together state, federal, and local entities including Kawerak, the regional Native nonprofit corporation, and the Bering Sea Fishermen's Association, working on these initiatives. Pieces of the Nome fishery history are found in Thomas (1980a, 1980b), Magdanz and Punguk (1981), Magdanz (1984), Magdanz and Olanna (1986), Magdanz (1992), Bue and Lean (1999), and Magdanz et al. (2002).

Since 1990, total subsistence salmon harvests by Yukon River communities decreased about 240,800 fish, from about 375,556 salmon in 1990 to 134,759 salmon in 2000, a decline of about 64% (McNeil 2002). The largest declines have occurred with fall chum and coho (Figs. 9-10). Subsistence fall chum harvests decreased 89% from 167,900 (1990) to 19,306 (2000), while coho harvests decreased 66% from 43,460 (1990) to 14,717 (2000). Harvests of fall chum and coho fell below the lower subsistence threshold in three or four of the last five years (1998-2002).

Subsistence summer chum harvests decreased 49% from 115,609 (1990) to 58,385 (2001), falling below the lower subsistence threshold in four of the last five years (Fig. 8). Subsistence chinook harvests decreased 26% from 48,587 (1990) to 35,841 (2000), falling below the lower subsistence threshold two of the last five years (Fig. 7).

Since 1989, total subsistence salmon harvests by Kuskokwim River communities decreased about 100,000 fish, from about 309,000 salmon in 1989 to 203,053 salmon in 2001, a decline of about 34% (Burkey et al. 2002). Harvest trends before 1989 cannot be assessed with precision because surveys between 1960-89 used different assessment methods. Subsistence chum harvests fell 72% from 139,687 (1989) to 39,970 (1997) (Fig. 12), while coho harvests fell 53% from 52,918 (1989) to 24,864 (1998) (Fig. 14), each approaching the lower bounds of the amount necessary for subsistence. Subsistence chinook and sockeye harvests (Figs. 11 and 13), while approaching the lower subsistence thresholds, show less definite trends compared with chum and coho. As shown in the above figures, reduced harvests have affected each segment of the river, including lower river communities (mouth to Tuluksak), upper river communities (Lower Kalskag to Nikolai), and Bethel. The greater harvest potential in the lower river, where most of the population lives, has posed potential problems for harvests in upriver villages. Weekly subsistence fishing closures in lower river districts have been implemented in part to help pass fish to upriver villages.

In the lower Kuskokwim Bay (Quinhagak, Goodnews Bay, and Platinum), subsistence salmon harvests declined about 42% from 12,549 salmon (1989) to 7,276 salmon (1996) (Fig. 15). Harvests rebounded between 1998-2001 in this area. The harvest numbers in Fig. 15 do not include salmon harvests within other coastal communities north of the Kuskokwim River mouth (Newtok, Nightmute, Toksook Bay, Tununak, Chefornak, and Mekoryak), where salmon harvests, thought to be comparatively small, are not consistently monitored.

Dogs and Salmon

Dogs are major consumers of chum and coho salmon from western Alaskan stocks, especially in the Yukon drainage but also to lesser extents in the Kuskokwim and Norton Sound areas (Andersen 1992a. 1992b; Gilbert and O'Malley 1921:145; Wolfe 1979:139, 144; Wolfe, Utermohle, and Andersen 2001). The primary use of fall chum (72%) and coho (69%) was for feeding dogs in Yukon drainage communities during the 1990s (these percentages are the 1990-90 means). While the primary use of Yukon River summer chum (64%) was for human food, this was due to use patterns in lower river communities where most summer chum is harvested; in upriver communities, the primary use of summer chum was for feeding dogs. Chinook salmon

were harvested almost exclusively for human food, although dogs may be fed scraps, diseased fish, and, more occasionally, immature "jacks."

Throughout the historic period, dog teams have been used for winter travel. "Transportation" is specifically listed as a subsistence use in state and federal statutes. Accordingly, catching salmon for feeding dogs is managed under subsistence fishing regulations as a subsistence use. During the late 20th century, dog teams in Yukon River villages were used for multiple purposes including transportation, hauling goods, subsistence hunting and fishing, subsistence trapping, and racing at winter festivals. Recent surveys have indicated that most teams in villages served multiple purposes, of which racing might be one (Andersen 1992a). Dog mushing has become an educational tool for village youth, who, in the maintenance of dog teams, acquire skills, work ethics, and knowledge directly applicable to subsistence activities

Salmon harvests for dog food peaked during the early 20th century. At this time families commonly kept somewhat less than a dozen sled dogs for general transportation, hauling wood, water, and supplies, trapping, and hunting. In addition, mail carriers were paid under territorial contracts to haul freight on dog sledges between communities. Commercial haulers maintained much larger dog lots and ran teams of 10 to 20 dogs. Dog populations fell during the early-to-mid 20th century as aircraft replaced dogs for transporting freight during winter. Dog populations fell again during the 1960s, replaced by snowmachines, to a low point in the early 1970s. During the 1970s, dog populations increased as part of a revival of dog mushing, especially in interior Alaska. The first Iditarod race was run in 1973 and early rural champions helped revitalize dog mushing as a cultural institution.

Changes in dog numbers in the Yukon drainage since 1966 are charted in Fig. 16, based on information collected by annual state salmon harvest surveys (Brase and Hamner 2003; McNeil 2002; Wolfe, Utermohle, and Andersen 2001). In a seven-year period dog populations increased from about 1,804 dogs (1972) to somewhat over 5,000 dogs (1979). During the 1980s, dog populations in the Yukon drainage stabilized between about 5,000-6,000 dogs. In the early 1990s, dog populations using subsistence salmon showed another jump, in part because urban residents in the Fairbanks area were allowed to harvest subsistence salmon (a result of McDowell v Alaska). The number of dogs owned by salmon-fishing households peaked at about 8,700 dogs in 1993. From this high point, dog populations decreased during the mid-to-late 1990s to about 5,345 dogs in 2002. Trends in dog populations cannot be tracked in the Kuskokwim or Norton Sound areas because there is little historic information.

The declining numbers of dogs on the Yukon River during the mid-to-late 1990s are linked to declining harvests of chum and coho for dog food, shown in Fig. 16. Overall, Yukon

River salmon harvests for feeding dogs in 2002 were 81% lower than harvests in 1992. The substantial declines in dog food harvests have occurred in all Yukon River districts, including declines of 85% in Districts 1-2, 78% in Districts 3-4, 84% in District 5, and 77% in District 6. However, in terms of numbers of fish, the upriver districts have been most severely affected, shown in Fig. 18.

Historically, dogs have been culled, sold, or given away in times of salmon shortages. Trends during the 1990s are consistent with past practices. Overall in Yukon drainage villages there were 39% fewer dogs in 2002 than in 1992. The largest decreases were in upriver districts: 29% (District 3-4), 37% (District 5), and 69% (District 6). In lower river villages (Districts 1-2) where salmon is less commonly fed to dogs, dog populations were only 5% lower. Families in upriver areas were more likely to cull dog lots in response to declining chum and coho runs than lower river families.

Relationships between dog numbers and salmon harvests for dog food are complex. In the 1990s, most dogs were fed a mixture of foods, with upper river villages using more salmon than lower river villages, and smaller lots using more salmon per dog than larger lots (Andersen 1992). Analysis of existing data sets might find statistical relationships between factors such as salmon run size, salmon harvests per dog, district, dog lot size, and commercial dog food use. Information from this type of analysis might be applied in management. Some additional flexibility may be possible in subsistence management regulations, such as identifying reasonable opportunity standards for dog food, distinct from salmon harvests for human food, based on customary and traditional practices. Trends in salmon harvests for human food and for dog food are shown in Fig. 19. Household guideline caps on dog food harvests during low salmon runs might reduce exploitation rates while providing a reasonable opportunity for subsistence uses. Under such an approach, increased salmon escapements would come from the harvests of the largest dog lots specializing in breeding and selling dogs.

Although it is a subsistence use, dog food was accorded a lower priority than human food in state disaster relief programs in 1998 and 2000. State officials felt it difficult to justify public expenditures for feeding dogs. Salmon were transported to disaster area villages for feeding families but not for dog food. Instead, privately-funded programs emerged to address dog food shortfalls in some Yukon River villages.

Traditional Ecological Knowledge

The term TEK (Traditional Ecological Knowledge) refers to local knowledge gained from long-term experience in a fishery (Berkes, George, and Preston 1991; Fehr and Hurst 1996;

Miraglia 1998; Moncrieff and Huntington 2002; Moncrieff and Klein 2003; Nakashima 1990; SP Research Associates 1991; Wenzel 1999; Yukon River Drainage Fisheries Association 2002). There are local bodies of knowledge about salmon, part of the cultural traditions of Alaska Natives and other long-term users of salmon. Local systems of knowledge commonly exist alongside those of academics, managers, and government officials. In western Alaska, formal partnerships are being created bringing together salmon experts from these different traditions. More complete understandings of fish and fisheries result from collaboration. Local interests benefit from access to academic findings. Scientists and managers benefit from access to local knowledge. The partnerships establish procedures for collecting, sharing, analyzing, interpreting, and using information.

TEK has entered the salmon regulatory system through the state's fish and game advisory committee system, the federal regional subsistence council system, and ad hoc committees formed at Alaska Board of Fisheries meetings. Through such advisory bodies, local experts have formal channels for creating and commenting on proposed fishing regulations (gear, seasons, areas, and so forth), as well as management elements like escapement goals, harvest goals, and in-season monitoring. At advisory meetings, fishery managers typically share information on the previous year's run characteristics, escapements, harvests, and management actions. TEK undoubtedly influences salmon regulations through these reviews. The collaborations necessarily are constrained by the formal meeting formats, the particular areas of expertise of participants, and the regulatory issues on the agenda. The information developed within the advisory sessions rarely makes it into a published record. The proceedings may become part of local oral histories, minutes, or written comments filed within a regulatory agency.

TEK may enter into in-season management of salmon fisheries through co-management entities like YRDFA (Yukon River Drainage Fisheries Association) and the Kuskokwim River Salmon Management Working Group (there was no similar co-management entity in the Norton Sound area). Consultation with co-management entities is a relatively new component of in-season management on the Kuskokwim and Yukon rivers, developed during this time of low salmon returns. In-season consultations are held between fishery managers and stakeholder entities (for example, a list of the Kuskokwim meetings are posted at www.cf.adfg.state.ak.us/region3/news/ayk_news.htm#kusknr). Up-to-date information is exchanged on run strength, catch levels, escapements, water conditions, management options, and other aspects of salmon returns.

There have been only a few research projects specifically designed to gather and analyze TEK about fish in the AYK-SSI region. Moncrieff and Klein (2003) compiled information on

salmon stocks, abundance, and life cycles along the Yukon River, based on interviews with 29 experts in four villages. The project explored several general topics pertaining to salmon. Information provided by local experts on *Ichthyophonus* supports that the disease was historically present in Yukon River chinook stocks and that increased numbers of infected fish during the 1990s were exceptional. This type of information is pertinent for work on stock size-disease relationships. Information on the number and timing of king runs and traditional indicators of run strength are potentially pertinent for management. The work illustrates that expert knowledge is commonly localized, derived from long-term observations within traditional use areas. Depictions of larger natural systems, such as salmon life histories within an entire drainage like the Yukon River, require combining and synthesizing information from local experts in different places along the river. Results of this project also are presented in a documentary video (YRDFA 2002).

Andersen and Fleener (2001) explored beaver-whitefish interactions in the Yukon Flats through interviews with fifteen local experts. According to this TEK analysis, during this past century there has been drying in the Yukon Flats so that some wetlands are transitioning into drier bottom lands. Concurrently, since the mid-20th century, beaver populations have expanded with declines of fur trapping. Seasonal, high-water flood events have been less frequent. This has increased the likelihood that beaver dams impede the seasonal movements of fish. Traditionally, some Alaska Native groups cleared key waterways connecting main stem and peripheral stream systems to help increase water flow and assist fish migrations. This TEK study focused on declining whitefish populations. How salmon stocks might fit into such ecological processes is an obvious research question. A logical next step to this type of research would be identifying affected geographic areas or fish stocks and integrating information on snowfall, rainfall, hydrology, and fish life cycles as well as recent beaver management practices on public lands.

The systematic collection of information on climate, habitat, and resource changes as observed at the local level is an unexplored research area. Information on changes in critical habitats such as near-shore rearing areas or inland spawning areas may be relevant to stock trends. For example, during the early 1980s, I was told by Stebbins residents of earlier springs and later freeze-ups in Norton Sound – usually sea ice broke about June 8-10, followed immediately by the first herring run, but break-up was now occurring in late May with earlier arrivals of herring and salmon. This was corroborated down the coast at Emmonak, which used to be lucky to get oil from St. Michael before June 15-20 because of ice. One expert observed that more king salmon were being taken at St. Michael – "they never used to get kings," and that beaver were moving downriver into the coastal flats – "they never used to be there." TEK studies

can be designed to collect and analyze this type of trend information. Is this type of information relevant to salmon trends? Possibly. But it remains an untapped research area.

TEK studies are more likely to yield information of use to understanding salmon stocks if they are collaborations of local experts, natural scientists, and social scientists. The connection of disciplines should occur in the field, not afterward with natural scientists reading a social science report and wondering how it might apply to their research problems. Studies with a focus on specific ecological questions will produce better information than general surveys. Small-scale, discrete projects can collect information around specific ecological questions pertaining to salmon. TEK collaborations represent new methodologies applied to difficult ecological questions, so as with any new research enterprise we can expect projects with different yields.

Some TEK may challenge basic assumptions within scientific traditions. A TEK study of western Alaska salmon fisheries found that in Yup'ik ecological models, fish are assumed to be particularly sensitive to human touch and waste (Wolfe 1989; Gross 1991). Under this ecological model, catch-and-release fishing is thought to entail substantial risks to salmon stocks. This traditional knowledge about salmon-human interactions stirred controversy, because it challenged catch-and-release fishing practices assumed to have acceptable mortality rates by state biologists. The Board of Fisheries considered both the Yup'ik and sport fishing models in deliberating regulations for salmon fishing in the Togiak and Kanektok river drainages.

A workshop on TEK by YRDFA identified a list of research ideas that might be explored with TEK methods. Areas included documenting local food web ecologies, historic fish cycles and fishers responses to them in local areas, and changes in climate on local salmon and salmon habitats (Moncrieff and Huntington 2002:4-5).

Information from interviews with local residents that contain TEK are stored in databases for Bristol Bay, Gulf of Alaska, Copper Basin, and for marine mammals, all maintained by the Alaska Department of Fish and Game. The AYK-SSI area as yet has no single computerized text database of key respondent materials. As TEK studies are funded, a centralized database for the AYK-SSI area might provide a single repository of information. Computerized text databases allow for information to be accessed under key word searches. The primary uses of text databases are for exploring topics of potential interest. Like harvest databases, databases of interview texts are unanalyzed data repositories rather than analyzed materials. In addition to scientific users, text databases are of potential use to school systems as repositories of ecological and cultural information from local experts that are accessible to students.

Discussion

Declining salmon harvests no doubt are placing stresses on the capacity of villages dependent on western Alaska salmon stocks to support themselves. However, the details of these effects cannot be described in a paper like this because there is little information gathered or published documenting local responses to the recent salmon shortages. The lack of information leaves more questions than answers regarding the extent of economic difficulties of families and villages caused by salmon downturns.

Because they are accustomed to dynamic natural systems, families in Native villages are exceptionally resourceful in dealing with harvest shortfalls of particular wild food species. In response to the declining abundance of a food species, families may intensify effort, such as harvesting more days, with more gear, or in other locations. Families also may reduce their efforts to harvest a depressed stock. Both types of responses were documented for marine mammals hunters faced with recent declining harbor seal and sea lion populations in the Gulf of Alaska (Wolfe, Fall, and Stanek 2002).

Another potential response is for families to increase harvests other wild resources to make up for shortfalls in subsistence food or monetary income. Little can be said regarding the details of such food replacement strategies. Which species may be substituted, in which villages, and the effects over the short and long terms are all unanswered questions. The information from the few community studies in the AYK-SSI area is stored in the Community Profile Database of the Alaska Department of Fish and Game. This data set indicates that the mixes of wild resources vary considerably between villages. The abilities of families to replace salmon shortfalls are constrained by the types and abundance of other wild resources available in village use areas. In general, it is likely that coastal villages have more wild food alternatives than inland villages because maritime ecosystems are more diverse and richer. Historically, coastal populations were larger than inland populations, probably reflecting more secure food resources. However, from the limited information at hand, one cannot identify with certainty the villages at most food risk from reduced salmon runs.

Based on experiences in 1998 and 2000, it is clear that disaster relief programs that airlift fish to villages cannot hope to replace subsistence salmon shortfalls. Despite considerable effort and cost, a relatively small proportion of the salmon shortfalls was replaced through the airlift programs in 1998 and 2000. By comparison, voucher systems allowing families to purchase subsistence equipment to fish and hunt, or to purchase replacement store foods, appear to be more flexible and efficient emergency relief programs.

Should commercial fisheries become marginal economic industries, permit holders are likely to pursue other forms of work. During the last decade, local and regional governments have been major sources of village employment, such as in local school systems, facilities maintenance, and community capital improvement projects. Revenues from CDQ fisheries fund employment in villages having those programs. Commercial fishing might follow the course of trapping in rural villages. With falling fur markets in the mid-20th century, fewer villagers trapped for sale, fur exports declined, partnerships between trappers and trading companies disappeared, and many traplines went fallow. Trapping for local subsistence uses continued while harvests for export sale substantially diminished in importance.

Out-migration by family members is another possible response to downturns of subsistence or employment in villages. In difficult times, families may fragment as individuals move to more promising places. Out-migration from villages may increase regional center populations if more employment is available there. However, Nome's population was stable between 1990 and 2000, suggesting its economy was unable to attract or keep new people. Migration threatens local traditions, especially when families move to urban centers like Fairbanks and Anchorage.

Programs to manage, restore, and enhance salmon are potentially new sources of income in villages. The position of these enterprises in the socioeconomic system are depicted in Fig. 2. Research, management, and restoration entities based from universities or agencies generally do not view their primary function as providing jobs in rural villages. Mandates are viewed as "building knowledge bases about salmon," "managing a fishery for sustained yield," or "restoring a salmon stock." However, an equally valid point of view is to see such programs as persons making money from salmon through government grants. Grants to enhance a salmon stock on their face resemble capital improvement grants, akin to a project to extend a village runway used by the public. It raises the logical question of who receives the income from the grant. This was the same question raised when western Alaska salmon stocks were initially eyed for development by commercial or sport fishing interests. In the new enterprise, will the workers be local residents so that income from the new salmon enterprises directly benefit cash-poor villages? Commercial fisheries were compatible with the cultures and economies of western Alaska villages because they were kept small-scale, employed local people, and brought value to local villages. In a similar fashion, structuring research, management, and restoration programs to involve local workers might provide immediate benefits to villages. Such partnerships may be more likely to receive local support or to be successful in their long-term outcomes. These issues will take on greater importance should the commercial buyer-processor and export market components

depicted in Fig. 2 disappear from the socioeconomic system. Then subsistence production and research-restoration will become the two primary economic enterprises involving western Alaska salmon stocks.

Twenty years ago, I described the Yup'iks of the lower Yukon River as a modern hunter-gatherer society successfully adapting within the global economy, integrating commercial salmon fisheries with traditional subsistence patterns (Wolfe 1984). Since that time, fish farms have revolutionized the world market, western Alaska salmon runs have crashed, and unprecedented fishing restrictions have been implemented. These challenges now threaten the sustainability of Native villages dependent on salmon. However, alongside these challenges, new enterprises have evolved. Organizations have emerged that bring together the expertise of federal, state, and co-management entities representing stakeholder interests. New stock assessment, management, and restoration programs are being developed and implemented. And new research is exploring emerging ideas about salmon combined with old wisdom from local traditions. Time will tell if these new partnerships prove fit to meet the new challenges.

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Table 1. Population Trends, 1950-2000
Arctic-Yukon-Kuskokwim Sustainable Salmon Initative Area, the Anchorage/Mat-Su Area, and the Fairbanks Area

	1950	1960	1970	1980	1990	2000
Kuskokwim Area Villages (36)	3,589	5,411	5,965	7,774	9,585	11,083
Bethel (Kuskokwim)	651	1,258	2,416	3,576	4,674	5,471
Yukon Area Villages (42)	4,316	7,010	7,862	9,919	11,204	12,248
Norton Sound Area Villages (14)	2,450	2,775	2,817	3,526	4,202	4,983
Nome (Norton Sound)	1,876	2,316	2,357	2,506	3,500	3,505
AYK-SSI Area Total	12,882	18,770	21,417	27,301	33,165	37,290
Anchorage/Mat-Su Area	35,021	88,021	132,894	192,247	266,021	319,240
Fairbanks Area	18,129	42,992	45,864	53,983	77,720	82,840

Table 2. Economic and Social Characteristics
Arctic-Yukon-Kuskokwim Sustainable Salmon Initative Area, the Anchorage/Mat-Su Area, and the Fairbanks Area

	Percent Alaska Native (2000)	Per Capita Income (2000)	Adjusted Per Capita Income (2000)*	Wild Food Harvests**
Kuskokwim Area Villages (36)	93%	$9,087	$4,563	739 lbs
Yukon Area Villages (42)	89%	$10,403	$5,397	601 lbs
Norton Sound Area Villages (14)	93%	$10,382	$4,408	700 lbs
Bethel (Kuskokwim)	68%	$20,267	$12,530	261 lbs
Nome (Norton Sound)	59%	$23,402	$14,649	240 lbs
Anchorage/Mat-Su Area	10%	$20,166	$20,116	21 lbs
Fairbanks Area	10%	$24,525	$24,083	19 lbs

*Adjusted for the cost of food in the community

** Estimated pounds per capita per year (usuable weights) during the 1990s

Table 3. Income to Commercial Salmon Fishers by Area, 1977 - 2002 (Ex-Vessel Value)

	Yukon Area	Kuskokwim Area	Norton Sound-Port Clarence	Total Areas
1977	$4,267,466	$3,891,950	$546,010	$8,705,426
1978	$5,740,191	$2,337,470	$907,330	$8,984,991
1979	$7,171,515	$3,678,000	$878,792	$11,728,307
1980	$5,789,752	$2,725,134	$572,125	$9,087,011
1981	$10,020,605	$3,766,525	$761,658	$14,548,788
1982	$6,675,742	$4,213,954	$1,069,723	$11,959,419
1983	$6,964,229	$2,670,400	$946,232	$10,580,861
1984	$5,669,624	$5,809,000	$738,064	$12,216,688
1985	$7,019,369	$3,248,089	$818,477	$11,085,935
1986	$6,261,115	$4,746,089	$546,452	$11,553,656
1987	$7,202,358	$6,392,822	$517,894	$14,113,074
1988	$13,379,691	$12,514,489	$760,641	$26,654,821
1989	$10,179,350	$5,171,860	$319,489	$15,670,699
1990	$6,517,794	$4,894,580	$474,064	$11,886,438
1991	$9,552,796	$3,971,423	$413,479	$13,937,698
1992	$11,331,871	$5,295,912	$463,616	$17,091,399
1993	$5,427,795	$3,962,890	$368,723	$9,759,408
1994	$4,786,687	$5,201,611	$863,060	$10,851,358
1995	$7,150,405	$4,209,752	$356,164	$11,716,321
1996	$4,797,993	$2,900,603	$292,264	$7,990,860
1997	$5,889,300	$1,058,808	$326,618	$7,274,726
1998	$1,955,891	$1,634,495	$351,410	$3,941,796
1999	$5,086,539	$551,725	$82,638	$5,720,902
2000	$734,239	$1,197,149	$143,621	$2,075,009
2001	--	--	$56,921	$56,921
2002	$1,722,367	$322,893	$2,941	$2,048,201

Table 4. Amounts Necessary for Subsistence by Salmon Stock and Area as Determined by the Alaska Board of Fisheries

Area	Stock	Amount Necessary	Code
Norton Sound District, Subdistrict 1	Chum salmon	3,430 - 5,716	5AAC 01.186
Norton Sound - Port Clarence Area	Salmon	96,000 - 160,000	5AAC 01.186
Yukon-Northern Area	King salmon Summer chum salmon Fall chum salmon Coho salmon	45,500 - 66,704 83,500 - 142,192 89,500 - 167,100 20,500 - 51,980	5AAC 01.236
Kuskokwim River Drainage	King salmon Chum salmon Sockeye salmon Coho salmon	64,500 - 83,000 39,500 - 75,500 27,500 - 39,500 24,500 - 35,000	5AAC 01.286
Kuskokwim Area Remainder	Salmon	7,500 - 13,500	5AAC 01.286

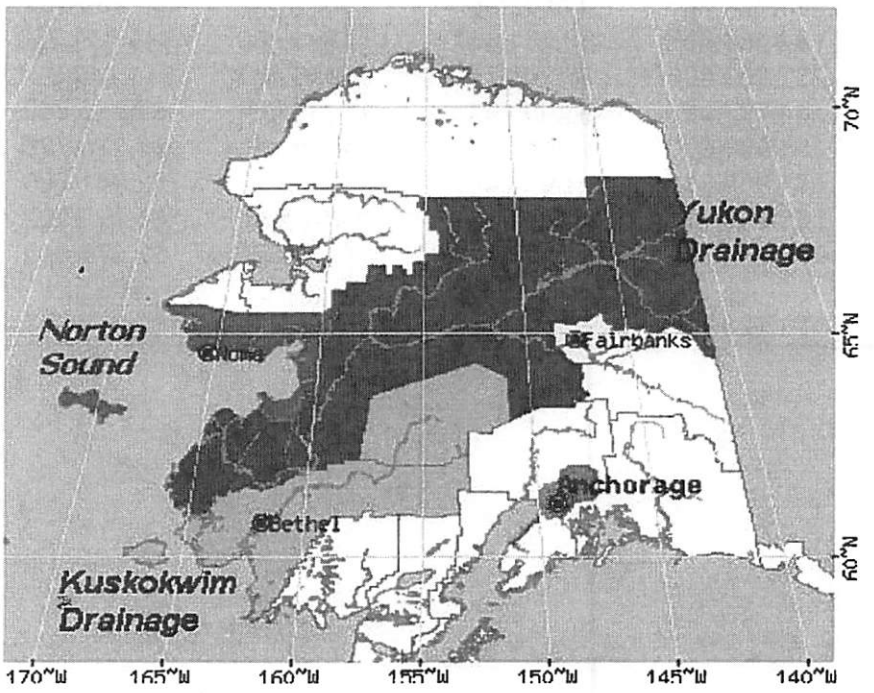


Fig. 1. The AYK-SSI Region

Fig. 2. People and Salmon Relationships in the AYK-SSI Area

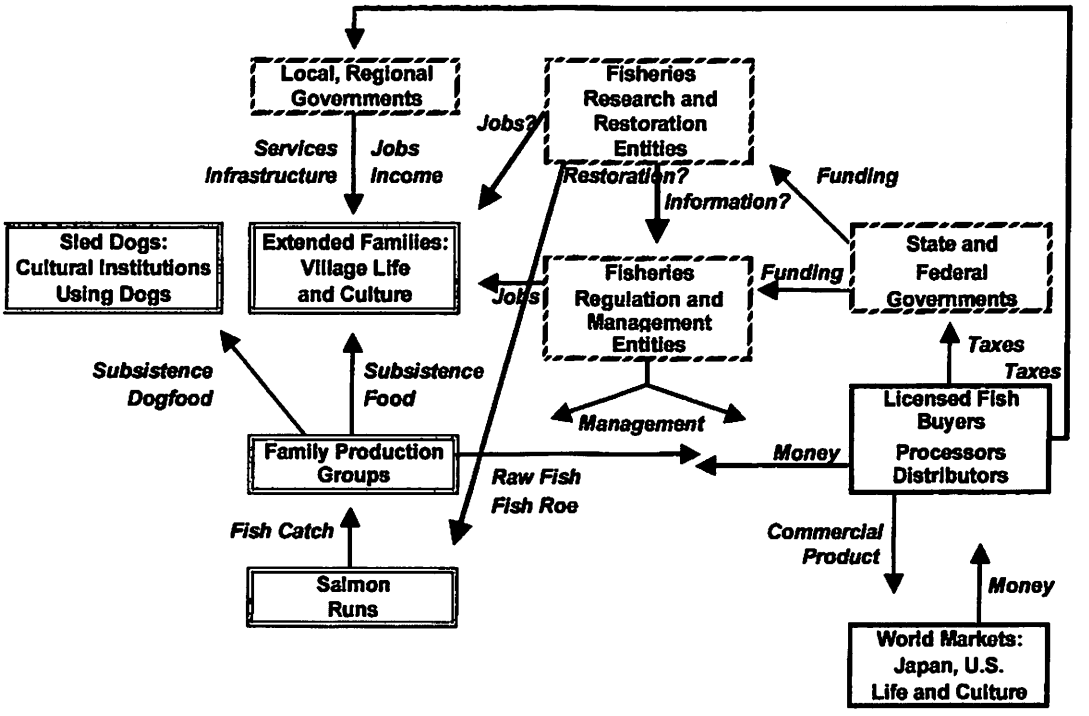


Fig. 3. Salmon Harvests, 1918 - 2002, Yukon River (Alaska)

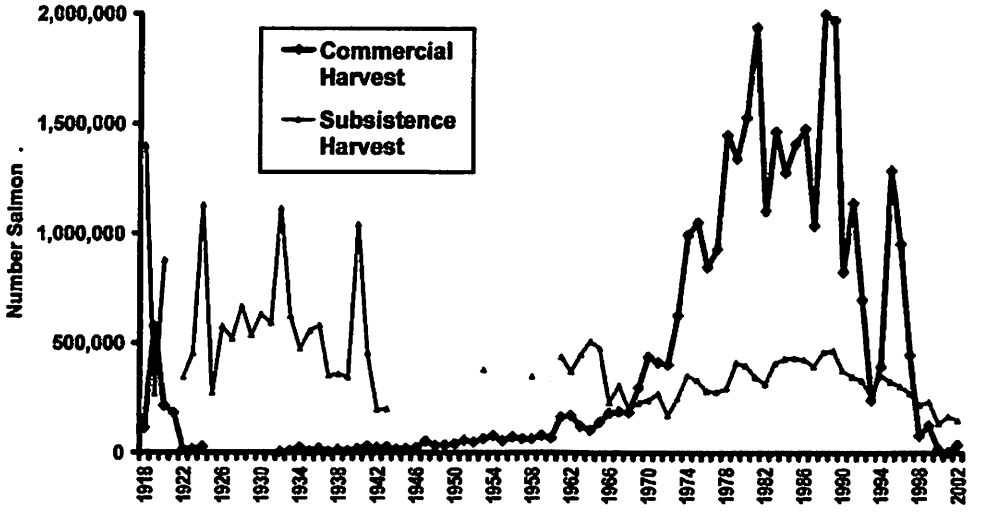


Fig. 4. Salmon Harvests, 1913 - 2003, Kuskokwim Area

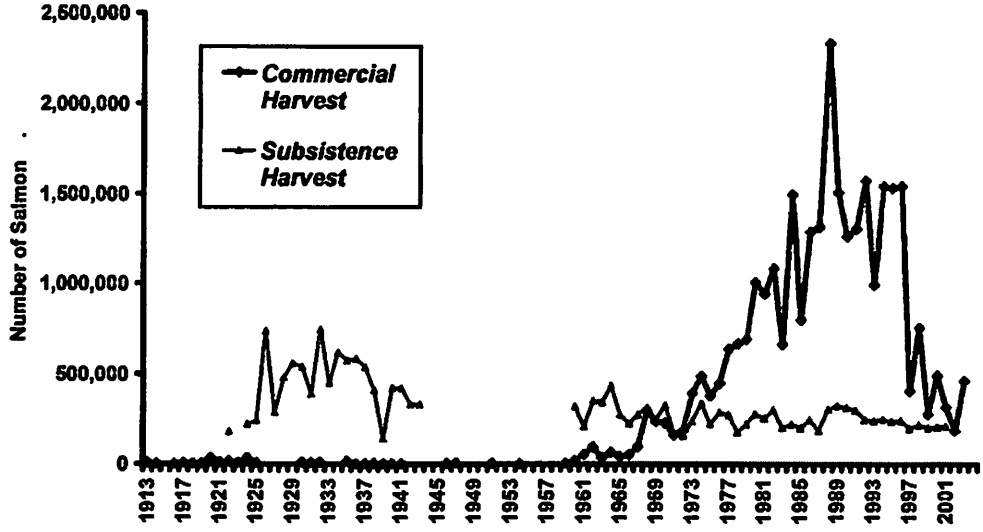


Fig. 5. Salmon Harvests, 1961 - 2003, Norton Sound-Port Clarence Area

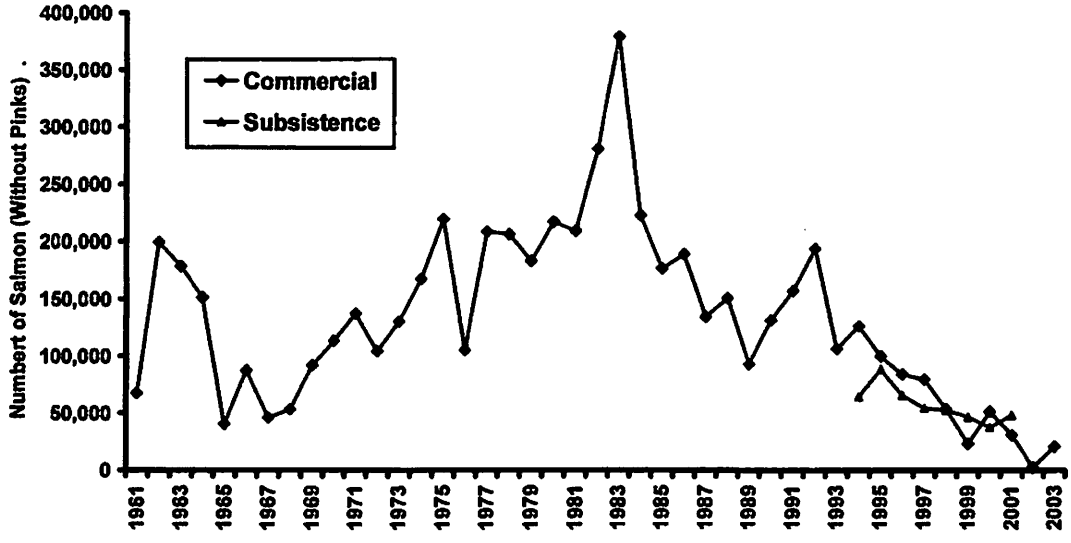
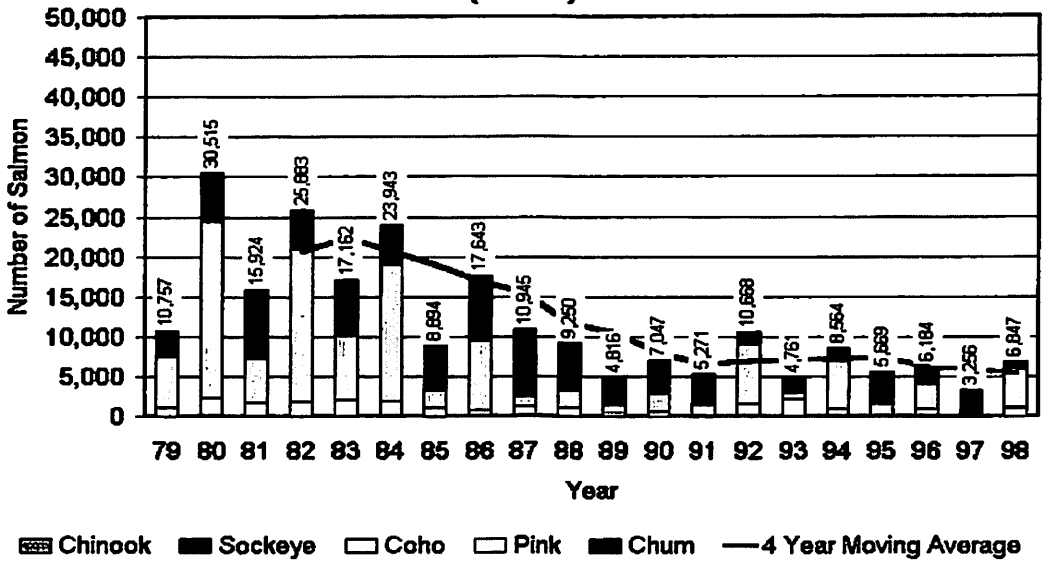


Fig. 6.

Norton Sound Subdistrict 1
Subsistence Salmon Harvests, 1979-98
(Nome)



NOTE: Subsistence salmon harvests in Nome are reported on subsistence salmon permits. Harvests shown in this chart are the reported harvests, not expanded estimated harvests. A few Nome households fish in areas where permits are not required.

Source: Subsistence Salmon Harvest Summary, Northwest Alaska, 1998, James Magdanz, Alaska Deparatment of Fish and Game, Division of Subsistence, Prepared for the Alaska Board of Fisheries, March 1999

Fig. 7. Subsistence Chinook Harvests, Yukon River 1961 - 2002, with Subsistence Thresholds

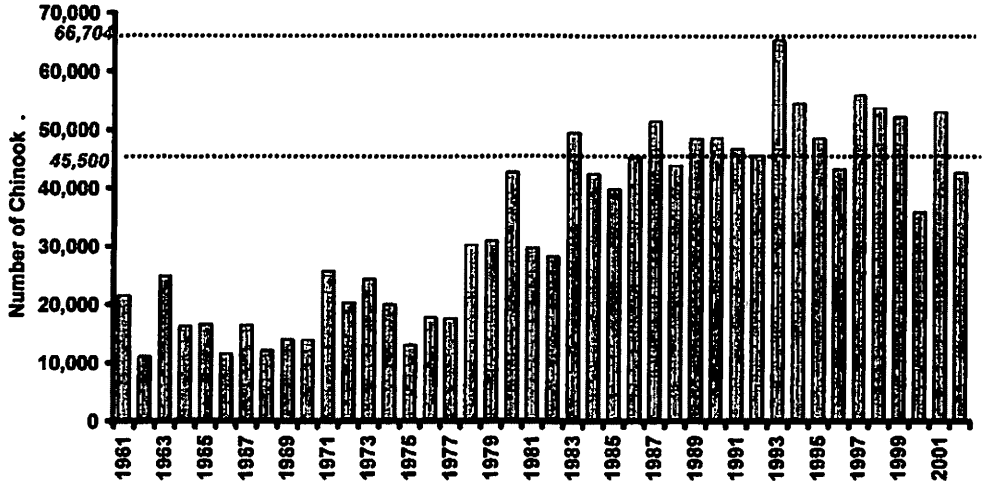


Fig. 8. Subsistence Summer Chum Harvests, Yukon River, 1961 - 2002, with Subsistence Thresholds

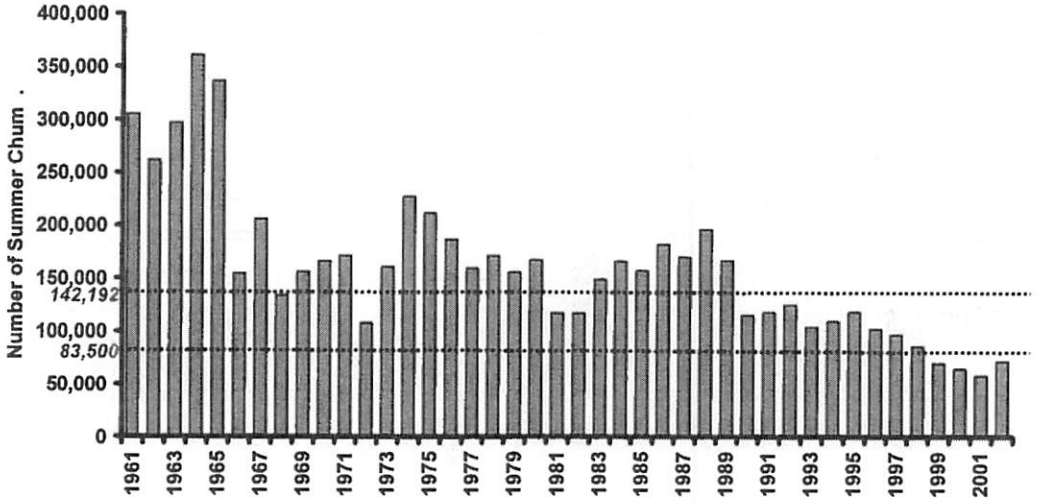


Fig. 9. Subsistence Fall Chum Harvests, Yukon River, 1961 - 2002, with Subsistence Thresholds

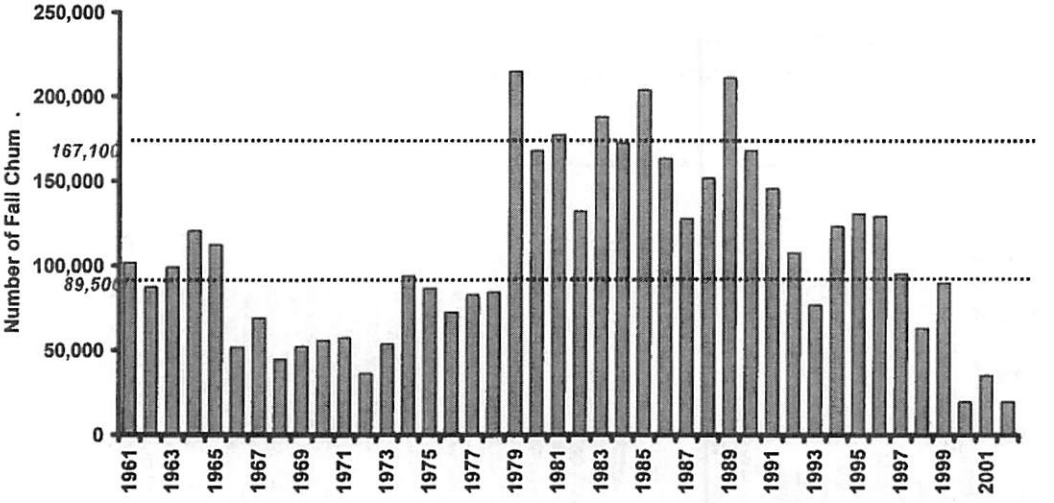


Fig. 10. Subsistence Coho Harvests, Yukon River, 1961 - 2002, with Subsistence Thresholds

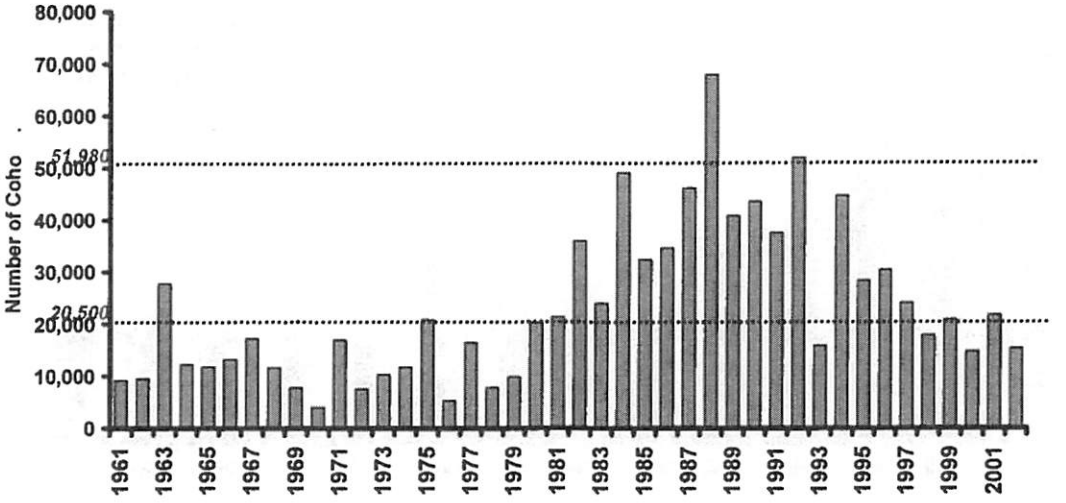


Fig. 11. Subsistence Chinook Harvests, Kuskokwim River, 1989 - 2001, with Subsistence Thresholds

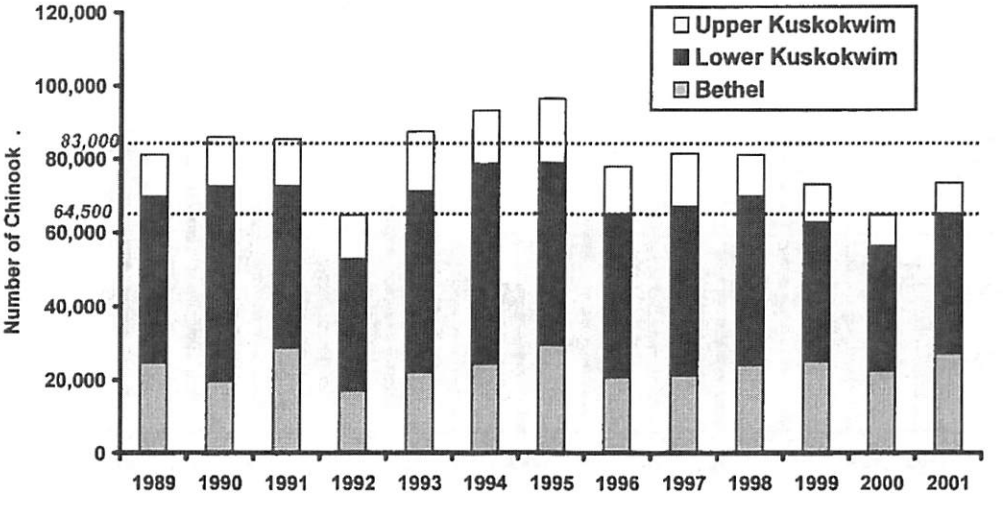


Fig. 12. Subsistence Chum Harvests, Kuskokwim River, 1989 - 2001, with Subsistence Thresholds

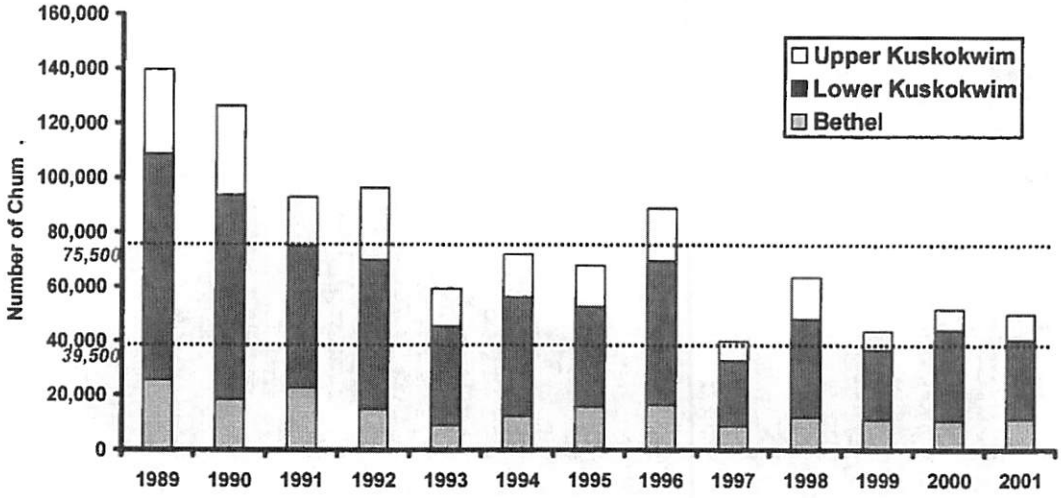


Fig. 13. Subsistence Sockeye Harvests, Kuskokwim River, 1989 - 2001, with Subsistence Thresholds

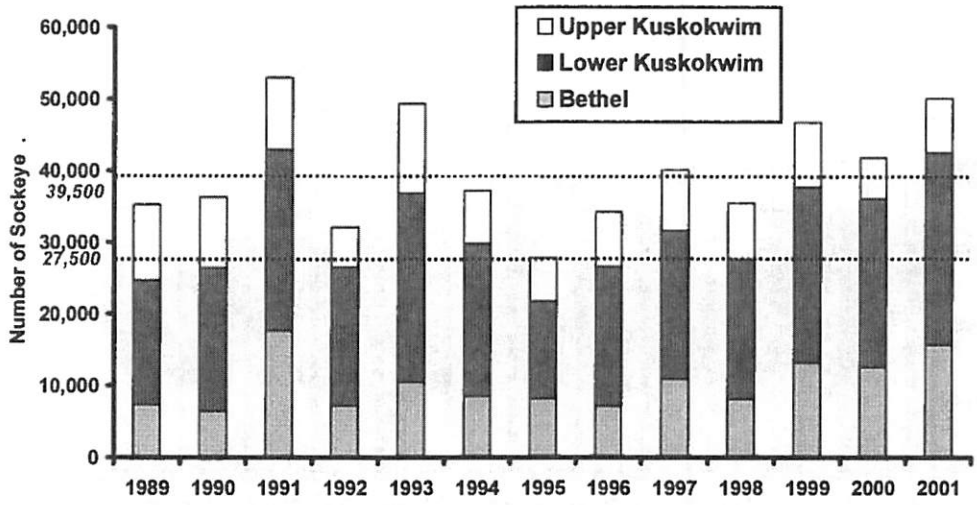


Fig. 14. Subsistence Coho Harvests, Kuskokwim River, 1989 - 2001, with Subsistence Thresholds

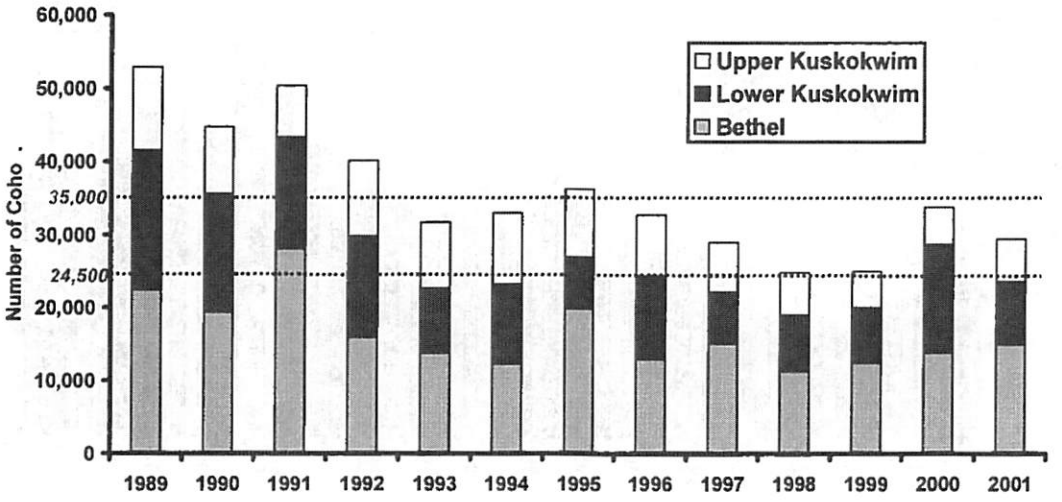


Fig. 15. Subsistence Salmon Harvests, South Kuskokwim Bay, 1989 - 2001, with Subsistence Thresholds

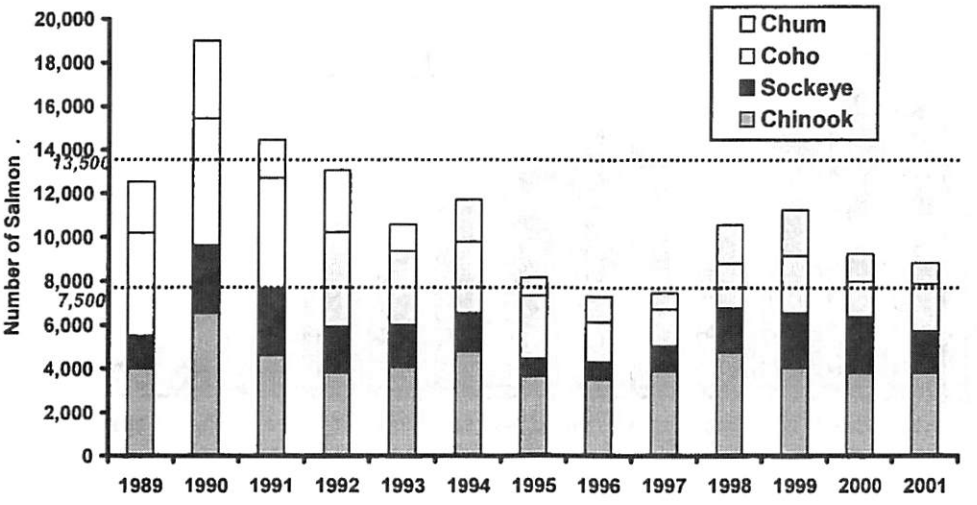


Fig. 16. Dog Population, Yukon Drainage, 1966 - 2002

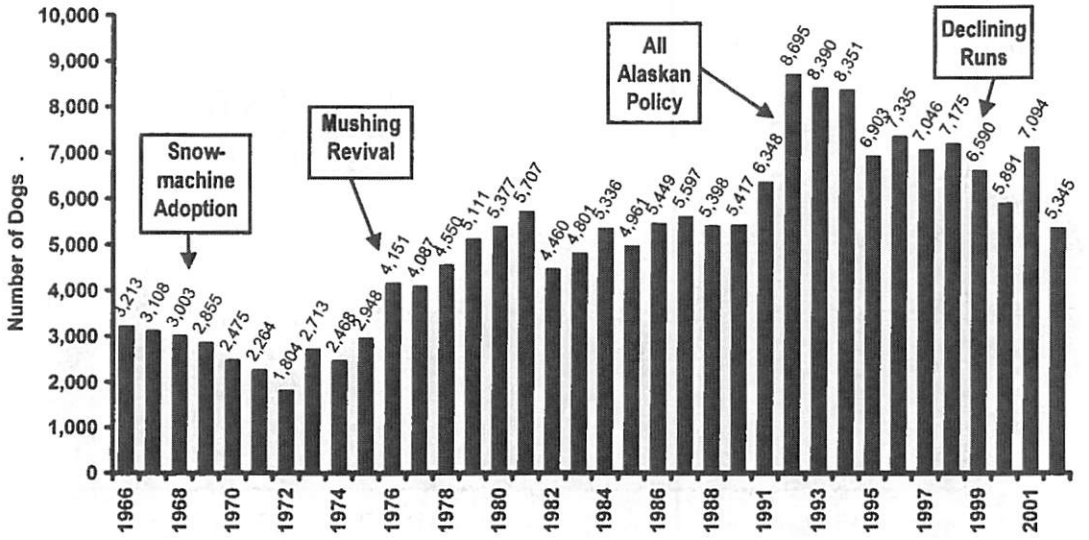


Fig. 17. Subsistence Salmon Harvests for Dog Food, Yukon River, 1990 - 2002

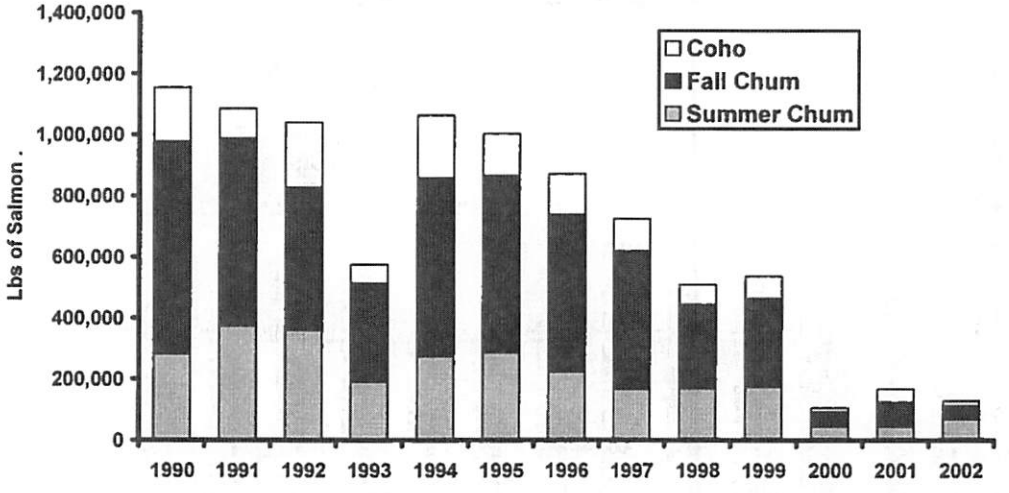


Fig. 18. Salmon Harvested for Dog Food, Yukon Districts, 1990 - 2002

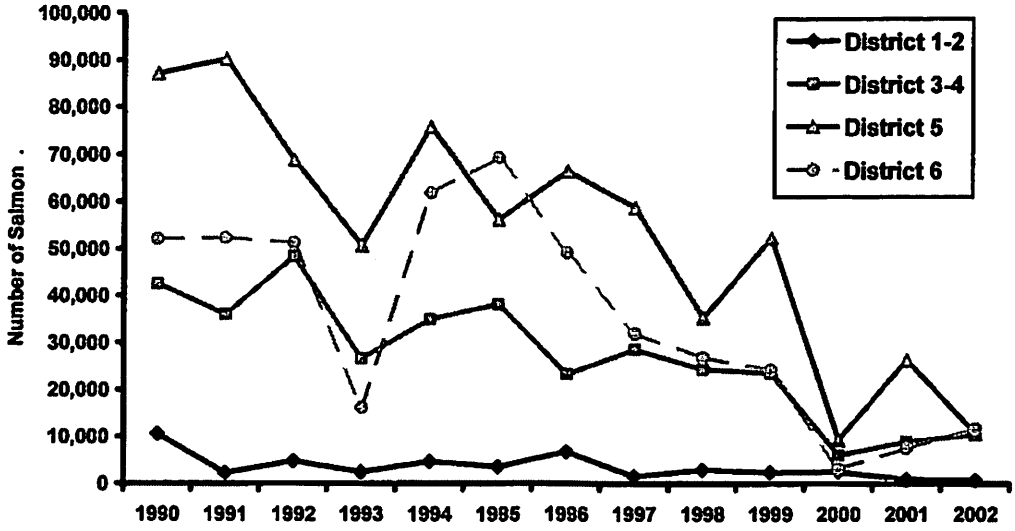


Fig. 19. Subsistence Salmon Harvests for Human Consumption or Dog Food, Yukon Districts 1-6, 1990-2002 (Lbs of Fish)

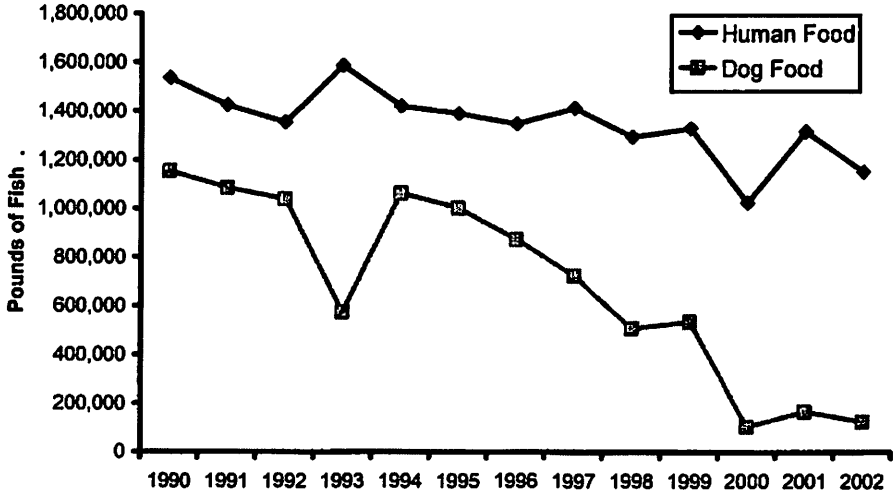


EXHIBIT B

Human Systems and Sustainable Salmon: Social, Economic, and Cultural Linkages

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Abstract

This paper summarizes linkages between sustainable salmon populations and local social, economic, and cultural systems of Alaska Native villages in the Arctic-Yukon-Kuskokwim area. The potential effects of salmon management on traditional local systems are identified, including culture, mixed economies, personal identities, and the societies of indigenous peoples of the far north.

Introduction

Salmon and human groups are tightly connected in the Arctic-Yukon-Kuskokwim region (Fig. 1). The management of salmon directly impacts rural communities and their traditional ways of living, especially the 92 Alaska Native villages and two regional centers (Nome and Bethel) in the AYK region (Table 1). In her opening plenary address, Mary Pete identified connections between salmon and humans, their dynamics and resilience in the face of historic changes (Pete 2007). In the breakout sessions, other papers dealt with demographic trends, cultural knowledge, economic systems, social processes, and other aspects of these linkages (Fleener 2007; Howe and Martin 2007; Knapp 2007; Moncreiff 2007; Sandone 2007). As a summary presentation, this paper highlights the major connections between salmon and human groups as reminders of the vital importance of good salmon management and science for the people of the AYK region.

In the AYK region, salmon is harvested primarily within family groups, a local economic organization called a "domestic mode of production" (Fig. 2, from Wolfe and Walker 1987; Wolfe and Utermohle 2000; Wolfe 2005). Commonly, men harvest and women process salmon for subsistence food, consumed within extended families and shared with others in the community. Even within the region's commercial fisheries, salmon typically is caught by small-holder fishermen who play dual roles on the water: they subsistence fish for their families and they commercial fish for sale on export markets using similar gear, commonly in the same areas, though usually during different openings. The economic firms in the domestic mode of production are extended families. Buyers and middlemen sellers commonly come from outside the region. Fishery managers typically work for state and federal agencies centered outside the region. They work within the fisheries with fishers from local family groups (Fig. 2).

Because of this organization, the management of AYK fisheries directly affects families and their customary responsibilities in the local society – rearing children, supporting the elderly, and transmitting traditional cultures between generations. Changes in the salmon fisheries, such as decreases in subsistence and commercial harvests (Fig. 3), can have broad impacts on the local ways of life, including traditional cultures, local economies, personal identities, and societies.

Salmon and Culture

Salmon are vital to the cultures of the people of the AYK region. There are old traditions connected to salmon, systems of knowledge and practice passed on from one generation to the next. Children learn them in a variety of contexts: at fishing camps, at cutting tables before drying racks at the villages, over the sides of skiffs watching nets pulled from frigid waters, at the boxes on fish wheels churning off the edge of a sandbar. An example of cultural knowledge is the method of processing salmon for local use. There are proper cuts for salmon specific to villages, such as belly pieces, side flanks, flesh along the rib cages, and split heads for soups. With drying and smoking, there are conventions about length of times, types of wood, amounts of salt, and quality of smoke to avoid rancid, maggoty, or overcooked products. These cultural practices typically are taught by parents to children.

Without sufficient salmon to cut, such systems of knowledge and practice get lost. Families cannot easily teach them. We see that now on the Kenai Peninsula where the few salmon taken in restrictive fisheries at Ninilchik and Kenai-Soldotna are insufficient for demonstrating a complete set of fish products to children at culture camps. Cultural knowledge held by families risks getting lost in a single generation if the fish camps are idle because the fish are too few. Nome faces this hardship now because of low salmon returns. Its main fish camp has sat idle and only a small number of salmon permits have been allocated to elders under a restrictive Tier II system (Magdanz and Olanna 1984; Magdanz 1992; Magdanz et al 2002).

Cultures are never static. Cultures change as families respond to changes in salmon runs. This is illustrated by the use of sled dogs, major consumers of salmon along the middle and upper Yukon River (Andersen 1992; Gilbert and O'Malley 1921; Wolfe, Utermohle, and Andersen 2001). Families have responded to changes in technologies and fisheries. Prior to snowmachines, most families used dog teams for winter travel. Summer chum, fall chum, and coho salmon were commonly caught to feed sled dogs. Harvests for dog food increased with the emergence of federal mail contracts during the early 20th century. Dried salmon was a form of currency, with many large local markets for dried fish. As mail planes and snowmachines replaced dog teams, local markets

decreased, replaced on the lower river by growing export markets for commercial chum (Fig. 4). Yet dog sledding became revitalized during the early 1970s leading to renewed local demand for dried fish, sometimes filled by carcasses left over from commercial roe fisheries. During the 1990s, dog teams decreased again, culled by families in response to declining salmon runs. These changes affect the transmission of culture. Children learn some cultural practices in association with dogs, taking them out on the land during winter, hauling goods and people, trapping, and racing at mid-winter carnivals. Cultural traditions get transmitted because of dogs. Salmon supports these sets of cultural traditions.

Salmon and Local Economies

Salmon are vital parts of traditional "mixed economies" in villages, the local mix of subsistence and cash that support families (Table 2). There is not one mixed economy, but many localized mixed economies, all dynamic and responsive to changes in local ecosystems (Wolfe and Walker 1987; Andrews 1988; Case and Halpin 1990; Sumida and Andersen 1990; Coffing 1992). The mixes of species and products vary locally. The local mix may include salmon, seals, and blackfish in certain coastal villages (Fig. 5); salmon, moose, and beaver in upriver villages (Fig. 6); and so on. Commercial salmon fishing has become a part of local mixed economies in many Yukon villages. Fishermen have sold salmon for a variety of marketable products, including whole fish flash frozen, salmon roe salted and boxed, half-dried carcasses cribbed for dog food, or historically, salt fish in barrels or canned salmon off the assembly lines.

If salmon is managed on a sustainable basis, salmon can support both the subsistence and commercial sectors of the local economy (Wolfe 1984). That helps to create viable communities. Good salmon management provides sufficient fish within every local area, including each segment of the river and coastline. And good management prioritizes. During low runs, commercial harvests for export are restricted first before restricting subsistence harvests for traditional local uses. This follows the priority of values of the people dependent on salmon. Certain management elements help to support local economies: keeping the fisheries small scale, keeping capital equipment affordable to family-based fishers, and keeping limited entry permits local. Finding high value

products for wild salmon is a constant challenge so that wild salmon can compete within world markets. Subsistence and commercial fisheries can be mutually supportive of traditional communities, if managed right.

Salmon and Personal Identities

In addition to culture and economy, salmon are vital parts of the identities of the people of the far north. People derive their identities from traditional relationships with the land. I have heard it said many times: 'we live off the land -- we hope our grandchildren will do this.' The people of the Yukon, Kuskokwim, and Norton Sound identify themselves as hunters and fishers, processors and users of wild foods, givers of wild products that flow among family members, elders, and friends. Fishing is central to these identities as traditional peoples. If the salmon runs dwindle, then what happens to self identities? Will it be said, 'I once was a fisher who dried and smoked fish for my family along this river, but now that's a memory?' This has happened time and again for indigenous peoples elsewhere. Sustainable fisheries help to preserve traditional identities.

Salmon and Society

Finally, salmon are vital to the survival of traditional groups, their communities, and their societies. One bottom-line indicator of successful salmon management is whether salmon populations are prospering. A corollary is this: are the local villages prospering, the human groups dependent on the salmon? Based on census trends, the communities of the lower reaches of the Yukon River are growing (Fig. 7). These are places where the salmon come in bright and the stocks are mixed and the ecosystems diverse. But what about the small upriver villages, those nearer the spawning areas, the fringe tributaries, the headwaters? The populations of many villages of the middle and upper Yukon River are leveling or falling (Fig. 7). In these areas, are families facing hard economic choices, forced to move out by hard circumstances? And what of the spillover from the robust growth of urban centers like Fairbanks, swelling with other traditions like sport angling and sport guiding? These new pressures especially impact the upriver areas.

Conclusion

The human dimensions framework for the AYK-SSI endeavor is found in Chapter 5 (p. 31-33) and Chapter 7 (pp. 47-48) of the research and restoration plan (Arctic-Yukon-Kuskokwim Salmon Research and Restoration Plan, AYK-SSI Scientific and Technical Committee, 2006). The framework's central question is how wild salmon stocks are affected by humans, especially by local demand, harvest pressure, and habitat alteration. These central questions focus on salmon populations. But this paper reminds us to not forget the flipside of the human dimensions framework, the other direction of the connections. How do the salmon runs affect people connected to salmon?

As shown above, good salmon management and science offer direct benefits to the people of the AYK region. Salmon sustains traditional cultures. Salmon supports traditional mixed economies with roots stretching back millennia. Salmon sustains the personal identities of indigenous peoples as fishers and hunters. And salmon helps societies survive. It's good work that's done well toward such valued ends. Sustainable fisheries and sustainable sociocultural systems together benefit the salmon and the people of the far north.

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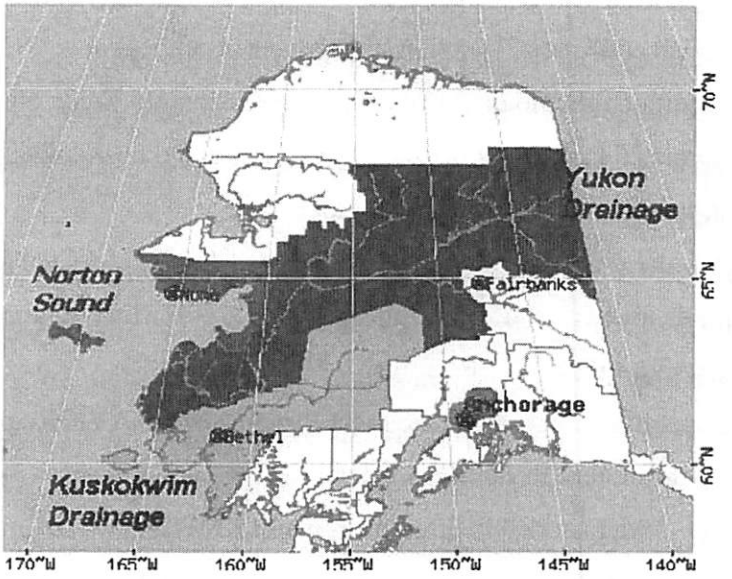


Fig. 1. The AYK-SSI Region

Fig. 2. People and Salmon Relationships in the AYK-SSI Area

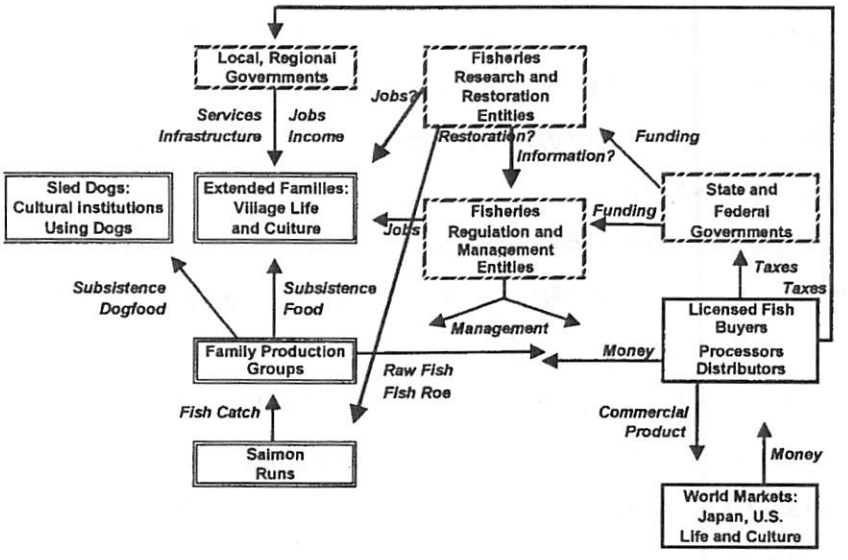


Fig. 3. Salmon Harvests, Yukon River, 1918-2005

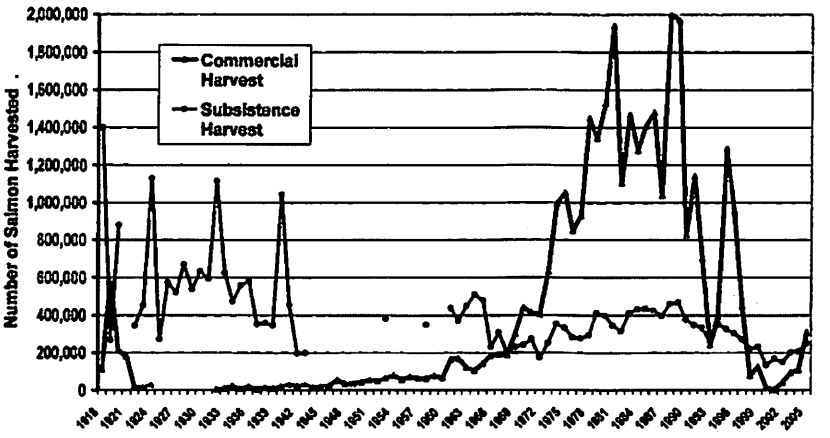
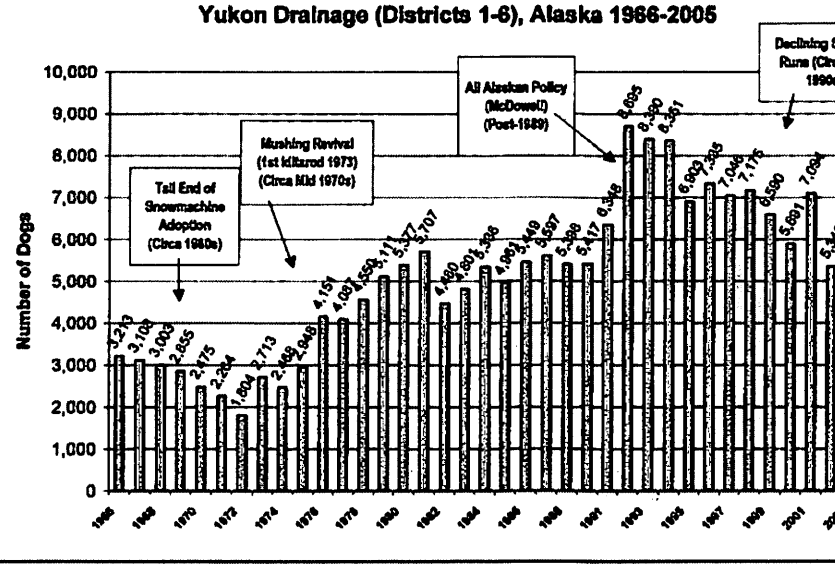


Fig. 4. Dog Population of Subsistence Fishing Communities, Yukon Drainage (Districts 1-6), Alaska 1966-2005



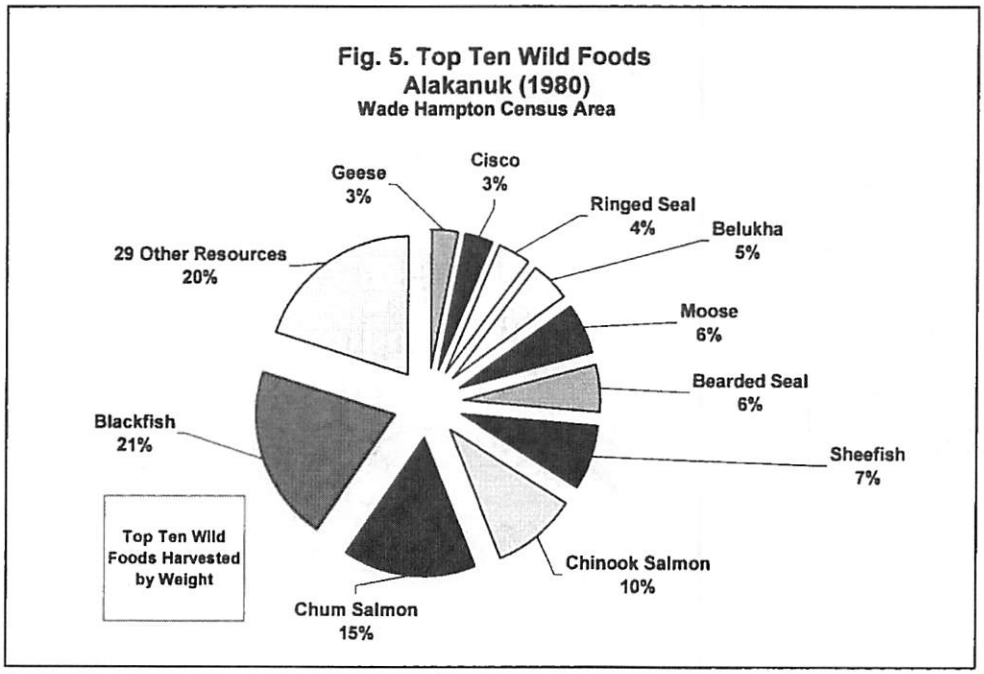


Fig. 5. Top Ten Wild Foods
Alakanuk (1980)
Wade Hampton Census Area
Geese 3%
Cisco 3%
Ringed Seal 4%
Belukha 5%
29 Other Resources 20%
Moose 6%
Bearded Seal 6%
Blackfish 21%
Sheefish 7%
Top Ten Wild Foods Harvested by Weight
Chinook Salmon 10%
Chum Salmon 15%

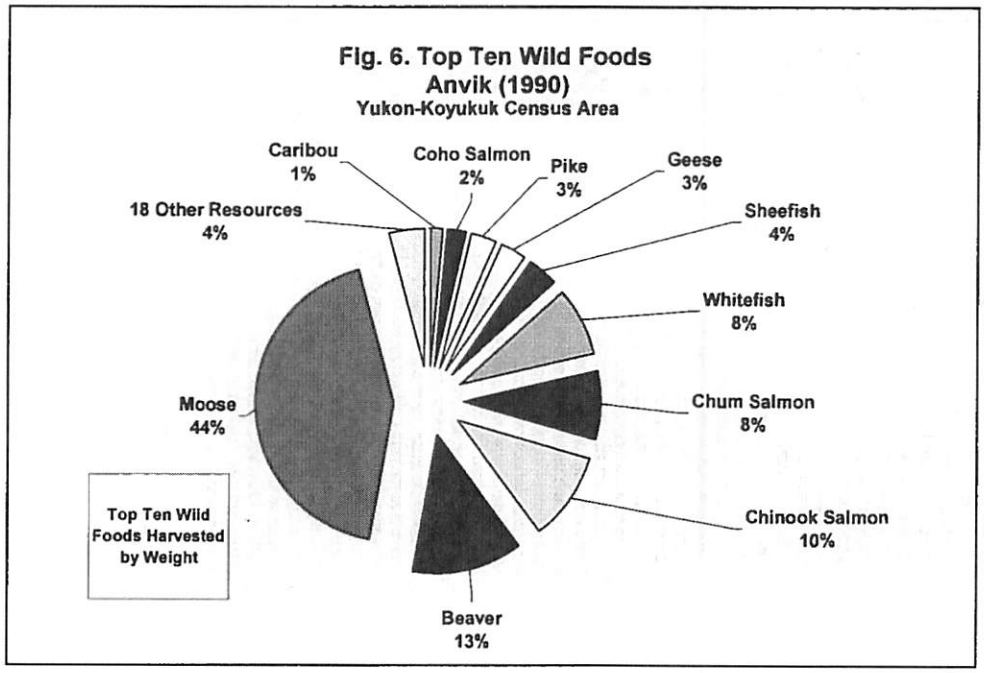


Fig. 6. Top Ten Wild Foods
Anvik (1990)
Yukon-Koyukuk Census Area
Caribou 1%
Coho Salmon 2%
Pike 3%
Geese 3%
18 Other Resources 4%
Sheefish 4%
Whitefish 8%
Moose 44%
Chum Salmon 8%
Top Ten Wild Foods Harvested by Weight
Chinook Salmon 10%
Beaver 13%

Table 1. Population Trends, 1950-2000
Arctic-Yukon-Kuskokwim Sustainable Salmon Initative Area,
the Anchorage/Mat-Su Area, and the Fairbanks Area

	1950	1960	1970	1980	1990	2000
Kuskokwim Area Villages (36)	3,589	5,411	5,965	7,774	9,585	11,083
Bethel (Kuskokwim)	651	1,258	2,416	3,576	4,674	5,471
Yukon Area Villages (42)	4,316	7,010	7,862	9,919	11,204	12,248
Norton Sound Area Villages (14)	2,450	2,775	2,817	3,526	4,202	4,983
Nome (Norton Sound)	1,876	2,316	2,357	2,506	3,500	3,505
AYK-SSI Area Total	12,882	18,770	21,417	27,301	33,165	37,290
Anchorage/Mat-Su Area	35,021	88,021	132,894	192,247	266,021	319,240
Fairbanks Area	18,129	42,992	45,864	53,983	77,720	82,840

Table 2. Economic and Social Characteristics
Arctic-Yukon-Kuskokwim Sustainable Salmon Initative Area,
the Anchorage/Mat-Su Area, and the Fairbanks Area

	Percent Alaska Native (2000)	Per Capita Income (2000)	Adjusted Per Capita Income (2000)*	Wild Food Harvests**
Kuskokwim Area Villages (36)	93%	$9,087	$4,563	739 lbs
Yukon Area Villages (42)	89%	$10,403	$5,397	601 lbs
Norton Sound Area Villages (14)	93%	$10,382	$4,408	700 lbs
Bethel (Kuskokwim)	68%	$20,267	$12,530	261 lbs
Nome (Norton Sound)	59%	$23,402	$14,649	240 lbs
Anchorage/Mat-Su Area	10%	$20,166	$20,116	21 lbs
Fairbanks Area	10%	$24,525	$24,083	19 lbs

*Adjusted for the cost of food in the community
** Estimated pounds per capita per year (usuable weights) during the 1990s

Fig. 7. Yukon Area Population Trends, 1950-2005

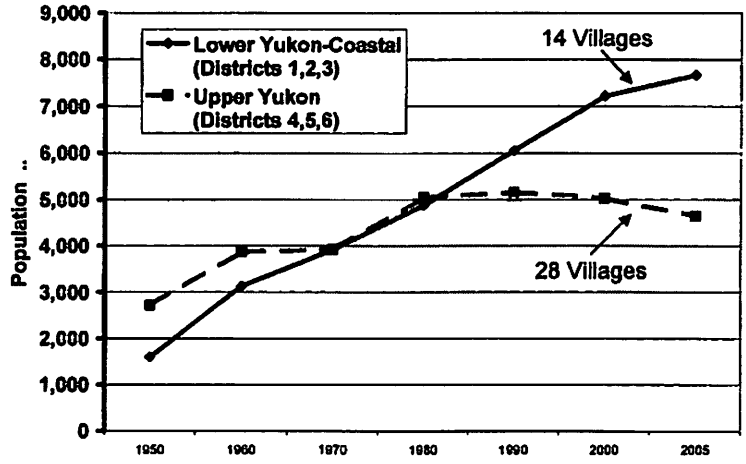


EXHIBIT C

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

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Date Issued: January 21, 2009

2008 Yukon River Fall Season Summary

This informational letter provides a summary of the 2008 Yukon Area fall season fishery including fall chum and coho salmon harvest and escapement. All project results and the 2008 subsistence and personal use harvest estimates provided in this summary should be considered preliminary and may be subject to modifications. Postseason assessment of the 2008 fall chum and coho salmon run is ongoing at the time of this writing.

Introduction

In response to the guidelines established in the *Policy for the Management of Sustainable Salmon Fisheries*, the Alaska Board of Fisheries (BOF) discontinued the stock of yield concern classification for the Yukon River fall chum salmon in February 2007, after reviewing stock status information and public input during the regulatory meeting. The determination was based on the availability of a near historical average harvestable surplus of fall chum salmon above escapement needs since 2003, a record run in 2005, an above average run in 2006, and a near-average run anticipated for 2007 which materialized above average. These runs indicated a return to near average production levels.

Inseason assessment of fall chum and coho salmon runs begin from the time the fish enter the mouth of the Yukon River and continue until they reach their spawning grounds in both Alaska and Canada. Fall chum salmon typically take 34 days to migrate as far as the U.S./Canada border. For management purposes, the Yukon River is divided into fishery districts, subdistricts, and drainages (Figure 1). In managing the fall chum salmon fishery, the department follows guidelines provided by the BOF in 5 AAC 01.249. *Yukon River Drainage Fall Chum Salmon Management Plan.* Coho salmon within the Yukon River have a slightly later, but overlapping, run timing with fall chum salmon and the department follows guidelines adopted by the BOF in 5 AAC 05.369. *Yukon River Coho Salmon Management Plan.*

The *Yukon River Drainage Fall Chum Salmon Management Plan* (Figure 2) incorporates the U.S./Canada treaty obligations for border passage of fall chum salmon and provides guidelines,

which are necessary for escapement and prioritized uses. There are incremental provisions in the plan to allow varying levels of subsistence salmon fishing balanced with requirements to attain escapement objectives. Commercial fishing is generally only allowed on the portion of the surplus above the upper end of the drainage-wide Biological Escapement Goal (BEG) range of 300,000 to 600,000. The intent of the plan is to align management objectives with the established BEG's, provide flexibility in managing subsistence harvest when the stocks are low, and bolster salmon escapement as run abundance increases. The extremely pulsed entry pattern of fall chum salmon and the run size disparity between fall chum with overlapping coho salmon run adds to the complexity of Yukon River fall season management.

Fall Season Overview

The 2008 preseason projection was for a run size of 890,000 to 1.2 million fall chum salmon as well as an average to above average run of coho salmon. The projection was decreased after analysis of the summer chum salmon run on July 19 which indicated the following fall chum salmon run size would be between 591,000 to 885,000 fish. Inseason, the fall chum run was comprised of three primary pulses with a timing of 5 days late when compared to the average midpoint. The preliminary 2008 post season run size was estimated to be approximately 730,000 fall chum salmon. This is below the 1974-2007 average 880,000 and above the average of 680,000 for the even numbered years from 1974-2006. Coho salmon run timing was near normal and the Pilot Station sonar passage estimate of 136,000 was slightly below the average of 143,000 for the project. A commercial fishery was conducted which landed approximately 120,000 fall chum and 36,000 coho salmon. The fall chum salmon commercial harvest was above the recent 5-year average of 92,000 and the coho salmon commercial harvest was below the recent 5-year average of 43,000 fish. The subsistence salmon fishery had reported mixed results, mostly due to weather conditions, with a harvest estimate of 80,000 to 90,000 fall chum which is similar to the past few years and a below average harvest of coho salmon. Drainage-wide, the escapement is estimated to be near 500,000 which is within the escapement goal range of 300,000 to 600,000 fall chum salmon. The Chandalar River, the Border Mainstem, and the Tanana River attained or exceeded their respective tributary escapement goals while the Sheenjek and Fishing Branch Rivers fell slightly below their escapement goals. The coho salmon run was assessed adequate to meet escapement needs.

Fall Chum Salmon Management Summary

Summer season results and the preseason projection influence early fall season management. However, the Pilot Station sonar project is the primary inseason assessment tool for management of the fall season by providing daily passage estimates of fall chum salmon used to derive run size projections as the run develops. Inseason run projections based on passage estimates provided by Pilot Station sonar trigger management actions as dictated by the fall chum salmon management plan. Additional lower river index projects including the drift gillnet test fisheries located at Emmonak (operated by ADF&G), Mountain Village (operated by Asacarsarmiut Traditional Council) and in the middle Yukon River at Kaltag (operated by the City of Kaltag) provide run timing information. Relationships in run timing and run strength from the various index projects and subsistence fishing reports were compared for consistency with the Pilot Station sonar estimates as a method to check that projects appeared to be operating correctly. Individual pulses were tracked as they moved up river and the Pilot Station sonar was used to estimate the abundance of each pulse (Figure 3). In 2008, each pulse of fall chum salmon appeared to correlate well between the Pilot Station sonar daily passage estimates and the other assessment projects for

run timing and relative magnitude. There was some uncertainty concerning the apportionment of sonar passage in the early portion of the season due to exceptionally high pink salmon abundance. However, after thorough inseason evaluation of the sonar data and operations, confidence was restored in the estimates provided which were found to be acceptable.

Similar to 2007, the 2008 preseason run size projection ranged from about 900,000 to 1.2 million fall chum salmon. The projection range was based on the upper and lower values of the 80% confidence bounds for the point projection. The point estimate of 1.0 million was derived by utilizing the 1984 to 2001 even/odd maturity schedules to represent the expected lower trend in production. However, the production models used to determine the 2008 preseason point estimate was suspect because of evidence of the drastic drop in high seas chum salmon catches as well as the low odds of that run size for an even-numbered year. At a run size of 1 million, the outlook was for a run that would provide for escapement requirements and for subsistence and personal use fisheries with a surplus of 50,000 to 400,000 fall chum salmon available for commercial harvest. The projection was refined as the fall season approached based on the summer to fall chum salmon relationship which reduced the commercially harvestable surpluses to less than 300,000 fish. Once inseason management begins, it becomes increasingly more dependent upon the projections from the cumulative passage which initially fluctuate drastically due to the irregular pulsing entry pattern of fall chum salmon and become more stable between the first quarter and mid-points.

The Pilot Station sonar cumulative total estimate of fall chum salmon for the 2008 season was approximately 615,000 fish through September 7, the last day of operation (Table 6). The delayed arrival of the first pulse which occurred near the average first quarter-point in run timing resulted in the run shifting 3 days late at that point, 5 days late at the midpoint and continued to be 4 days late at the average three-quarter point. The Pilot Station sonar estimate was combined with the estimated subsistence and commercial harvests downstream of the project to reconstruct the run postseason. The preliminary total fall chum salmon run size was estimated postseason to be approximately 730,000 fish.

With an expectation of continued good production, the 2008 preseason management strategy was to begin the fall season using the pre-2001 subsistence fishing regulations in accordance with the management plan. In 2007, when early periods were delayed to allow time for poor quality late summer chum salmon to move out of the area and provide early upriver fall chum salmon stocks safe passage, the 2008 fall season began with commercial fishing periods immediately following the summer season. This took advantage of harvesting unusually good quality late summer chum salmon when they were mixed with overlapping early fall chum salmon. The relationship between the summer and fall chum salmon runs suggested the fall run would perform similarly and thereby increased confidence that there would be surplus fall chum salmon available for commercial harvest.

On July 16, the fall chum salmon management plan went into effect and subsistence fishing management actions, initiated during the summer season, were continued into the fall season. Subsistence fishing in the Coastal District, and Districts 1, 2, and 3, was open 7-days a week, 24-hours a day except for closures of 12-hours before, during, and until 12-hours after each commercial salmon fishing period. The Innoko River was open 7-days per week and the pre-2001 subsistence salmon fishing regulations were applied in the Upper Yukon Area.

Districts 1 and 2, and Subdistricts 5-B and 5-C, and District 6 had commercial buyer commitments prior to the season with an additional buyer expressing interest in purchasing

salmon in Subdistrict 4-A. The first fall season commercial fishing periods began on July 17 in District 1 and July 20 in District 2 (Table 1). Commercial fishing periods continued to be scheduled in both District 1 and District 2 until August 1 and July 30, respectively. Fall chum salmon were harvested commercially prior to and during the first pulse of fish. Nine commercial fishing periods were opened, five in District 1 and four in District 2 through August 1. The Pilot Station sonar cumulative estimate through August 1 of 162,000 was below the historical average of 188,000 for that date. At the time, the total season run size was projected to be near 530,000 fish based on average run timing. According to the management plan, additional fish were needed to catch-up with the run passage necessary to support normal escapement and meet subsistence requirements before additional commercial harvest could take place. Consequently, commercial fishing activity was suspended.

The second pulse of fall chum salmon entered the river on August 12-14 and was allowed to passed through the Lower Yukon Area with little exploitation which was intended to contribute to escapement and provide upriver fishers comparable harvest shares. The sonar estimated the second pulse to be approximately 100,000 fall chum salmon bringing the cumulative passage estimate through August 17 to 412,000 fish which was below the historical average of 505,000 for that date. Unfortunately, the addition of the second pulse was late and not large enough to warrant additional commercial fishing at that time.

On August 22-24, a small bump of fall chum salmon was detected entering the river. Pilot Station estimated this group to number about 25,000 fish. As of August 24, the overall fall chum salmon projected run size had continued to decline to between 520,000 and 579,000 fish. With the outlook for only an additional 10% fall chum salmon still to enter the river, management turned to the possibilities of coho salmon directed fishing. With the expectation that the fall chum salmon run would total around 550,000 to 600,000 fish, the coho salmon management plan would allow a limited directed commercial harvest for coho salmon without substantially impacting the fall chum salmon. Commercial fishing periods were scheduled for August 25 and August 26 for District 2 and District 1, respectively to provide opportunity to target coho salmon.

A late and moderate sized third pulse of fall chum salmon began entering the river on August 25 and continued through to August 27. The Pilot Station sonar project estimated about 90,000 fall chum salmon in the third pulse and the cumulative total passage estimate increased to 597,000 fish. With the unanticipated late timing of the third pulse, management shifted back to the fall chum management plan. Additional, commercial periods were scheduled and the commercial fishing season was extended until September 10. A total of 12 additional periods were opened, six in both District 1 and District 2 between August 25 and September 10.

In an effort to maximize fishing efficiency, fishing times in District 1 were scheduled to coincide with daily high tides which typically carry new fish into the river. Daylight fishing times were scheduled in the late part of the season to maintain fishermen safety. No commercial fishing periods were opened in District 3 due to lack of market, but some District 3 residents traveled to fish in Districts 1 and 2.

The commercial salmon fishing season was initially opened in District 4 during the summer season with the only fall season fishing period occurring in Subdistrict 4-A. The buyer showed interest to continue into the fall season, but delayed the commitment in hopes of having a large volume of fish to work on. At the buyer's request, the department scheduled one 120-hour commercial period to begin on September 9 in Subdistrict 4-A. However, most commercial

fishers' interests had diminished or they were unavailable to fish late in the season. Consequently, no fish were harvested during the one fall season commercial fishing period. Subsistence fishing was on a schedule of 5-days a week in District 4 and concurrent with the commercial period. Later, subsistence period length was extended to 7-days a week beginning October 3 to provide increased opportunity for subsistence fishers to harvest late running fish since high water hampered their efforts earlier in the season.

A total of eleven fall season commercial periods were opened in Subdistricts 5-B and 5-C with the first commercial fishing period beginning on August 8. A total of 561 fall chum salmon were harvested which mostly comprised the early portion of the fall chum salmon run moving upriver, but also included some late local summer chum salmon stocks. Two additional early periods were scheduled on August 12 and August 15 which yielded 653 and 677 fall chum salmon, respectively. The three early commercial periods provided for a small flesh market. Beginning September 5, the first of eight additional 48-hours periods in Subdistrict 5-B were scheduled primarily to target female fall chum salmon for roe product. A total of 2,665 female fall chum salmon were reported harvested for commercial purposes. Poor weather and low catches attributed to no commercial harvest during the final two scheduled 48-hour periods, the last ending on October 2. Subsistence fishing was on a schedule of 5-days a week in Subdistricts 5-A, 5-B, and 5-C during most of the fall season and was then liberalized to 7-days a week beginning October 3 to provide additional opportunity for subsistence fishers to harvest late running fish. Subdistrict 5-D was returned to the normal 7-day per week subsistence fishing schedule on July 31 and remained on that schedule throughout the fall fishing season.

The Tanana River is managed under the *Tanana River Salmon Management Plan* which provides guidelines to manage District 6 as a terminal fishery based on the assessed strength of the stocks in the Tanana River drainage. The commercial harvest in District 6 was comprised of predominantly female salmon with the primary product bound for roe markets. A total of nine commercial periods were scheduled in District 6, the first beginning on August 15. The initial commercial period of 42-hours was scheduled, however due to flooding events and continued high water, much of the commercial fishing gear was lost or destroyed and consequently no fishing activity took place. After water levels subsided and some fishers were able to resurrect or build new fish wheels, additional periods were scheduled in early September which corresponded with the peak run timing of fall chum and coho salmon. On September 6, two 24-hour periods were announced followed by six 42-hour periods. The commercial harvest for all nine fall season periods was 5,856 fall chum and 3,177 coho salmon. The commercial fishing season in the Tanana River ended on October 1, due to freezing temperatures which decreased product value. Subsistence and personal use fishing was open concurrent with the commercial fishing periods. Personal use periods in Subdistrict 6-C remained on the two 42-hour fishing periods per week while subsistence fishing in Subdistricts 6-A and 6-B was relaxed to 7-days a week effective October 2 in accordance with the management plan at the close of the commercial fishing season. The Tanana River commercial harvest of 5,856 fall chum salmon was within the guideline harvest range (GHR) of 2,750 to 20,500. A majority of the male portion of the harvest was reported as "caught but not sold" and subsequently used for subsistence and was not counted towards the commercial harvest. Additionally, an undetermined amount of carcasses from the roe fisheries was also utilized in the subsistence fisheries. Postseason assessment indicated that escapement goals were exceeded in the Tanana River.

The nature of the fall chum salmon pulses spread out over the length of the season separated with long durations of low passage rates of fish entering the river made inseason run size projection difficult. The late arrival of the third moderate sized fall chum salmon pulse at the end of August shifted the run timing 5 days later than average and provide enough surplus of fish to schedule additional commercial fishing opportunities into September. The overall harvest resulted in an exploitation rate (approximately 32%) nearly doubling the recent 10-year average from 1998-2007 and nearly equaling the previous ten-year average from 1988-1997. The amount of commercial opportunity was high with moderate effort and subsistence opportunity was liberal. The drainage-wide escapement was within the targeted range and most of the tributary goals and border commitments were met.

Coho Salmon Management Summary

The 2008 coho salmon run was managed to provide for escapement needs, subsistence, personal use, and commercial harvests. However, the commercial harvest was dependent to a large extent upon the abundance of fall chum salmon and the accompanying management strategies. The 2008 coho salmon outlook was for a continuation in the trend of average to above average runs, below average subsistence harvests because of low effort, with a potential commercial harvest of 50,000 to 70,000 fish.

The coho salmon run exhibited normal run timing and slightly below average run size based on Pilot Station sonar (Figure 6). Test fishery projects at Emmonak, Mountain Village, Kaltag, and in the Tanana River provided similar run assessment of magnitude and run timing. The run size estimate at Pilot Station sonar through September 7 was approximately 136,000 fish, which was below the historical average (1998-2007) passage estimate of 148,000 coho salmon (Table 7).

Even though the primary focus of commercial fishing was to target fall chum and summer chum salmon early in the run, fishing periods were also controlled to spread harvest impacts late in the season across the smaller and overlapping coho salmon stock. As with fall chum salmon, transportation costs were a major limiting factor in the coho salmon fishery. Fish buyers only operated near the transportation hubs in the lower river Districts 1 and 2 and upriver in Subdistricts 5-B and 5-C, and in District 6 near Manley, Nenana, and Fairbanks. Fishers had to weigh the price of gas in relation to the benefits of potential commercial harvests. The liberalized subsistence fishing time increased fishing opportunity for coho salmon throughout the drainage.

Subsistence Harvest Reporting

The majority of communities within the Yukon Area have no regulatory requirements to report their subsistence salmon harvest. To estimate the harvest of each salmon species from these communities, the department utilizes an annual voluntary survey program. Household subsistence salmon surveys began in the Lower Yukon Area in September and continued in the Upper Yukon Area throughout October. The intensive survey program utilizes subsistence catch calendars, postseason household interviews, and postseason household telephone interviews as well as postcards to collect harvest information. Completed surveys are edited and compiled into the electronic database for further analysis.

In more accessible portions of the Yukon Area, subsistence fishermen are required to obtain an annual household subsistence permit prior to fishing for salmon and/or non-salmon fish species. Fishermen must record their subsistence salmon and/or non-salmon harvest on their permit and return it to the department at the end of the fishing season. Permits were required in the entire

Tanana River drainage, the Yukon River drainage between Garnet Island and the Dall River, referred to as the Rampart Village and Yukon River Bridge Areas, and the upper Yukon River drainage between the upstream mouth of Twenty-Two Mile Slough and the U.S./Canada border, referred to as the Circle/Eagle Areas. Subsistence salmon fishing permits were issued to 295 households in 2008. This total included 16 permits issued to households fishing in the Rampart section of the Yukon River bridge permit area where household harvest estimates, prior to 2004, were accounted for during the annual postseason communities subsistence surveys. Including the Rampart permit area, the 5 year (2003-2007) and 10 year (1998-2007) averages for permit issued to harvest salmon were 280 and 289 permits, respectively.

Subsistence fishing permits to harvest pike and other non-salmon fish species were issued to 205 fishermen in 2008. Areas that require a subsistence fishing permit for non-salmon fish species include the Tolovana River drainage to harvest northern pike, and the Upper Tanana River drainage and the upper portion of the middle and south forks of the Koyukuk River in District 4 to harvest non-salmon fish species (typically whitefish).

A comprehensive estimate of the 2008 subsistence harvest based on surveys and permit harvest information for salmon and non-salmon species is not available at this time, but is anticipated to be available by late spring of 2009. Figures 4 and 7 provide historical drainage-wide subsistence harvest estimates of fall chum and coho salmon. Preliminary estimates for 2008 assume the fall subsistence harvests were similar to the past few years with 80,000 to 100,000 fall chum and near 20,000 coho salmon.

Personal Use Permits

A household permit is required for personal use fishing in the portion of the Tanana River drainage within the Fairbanks Non-subsistence Area. Fishermen are required to document their personal use harvest on household permits and return them to the department at the end of the season. In 2008, a total of 51 personal use salmon permits were issued. This compares to the 5-year average (2003-2007) of 65 permits and 10-year average (1998-2007) of 71 permits. In addition, five personal use whitefish and sucker permits were issued in 2008 to fishermen in the Fairbanks Non-subsistence Area. There were no personal use salmon fishing restrictions imposed during the 2008 season because of the adequate strength of salmon runs to the Tanana River. Personal use fishery harvest estimates are not available at this time.

Commercial Summary

The 2008 total commercial harvest for the Yukon River fall season included 119,265 fall chum and 35,691 coho salmon for the Alaskan portion of the drainage (Table 1). The fall chum and coho salmon harvests were the third and fifth highest, respectively, since 1995 (Tables 2 and 3). A total of 108,974 fall chum and 33,192 coho salmon were harvested in the Lower Yukon Area and 10,291 fall chum and 2,499 coho salmon were harvested in the Upper Yukon Area. All salmon were sold in the round and no salmon roe was sold separately. However, in Subdistrict 5-B and District 6, whole female salmon were selectively purchased for roe extraction during the fall season. The 2008 Yukon Area fall chum salmon commercial harvest was about 148% above the previous 10-year average (1998-2007) of 48,086 fish and 66% above the 10-year average of 21,490 coho salmon.

There were a total of 21 fall commercial fishing periods in the Yukon River Districts 1 and 2 combined (11 periods in Y-1; 10 periods in Y-2) (Table 1). Period length varied from 4 to 12

hours in District 1 and from four to 9 hours in District 2. No periods were scheduled in District 3 due to the lack of a market. The commercial fishing season was open in District 4 with only one 120-hour period opened in Subdistrict 4-A which had no harvest due to lack of fishers. Subdistricts 5-B and 5-C had eleven 48-hour commercial periods in the fall season with fishers landing 4,556 fall chum salmon and 91 coho salmon. No fishing took place during the last two commercial periods in Subdistricts 5-B and 5-C because of lack of effort, due primarily to cold weather conditions and reduced number of fish. In the Tanana River, District 6, there were nine commercial salmon fishing periods (two 24-hour and seven 42-hour periods) from August 15 through October 1 until the weather became too cold to hold fish outdoors without freezing thereby damaging the catch.

The preliminary 2008 commercial fall chum and coho salmon season value for the Yukon Area was $671,600 ($645,800 for the Lower Yukon Area, $25,800 for the Upper Yukon Area) (Table 4). The previous 10-year average value for the Yukon Area was $114,000 ($99,300 for the Lower Yukon Area, $14,700 for the Upper Yukon Area). Yukon River fishers received an average price of $0.55 per pound for fall chum salmon in the Lower Yukon Area and $0.27 per pound in the Upper Yukon Area in 2008. This compares to the 1998-2007 average of $0.24 per pound and $0.14 per pound, respectively. For coho salmon, fishers in the Lower and Upper Yukon Areas received an average price of $0.97 per pound and $0.20 per pound compared to the recent ten-year average price of $0.29 and $0.10 per pound, respectively.

Fishing effort has increased in recent years (Table 5). A total of 439 fishers participated in the 2008 fall chum and coho salmon fishery (428 for the Lower Yukon Area, 11 for the Upper Yukon Area) compared to the recent ten year average of 117 permit holders (112 for the Lower Yukon Area, 5 for the Upper Yukon Area). Even though the effort appears high, participation is concentrated around a few buying stations rather than spread throughout the drainage as it was prior to 1997.

Salmon Escapement

The total 2008 fall chum salmon run size was estimated to be approximately 730,000 which was below the preseason projection of 900,000 to 1.2 million salmon and within the range provided by the summer to fall chum salmon relationship (591,000 to 885,000). Parent year escapements in 2003 and 2004 were 695,000 and 538,000 fall chum salmon respectively. The drainage-wide escapement was estimated to be near 500,000 fall chum salmon in 2008 which is within the BEG goal of 300,000 to 600,000. Tributary stock escapement goals and management objects were within or exceeded for the Chandalar River, the Canadian Mainstem, and the Tanana River while escapements fell slightly below goals for the Sheenjek and Fishing Branch Rivers. (Table 6).

One method to determine total run size is based on the Pilot Station sonar abundance estimate of 615,000 with the addition of estimated commercial and subsistence harvests downstream of the sonar site, including test fisheries (approximately 115,000 fish). Therefore, the preliminary total run size for the Yukon River drainage, primarily calculated from the main river sonar at Pilot Station, is estimated to be approximately 730,000 fall chum salmon. Based on the location of the project, at river mile 123, the abundance estimate includes Koyukuk River drainage stocks.

A second method to calculate run size utilizes the individually monitored spawning escapements in the upper Yukon and Tanana River including estimated U.S. and Canadian harvests where appropriate (Figure 5). In 2008 two projects were changed, one being that the Canadian mainstem passage was estimated using the sonar estimate at Eagle Alaska and the other was to estimate fall chum abundance based on genetic apportionment to replace the loss of the Tanana

and Kantishna River mark–recapture project estimates. For 2008, this tributary escapement method resulted in a preliminary estimate of 740,000 fall chum salmon. This method however does not include an escapement estimate of approximately 25,000 for stocks located in tributaries downstream of the confluence of the Tanana River such as in the Koyukuk River. The use of the Eagle sonar passage estimate instead of the border mark–recapture project only changes the amount of harvest included based on the locations of the individual projects. The estimate of run size based on individual projects is typically higher than that based on Pilot Station sonar.

In 2008, the proportion of age-4 (42%) fish was well below average (68%) and correspondingly age-5 (56%) fish was well above average (27%) while the age-6 (1.7%) fish was also higher than average (0.8) based on the Lower Yukon Test Fishery weighted averages for the years 1977 to 2007. The run size in 2008 was diminished from the preseason projection by the weakness in the age-4 component.

Weakness was again evident in the Porcupine River system. An interim management escapement goal (IMEG) of 22,000 to 49,000 fish was established for the Fishing Branch River prior to the 2008 season, to apply through 2010. This goal uses percentiles and was a reanalysis using weir data only, excluding all years with extrapolations based on other methods of measurement. The estimated weir passage of approximately 20,000 fish (thru October 5) was 91% of the low end of the interim goal.

The Sheenjek River, also a tributary of the Porcupine River, escapement was monitored by a DIDSON sonar project operated from August 9 through September 24, 2008. The Sheenjek River project utilized sonar gear on both the right and left banks. Unlike other projects, most historical Sheenjek River escapement estimates were only estimated from the right bank which has ranged from 14,000 in 1999 to 247,000 fall chum salmon in 1996, with the high of 438,000 fish observed on both banks combined in 2005 (Table 6).The right bank estimated escapement of approximately 36,000 fish in 2008 was 28% below the lower end of the BEG range of 50,000 to 104,000 fall chum salmon. The left bank estimate of 6,930 fish represented approximately 16% of the combined estimate in 2008. The cumulative estimate at the project termination was approximately 42,842 chum salmon for both banks combined.

The Chandalar River sonar project ran from August 8 through September 25, 2008. The preliminary escapement estimate was approximately 158,000 fall chum salmon, approximately 14% lower than the 1995–2006 average of 184,000 fish using Split Beam Sonar technology and 31% lower than 2007, the first year using DIDSON sonar technology. Chandalar River Split Beam sonar estimates of fall chum salmon range from a low of 66,000 fish in 2000, to a high of 497,000 fish in 2005. The 2008 estimated escapement in the Chandalar River was approximately 4% above the upper end of the BEG range of 74,000 to 152,000 fall chum salmon (Table 6).

The Eagle sonar was operated into the fall season for the third year in 2008 to enumerate chum salmon. At the preseason U.S./Canada meetings it was agreed to use the Eagle sonar units to determine mainstem border passage. In 2008, the Eagle sonar passage estimate through October 6 was 171,000, but was still passing 4,000 fall chum salmon a day at the end of the project. Due to the late timing, an extrapolation to typical cessations of the run was conducted to expand the estimate through October 18. The resulting estimate of passage based on timing is approximately 191,000 fall chum salmon, and with the removal of approximately 13,000 fish estimated for Eagle residence harvest above the sonar site, the border passage estimate is approximately 178,000 fall chum salmon. Further the removal of Canadian commercial and aboriginal harvests estimated to be less than 6,000 fall chum salmon results in a preliminary escapement estimate of

172,000 (Table 6). The estimated escapement based on the Eagle sonar passage estimate is approximately 1.2 times higher than the mainstem goal of greater than 80,000 fall chum salmon. Overall the relative contribution of Canadian origin stock represents approximately 31% to the total run in 2008.

Due to lack of funding in 2008, the Tanana/Kantishna River mark–recapture project was unavailable to management for use in assessing fall chum salmon run abundance. In 2008, inseason monitoring of the Tanana River drainage consisted of monitoring fall chum run timing at the various test fish wheel locations near Tanana Village, Kantishna River mouth, and Nenana, as well as monitoring subsistence and commercial harvest in the fisheries. With a lack of other methods to determine run size in the Tanana River, the genetic apportionment at Pilot Station was used which resulted in a preliminary estimate of 162,000 fish. With the removal of the estimated harvests from at least Subdistrict 5-A and District 6 (23,000) and some undetermined amount of mixed harvest in downstream fisheries, the level of the Tanana River return was believed to be sufficient to fall within the Tanana River BEG range of 61,000 to 136,000 fall chum salmon (Table 6). The relative contribution of Tanana River stocks to the total Yukon River fall chum salmon run is approximately 29%.

The Delta River, a tributary in the upper Tanana River drainage, has a BEG range of 6,000 to 13,000 fall chum salmon. Evaluation of the run to the Delta River in 2008 was based on eight replicate foot surveys conducted between October 6 and November 26. The Delta River escapement was estimated to be approximately 23,000 fall chum salmon based on the area under the curve method. This level of escapement was 77% above the upper end of the BEG range (Table 6).

Because of the slightly late run timing (on average 6 days late for projects monitoring primarily Tanana River stocks) and the relative abundance of the last component, several projects were still passing significant amounts of fish when they had to be terminated due to the onset of winter. Similar to 2007 season, the run timing in 2008 was more a function of the projects duration than timing of actual fish passage. The sonar's operated on the Chandalar and Sheenjek Rivers were still producing estimates of greater than 3,500 and 1,500 fish per day, respectively, when terminated, and Tanana River assessment test fish wheel projects near Tanana Village, Kantishna River, and Nenana were also passing good numbers of fish before shutting down. Therefore attempts may be made to expand the estimate in efforts to represent the overall run size as described for the Eagle passage estimate. Developing run size based on upriver projects still results in Pilot Station being biased low even when considering that in 2008 most of the fall chum salmon and a larger portion than usual of coho salmon was monitored due to the extended week of operations at Pilot Station.

There are few assessment projects for coho salmon spawning escapements in the Yukon River drainage due to funding limitations. The sonar at Pilot Station was operated a week longer than usual, through September 7, with an estimated passage of 135,600 coho salmon which is slightly less than average passage of 147,700 fish. The Delta Clearwater River has the only established escapement goal for coho salmon, a SEG of 5,200–17,000 fish. The 2008 boat count survey estimated a below average escapement of 7,500 coho salmon which is within the escapement goal range. Compared to the recent high escapements (5-year average of 41,900 fish), the 2008 coho salmon run appears well below average. In comparison to historical harvest and escapement, the 2008 run had the lowest escapement documented for the Delta Clearwater River since 1992 when less than 4,000 coho salmon were counted. Historic coho salmon escapement information along with preliminary 2008 escapement results are presented in Table 7.

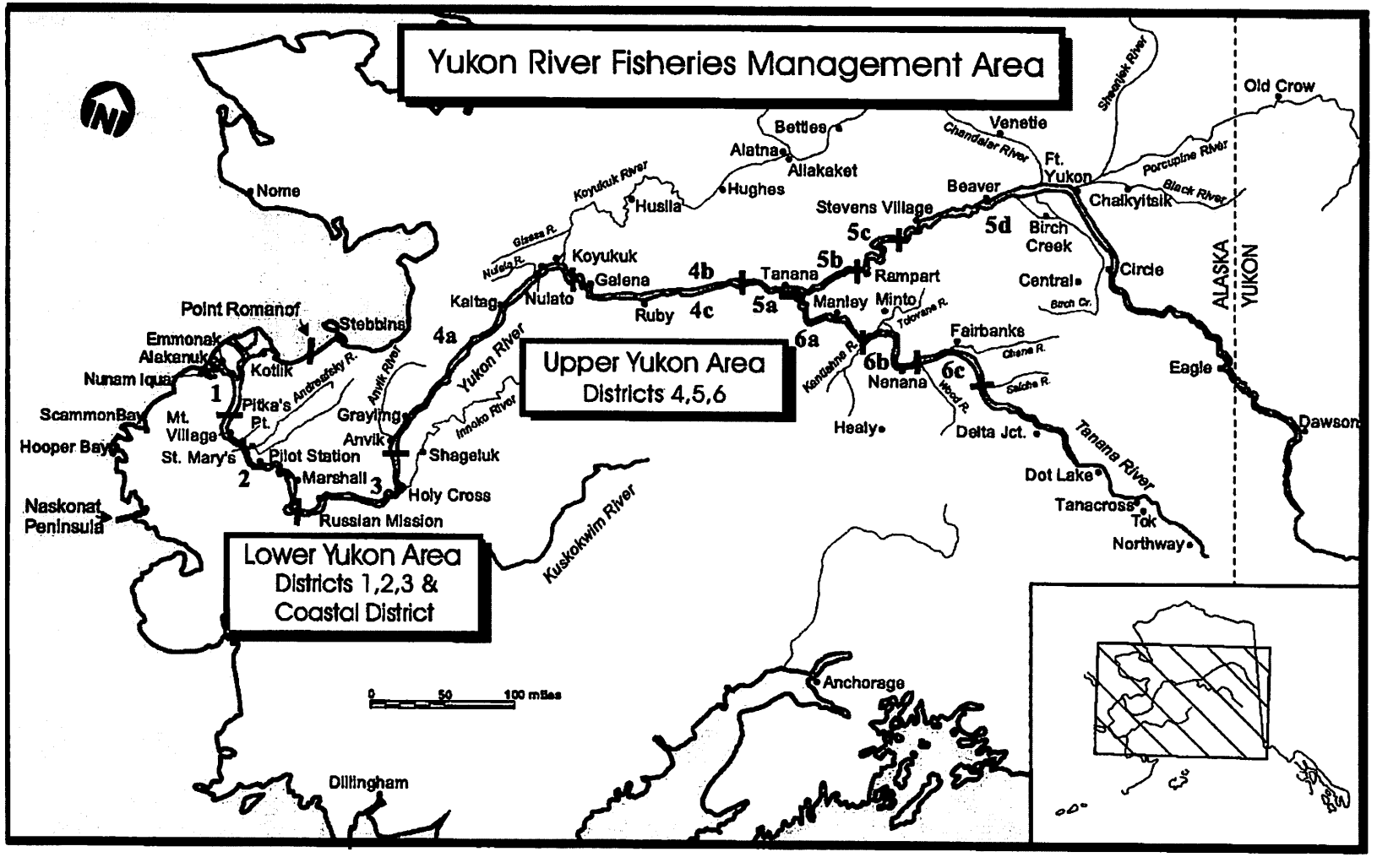


Figure 1. Alaskan portion of the Yukon River drainage showing fishing districts and communities.

Figure 2. The Yukon River drainage fall chum salmon management plan, 5 AAC 01.249.

Fall Chum Salmon Management Plan Overview

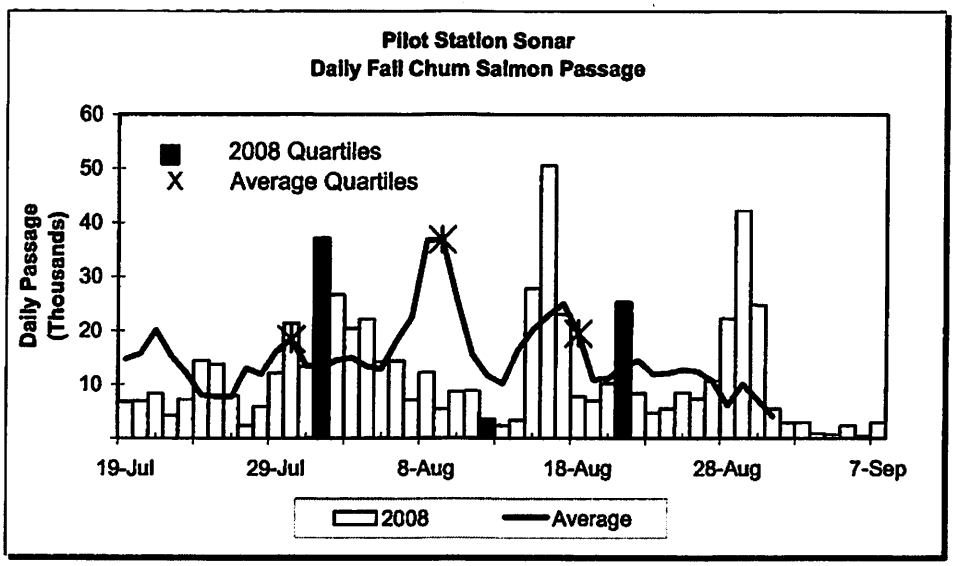
Projected Run Size[1]	RECOMMENDED MANAGEMENT ACTION				Targeted Drainagewide Escapement
	Commercial	Personal Use	Sport	Subsistence	
300,000 or less	Closure	Closure	Closure	Closure[2]	300,000 to 600,000
300,001 to 500,000	Closure	Closure[2]	Closure[2]	Possible Restrictions[2&3]	
500,001 to 600,000	Restrictions[2]	Open	Open	Pre-2001 Fishing Schedules	
Greater than 600,000	Open[4]	Open	Open	Pre-2001 Fishing Schedules	

[1] PROJECTED RUN SIZES use the best available data (including preseason projections, mainstem river sonar passage estimates, test fisheries indices, subsistence and commercial fishing reports, and passage estimates from escapement monitoring projects)

[2] The fishery may be opened or less restrictive in areas that indicator(s) suggest the escapement goal(s) in that area will be achieved.

[3] Subsistence fishing will be managed to achieve a minimum drainage-wide escapement goal of 300,000.

[4] DRAINAGE-WIDE COMMERCIAL FISHERIES may be open and the harvestable surplus above 600,000 will be distributed by district or subdistrict (in proportion to the guidelines harvest levels established in 5AAC 05.362 (f) and (g) and 5 AAC 05.365).



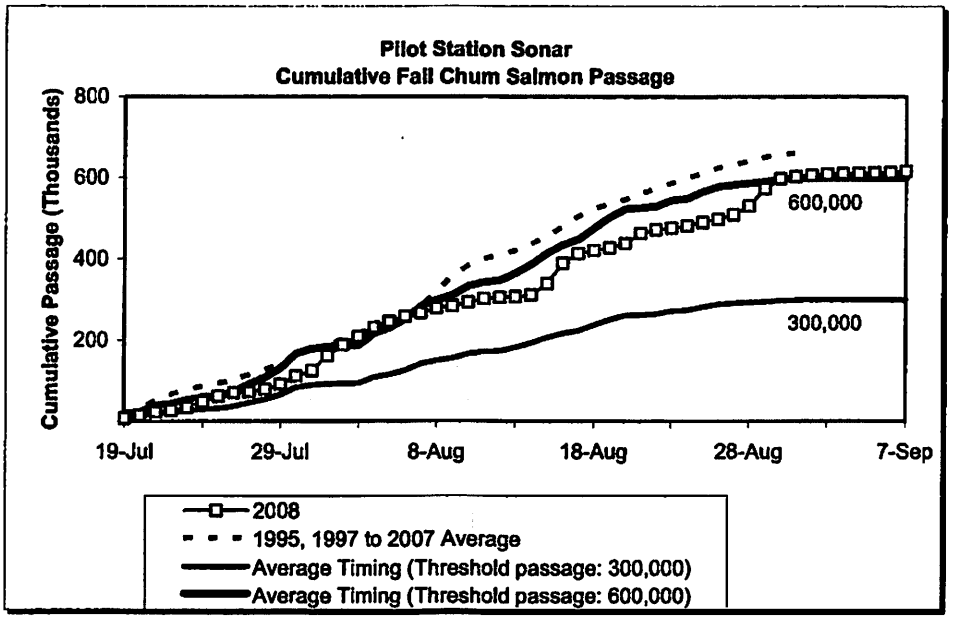


Figure 3. Daily sonar passage counts attributed to fall chum salmon, located near the community of Pilot Station, Yukon River, 1995, and 1997 through 2007 average compared to 2008, and cumulative sonar passage counts, 1993, 1995, and 1997 through 2007 average timing to obtain threshold passage, compared to 2008.

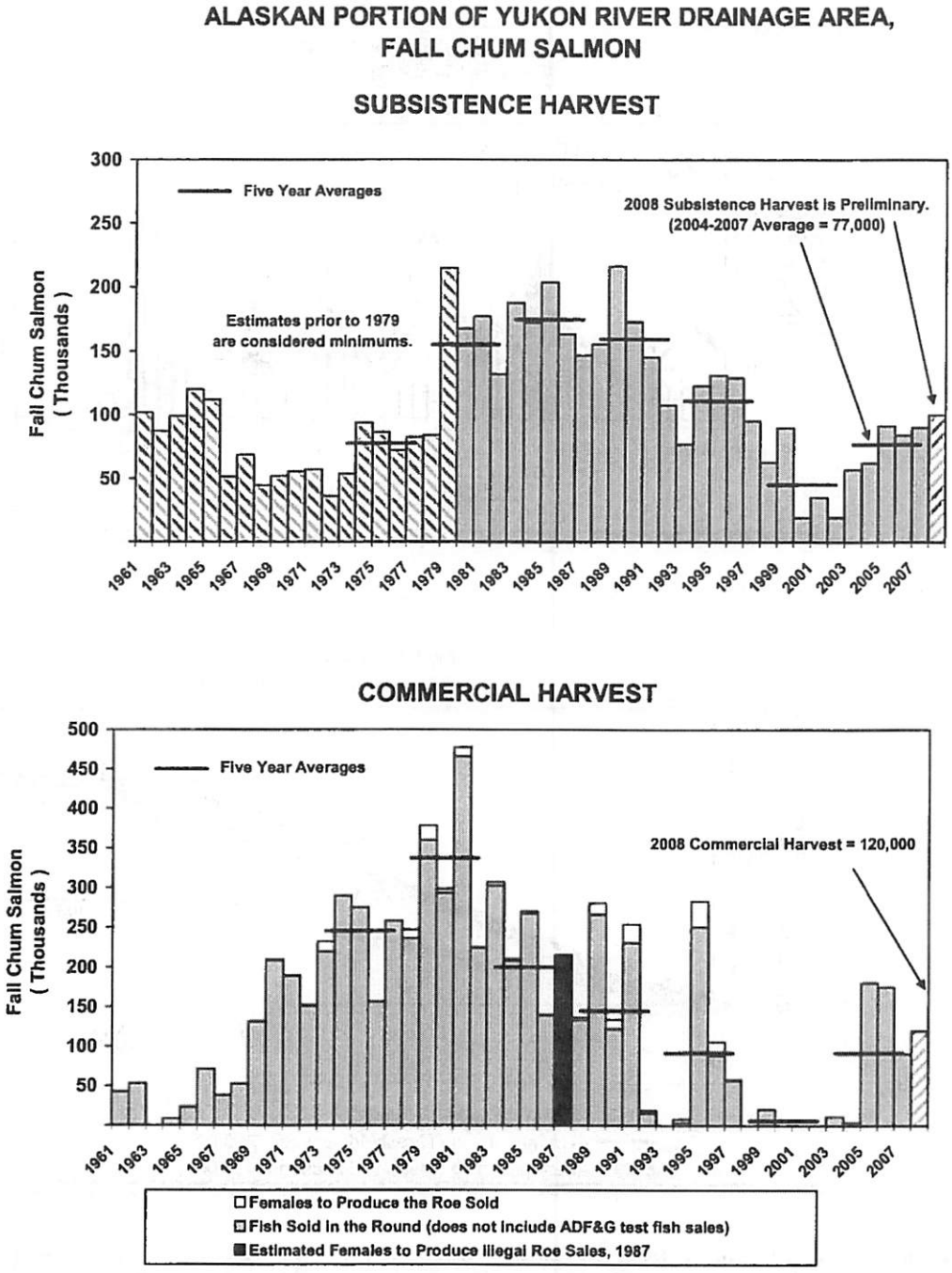
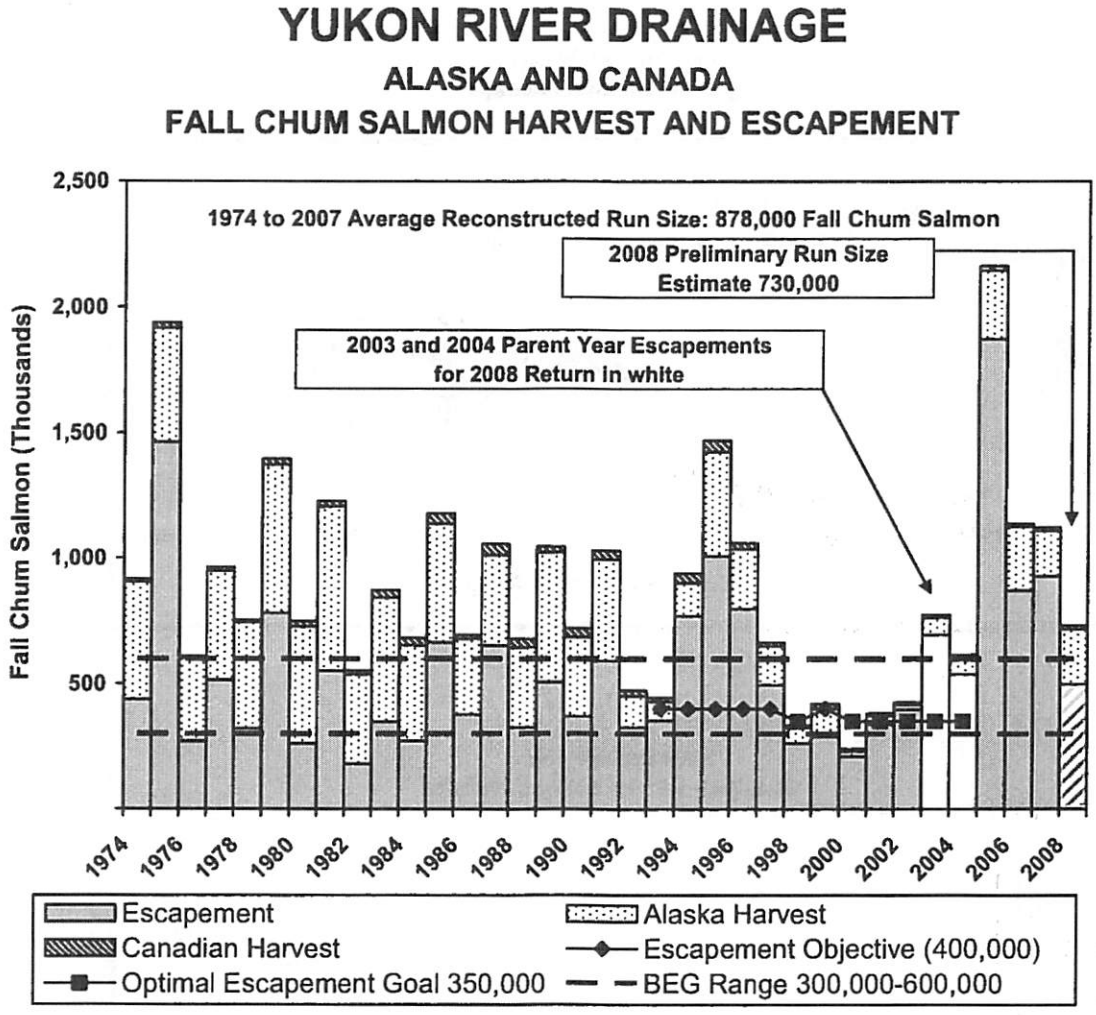
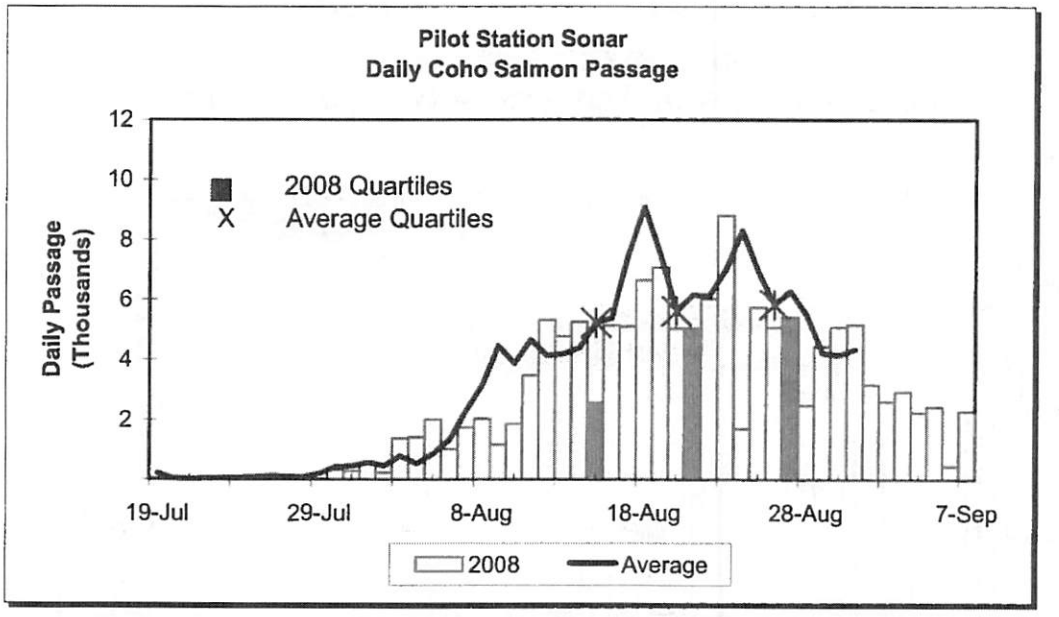


Figure 4. Subsistence and commercial harvest of fall chum salmon, Yukon River drainage, Alaska portion, 1961-2008.



The drainage wide escapement goal is 400,000 fall chum salmon established in 1993.
In 1996 an optimal escapement goal of 350,000 fall chum salmon was established in the Yukon River Fall Chum Salmon Management Plan and was utilized in 1998, 2000, and 2001.
In 2004, a drainage wide escapement goal of 300,000 to 600,000 fall chum salmon was established.
Historical escapement and harvest estimates as provided in the 2008 Fall Chum Salmon Run Projectior Memorandum, by B. Borba.

Figure 5. Estimated harvest and escapement of fall chum salmon, Alaska and Canada, Yukon River drainage, 1974 to 2007, and the 2008 run size estimate.



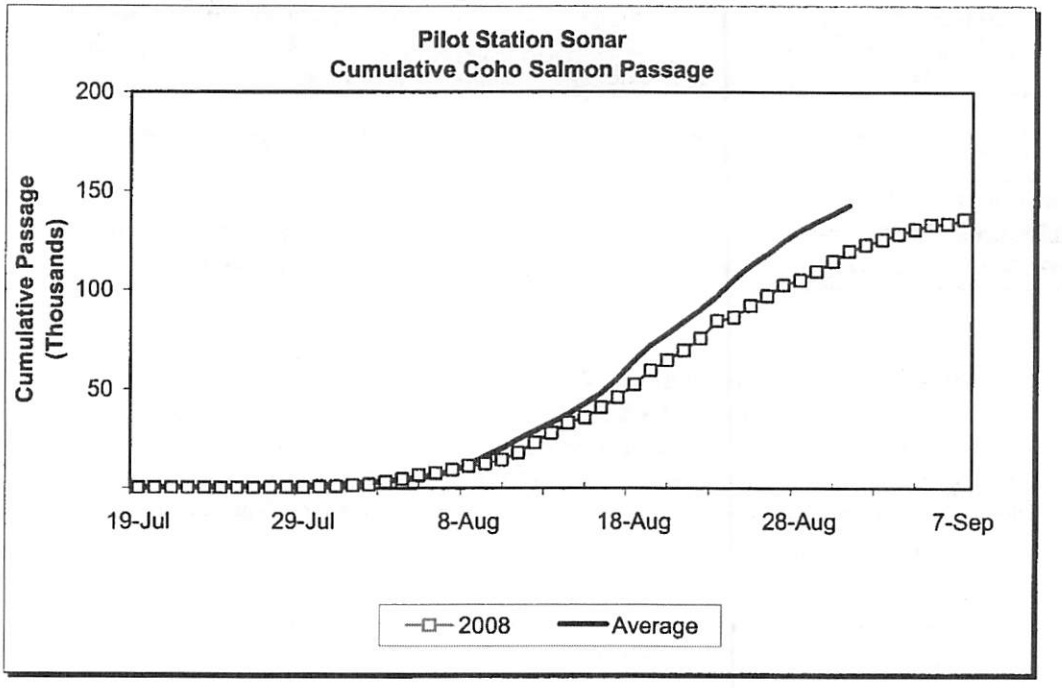


Figure 6. Daily sonar passage counts attributed to coho salmon, located near the community of Pilot Station, Yukon River, 1995, and 1997 through 2007 average compared to 2008, and cumulative sonar passage counts, 1993, 1995, and 1997 through 2007 average timing to obtain threshold passage, compared to 2008.

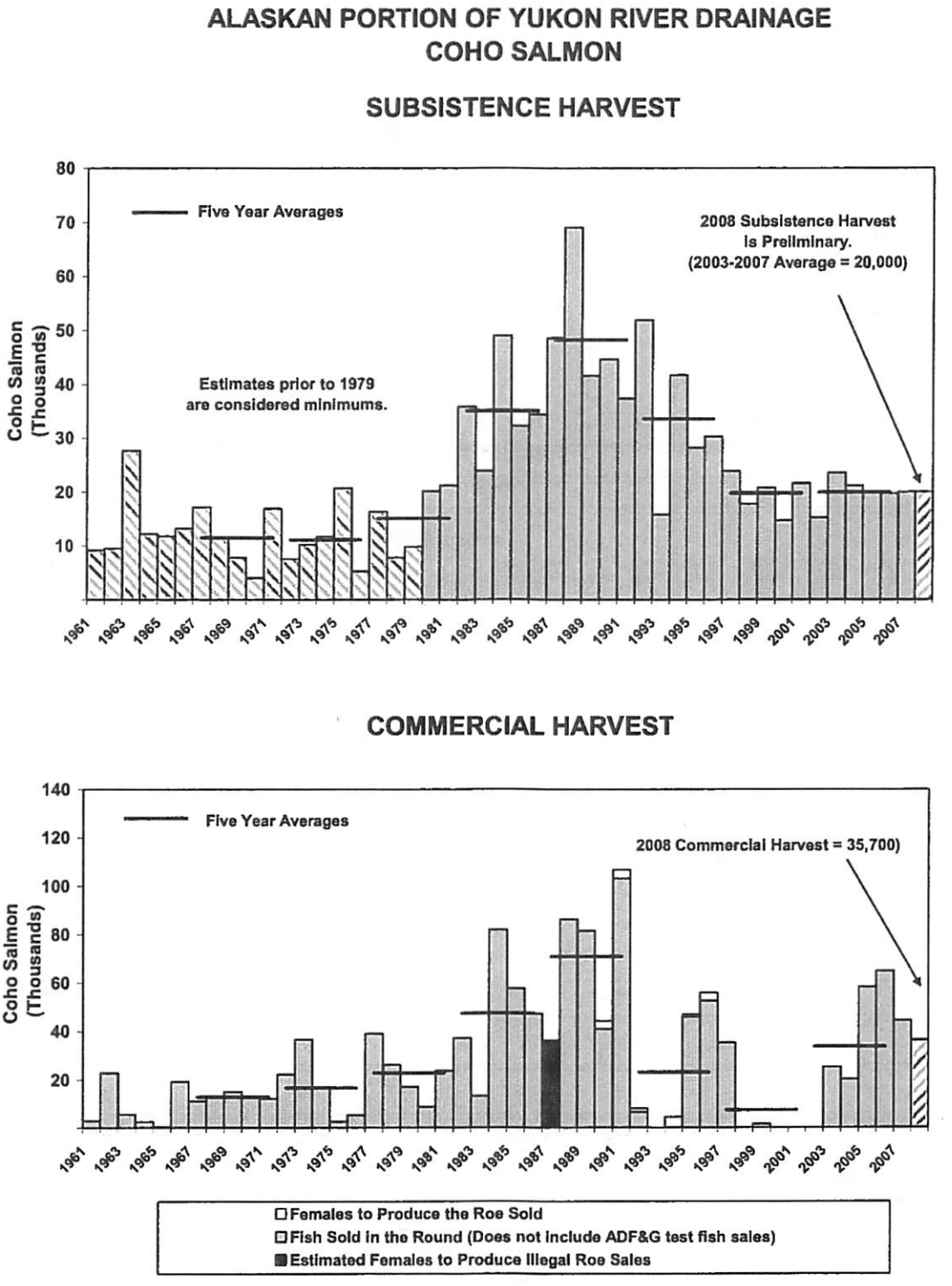


Figure 7. Subsistence, personal use, and commercial harvest of coho salmon, Yukon River drainage, Alaska portion, 1961-2008.

Table 1. Preliminary fall season commercial harvest summary, Yukon Area, 2008.

District 1

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished Drift	Hours Fished Set	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	3:00 PM	17-Jul	12:00 AM	17-Jul	9	9	77	2,131	14,602	6.9	7	47	6.7	0.3%
2	3:00 PM	22-Jul	12:00 AM	22-Jul	9	9	102	6,030	42,375	7.0	83	561	6.8	1.4%
3	3:00 PM	25-Jul	12:00 AM	25-Jul	9	9	125	4,905	34,552	7.0	205	1,321	6.4	4.0%
4	11:00 AM	29-Jul	8:00 PM	29-Jul	9	9	181	19,344	144,275	7.5	1,292	8,524	6.6	6.3%
5	11:00 AM	1-Aug	8:00 PM	1-Aug	9	9	189	18,303	133,705	7.3	2,456	15,823	6.4	11.8%
6	5:00 PM	26-Aug	9:00 PM	26-Aug	4	4	142	9,821	71,799	7.3	2,812	19,605	7.0	22.3%
7	3:00 PM	30-Aug	9:00 PM	30-Aug	6	6	65	851	6,249	7.3	1,379	9,518	6.9	61.8%
8	10:00 AM	2-Sep	7:00 PM	2-Sep	9	9	119	1,637	11,424	7.0	2,220	15,184	6.8	57.6%
9	7:00 AM	5-Sep	7:00 PM	5-Sep	9	12	103	2,051	14,390	7.0	1,696	11,831	7.0	45.3%
10	7:00 AM	8-Sep	7:00 PM	8-Sep	9	12	78	1,992	14,044	7.1	1,135	7,752	6.8	36.3%
11	7:00 AM	10-Sep	7:00 PM	10-Sep	9	12	73	639	4,403	6.9	659	4,568	6.9	50.8%
12										-			-	-
District 1 Subtotal:			Current as of:	10-Sep	91	100	251	67,704	491,818	7.3	13,946	94,732	6.8	17.1%
							Boat Hours:	3.57						

District 2

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	3:00 PM	20-Jul	9:00 PM	20-Jul	6	U	35	710	4,684	6.6	1	5	5.0	0.1%
2	3:00 PM	23-Jul	9:00 PM	23-Jul	6	U	51	4,053	28,095	6.9	16	110	6.9	0.4%
3	12:00 PM	27-Jul	6:00 PM	27-Jul	6	U	60	2,262	15,568	6.9	53	329	6.2	2.3%
4	2:00 PM	30-Jul	8:00 PM	30-Jul	6	U	111	10,882	76,732	7.1	427	2,557	6.0	3.8%
5	8:00 AM	25-Aug	12:00 PM	25-Aug	4	U	80	3,382	24,729	7.3	2,966	20,038	6.8	46.7%
6	8:00 AM	28-Aug	2:00 PM	28-Aug	6	U	108	11,505	83,624	7.3	5,751	38,491	6.7	33.3%
7	8:00 AM	1-Sep	2:00 PM	1-Sep	6	U	123	3,718	25,027	6.7	4,670	31,268	6.7	55.7%
8	10:00 AM	4-Sep	6:00 PM	4-Sep	8	U	91	1,279	8,689	6.8	2,541	17,433	6.9	66.5%
9	10:00 AM	7-Sep	7:00 PM	7-Sep	9	U	63	1,421	9,955	7.0	1,583	10,629	6.8	52.4%
10	10:00 AM	10-Sep	7:00 PM	10-Sep	9	U	70	2,058	14,243	6.9	1,258	8,505	6.8	37.9%
11										-			-	-
12														
District 2 Subtotal:			Current as of:	10-Sep	66		177	41,270	291,346	7.1	19,248	129,365	6.7	31.8%
							Boat Hours:	5.18						

District 3

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	No commercial fishing				0	0	0	0	-	0	0	-	-
District 3 Subtotal:			Current as of:	-	0	0	0	0	-	0	0	-	-

	Hours Fished Drift	Hours Fished Set	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
Lower Yukon Area, Fall Season, Districts 1, 2, and 3 Subtotal:	#REF!	100	428	108,974	783,164	7.2	33,192	224,097	6.8	23.3%

Districts 1, 2, and 3 Guideline Harvest Range: 60,000 to 220,000 fall chum salmon.

-Continued-

Table 1 (continued).

District 4

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished 4-A	Hours Fished 4-BC	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	6:00 PM	9-Sep	6:00 PM	14-Sep	120	0	0	0	0	-	0	0	-	-
District 4 Subtotal:			Current as of:	14-Sep	120	0	0	0	0	-	0	0	-	-

District 4 Guideline Harvest Range: 5,000 to 40,000 fall chum salmon.

Subdistrict 5-A

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	No commercial fishing				0	0	0	0	-	0	0	-	-
Subdistrict 5-A Subtotal:			Current as of:	2-Oct	0	0	0	0	-	0	0	-	-

Subdistrict 5-A Guideline Harvest Range: 0 to 4,000 lbs fall chum salmon roe and 0 to 2,000 lbs coho salmon roe.

Subdistricts 5-B and 5-C

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	6:00 PM	8-Aug	6:00 PM	10-Aug	48	2	561	3,927	7.0	0	0	-	0.0%
2	6:00 PM	12-Aug	6:00 PM	14-Aug	48	2	653	4,991	7.6	0	0	-	0.0%
3	6:00 PM	15-Aug	6:00 PM	17-Aug	48	2	677	5,416	8.0	0	0	-	0.0%
4	6:00 PM	5-Sep	6:00 PM	7-Sep	48	1	92	644	7.0	0	0	-	0.0%
5	6:00 PM	9-Sep	6:00 PM	11-Sep	48	1	421	2,947	7.0	0	0	-	0.0%
6	6:00 PM	12-Sep	6:00 PM	14-Sep	48	1	501	3,507	7.0	31	217	7.0	5.8%
7	6:00 PM	16-Sep	6:00 PM	18-Sep	48	1	578	4,544	7.9	0	0	-	0.0%
8	6:00 PM	19-Sep	6:00 PM	21-Sep	48	1	750	6,380	8.5	52	355	6.8	6.5%
9	6:00 PM	23-Sep	6:00 PM	25-Sep	48	1	325	2,774	8.5	8	56	7.0	2.4%
10	6:00 PM	28-Sep	6:00 PM	28-Sep	48	0	0	0	-	0	0	-	
11	6:00 PM	30-Sep	6:00 PM	2-Oct	48	0	0	0	-	0	0	-	-
Subdistricts 5-B and 5-C			Current as of:	2-Oct	528	3	4,556	35,140	7.6	91	628	6.9	2.0%

Subdistricts 5-B and 5-C Guideline Harvest Range: 4,000 to 38,000 fall chum salmon.

-continued-

Table 1 (continued).

Subdistrict 5-D

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	No commercial fishing				0	0	0	0	-	0	0	-	-
Subdistrict 5-D		Current as of:	-		0	0	0	0	-	0	0	-	-

Subdistrict 5-D Guideline Harvest Range: 1,000 to 4,000 fall chum salmon.

Subdistricts 6-A, 6-B, and 6-C

Period Ending	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	6:00 PM	15-Aug	12:00 PM	17-Aug	42	0	0	0	-	0	0	-	-
2	12:00 PM	6-Sep	12:00 PM	7-Sep	24	6	694	4,858	7.0	350	2,408	6.9	33.5%
3	12:00 PM	9-Sep	12:00 PM	10-Sep	24	3	480	3,528	7.4	133	798	6.0	21.7%
4	6:00 PM	12-Sep	12:00 PM	14-Sep	42	5	1,182	9,432	8.0	88	714	8.3	6.8%
5	6:00 PM	15-Sep	12:00 PM	17-Sep	42	4	904	7,405	8.2	208	1,740	8.4	18.7%
6	6:00 PM	19-Sep	12:00 PM	21-Sep	42	4	1,444	11,701	8.1	638	4,671	7.3	30.6%
7	6:00 PM	22-Sep	12:00 PM	24-Sep	42	4	554	4,421	8.0	374	3,053	8.2	40.3%
8	6:00 PM	26-Sep	12:00 PM	28-Sep	42	4	398	3,303	8.3	508	4,052	8.0	56.1%
9	6:00 PM	29-Sep	12:00 PM	1-Oct	42	1	79	621	7.9	111	869	7.8	58.4%
10									-			-	
District 6 Subtotal:			Current as of:	1-Oct	342	10	5,735	45,269	7.8	2,408	18,305	6.0	42.0%

Subdistricts 6-A, 6-B, and 6-C Guideline Harvest Range: 2,750 to 20,500 fall chum salmon.

Upper Yukon Area, Fall Season, Districts 4, 5, and 6 Subtotals:					990	13	10,291	80,409	7.7	2,499	18,933	6.5	24.3%

Yukon Area, Fall Season, Districts 1 Through 6 Total:					1090	441	119,265	863,573	7.2	35,691	243,030	6.8	23.0%

Table 2. Estimated fall chum salmon commercial harvest in estimated numbers of fish by district, Yukon Area in Alaska, 1961 – 2008.

	Lower Yukon				*Upper Yukon* [b]				Yukon
Year [a]	District 1	District 2	District 3	*Subtotal*	District 4	District 5	District 6	*Subtotal*	Total
1961	42,461	-	-	42,461	0	-	-	0	42,461
1962	53,116	-	-	53,116	0	-	-	0	53,116
1963	0	-	-	0	0	-	-	0	0
1964	8,347	-	-	8,347	0	-	-	0	8,347
1965	22,936	-	-	22,936	381	-	-	381	23,317
1966	69,836	-	1,209	71,045	0	-	-	0	71,045
1967	36,451	-	1,823	38,274	0	-	-	0	38,274
1968	49,857	-	3,068	52,925	0	-	-	0	52,925
1969	128,866	-	1,722	130,588	722	-	-	722	131,310
1970	200,306	4,858	3,285	208,449	1,146	-	-	1,146	209,595
1971	188,533	0	0	188,533	1,061	-	-	1,061	189,594
1972	136,711	12,898	1,313	150,922	1,254	-	-	1,254	152,176
1973	173,783	45,304	0	219,087	13,003	-	-	13,003	232,090
1974	176,036	53,540	552	230,128	9,213	23,551	26,884	59,648	289,776
1975	158,183	51,666	5,590	215,439	13,666	27,212	18,692	59,570	275,009
1976	105,851	21,212	4,250	131,313	1,742	5,387	17,948	25,077	156,390
1977	131,758	51,994	15,851	199,603	13,980	25,730	18,673	58,383	257,986
1978	127,947	51,646	11,527	191,120	12,709	26,236	16,946	55,891	247,011
1979	109,406	94,042	25,955	229,403	52,098	55,556	41,355	149,009	378,412
1980	106,829	83,881	13,718	204,428	32,730	42,245	19,519	94,494	298,922
1981	167,834	154,883	19,043	341,760	19,851	94,793	29,608	144,252	486,012
1982	97,484	96,581	5,815	199,880	4,061	13,979	7,370	25,410	225,290
1983	124,371	85,645	10,018	220,034	6,114	43,993	35,994	86,101	306,135
1984	78,751	70,803	6,429	155,983	9,841	24,117	17,785	51,743	207,726
1985	129,948	40,490	5,164	175,602	26,977	25,338	42,352	94,667	270,269
1986	59,352	51,307	2,793	113,452	2,045	22,448	2,074	26,567	140,019
1987	0	0	0	0	0	0	0	0	0
1988	45,317	31,861	2,090	79,268	17,083	16,989	23,650	57,722	136,990
1989	77,876	97,906	15,332	191,114	15,183	22,204	56,443	93,830	284,944
1990	27,337	37,173	3,715	68,225	8,166	8,976	50,717	67,859	136,084
1991	59,724	102,628	9,213	171,565	6,091	32,114	44,448	82,653	254,218
1992	0	0	0	0	0	0	19,022	19,022	19,022
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	3,630	4,369	7,999	7,999
1995	79,345	90,831	0	170,176	8,731	30,033	74,117	112,881	283,057
1996	33,629	29,651	0	63,280	2,918	21,858	17,574	42,350	105,630
1997	27,483	24,326	0	51,809	2,458	3,920	0	6,378	58,187
1998	0	0	0	0	0	0	0	0	0
1999	9,987	9,703	0	19,690	681	0	0	681	20,371
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	5,586	0	0	5,586	1,315	0	4,095	5,410	10,996
2004	660	0	0	660	0	0	3,450	3,450	4,110
2005	130,525	0	0	130,525	0	0	49,637	49,637	180,162
2006	101,254	39,905	0	141,159	0	10,030	23,353	33,383	174,542
2007	38,852	35,826	0	74,678	0	427	15,572	15,999	90,677
2008 [c]	67,704	41,270	0	108,974	0	4,556	5,735	10,291	119,265
5 Year Average 2003 - 2007	55,375	15,146	0	70,522	263	2,091	19,221	21,576	92,097
10 Year Average 1998 - 2007	28,686	8,543	0	37,230	200	1,046	9,611	10,856	48,086

[a] Numbers of fish harvested are based on reports from the State TIX and Zephyr programs.

[b] Estimated harvest is the number of fish sold in the round plus the estimated number of females to produce the roe sold.

[c] Preliminary data

Table 3. Estimated coho salmon commercial harvest in estimated numbers of fish by district, Yukon Area in Alaska, 1961–2008.

Year [a]	Lower Yukon				Upper Yukon [b]				Yukon
	District 1	District 2	District 3	*Subtotal*	District 4	District 5	District 6	*Subtotal*	Total
1961	2,855	-	-	2,855	-	-	-	-	2,855
1962	22,926	-	-	22,926	-	-	-	-	22,926
1963	5,572	-	-	5,572	-	-	-	-	5,572
1964	2,446	-	-	2,446	-	-	-	-	2,446
1965	350	-	-	350	-	-	-	-	350
1966	19,254	-	-	19,254	-	-	-	-	19,254
1967	9,925	0	1,122	11,047	-	-	-	-	11,047
1968	13,153	0	150	13,303	-	-	-	-	13,303
1969	13,989	0	1,009	14,998	95	-	-	95	15,093
1970	12,632	0	0	12,632	556	-	-	556	13,188
1971	12,165	0	0	12,165	38	-	-	38	12,203
1972	21,705	506	0	22,211	22	-	-	22	22,233
1973	34,860	1,781	0	36,641	0	-	-	0	36,641
1974	13,713	176	0	13,889	0	1,409	1,479	2,888	16,777
1975	2,288	200	0	2,488	0	5	53	58	2,546
1976	4,064	17	0	4,081	0	0	1,103	1,103	5,184
1977	31,720	5,319	538	37,577	0	2	1,284	1,286	38,863
1978	16,460	5,835	758	23,053	32	1	3,066	3,099	26,152
1979	11,369	2,850	0	14,219	155	0	2,791	2,946	17,165
1980	4,829	2,660	0	7,489	30	0	1,226	1,256	8,745
1981	13,129	7,848	419	21,396	0	0	2,284	2,284	23,680
1982	15,115	14,179	87	29,381	15	0	7,780	7,795	37,176
1983	4,595	2,557	0	7,152	0	0	6,168	6,168	13,320
1984	29,472	43,064	621	73,157	1,095	0	7,006	8,101	81,258
1985	27,676	17,125	171	44,972	938	0	11,760	12,698	57,670
1986	24,824	21,197	793	46,814	0	0	441	441	47,255
1987	0	0	0	0	0	0	0	0	0
1988	36,028	34,758	1,419	72,205	2	8	13,972	13,982	86,187
1989	24,670	38,397	3,988	67,055	3	84	16,079	16,166	83,221
1990	13,354	16,405	918	30,677	0	0	14,804	14,804	45,481
1991	54,095	40,898	1,905	96,898	14	0	9,774	9,788	106,686
1992	0	0	0	0	0	0	7,979	7,979	7,979
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	4,451	4,451	4,451
1995	21,625	18,488	0	40,113	0	0	6,900	6,900	47,013
1996	27,705	20,974	0	48,679	161	0	7,142	7,303	55,982
1997	21,450	13,056	0	34,506	814	0	0	814	35,320
1998	0	0	0	0	0	0	0	0	0
1999	855	746	0	1,601	0	0	0	0	1,601
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	9,757	0	0	9,757	0	0	15,486	15,486	25,243
2004	1,583	0	0	1,583	0	0	18,649	18,649	20,232
2005	36,533	0	0	36,533	0	0	21,778	21,778	58,311
2006	39,323	14,482	0	53,805	0	0	11,137	11,137	64,942
2007	21,720	21,487	0	43,207	0	0	1,368	1,368	44,575
2008 [c]	13,946	19,246	0	33,192	0	91	2,408	2,499	35,691
5 Year Average 2003 - 2007									
	21,783	7,194	0	28,977	0	0	13,684	13,684	42,661
10 Year Average 1998 - 2007									
	10,977	3,672	0	14,649	0	0	6,842	6,842	21,490

[a] Numbers of fish harvested are based on reports from the State TIX and Zephyr programs.

[b] Estimated harvest is the number of fish sold in the round plus the estimated number of females to produce the roe sold.

[c] Preliminary data

Table 4. Value in dollars of commercial salmon fishery to Yukon Area fishermen, Fall Season, 1977-2008.

	Fall Chum					Coho						Value by Species		Value by Area		
	Lower Yukon		Upper Yukon			Lower Yukon			Upper Yukon							
Year	$/lb	Value	$/lb	$/lb Roe	Value	$/lb	$/lb Roe	Value	$/lb	$/lb Roe	Value	Fall Chum	Coho	Lower	Upper	Total
1977	0.45	718,571	0.22		102,170	0.50		140,914	0.27		2,251	820,741	143,165	859,485	104,421	963,906
1978	0.47	691,854	0.25		103,091	0.60		95,823	0.24		6,105	794,945	102,928	788,677	109,196	897,873
1979	0.68	1,158,485	0.29		347,814	0.80		83,466	0.25		6,599	1,506,299	90,065	1,241,951	354,413	1,596,364
1980	0.28	394,162	0.27		198,088	0.36		17,374	0.29		2,374	592,250	19,748	411,536	200,462	611,998
1981	0.55	1,503,744	0.35		356,805	0.60		87,385	0.35		4,568	1,860,549	91,953	1,591,129	361,373	1,952,502
1982	0.55	846,492	0.28		53,258	0.69		135,828	0.37		18,786	899,750	154,614	982,320	72,044	1,054,364
1983	0.34	591,011	0.19		128,950	0.35		17,497	0.31		11,472	719,961	28,969	608,508	140,422	748,930
1984	0.32	374,359	0.26		103,417	0.50		256,050	0.24		12,823	477,776	268,873	630,409	116,240	746,649
1985	0.47	634,616	0.25		178,125	0.53		176,254	0.33		26,797	812,741	203,051	810,870	204,922	1,015,792
1986	0.49	399,321	0.14		30,309	0.71		211,942	0.21		556	429,630	212,498	611,263	30,865	642,128
1987	-	0	-		0	-		0	-		0	0	0	0	0	0
1988	1.01	638,700	0.32		151,300	1.38		734,400	0.37		34,116	790,000	768,516	1,373,100	185,416	1,558,516
1989	0.50	713,400	0.28		223,996	0.66		323,300	0.35		33,959	937,396	357,259	1,036,700	257,955	1,294,655
1990	0.45	238,165	0.29		174,965	0.66		137,302	0.34		37,026	413,130	174,328	375,467	211,991	587,458
1991	0.34	438,310	0.23	3.56	157,831	0.44		300,182	0.30	2.50	21,556	596,141	321,738	738,492	179,387	917,879
1992	-	0	0.39	4.50	54,161	-		0	0.39	2.18	19,529	54,161	19,529	0	73,690	73,690
1993	-	0	-		0	-		0	-		0	0	0	0	0	0
1994	-	0	0.16	1.50	8,517	-		0	0.48	1.50	8,739	8,517	8,739	0	17,256	17,256
1995	0.15	185,036	0.13	2.96	167,571	0.29		80,019	0.14	2.51	11,292	352,607	91,311	265,055	178,863	443,918
1996	0.10	48,579	0.13	1.71	45,438	0.26	2.96	96,795	0.09	2.16	13,020	94,017	109,815	145,374	58,458	203,832
1997	0.22	86,526	0.17	1.75	7,252	0.32		79,973	0.20		1,062	93,778	81,035	166,499	8,314	174,813
1998	-	0	-		0	-		0	-		0	0	0	0	0	0
1999	0.25	35,639	0.20		876	0.35		3,620	-		0	36,515	3,620	39,259	876	40,135
2000	-	0	-		0	-		0	-		0	0	0	0	0	0
2001	-	0	-		0	-		0	-		0	0	0	0	0	0
2002	-	0	-		0	-		0	-		0	0	0	0	0	0
2003	0.15	5,993	0.10		3,398	0.25		18,168	0.05		5,095	9,391	23,263	24,161	8,493	32,654
2004	0.25	1,126	0.05		848	0.25		2,774	0.06		6,372	1,974	9,146	3,900	7,220	11,120
2005	0.32	316,688	0.14		48,159	0.32		83,793	0.12		19,182	364,857	102,975	400,491	67,341	467,832
2006	0.20	202,637	0.14		33,806	0.20		50,299	0.19		11,137	236,443	61,436	252,936	44,943	297,879
2007	0.27	144,256	0.20		16,907	0.39		127,869	0.20		1,368	161,163	129,237	272,125	18,275	290,400
2008	0.55	428,989	0.27		22,089	0.97		216,777	0.20		3,717	451,058	220,494	645,746	25,806	671,552
10 Year Average (1998-2007)	0.24	70,635	0.14		10,399	0.29		28,652	0.10		4,315	81,034	32,968	99,287	14,715	114,002
2008 vs. 10 Year Avg	129.2%	507.3%	95.2%		112.4%	230.7%		656.6%	93.5%		-13.9%	456.6%	568.6%	550.4%	75.4%	489.1%

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Table 5. Number of participating commercial salmon fishing gear permit holders by district and season, Yukon Area in Alaska, 1971-2008.[a]

	Fall Chum and Coho Salmon Season								
	Lower Yukon Area				Upper Yukon Area				Yukon Area
Year	District 1	District 2	District 3	Subtotal[b]	District 4	District 5	District 6	Subtotal[c]	Total
1971	352	-	-	352	-	-	-	-	352
1972	353	75	3	431	-	-	-	-	431
1973	445	183	0	628	-	-	-	-	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	312	224	18	554	13	29	23	65	619
1984	327	216	12	536	18	39	26	83	619
1985	345	222	13	559	22	39	25	86	645
1986	282	231	14	510	1	21	16	38	548
1987	0	0	0	0	0	0	0	0	0
1988	328	233	13	563	20	20	32	72	635
1989	332	229	22	550	20	24	28	72	622
1990	301	227	19	529	11	11	27	49	578
1991	319	238	19	540	8	21	25	54	594
1992	0	0	0	0	0	0	22	22	22
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	1	11	12	12
1995	189	172	0	361	4	12	20	36	397
1996	158	109	0	263	1	17	17	35	298
1997	176	130	0	304	3	8	0	11	315
1998	0	0	0	0	0	0	0	0	0
1999	146	110	0	254	4	0	0	4	258
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	75	0	0	75	2	0	5	7	82
2004	26	0	0	26	0	0	6	6	32
2005	177	0	0	177	0	0	7	7	184
2006	219	71	0	286	0	4	11	15	301
2007	181	122	0	300	0	2	8	10	310
2008	251	177	0	428	0	3	8	11	439
Average									
1971-2007	236	127	9	364	11	17	17	45	406
1998-2007	82	30	0	112	1	1	4	5	117
2003-2007	136	39	0	173	0	1	7	9	182

[a] Number of permit holders which made at least one delivery.

[b] Since 1984, the Subtotal for the Lower Yukon Area was the "unique" number of permits fished. Consequently, the Districts 1, 2, and 3 totals may add up to be greater than the Lower Yukon Subtotal. Before 1984, the Districts 1, 2, and 3 totals are summed and the resulting Subtotals may reflect that some permit holders operated in more than one district during the year.

[c] The sum of Districts 4 , 5, and 6 averages may not equal Upper Yukon Area district Subtotal due to rounding error.

Table 6. Preliminary fall chum salmon passage estimates or escapement estimates for selected spawning areas, Yukon River drainage, 1971 to 2008. [a]

		Alaska								Canada	
		Tanana River Drainage					Upper Yukon River Drainage				
Year	Yukon River Mainstem Sonar Estimate	Tokiat River [b]	Kantishna / Tokiat Rivers Tagging Estimate [c]	Delta River [d]	Bluff Cabin Slough [e]	Upper Tanana River Tagging Estimate [f]	Rampart Rapids Tagging Estimate [g]	Chandalar River [h]	Sheenjek River [i]	Fishing Branch River [k]	Mainstem Tagging Escapement Estimate [m]
1971										312,800	
1972										35,125 [n]	
1973										15,989	
1974		41,798		5,915 [p]					89,966 [r]	31,525	
1975		92,265		3,734					173,371 [r]	353,262	
1976		52,891		6,312					26,354 [r]	38,584 [s]	
1977		34,887		16,876					45,544 [r]	88,400 [s]	
1978		37,001		11,136 [p]					32,449 [r]	40,600 [s]	
1979		158,336		8,355 [p]					91,372 [r]	119,898 [s]	
1980		26,346		5,137 [p]	3,190 [t]				26,933 [r]	55,268 [s]	22,912
1981		15,623		23,508 [p]	6,120 [t]				74,560	57,386 [u]	47,066
1982		3,624		4,235 [p]	1,156				31,421	15,901 [s]	31,958
1983		21,869		7,705 [p]	12,715				49,392	27,200 [s]	90,875
1984		16,758		12,411 [p]	4,017				27,130	15,150 [s]	56,633 [v]
1985		22,750		17,276	2,655 [t]				152,768 [w,	56,016	62,010
1986		17,976		6,703	3,456			59,313	84,207 [w, x]	31,723	87,940
1987		22,117		21,180 [p]	9,395			52,416	153,267 [w, x]	48,956	80,776
1988		13,436		18,024 [p]	4,481 [t]			33,619	45,206 [x]	23,597	36,786
1989		30,421		21,342	5,386 [t]			69,161	99,116 [x]	43,834	35,750
1990		34,739		8,892	1,632			78,631	77,750 [x]	35,000 [y]	51,735
1991		13,347		32,905	7,198				86,496	37,733	78,461
1992		14,070		6,893	3,615 [t]				78,608	22,517	49,082
1993	295,000	27,838		19,857 [p]	5,550 [t]				42,922	28,707	29,743
1994	407,000	76,057		23,777	2,277 [t]				150,565	65,247	98,358
1995	1,053,245	54,513 [z]		20,587 [p]	19,460	268,173		280,999	241,855	51,971 [aa]	158,092
1996		18,264		19,758	7,074	134,583	654,296	208,170	246,889	77,278	122,429
1997	508,621	14,511		7,705	5,707	71,661	369,547	199,674	80,423 [ab]	26,959	85,439
1998	372,927	15,605		7,804	3,549	62,384	194,963	75,811	33,058	13,564	46,305
1999	379,493	4,551	27,199	16,534	7,037	97,843	189,742 [ac]	88,662	14,229	12,904	58,682
2000	247,935	8,911 [ad]	21,450	3,001	1,595	34,844	[af]	65,694	30,084 [ag]	5,053	53,742
2001	376,182	6,007	22,992	8,103	1,808 [t]	96,556 [ah]	201,766	110,971	53,932	21,669	33,851
2002	326,858	28,519	56,665	11,992	3,116	109,961	196,186	89,850	31,642	13,563	98,685
2003	889,778	21,492	87,359	22,582	10,600 [t]	193,418	485,102	214,416	44,047 [aj]	29,519	142,683
2004	594,060	35,480	76,163	25,073	10,270 [t]	123,879	618,579	136,703	37,878	20,274	154,080
2005	1,813,589	17,779 [z]	107,719	28,132	11,964 [t]	377,755	1,987,982	496,484	438,253 [w]	121,413	437,920
2006	790,563	-	71,135	14,055	-	202,689	-	245,090	160,178 [w]	30,849	211,193
2007	684,011	-	81,843	18,610	-	320,811	-	226,056	65,435 [w]	33,750	214,802
2008 [ak]	615,127	-	- [am]	23,055	1,198	- [am]	-	157,843	42,842 [w]	20,055	172,402
All Years Average	623,493	31,243	61,392	14,608	5,786	161,117	544,240	152,209	90,353	54,670	98,290
Five Year Average 2003-2007	954,400	24,917	84,844	21,690	10,945	243,708	1,030,554	264,150	149,158	47,161	232,136
BEG Range		15,000 33,000	N/A	6,000 13,000	N/A	46,000 [an] 103,000	212,000 [ap] 441,000	74,000 152,000	50,000 104,000	27,000 56,000	60,000 129,000
Drainage-wide BEG 30,0000 - 600,000									Treaty Negotiated Interim Objectives: 50,000-120,000 Yukon River Panel Negotiated Objectives for 2008-2010: 22,000-49,000		> 80,000 > 80,000

-Continued-

Table 6. (continued).

a Latest table revision January 21, 2008.
b Total abundance estimates for the upper Toklat River drainage spawning index area using stream life curve method developed with 1987 to 1993 data.
c Fall chum salmon passage estimate for the Kantishna and Toklat River drainages is based on tag deployment from a fish wheel located at the lower end of the Kantishna River and recaptures three fish wheels; two located on the Toklat River (1999 to 2007) about eight miles upstream of the mouth and one fish wheel on the Kantishna River (2000 and 2007) near the Bear Paw River.
d Population estimate generated from replicate foot surveys and stream life data (area under the curve method), unless otherwise noted.
e Peak counts from foot surveys unless otherwise noted.
f Fall chum salmon passage estimate for the upper Tanana River drainage based on tag deployment from a fish wheel (two fish wheels in 1995) located just upstream of the Kantishna River and recaptures from one fish wheel (two fish wheels from 1995 to 1998) located downstream from the village of Nenana.
g Fall chum salmon passage estimate for the upper Yukon River drainage based on tag deployment at two fish wheels located at the "Rapids" and recaptured by a fish wheel located downstream from the village of Rampart, operational from 1996 to 2005.
h Side-scan sonar estimate from 1986 through 1990. Split beam sonar estimate from 1995 through 2006. DIDSON sonar estimate in 2007 to present.
i Side-scan sonar estimate from 1986 through 1999, 2001, and 2002. Split-beam sonar estimate from 2003 through 2004. DIDSON sonar estimate since 2005. Counts prior to 1986 are considered conservative; approximating the period from the end of August through middle of the fourth week of September. Since 1991, Total abundance estimates are for the approximate period second week in August through the middle of the fourth week of September.
k Total escapement estimated using weir count unless otherwise indicated. Counts for 1974, 1975, and 1998 revised from DFO, February 23, 2000.
m Estimated border passage minus Canadian mainstem harvest and excluding Canadian Porcupine River drainage escapement.
n Weir installed on September 22, 1972. Estimate consists of a weir count of 17,190 after September 22, and a tagging passage estimate of 17,935 prior to weir installation.
p Total escapement estimate generated from the migratory time density curve method.
r Total escapement estimate using sonar to aerial survey expansion factor of 2.22.
s Total escapement estimated using weir to aerial survey expansion factor of 2.72.
t Peak counts aerial surveys.
u In 1981, the initial aerial survey count was doubled before applying the weir to aerial expansion factor of 2.72 since only half of the spawning area was surveyed.
v In 1984, the escapement estimate based on mark-recapture program is unavailable. Estimate is based on assumed average exploitation rate.
w Sonar counts included both banks in 1985-1987 and 2005 to present.
x Expanded estimates, using Chandalar River fall chum salmon run timing data, for the approximate period from mid-August through the middle of the fourth week of September 1986-1990.
y Population of spawners was reported by DFO as between 30,000 to 40,000 fish considering aerial survey timing. For purpose of this table an average of 35,000 fall chum salmon was estimated to pass by the weir. Note: A single survey flown October 26, 1990, counted 7,541 chum salmon. A population estimate of approximately 27,000 fish was made through date of survey, based upon historic average aerial to weir expansion of 28%.
z Minimal estimate because of late timing of ground surveys with respect to peak of spawning.
aa Minimal count because weir was closed while submerged due to high water, during the period August 31 to September 8, 1995.
ab The passage estimate includes an additional 15,134 salmon that were estimated to have passed during 127 hours that the sonar was inoperable due to high water from August 29 until September 3, 1997.
ac Due to transposed numbers, total does not match the population estimate in the U.S. Fish and Wildlife Service's Alaska Fisheries Technical Report Number 57, *Estimated Abundance of Adult Fall Chum Salmon in the Middle Yukon River, Alaska, 1998-1999*.
ad Aerial survey count from 10/23/00. Unexpanded Toklat foot survey counts conducted from 10/11-10/16/00 was 2,496 fall chum salmon.
af Project ended early, population estimate through 19 August 2000 was 45,021 on average this represents 0.24 percent of the run.
ag Project ended early, sonar passage estimate was 18,652 (62% of normal run timing). The total sonar passage estimate, 30,083, was expanded to reflect the 1986-1999 average run timing through September 24.
ah Due to low numbers of tags deployed and recovered on the Tanana the estimate has a large range in confidence interval (95% CI ± 41,172).
aj Project ended on peak daily passages due to late run timing, estimate was expanded based on run timing (87%) at Rapids.
ak Preliminary.
am Tanana tagging project discontinued beginning in 2008. Tanana River estimate in 2008 is based on genetics apportionment to Pilot Station sonar and represents all Tanana fall chum salmon as well as Tanana summer chum salmon after July 19 to be comparable to the historical mark-recapture estimates (a minimum estimate of 161,924 fall chum salmon)
an Upper Tanana River goal is the Tanana River drainage BEG (61,000 to 136,000) minus the lower and upper ranges of the Toklat River goal based on Eggers (2001) and is not an established BEG.
ap Sum of BEG's for Chandalar, Sheenjek, Fishing Branch, and border escapements based on Eggers (2001) and is not an established BEG.

Table 7. Coho salmon escapement estimates for selected spawning areas, Yukon River drainage, 1972 to 2008.

Year	East Fork Andreafsky River b	Yukon River Mainstem Sonar Estimate c	Kantishna River Drainage: Anvik River	Kantishna River Drainage: Geiger Creek d	Kantishna River Drainage: Barton Creek	Nenana River Drainage: Lost Slough	Nenana River Drainage: Nenana Mainstem f	Nenana River Drainage: Wood Creek	Nenana River Drainage: Seventeen Slough	Nenana River Drainage: Lignite Springs d	Delta Clearwater River g	Delta Clearwater River Tributaries h	Clearwater Lake and Outlet	Richardson Clearwater River j
1972											632		417	454 k
1973											3,322		551	375
1974						1,388			27		3,954 k		560	652
1975						943			956		5,100		1,575 m	4 k
1976			467 j	25 j k		118			281		1,920		1,500 m	80 k
1977			81 j	60		524 j		310 d	1,167		4,793		730 m	327
1978						350		300 d	466		4,798		570 m	
1979						227			1,987		8,970		1,015 m	372
1980				3 j k		499 j		1,603 d	592		3,946		1,545 m	611
1981	1,657 j					274		849 n p	1,005		8,563 r		459 j	550
1982				81				1,436 n p			8,365 r			
1983				42		766		1,042 n	103		8,019 r		253	88
1984				20 j k		2,677		8,826 n			11,061		1,368	428
1985				42 j k		1,584		4,470 n	2,081		6,842		750	
1986				5	496	794		1,664 n	218 m		10,857		1,800	146 k
1987				1,175		2,511		2,387 n	3,802		22,300		4,225 m	
1988	1,913 s		1,203	159	437	348		2,046 n			21,600		825 m	
1989				155	12 j			412 n	824 j		12,600		1,600 m	483
1990				211		688	1,308		15 j		8,325		2,375 m	
1991				427	487 j	564	447		52		23,900		3,150 m	
1992				77	55 j	372			490		3,963		229 m	500
1993				138	141	484	419	666 n t	581		10,875		3,525 m	
1994				410	2,000 n u	944	1,648	1,317 n v	2,909	244	62,675	17,565	3,425 m	5,800
1995	10,901	101,806		142	192 n w	4,169	2,218	500 n	2,972 j		20,100	6,283	3,625 m	
1996	8,037			233	0 n	2,040	2,171	201 k x	3,668 m	282	14,075	3,300	1,125 k	
1997	9,472	104,343		274		1,524 y	1,446	k x	1,996	50 n aa	11,525	2,375	2,775 m	
1998	7,193	136,906		157		1,360 k	2,771 k	370 z ab	1,413 z	175 n	11,100	2,775	2,775 m	
1999	2,983	62,521		29		1,002 k	745 k	ab	662 k		10,975	2,805		
2000	8,451	175,421		142		55 j k	66 j k	ab	879 j k	95	9,225	2,358	1,025 m	2,175
2001	15,898	137,769	262 j	578		242	855	699	3,741	135	46,875	11,982	4,425 m	1,531
2002	3,577	122,566		744		0	328	935	1,910	130	38,625	9,873	5,900 m	874
2003	8,231	269,081		973		85	658	3,055	4,535	67	105,850	27,057	8,800	6,232
2004	11,146	188,350		583		220	450	840	3,370	91	37,950	9,701	2,925	8,626
2005	5,303	184,281		625		430	325 k	1,030	3,890	378	34,293	8,766	2,100	2,024
2006		131,919				194	160 k	634	1,916	168	16,748	4,281	4,375	271
2007		173,289				63	520	605	1,733	334	14,650	3,961	2,075	553
2008 ac		135,570		183		1,342	1,539	578	1,652	343	7,500	1,917	1,275	265
All Years Average	7,288	147,966	503	275	422	872	1,004	1,471	1,622	169	17,213	7,667	2,161	1,393
Five Year Average 2003-2007	8,227	189,384	-	727	-	198	423	1,233	3,089	208	41,898	10,753	4,055	3,541
Interim Escapement Objective											5,200 to 17,000 ad			

-Continued-

Table 7. (continued).

a Only peak counts presented. Survey rating is fair to good, unless otherwise noted.
b Weir count, unless otherwise indicated.
c Passage estimates for coho salmon are incomplete. The sonar project is terminated prior to the end of the coho salmon run.
d Foot survey, unless otherwise indicated.
f Mainstem Nenana River between confluence's of Lost Slough and Teklanika River.
g Boat survey counts in the lower 17.5 river miles, unless otherwise indicated.
h Helicopter surveys counted tributaries of the Delta Clearwater River, outside of the normal mainstem index area, from 1994 to 1999 after which an expansion factor was used to estimate the escapement to the areas.
j Aerial survey, fixed winged or helicopter.
k Poor survey.
m Boat Survey.
n Weir count.
p Coho weir was operated at the mouth of Clear Creek (Shores Landing).
r Expanded estimate based on partial survey counts and historic distribution of spawners from 1977 to 1980.
s The West Fork Andreafsky was also surveyed and 830 chum salmon were observed.
t Weir project terminated on October 4, 1993. Weir normally operated until mid to late October.
u A total of 298 coho salmon were passed between September 11 and October 4, 1994. However, it was estimated that 1,500 to 2,000 coho salmon passed the weir site within a 24-hour period beginning at approximately Weir operated from August 18 through morning of October 5, 1994.
v Weir project terminated September 27, 1994. Weir normally operated until mid-October.
w An additional 1,000 coho salmon were estimated pooled downstream of weir on October 2, 1995, just prior to weir removal.
x Beginning at confluence of Clear Creek, the survey includes counts of both Glacier and Wood Creeks to their headwaters.
y Survey of western floodplain only.
z Combination foot and boat survey.
aa Estimated count by Perry Corsetti, Healy school teacher, operating a school project weir, after coho salmon were illegally (shot) taken from spawing grounds prior to October 9, 1997.
ab No survey of Wood Creek due to obstructions in creek.
ac Preliminary.
ad Interim escapement objective established March, 1993, based on boat survey counts of coho salmon in the lower 17.5 river miles during the period October 21 through 27. SEG established in 2004.

EXHIBIT D

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

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2008 Preliminary Yukon River Summer Season Summary

This informational letter provides a preliminary summer season summary report for the 2008 Yukon Area Chinook and summer chum salmon fisheries. Subsistence and personal use harvests for 2008 are not available at this time. For management purposes, the Yukon River is divided into fishing Districts/Subdistricts (Figure 1).

2008 Preseason Outlook

Chinook Salmon

The 2007 Chinook salmon run was well below average despite good escapements in parent years of 2001 and 2002, and yielded approximately 60,000 less fish than expected.

The 2008 run was expected to be below average and similar to the 2007 run. Based on good escapements in the parent years producing this year's run, the run was anticipated to provide for escapements, support a normal subsistence harvest, and a small commercial harvest. Initial management was based on preseason projections and shifted to inseason project assessment as the run developed.

The management strategy for 2008 was to continue the regulatory subsistence salmon fishing schedule until run assessment indicated that a harvestable surplus was available for additional subsistence opportunity and other uses. The schedule is intended to reduce harvest impacts during years of low salmon runs on any particular run component and to spread subsistence harvest opportunity among users. Because of the unexpected weak run in 2007, any decisions regarding a Chinook salmon directed commercial fishery in 2008 were to be delayed until the projected midpoint of the run recognizing that there was a possibility that the run might not be large enough to support even a small directed commercial fishery. If inseason indicators of run strength suggested sufficient abundance existed to have a commercial Chinook salmon fishery, the commercial harvest was expected to range from 5,000 to 30,000 Chinook salmon including the incidental harvest taken during anticipated summer chum directed periods. This range of commercial catch is below the 10-year (1998-2007) average of approximately 39,400 Chinook salmon.

Summer Chum Salmon

The strength of the summer chum salmon run in 2008 was dependent on production from the parent year escapements from 2004 (age-4 fish) and 2003 (age-5 fish) as these age classes generally dominate the run. The total run during 2002 and 2003 was approximately 1.2 million summer chum salmon each year, though tributary escapements were highly variable. It appears that production has shifted from major spawning tributaries in the lower portion of the drainage, such as the Andreafsky and Anvik rivers over the last 5 years, to higher production in spawning tributaries upstream.

Using the Anvik River brood table, sibling relationships between age-4 and age-5 fish, and the 5-year average ratio between the Anvik River and Pilot Station Sonar, a preseason projection for the total Yukon River run was estimated to range from 2.0 to 2.5 million summer chum salmon which constitutes an average run.

The 2008 run was anticipated to be near average and provide for escapements and support a normal subsistence and commercial harvest. Summer chum salmon runs have exhibited steady improvements since 2001 with a harvestable surplus in each of the last 5 years (2003–2007). The commercial harvest surplus in Alaska was expected to range from 500,000 to 900,000 summer chum salmon, recognizing that the actual commercial harvest of summer chum salmon in 2008 was likely dependent on market conditions and could be affected by a potentially poor Chinook salmon run, as Chinook salmon are incidentally harvested in fisheries directed at chum salmon.

2008 Subsistence Fishery

ADF&G and United States Fish and Wildlife Service (USFWS) staff cooperatively develop the preseason and inseason management approaches which were distributed in May, as the 2008 Yukon River Salmon Fisheries informational flyer. The subsistence salmon fishing schedule was initiated on May 26 in District 1 and implemented upriver chronologically, consistent with migratory timing as the run progressed upstream. The 2008 subsistence schedule is listed below.

Area	Regulatory Subsistence Fishing Periods	Schedule to Begin	Days of the Week
Coastal District	7 days/week	By Regulation	M/T/W/TH/F/SA/SU – 24 hours
District 1	Two 36-hour periods/week	May 26, 2008	Mon. 8 pm to Wed. 8 am /Thu. 8 pm to Sat. 8 am
District 2	Two 36-hour periods/week	May 28, 2008	Wed. 8 pm to Fri. 8 am / Sun. 8 pm to Tue. 8 am
District 3	Two 36-hour periods/week	May 30, 2008	Fri. 8 am to Sat. 8 pm / Tue. 8 am to Wed. 8 pm
District 4	Two 48-hour periods/week	June 8, 2008	Sun. 6 pm to Tue. 6 pm / Wed. 6 pm to Fri. 6 pm
Koyukuk River	7 days/week	By Regulation	M/T/W/TH/F/SA/SU – 24 hours
Subdistricts 5-A, B, C	Two 48-hour periods/week	June 17, 2008	Tue. 6 pm to Thu. 6 pm /Fri. 6 pm to Sun. 6 pm
Subdistrict 5-D	7 days/week	By Regulation	M/T/W/TH/F/SA/SU – 24 hours
District 6	Two 42-hour periods/week	By Regulation	Mon. 6 pm to Wed. Noon /Fri. 6 pm to Sun. Noon
Old Minto Area	5 days/week	By Regulation	Friday 6 pm to Wednesday 6 pm

All available run assessment information was reviewed on a daily basis, including the Lower Yukon Test Fishery (LYTF), Pilot Station sonar, Marshall Test Fishery, subsistence harvest reports, age composition data, and abundance and run timing information from other western Alaska rivers. This information was used to evaluate abundance, run timing, and quality of the

Chinook salmon run. By June 20, the historical midpoint of the run, most indicators pointed to a weak Chinook salmon run.

The LYTF detected the first pulse of Chinook salmon entering the Yukon River from the evening of June 14 through June 17, followed by 5 days of low catch rates. On June 20, the cumulative catch per unit effort (CPUE) was approximately half the historic average for that date. The first pulse of Chinook salmon yielded a lower than expected estimate of approximately 10,000 fish at Pilot Station Sonar. The estimated total run passed Pilot Station at that time appeared to be as low as 80,000 fish. These data raised concerns about the magnitude of the run. The projected Chinook salmon run abundance would not support average subsistence harvests in Alaska (approximately 50,000 Chinook salmon) and meet escapement goals in Alaska and meet the interim management escapement goal (IMEG) of >45,000 fish in Canada agreed to by the Yukon River Panel.

During Yukon River Drainage Fisheries Association (YRDFA) weekly teleconferences ADF&G and USFWS staff provided run assessment and potential management strategies. Subsistence fishers provided reports on fishing efforts and were encouraged to provide input on management strategies. In an effort to conserve Chinook salmon, management actions were implemented that reduced subsistence salmon fishing periods duration chronologically downriver to upriver after the first pulse of Chinook salmon had passed consistent with the migratory timing as the run progressed. These reductions beginning June 23 in District 1, while unfortunate, were needed to provide adequate numbers of Chinook salmon on the spawning grounds.

The inseason management strategy was to protect the second and third pulses throughout the Yukon River mainstem by attempting to implement subsistence fishing period reductions equally among each of the districts and subdistricts to conserve Chinook salmon as these pulses migrated upriver (Table 1). This entailed reducing the regulatory fishing periods by half for three consecutive periods in Districts 1-4 and Subdistricts 5-ABC. Because Subdistrict 5-D has a regulatory schedule of 7 days per week, the schedule was reduced by half for 2 weeks. Additionally, gillnet mesh size was restricted to 6 inch or smaller in Districts 1-3 to target chum salmon. This management action was taken to the account for the opportunity lower river fishers had to harvest Chinook during the first pulse and was implemented when good quality chum salmon were available for harvest. This strategy may have impacted District 3 fishers more, because historically fewer chum salmon are harvested for subsistence than in Districts 1 and 2.

During the YRDFA weekly teleconferences, there were discussions about applying similar mesh size restrictions in upriver districts consistent with the lower river and establishing fish wheel restrictions requiring release of Chinook salmon. However, it was determined that fewer fishers upriver had access to smaller mesh size gillnets and the presence of poor quality of chum salmon would not be utilized for subsistence. Therefore, subsistence periods were reduced in Districts 4 and 5, but no gear restrictions were established. Subsistence fishing restrictions were not implemented in the Tanana and Koyukuk River drainages, because of low fishing effort, and in the case of the Tanana River, assessment projects are available to manage this river separately.

2008 Commercial Fishery Summary

Chinook Salmon

Ice break up in the lower river occurred with near average timing around May 24. River conditions in the lower river early in the season were characterized as being higher than normal water levels. The first reported subsistence caught Chinook salmon was reported near Alakanuk

on June 2 and the first subsistence caught summer chum salmon was reported near Emmonak on June 6. The LYTF recorded the first Chinook salmon catches on June 3.

After the first pulse identified at the LYTF yielded a lower than expected passage estimate at the Pilot Station sonar, the resulting projection for the total run passed Pilot Station appeared to be as low as 80,000 Chinook. It became clear that Chinook salmon abundance would not be sufficient enough to support average subsistence harvests in Alaska and meet escapement goals in Alaska and meet the interim management escapement goal (IMEG) of >45,000 fish in Canada agreed to by the Yukon River Panel.

The second and third pulses of Chinook salmon did provide some strength later in the run but were not sufficient enough for a directed commercial fishery. The LYTF concluded operations on July 15 with a cumulative CPUE for the 2008 season of 22.27 which is near the average of 22.79. The first quarter point, midpoint, and third quarter point are June 18 (3 days late), June 26 (6 days late), and June 29 (3 days late) respectively.

The Pilot Station sonar project preliminary cumulative passage estimate from May 31 to September 7 was 130,643 Chinook salmon. The first quarter point, midpoint, and third quarter point were on June 23, June 29, and July 3 respectively.

Due to the uncertainty concerning the Chinook salmon run strength after the first pulse of fish, management of the Chinook salmon commercial fishery continued to follow the conservative preseason management strategy. No commercial periods targeting Chinook salmon were allowed in 2008. A total of 4,348 Chinook salmon were incidentally harvested during the summer season during eleven periods restricted to six inch or smaller mesh size in Districts 1 and 2 (Table 2).

The total commercial harvest was 4,641 Chinook salmon for the Alaskan portion of the Yukon River drainage which includes 293 fish harvested during the fall season. This range of commercial catch for Chinook salmon is 88% below the recent 10-year (1998–2007) average of 39,367 Chinook salmon (Table 3).

Summer Chum Salmon

Since 2007, there has been a renewed market interest for summer chum salmon. Based on the projected average run estimate for summer chum, the department initiated short commercial periods restricted to 6-inch maximum mesh size in the lower river districts directed at chum salmon beginning in District 1 on July 2. Because of the uncertainty about the Chinook salmon run strength, only restricted mesh openings were allowed in 2008. Additionally, the department attempted to schedule these chum-directed commercial periods when Chinook salmon abundance was low. Additionally, seven commercial periods were established in Subdistrict 4-A. Six commercial periods were established in District 6 directed at summer chum salmon but due to high water events, fishing effort was limited (Table 2).

The Pilot Station sonar project summer chum cumulative passage estimate through July 18 was 1,665,667 fish. The first quarter point, midpoint, and third quarter point were on June 26, June 30, and July 8 respectively.

The total commercial harvest was 151,786 summer chum salmon for the Yukon River drainage. The summer chum salmon harvest was 206% above the 1998-2007 average harvest of 49,675 fish. Additionally, a total of 14,100 pink salmon were harvest in Districts 1 and 2 (Table 4).

2008 Fishing Effort and Exvessel Value

A total of 457 permit holders participated in the summer chum salmon fishery, which was approximately 24% below the 1998–2007 average of 599 permit holders (Table 5). The Lower Yukon Area (Districts 1-3) and Upper Yukon Area (Districts 4-6) are separate Commercial Fisheries Entry Commission (CFEC) permit areas. A total of 444 permit holders fished in the Lower Yukon Area in 2008, which was approximately 23% below the 1998–2007 average of 577. In the Upper Yukon Area, 13 permit holders fished, which was approximately 48% below the 1998–2007 average of 25.

Yukon River fishermen in Alaska received an estimated $718,000 for their Chinook and summer chum salmon harvest in 2008, approximately 71% below the 1998–2007 average of $2.5 million (Table 6). Two buyer-processors and five catcher-sellers operated in the Lower Yukon Area (Districts 1–3). Lower Yukon River fishers received an estimated average price per pound of $4.64 for incidentally harvested Chinook and $0.40 for summer chum salmon. The average price paid for Chinook salmon in the Lower Yukon Area was approximately 35% above the 1998-2007 average of $3.44 per pound. The average income for Lower Yukon Area fishers in 2008 was $1,479. Three buyer-processors and one catcher-seller operated in the Upper Yukon Area (Districts 4–6). Upper Yukon Area fishers received an estimated average price per pound of $0.25 for summer chum sold in the round and $3.00 for summer chum roe. The average price paid for summer chum sold in the round in the Upper Yukon Area was approximately 7% above the 1998–2007 average of $0.23 per pound. No Chinook salmon were sold in the Upper Yukon Area. The average income for Upper Yukon Area fishers that participated in the 2008 fishery was $2,633. The majority of the income earned in the upper river was from the Subdistrict 4-A commercial fishery.

2008 Age and Sex Composition

The Chinook salmon age composition from the LYTF for the season was 1% age-4, 44% age-5, 51% age-6, and 4% age-7 fish. The sample size was 1,263 fish. Age-5 fish were 19 percentage points above average. Females comprised 46% of the sample; 7 percentage points below average. The mean weight of Chinook salmon from the test fishery was 17.9 pounds for males and 21.9 pounds for females; the sample size was 1,313.

The Chinook salmon age composition from the District 1 restricted commercial harvest, periods 1 through 6, was less than 1% age-3, 13% age-4, 58% age-5, 26% age-6, and 2% age-7 fish. The sample size was 524 fish and females comprised 39%.

The Chinook salmon age composition from the District 2 restricted commercial harvest, period 1, was 11% age-4, 58% age-5, 30% age-6, and 1% age-7 fish. The sample size was 108 fish and females comprised 39%.

The chum salmon age composition from the 5.5" drift gill net test fishery for the season was 41% age-4, 54% age-5, and 5% age-6 fish. Age-4 fish were slightly below average and age-6 fish were above average. The sample size was 784 fish and females comprised 55%.

2008 Escapement

Chinook Salmon

High water hampered efforts to accurately quantify escapement in 2008 via tower counts and aerial surveys; thus, most escapement goals could not be assessed (Table 3). Based on available data, it appears that the lower end of the BEGs in the Chena and Salcha rivers, the largest

producing tributaries of Chinook salmon in the Alaska portion of the drainage, were met. Typically, about 50% of the Chinook salmon production occurs in Canada; hence, the US/Canada Yukon River Panel agreed to one year Canadian Interim Management Escapement Goal (IMEG) of >45,000 Chinook salmon based on the Eagle sonar program is a top priority. The preliminary estimated escapement into Canada is approximately 32,500 or 28% below the goal. Selected 2008 escapement estimates for tributaries with goals were as follows:

Stream	Current Goal	Type of Goal	2008
East Fork Andreafsky River Aerial	960–1,900	SEG	278[1]
West Fork Andreafsky River Aerial	640–1,600	SEG	262[1]
Anvik River Index Aerial	1,100–1,700	SEG	992[1]
Nulato River Aerial (Forks Combined)	940–1,900	SEG	922
Gisasa River Aerial	420–1,100	SEG	487
Chena River Tower	2,800–5,700	BEG	3,080[3]
Salcha River Tower	3,300–6,500	BEG	2,835[3]
Canadian Border	<45,000	IMEG[2]	32,500[3]

[1] Rated as incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.

[2] The US/Canada Yukon River Panel agreed to a one year Canadian Interim Management Escapement Goal (IMEG) of >45,000 Chinook salmon based on the Eagle sonar program. In order to meet this goal, the passage at Eagle Sonar must include a minimum of 45,000 fish for escapement, provide for a subsistence harvest in the community of Eagle of approximately 2,000 fish, and incorporate the US/Canada Yukon River Panel allowable catch (20%-26% of the total allowable catch); this would have resulted in approximately 53,000 fish counted at Eagle Sonar necessary to meet the goal in 2008.

[3] Data are preliminary.

Summer Chum Salmon

In 2008 there was an exceptionally large run of pink salmon and, for the period of approximately June 30 through July 3, we believe a significant number of pinks were initially incorrectly apportioned by Pilot Station sonar as summer chum salmon. These estimates were corrected postseason, reducing the final estimate for summer chums from 1,858,000 to 1,665,667, still well above the drainage wide optimum escapement objective of 600,000 for the Yukon River.

Preliminary post-season analysis indicates summer chum escapements were generally good in most lower river tributaries and the Koyukuk River drainage (Table 4). Escapement goals have been established for the Andreafsky and Anvik Rivers. The estimated escapement of 57,259 summer chum salmon for the East Fork Andreafsky River was below the BEG range of 65,000-135,000. The Anvik River sonar-based escapement count of 374,929 summer chum salmon was within the BEG range of 350,000 to 700,000. Once again, the large number of pink salmon in the Anvik River precluded accurate inseason estimates, and a postseason adjustment was necessary. Selected 2008 escapement estimates for tributaries without goals were as follows:

Stream	Current Goal	Type of Goal	2008
East Fork Andreafsky River, weir	65,000-130,000	BEG	57,259
Anvik River, weir	350,000-750,000	BEG	374,929[1]
Gisasa River, weir			36,758
Henshaw Creek, weir			96,731
Tozitna River, weir			8,470[2]
Chena River Tower			N/A[2]
Salcha River Tower			N/A[2]

[1] Due to due to the large run of pink salmon observed in 2008, species apportionment issues were encountered. After more thorough analysis, sonar estimates have been adjusted post season.

2 Due to due to high water events/weather conditions counts were considered minimum or inaccurate.

Canadian Fisheries

The preseason outlook was for approximately 111,000 Canadian-origin Chinook salmon applicable to Eagle sonar-based total run estimates. However, due to the relationship between the expected and observed run size in 2007, the expected 2008 run size could have been as low as 80,000 fish.

Based on the projected total U.S. harvest of Canadian-origin Chinook salmon in 2008 and the harvest sharing arrangements defined in the Canada/U.S. Yukon River Salmon Agreement, it was expected that the total border escapement would be at least 53,000 Chinook salmon as measured by the Eagle sonar program. However, similar to 2007, there was a shortfall in the run into Canada. The preliminary Eagle sonar estimate is 38,097 Chinook salmon. Because of the weak run strength, the Canadian commercial and domestic fisheries were not allowed in 2008 for Chinook salmon. Effective July 11, restrictions in the recreational fishery included non-retention of Chinook salmon. Additionally, all recreational fishing was closed in Tatchun Creek and in the Yukon River near the confluence of Tatchun Creek within a designated area. No restrictions were placed on the First Nations' fishery, but voluntary measures were implemented to reduce their Chinook salmon harvest to 4,000 fish or approximately half of the recent average of 8,000. An estimated 2,761 Chinook salmon have been harvested.

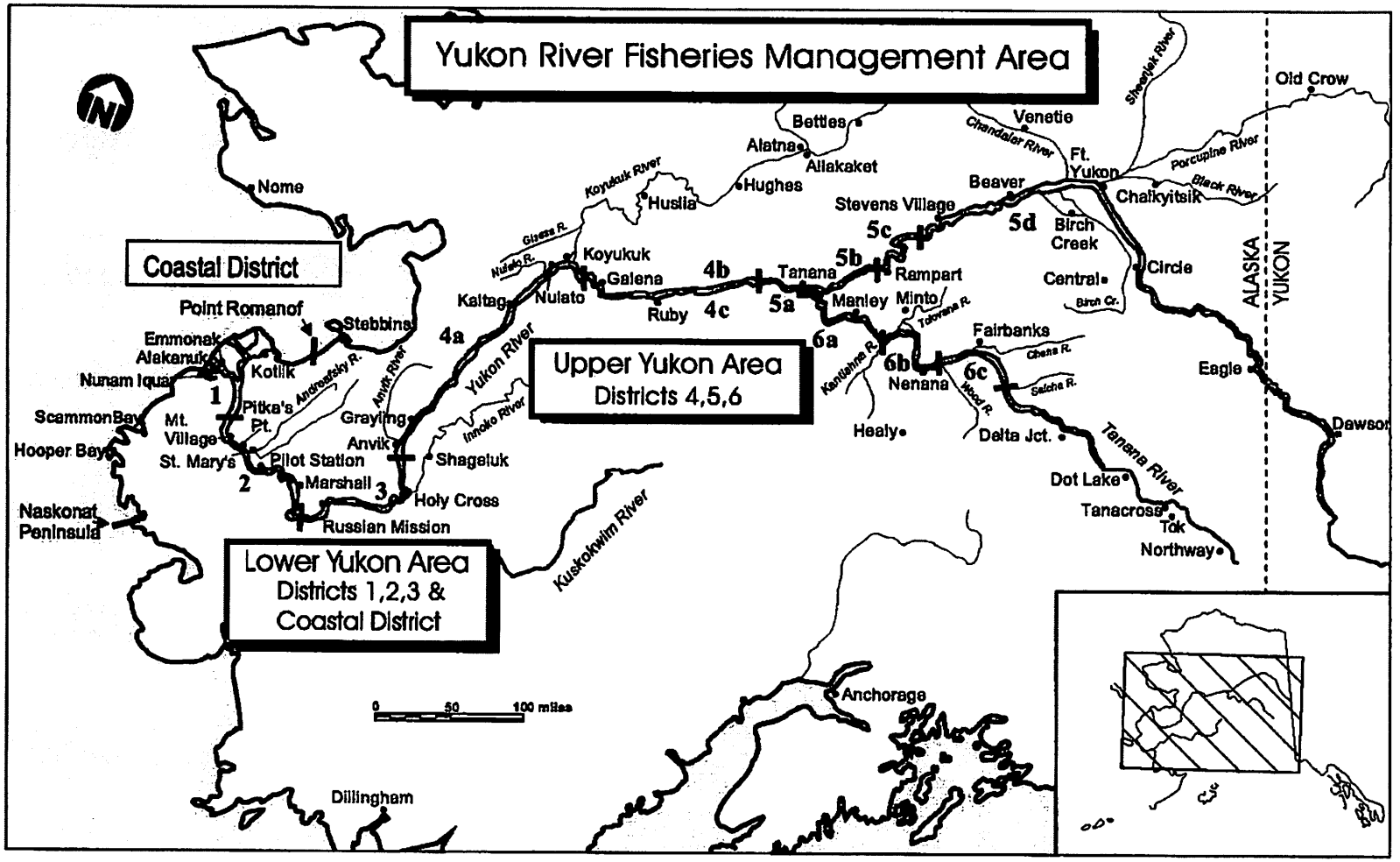

Figure 1.–Yukon Area communities and fishing districts.

Table 1. 2008 subsistence salmon fishing period reductions, Yukon River. [c]

		Coastal District [a]	District 1	District 2	District 3 [b]	Subd 4A	Subd 4B / 4C	Subd 5A / 5B / 5C	Subd 5D [d]
Mon.	23-Jun	18-hour Period	18-hour Period	open	closed	open	open	closed	open
Tues.	24-Jun	6"mesh restrict	6"mesh restrict	close @ 8 a.m.	open @ 8 a.m.	close @ 6 p.m.	close @ 6 p.m.	open @ 6 p.m.	open
Weds.	25-Jun	closed	closed	18-hour Period	close @ 8 p.m.	open @ 6 p.m.	open @ 6 p.m.	open	open
Thurs.	26-Jun	18-hour Period	18-hour Period	6"mesh restrict	closed	open	open	close @ 6 p.m.	open
Fri.	27-Jun	6"mesh restrict	6"mesh restrict	closed	18-hour Period	close @ 6 p.m.	close @ 6 p.m.	open @ 6 p.m.	open
Sat.	28-Jun	closed	closed	closed	6"mesh restrict	closed	closed	open	open
Sun.	29-Jun	closed	closed	18-hour Period	closed	open @ 6 p.m.	open @ 6 p.m.	close @ 6 p.m.	open
Mon.	30-Jun	18-hour Period	18-hour Period	6"mesh restrict	closed	open	open	closed	open
Tues.	1-Jul	6"mesh restrict	6"mesh restrict	closed	18-hour Period	close @ 6 p.m.	close @ 6 p.m.	open @ 6 p.m.	open
Weds.	2-Jul			18-hour Period	6"mesh restrict	24-hour Period	open @ 6 p.m.	open	open
Thurs.	3-Jul			6"mesh restrict	closed	No mesh/FW restric	open	close @ 6 p.m.	open
Fri.	4-Jul				18-hour Period	closed	close @ 6 p.m.	open @ 6 p.m.	open
Sat.	5-Jul				6"mesh restrict	closed	closed	open	open
Sun.	6-Jul					24-hour Period	24-hour Period	close @ 6 p.m.	open
Mon.	7-Jul					No mesh/FW restric	No mesh/FW restri	closed	open
Tues.	8-Jul					closed	closed	24-hour Period	open
Weds.	9-Jul					24-hour Period	24-hour Period	No mesh/FW restri	open
Thurs.	10-Jul					6"mesh/FW restric	No mesh/FW restri	closed	open
Fri.	11-Jul						closed	closed	open
Sat.	12-Jul						closed	24-hour Period	open
Sun.	13-Jul						24-hour Period	No mesh/FW restri	open
Mon.	14-Jul						6"mesh/FW restric	closed	open
Tues.	15-Jul							closed	close @ 6 p.m.
Weds.	16-Jul							closed	closed
Thurs.	17-Jul							24-hour Period	open @ 6 p.m.
Fri.	18-Jul							No mesh/FW restri	open
Sat.	19-Jul								open
Sun.	20-Jul								open
Mon.	21-Jul								close @ 6 a.m.
Tues.	22-Jul								3.5 day Restrict
Weds.	23-Jul								No mesh/FW restrict
Thurs.	24-Jul								open @ 6 p.m.
Fri.	25-Jul								open
Sat.	26-Jul								open
Sun.	27-Jul								open
Mon.	28-Jul								close @ 6 a.m.
Tue	29-Jul								3.5 day Restrict
Wed	30-Jul								No mesh/FW restrict
Thu	31-Jul								open @ 6 p.m.
Fri	1-Aug								open
Sat	2-Aug								close @ 6 p.m.
Sun	3-Aug								No mesh/FW restrict
Mon	4-Aug								open @ 6 p.m.

a. The Coastal District south of 62 degrees north, which includes the villages of Chevak, Hooper Bay, and Scammon Bay, subsistence salmon fishing remained open 7 days per week. That portion of the Coastal District north of 62 degrees north latitude and south of Chris Point, subsistence salmon fishing was open from 8:00 p.m. Mondays until 2:00 p.m. Tuesdays and from 8:00 p.m. Thursdays until 2:00 p.m. Fridays with gill nets restricted to a maximum of 6-inch mesh size

b. Innoko River drainage remained on 7 days per week due to low Chinook Salmon populations, but gillnets were restricted to 6 inch or less from July 2 to July 6.

c. The Tanana and Koyukuk river drainages did not have any subsistence fishing restrictions, because of low fishing effort, and in the case of the Tanana River, there are escapement counting tower projects to manage this river separately.

d. Effective 6 p.m. Monday, August 4, Subdistrict 5-D returned to the 7 day per week regulatory subsistence schedule.

Table 2. Preliminary summer season commercial harvest summary, Yukon Area, 2008.

District 1

Period	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh Size	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	Pink Salmon Number	Pink Salmon Pounds	Pink Salmon Average Weight
1	6:00 PM	2-Jul	10:00 PM	2-Jul	4	R	193	472	7,081	15.0	5,536	36,773	6.6	1,765	6,175	3.5
2	6:00 PM	5-Jul	12:00 Midnight	5-Jul	6	R	209	819	11,224	13.7	20,518	137,067	6.7	5,469	17,569	3.2
3	12:00 Midnight	7-Jul	6:00 AM	8-Jul	6	R	208	474	6,445	13.6	13,533	88,384	6.5	6,060	20,031	3.3
4	6:00 AM	10-Jul	12:00 Noon	10-Jul	6	R	157	343	4,528	13.2	15,520	106,608	6.9	76	244	3.2
5	3:00 PM	12-Jul	12:00 Midnight	12-Jul	9	R	176	183	2,935	16.0	8,057	53,758	6.7	1	3	3.0
6	3:00 PM	14-Jul	12:00 Midnight	14-Jul	9	R	113	90	1,297	14.4	4,285	27,615	6.4	0	0	-
			Chinook salmon sold in the fall season *					149	2,316	15.5						
			Unrestricted Mesh Subtotal:													
			Restricted Mesh Subtotal:		40		-	2,530	35,806	14.2	67,459	450,245	6.7	13,391	44,042	3.3
District 1 Subtotals:					40		266	2,530	35,806	14.2	67,459	450,245	6.7	13,391	44,042	3.3

District 2

Period	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh Size	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	Pink Salmon Number	Pink Salmon Pounds	Pink Salmon Average Weight
1	6:00 PM	4-Jul	10:00 PM	4-Jul	4	R	114	519	7,022	13.5	6,163	39,151	6.4	471	1,841	3.5
2	6:00 PM	6-Jul	12:00 Midnight	6-Jul	6	R	153	610	8,455	13.9	15,530	100,203	6.5	238	881	3.7
3	6:00 PM	10-Jul	12:00 Midnight	10-Jul	6	R	139	447	6,556	14.7	18,104	116,533	6.4	0	0	
4	9:00 PM	13-Jul	6:00 AM	14-Jul	9	R	143	316	4,613	14.6	15,324	100,128	6.5	0	0	
5	6:00 PM	16-Jul	12:00 Midnight	16-Jul	6	R	61	75	1,147	15.3	3,018	19,832	6.6	0	0	
			Chinook salmon sold in the fall season *					144	1,959	13.6						
			Unrestricted Mesh Subtotal:													
			Restricted Mesh Subtotal:		31		-	2,111	29,752	14.1	58,139	375,847	6.5	709	2,522	3.6
District 2 Subtotals:					31		181	2,111	29,752	14.1	58,139	375,847	6.5	709	2,522	3.6

District 3

Period	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh Size	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	Pink Salmon Number	Pink Salmon Pounds	Pink Salmon Average Weight
		No commercial fishing														

	Hours Fished	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	Pink Salmon Number	Pink Salmon Pounds	Pink Salmon Average Weight
Lower Yukon Area, Summer Season, Districts 1, 2, and 3 Subtotal:	71	444	4,641	65,558	14.1	125,598	826,092	6.6	14,100	48,564	3.3

Districts 1 and 2 Combined Guideline Harvest Range: 60,000 to 120,000 Chinook salmon.
District 3 Guideline Harvest Range: 1,800-2,200 Chinook salmon.

Table 2. Preliminary summer season commercial harvest summary, Yukon Area, 2008. Page 2 of 2

District 4

Period	Starting Time	Start Date	Ending Time	End Date	Hours Fished 4-A	Hours Fished 4-BC	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds of Roe	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds of Roe	Summer Chum Salmon Average Weight	Pink Salmon Number	Pink Salmon Pounds of Roe	Pink Salmon Average Weight
1	6:00 PM	9-Jul	6:00 PM	10-Jul	24	0	6	0	0		4,175	3,427	6.5	0	0	
2	6:00 PM	13-Jul	6:00 PM	15-Jul	48	0	8	0	0		5,847	5,038	6.5	0	0	
3	6:00 PM	16-Jul	6:00 PM	18-Jul	48	0	8	0	0		5,631	5,067	6.5	0	0	
4	6:00 PM	20-Jul	6:00 PM	22-Jul	48	0	7	0	0		5,203	4,683	6.5	0	0	
5	6:00 PM	23-Jul	6:00 PM	25-Jul	48	0	7	0	0		3,212	2,930	6.5	0	0	
6	6:00 PM	27-Jul	6:00 PM	29-Jul	48	0	4	0	0		478	430	6.5	0	0	
7	6:00 PM	30-Jul	6:00 PM	1-Aug	48	0	0	0	0		0	0	-	0	0	
District 4 Subtotal:			Current as of:	1-Aug	312	0	8	0	0		24,348	21,575	6.5	0	0	

District 4 Guideline Harvest Range: 2,250-2,650 Chinook salmon.

District 5

Period	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	Pink Salmon Number	Pink Salmon Pounds	Pink Salmon Average Weight

NO COMMERCIAL FISHING

Subdistricts 6-A, 6-B, and 6-C

Period	Starting Time	Start Date	Ending Time	End Date	Hours Fished 6-A	Hours Fished 6-BC	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Avg Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Avg Weight	Pink Salmon Number	Pink Salmon Pounds	Pink Salmon Ave Weight
1	12:00 Noon	26-Jul	12:00 Noon	27-Jul	24	24	4	0	0		1,062	6,316	5.9	0	0	
2	12:00 Noon	29-Jul	12:00 Noon	30-Jul	24	24	2	0	0		332	2,324	7.0	0	0	
3	6:00 PM	1-Aug	12:00 Noon	3-Aug	42	42	0	0	0		0	0	-	0	0	
4	6:00 PM	4-Aug	12:00 Noon	6-Aug	42	42	1	0	0		82	492	6.0	0	0	
5	6:00 PM	8-Aug	12:00 Noon	10-Aug	42	42	1	0	0		134	804	6.0	0	0	
6	6:00 PM	11-Aug	12:00 Noon	13-Aug	42	42	1	0	0		232	1,392	6.0	0	0	
District 6 Subtotal:			Current as of:	13-Aug	216	216	5	0	0		1,842	11,328	6.1	0	0	

Subdistricts 6-A, 6-B, and 6-C Guideline Harvest Range: 600-800 Chinook salmon.

		Number	Pounds	Ave Weight	Number	Pounds	Ave Weight	Number	Pounds	Ave Weight
Upper Yukon Area, Summer Season, Districts 4, 5, and 6 Subtotals:	Sold in round:				1,842	11,328	6.1			
	Roe sold: [b]				24,346	21,575				
	Total:	528	13	0	0	26,188		0	0	

		Number	Pounds	Ave Weight	Number	Pounds	Ave Weight	Number	Pounds	Ave Weight
Yukon Area, Summer Season, Districts 1 Through 6 Total:	Sold in round:	4,641	65,556	14.1	127,440	837,420	6.6	14,100	46,564	3.3
	Roe sold: [b]				24,346	21,575				
	Total:	599	457	4,641	65,556	14.1	151,786		14,100	46,564	3.3

U=UNRESTRICTED, R=6" MAXIMUM MESH SIZE

[a] Fall Chinook salmon sales were added to the restricted mesh size subtotals in Districts 1 and 2.

[b] Number of females sold in the round to produce roe sold in Subdistrict 4-A. Average weight of females bought for roe was 6.5 pounds.

Table 3. Chinook salmon commercial harvest and escapement comparisons, Yukon River, 1997-2008.

Chinook Salmon Commercial Harvest a																
District/Subdistrict	Guideline Harvest Range	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Comparison of 2008 to 10-Yr. Average	Recent 10-Year Average (1998-2007)
Y-1		66,384	25,413	37,161	4,735		11,159	22,750	28,401	16,694	23,748	18,615	2,530	-88%	20,964
Y-2		39,363	16,806	27,133	3,783		11,434	14,178	24,164	13,413	19,843	13,302	2,111	-87%	16,006
Subtotal Y1 & Y2	60,000-120,000	105,747	42,219	64,294	8,518		22,593	36,928	52,565	30,107	43,591	31,917	4,641	-87%	36,970
Y-3	1,800-2,200			538							315	190			
Y-4A															
Y-4BC		1,457		1,437				562							1,000
Subtotal Y-4	2,250-2,850	1,457		1,437				562							1,000
Y-5ABC	2,400-2,800	3,071	475	2,189			564	908	1,548	1,469	1,839	1,241			1,279
Y-5D	300-500	607	42	415			207	226							223
Subtotal Y-5		3,678	517	2,604			771	1,134	1,548	1,469	1,839	1,241			1,390
Y-6	600-800	2,728	963	689			1,068	1,813	2,057	453	84	281			926
Total Alaska	67,350-129,150	113,610	43,699	69,562	8,518		24,430	40,437	56,168	32,029	45,829	33,629	4,641	-88%	39,387
Canada b		15,717	5,838	12,354	4,829	9,769	9,069	9,446	10,946	10,680	8,758	4,000 m	2,761	-88%	8,569

Chinook Salmon Escapement																
Project	Escapement Goal	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Comparison of 2008 to 5-Yr. Average	Recent 5-Year Average (2002-2006)
East Fork Andreafsky River Weir		3,186	4,011	3,347	1,380	n	4,106	4,383	7,912	2,239	6,463	4,504	4,242	-17%	5,100
East Fork Andreafsky River Aerial c	960-1,700 SEG j,r	1,140	1,027		1,018	1,065	1,447		2,879	1,492	591 g	1,758	278 g		1,680
West Fork Andreafsky River Aerial c	640-1,600 SEG j,r	1,510	1,249 g	870 g	427	570	977	1,578	1,317	1,715	824	976	262 g		1,282
Pilot Station Sonar		195,647	87,852	144,723	44,428	99,403	123,213	268,537	156,606	159,441	189,403	123,795	130,643 w	-26%	175,556
Anvik River Index Aerial c	1,100-1,700 SEG j,r	2,690	648 g	950 g	1,394	1,430	1,713		3,681	2,421	1,688	1,529	992 g		
Nulato River Tower		4,766	1,536	1,932	908	o	2,532	1,716	p	p	p	p	p		
Nulato River Aerial c	940-1,900 SEG j,s		1,053			1,884	1,584				1,292	2,583	922	-52%	1,938
Gisasa River Weir		3,764	2,356	2,631	2,089	3,052	1,931	1,673	1,774	3,111	2,851	1,425	1,735	-21%	2,207
Gisasa River Aerial c	420-1,100 SEG j,r	144 g	889 g			1,288	506		731	950	843	593	467	-36%	779
Chena River Tower/MR Tagging	2,600-5,700 BEG k f	13,390	4,745	6,485	4,707 f	9,209 f	6,967 f	8,739 f	9,645	o	2,936	3,576 t	3,080 t		6,224
Salcha River Tower/MR Tagging	3,300-6,500 BEG k	18,396	5,027	9,198	4,595	13,328	4,644 f	11,758 f	15,761	5,988	10,879	5,712 t	2,835 t		9,980
Eagle Sonar										81,527	74,000	41,182	38,097	-42%	65,570
Canadian Estimated Escapement	33,000-43,000 u	37,683	18,750	11,362	11,344	42,438	40,145	47,486	37,165	31,268	27,990	23,000	32,500 m	-3%	33,382
ESCAPEMENT INDEX h		81,185	34,425	34,955	25,023	66,027	60,325	75,955	72,257	42,606	50,919	38,217	44,392	-32%	55,991

a Commercial harvest includes the estimated harvest of females to produce roe sold.
b Total harvest for all fisheries in Canadian mainstem Yukon River.
c Aerial surveys rated good to fair unless noted otherwise.
f Mark and recapture tagging estimate; tower counts were minimum/incomplete due to late installation and/or early removal of project, or high water events/weather conditions.
g Aerial surveys rated as incomplete and/or poor survey conditions; data not comparable to other years.
h The escapement index is the summed escapements for East Fork Andreafsky weir, Nulato tower, Gisasa weir, Chena and Salcha towers, and Canada mainstem tagging.
j SEG = "Sustainable escapement goal", as defined by the Sustainable Fisheries Policy
k BEG = "Biological escapement goal", as defined by the Sustainable Fisheries Policy. Range established in 2001.
m DATA ARE PRELIMINARY.
n Weir counts incomplete due to late start-up. On average, missed approximately 75% of chinook passage. Total counts for 2001 were 1,148 chinook salmon.
o No data due to incomplete operations.
p Did not operate.
r In 2001, the escapement goals were revised.
s In 2001, the Nulato River escapement goal was established for both forks combined.
t Tower counts were minimum due to high water events/weather conditions.
u In 2007, the escapement goals were revised.
w Due to the large run of pink salmon observed in 2008, species apportionment issues were encountered. After more thorough analysis, sonar estimates have been adjusted post season.

Table 4. Summer chum salmon commercial harvest and escapement comparisons, Yukon River, 1998-2008.

Summer Chum Salmon Commercial Harvest a															
District/Subdistrict		Guideline Harvest Range	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Comparison of 2008 to 10-Yr. Average	Recent 10-Year Average (1998-2007)
Y-1			21,270	18,181	3,315		6,333	3,579	13,993	23,965	21,816	106,790	67,459	179%	24,138
Y-2			6,848	11,702	3,309		4,011	2,583	5,782	8,313	25,543	69,432	58,139	280%	15,280
Subtotal Y-1 & Y-2		251,000-755,000	28,118	27,883	6,624		10,344	6,162	19,775	32,278	47,359	176,222	125,598	219%	39,418
Y-3		6,000-19,000									118	1			
Anvik River	Est. Fish														
	lbs. Roe	100,000													
Y-4A	Est. Fish	113,000-338,000										7,304	24,348		7,304
	lbs. Roe	61,000-183,000										5,938	21,575		5,938
Y-4BC	Est. Fish	16,000-47,000		1,267				62							665
	lbs. Roe														
Subtotal Y-4				1,267				62							665
Y-5ABC			110	114			6		25		20				55
Y-5D				1											
Subtotal Y-5		1,000-3,000	110	115			6		25		20				55
Y-6	Est. Fish	13,000-38,000	570	147			3,218	4,461	6,810	8,988	44,621	14,674	1,842	-82%	10,411
	lbs. Roe		140	24											
Total		400,000-1,200,000	28,798	29,412	6,624		13,568	10,685	26,410	41,264	92,116	198,201	151,788	206%	49,675

Summer Chum Salmon Escapement														
Project	Escapement Goal	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Comparison of 2008 to 5-Yr. Average	Recent 5-Year Average (2003-2007)
East Fork Andreafsky River W	65,000-135,000 BEG k	67,591	32,229	22,918	n	45,019	22,603	62,730	20,127	101,465	89,642	57,259	4%	55,313
Pilot Station Sonar		826,385	973,708	456,271	441,450	1,088,483	1,188,518	1,357,826	2,439,616	3,767,044	1,726,885	1,665,667 s	-20%	2,091,978
Anvik River Sonar	350,000-700,000 BEG;p	471,865	437,631	196,349	224,058	482,101	251,358	365,691	525,391	599,146 c	459,517	374,929 s	-15%	440,221
Kaltag River Tower		8,113	5,300	6,727	c	13,583	3,056	5,247	22,093	r	r	r		10,132
Nulato River Tower		49,140	30,076	24,308	c	72,230	17,814	r	r	r	r	r		17,814
Gisasa River Weir		18,228	9,920	11,415	17,936	32,943	24,379	37,851	172,259	225,225	46,257	38,758	-64%	101,194
Clear Creek Tower		212 c	11,300	18,698	3,674	13,150	5,230	15,861	26,420	r	r	r		15,770
Chena River Tower		5,901 c	9,165 c	3,515 c	4,209 c	c	c	15,162	c	34,857	4,705 c	c		18,241
Salcha River Tower		17,289	23,221	20,516	19,671	18,640 c	c	47,881	193,085	111,869	12,876 c	c		91,423
ESCAPEMENT INDEX g		632,228	547,542	285,748	265,874	644,516	319,210	534,542	932,855	1,072,562	592,997	468,946	-14%	690,453

a Commercial harvest includes the estimated harvest of females to produce roe sold, except for Districts 3 and 4, which also includes the estimated number of males harvested to produce roe sold.
b Aerial surveys rated good to fair unless noted otherwise.
c Project counts not comparable to other years; incomplete counts due to early removal of project or high water events/weather conditions.
f Aerial surveys rated poor or incomplete; data not comparable to other years.
g The escapement index is the summed escapements for East Fork Andreafsky weir, Anvik sonar, Gisasa weir, Kaltag, Nulato, and Salcha towers.
k BEG = "Biological escapement goal", as defined by the Sustainable Fisheries Policy. Range established in 2001.
m DATA ARE PRELIMINARY.
n Weir counts incomplete due to late start-up. On average, missed approximately 75% of chinook passage. Total counts for 2001 were 2,086 summer chum salmon.
p Escapement goal revised in 2001.
r Did not operate.
s Due to the large run of pink salmon observed in 2008, species apportionment issues were encountered. After more thorough analysis, sonar estimates have been adjusted post season.

Table 5. Number of commercial salmon fishing gear permit holders who delivered fish, listed by district and season, Yukon Area, 1971-2008.

	Chinook and Summer Chum Salmon Season								
	Lower Yukon Area				Upper Yukon Area				
Year	District 1	District 2	District 3	Subtotal [a]	District 4	District 5	District 6	Subtotal	Total
1971	405	154	33	592	-	-	-	-	592
1972	426	153	35	614	-	-	-	-	614
1973	438	167	38	643	-	-	-	-	643
1974	396	154	42	592	27	31	20	78	670
1975	441	149	37	627	93	52	36	181	808
1976	453	189	42	684	80	46	29	155	839
1977	392	188	46	626	87	41	18	146	772
1978	429	204	22	655	80	45	35	160	815
1979	425	210	22	657	87	34	30	151	808
1980	407	229	21	657	79	35	33	147	804
1981	448	225	23	696	80	43	26	149	845
1982	450	225	21	696	74	44	20	138	834
1983	455	225	20	700	77	34	25	136	836
1984	444	217	20	613	54	31	27	112	725
1985	425	223	18	666	74	32	27	133	799
1986	441	239	7	672	75	21	27	123	795
1987	440	239	13	659	87	30	24	141	800
1988	456	250	22	678	95	28	33	156	834
1989	445	243	16	687	98	32	29	159	846
1990	453	242	15	679	92	27	23	142	821
1991	489	253	27	678	85	32	22	139	817
1992	438	263	19	679	90	28	19	137	816
1993	448	238	6	682	75	30	18	123	805
1994	414	250	7	659	55	28	20	103	762
1995	439	233	0	661	87	28	21	136	797
1996	448	189	9	627	87	23	15	125	752
1997	457	188	0	639	39	29	15	83	722
1998	434	231	0	643	0	18	10	28	671
1999	412	217	5	631	5	26	6	37	668
2000	350	214	-	562	-	-	-	-	562
2001 [b]	-	-	-	-	-	-	-	-	-
2002	323	223	[c]	540	[c]	14	6	20	560
2003	352	217	[c]	556	3	16	7	26	582
2004	396	213	[c]	550	[c]	14	6	20	570
2005	370	228	[c]	578	[c]	12	5	17	595
2006	379	214	6	569	[c]	15	10	25	594
2007	359	220	3	564	5	12	10	27	591
2008	266	181	[c]	444	8	[c]	5	13	457
1998-2007 Avg.	375	220	4	577	3	16	8	25	599
2008 vs. Avg.	-29.1%	-17.6%		-23.1%	146.2%		-33.3%	-48.0%	-23.7%

[a] Since 1984 the subtotal for the Lower Yukon Area was the unique number of permits fished. Prior to 1984, the subtotals are additive for District 1, 2, and 3. Some individual fishermen in the Lower Yukon Area may have operated in more than one district during the season.

[b] No commercial fishing occurred in 2001.

[c] No commercial fishing periods in portions or all of Districts 3, 4, and 5.

Table 6. Value of commercial salmon fishery to Yukon Area fishermen, 1977-2008.

	Chinook					Summer Chum						Value by Species		Value by Area		
	Lower Yukon		Upper Yukon			Lower Yukon			Upper Yukon							
Year	$/lb	Value	$/lb	$/Roe	Value	$/lb	$/Roe	Value	$/lb	$/Roe	Value	Chinook	Summer Chum	Lower	Upper	Total
1977	0.85	1,841,033	1.37		148,766	0.40		1,007,280	0.27	2.66	306,481	1,989,799	1,313,761	2,848,313	455,247	3,303,560
1978	0.90	2,048,674	0.87		66,472	0.45		2,071,434	0.24	N/A	655,738	2,115,146	2,727,172	4,120,108	722,210	4,842,318
1979	1.09	2,763,433	1.00		124,230	0.52		2,242,564	0.25	3.00	444,924	2,887,663	2,687,488	5,005,997	569,154	5,575,151
1980	1.04	3,409,105	0.85		113,662	0.20		1,027,738	0.23	2.50	627,249	3,522,767	1,654,987	4,436,843	740,911	5,177,754
1981	1.20	4,420,669	1.00		206,380	0.40		2,741,178	0.20	3.00	699,876	4,627,049	3,441,054	7,161,847	906,256	8,068,103
1982	1.41	3,768,107	1.02		162,699	0.40		1,237,735	0.18	2.75	452,837	3,930,806	1,690,572	5,005,842	615,536	5,621,378
1983	1.40	4,093,562	1.08		105,584	0.34		1,734,270	0.16	1.66	281,883	4,199,146	2,016,153	5,827,832	387,467	6,215,299
1984	1.50	3,510,923	0.95		102,354	0.26		926,922	0.23	1.78	382,776	3,613,277	1,309,698	4,437,845	485,130	4,922,975
1985	1.50	4,294,432	0.86		82,644	0.35		1,032,700	0.23	1.94	593,801	4,377,076	1,626,501	5,327,132	676,445	6,003,577
1986	1.63	3,165,078	0.89		73,363	0.38		1,746,455	0.22	2.08	634,091	3,238,441	2,380,546	4,911,533	707,454	5,618,987
1987	1.98	5,428,933	0.79		136,196	0.48		1,313,618	0.19	2.22	323,611	5,565,129	1,637,229	6,742,551	459,807	7,202,358
1988	2.97	5,463,800	1.04		142,284	0.66		5,001,100	0.23	4.33	1,213,991	5,606,084	6,215,091	10,464,900	1,356,275	11,821,175
1989	2.77	5,181,700	0.84		108,178	0.34		2,217,700	0.24	4.41	1,377,117	5,289,878	3,594,817	7,399,400	1,485,295	8,884,695
1990	2.84	4,820,859	0.72		105,295	0.24		497,571	0.11	4.41	506,611	4,926,154	1,004,182	5,318,430	611,906	5,930,336
1991	3.70	7,128,300	0.70	2.92	97,140	0.36		782,300	0.18	4.21	627,177	7,225,440	1,409,477	7,910,600	724,317	8,634,917
1992	4.12	9,957,002	0.91	2.82	168,999	0.27		606,976	0.30	4.53	525,204	10,126,001	1,132,180	10,563,978	694,203	11,258,181
1993	2.70	4,884,044	1.06	5.52	113,217	0.37		226,772	0.35	8.53	203,762	4,997,261	430,534	5,110,815	316,979	5,427,794
1994	2.07	4,169,270	0.92	3.11	124,270	0.21		79,206	0.20	3.77	396,685	4,293,540	475,891	4,248,476	520,955	4,769,431
1995	2.09	5,317,508	0.77	2.64	87,059	0.16		241,598	0.13	3.57	1,060,322	5,404,567	1,301,920	5,559,106	1,147,381	6,706,487
1996	1.95	3,491,582	0.95	2.57	47,282	0.09	2.96	89,020	0.07	3.05	966,277	3,538,864	1,055,297	3,580,602	1,013,559	4,594,161
1997	2.46	5,450,433	0.97	1.62	110,713	0.10		56,535	0.07	1.08	96,806	5,561,146	153,341	5,506,968	207,519	5,714,487
1998	2.51	1,911,370	0.91	2.00	17,285	0.14		26,415	0.18	1.90	821	1,928,655	27,236	1,937,785	18,106	1,955,891
1999	3.80	4,950,522	1.10	2.11	74,475	0.10		19,687	0.18	2.25	1,719	5,024,997	21,406	4,970,209	76,194	5,046,403
2000	4.57	725,606				0.17		8,633				725,606	8,633	734,239		734,239
2001																
2002	3.77	1,691,105	0.75	1.75	20,744	0.06		4,342	0.32	2.25	6,176	1,711,849	10,518	1,695,447	26,920	1,722,367
2003	2.37	1,871,202	0.80		40,957	0.05		1,585	0.27		6,879	1,912,159	8,464	1,872,787	47,836	1,920,623
2004	2.80	3,063,667	0.77		38,290	0.05		8,884	0.27		9,645	3,101,957	18,529	3,072,551	47,935	3,120,486
2005	3.43	1,952,109	0.87		24,415	0.05		11,004	0.25		13,479	1,976,524	24,483	1,963,113	37,894	2,001,007
2006	3.94	3,290,367	1.30		32,631	0.05		23,862	0.16		42,988	3,322,998	66,850	3,314,229	75,619	3,389,848
2007	3.73	1,939,114	1.33		27,190	0.19		220,715	0.25	2.36	34,421	1,966,304	255,136	2,159,829	61,611	2,221,440
2008	4.64	325,470				0.40		326,930	0.25	3.00	65,840	325,470	392,770	656,606 [b]	65,840	718,240
1998-2007 Avg. [a]	3.44	2,377,229	0.98	1.95	34,498	0.10		36,125	0.23	2.19	14,516	2,407,894	49,028	2,413,354	49,014	2,456,923
2008 vs. Avg.	35.1%	-86.3%				318.6%		805.0%	6.6%	37.0%	353.6%	-86.5%	701.1%	-72.8%	34.3%	-70.8%

[a] Does not include 2001.

[b] Includes $4,656 in sales of pink salmon in Districts 1 and 2..

EXHIBIT E

ALASKA FEDERATION OF NATIVES, INC.

2008 ANNUAL CONVENTION

RESOLUTION 08-17

TITLE: REQUESTING THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL AND THE NATIONAL MARINE FISHERIES SERVICE TO TAKE EMERGENCY AND PERMANENT ACTION TO REGULATE SALMON BYCATCH IN THE BERING SEA POLLOCK FISHERY

WHEREAS: The Alaska Federation of Natives (AFN) takes an active role whenever the traditional Subsistence Way of Life and the economic stability of our Native villages are threatened; and

WHEREAS: The 2008 Chinook salmon returns on many river systems in Alaska, including the AVCP Region, were far below the number necessary for conservation, to meet international treaty requirements to provide for the needs of the Indigenous people in Canada, and far below the number of Chinook salmon necessary to meet the subsistence needs of Alaska Native families and to provide for commercial opportunities essential to meet the financial needs of the Alaska Native families; and

WHEREAS: Specifically, on the Yukon River, the Alaska Department of Fish & Game, in cooperation with the U.S. Fish & Wildlife Service, opened the 2008 subsistence salmon harvest season with window regulations in place for the entire Yukon River; for the AVCP region that meant two 36-hour open periods a week; and

WHEREAS: The return of the Yukon River Chinook salmon began fearfully slow and required even further restrictions placed on the Yukon in-river subsistence fishermen and their families (i.e., from the two 36-hour openers in the Lower River districts down to two 18-hour openers) for fear that the "run abundance would not support the customary subsistence harvests and meet escapement goals in Alaska and meet the interim management escapement goal of at least 45,000 fish into Canada agreed to by the Yukon River Panel," (taken from the ADFG/USFWS 2008 Yukon River Summer Salmon Fishery News Release #14, dated June 22, 2008), and, in the lower river districts, the mesh size was reduced to a maximum of 6-inch stretch mesh in order to conserve Chinook salmon; and

WHEREAS: By the end of the 2008 season, it was determined that the total Yukon River run was approximately 151,000 Chinook salmon (36% below the most recent 5-year average) and was not enough to satisfy all of the historical needs, including Subsistence; and

WHEREAS: Since 2001 to date, the minimum number of Chinook salmon intercepted and wasted by the Bering Sea Pollock fishery is over 450,000, most notably the 2007 record high bycatch amount of 122,000; and

WHEREAS: In the meantime, the Bering Sea Pollock fishery continues to fish without any regulatory restrictions, further endangering our future Chinook salmon

resources and our ability to meet our subsistence and small scale in-river commercial fishery needs; and

WHEREAS: At their June meeting in Kodiak, the North Pacific Fishery Management Council (NPFMC) and the National Marine Fisheries Service (NMFS determined that the NPFMC would likely not take final action regulating bycatch in the Pollock fishery until April 2009, and that the regulations will probably not be implemented until the start of the 2011 Pollock fishery season; and

WHEREAS: Subsistence and commercial Chinook users cannot wait until 2011 for effective management measures to be implemented, for fear of another season such as 2007, where 120,000+ Chinook salmon were wasted in the Bering Sea Pollock fishery, and for additional years of no commercial fishing and going without meeting subsistence needs; and

NOW THEREFORE BE IT RESOLVED by the delegates to the 2008 Annual Convention of the Alaska Federation of Natives that AFN encourage the NPFMC and the NMFS take action, through emergency authority, to regulate the 2009 Bering Sea Pollock fishery, and to implement permanent regulations applicable for the 2010 Pollock fishery, and that such regulations restrict the Chinook bycatch so as to ensure the conservation and rebuilding of Western Alaska Chinook salmon stocks and to ensure and prioritize the restoration of thriving subsistence and commercial Chinook salmon fisheries in Alaska; and

BE IT FURTHER RESOLVED that a hard cap of no more than 30,000 Chinook salmon be put in place in order to further protect our fully utilized salmon stocks.

SUBMIITED BY: ASSOCIATION OF VILLAGE COUNCIL PRESIDENTS

COMMITTEE ACTION: DO PASS

CONVENTION ACTION: PASSED

EXHIBIT F

AVCP

ASSOCIATION OF VILLAGE COUNCIL PRESIDENTS
P.O. BOX 219 • BETHEL, ALASKA 99559 • PHONE 543-3521

44TH ANNUAL CONVENTION
BETHEL, ALASKA OCTOBER 7-9, 2008

RESOLUTION 08-10-14

TITLE: REQUESTING THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL AND THE NATIONAL MARINE FISHERIES SERVICE TO TAKE EMERGENCY AND PERMANENT ACTION TO REGULATE SALMON BYCATCH IN THE BERING SEA POLLOCK FISHERY

WHEREAS The Association of Village Council Presidents (AVCP) is the recognized tribal organization and non-profit Alaska Native regional corporation for its fifty-six member indigenous Native villages within Western Alaska and supports the endeavors of its member villages; and

WHEREAS AVCP fully supports its member villages in all aspects of their self-determination, health and well-being; and

WHEREAS AVCP takes an active role wherever the traditional Subsistence Way of Life and the economic stability of our Native villages is concerned; and

WHEREAS The 2008 chinook salmon returns on many river systems in the AVCP Region were far below the number necessary for conservation, to meet international treaty requirements to provide for the needs of the Indigenous people in Canada, and far below the number of chinook salmon necessary to meet the subsistence needs of AVCP families and to provide for commercial opportunities essential to meet the financial needs of AVCP families; and

WHEREAS Specifically, on the Yukon River, the Alaska Department of Fish & Game, in cooperation with the U.S. Fish & Wildlife Service, opened the 2008 subsistence salmon harvest season with windows regulations in place for the entire Yukon River; for the AVCP region that meant 2 36-hour open periods a week; and

WHEREAS The return of the Yukon River chinook salmon began fearfully slow and required even further restrictions placed on the Yukon in-river subsistence fishermen and their families (i.e., from the 2 36-hour openers in the Lower River districts down to 2 18-hour openers) for fear that the "run abundance would not support the customary subsistence harvests and meet escapement goals in Alaska and meet the interim management escapement goal of at least 45,000 fish into Canada agreed to by the Yukon River Panel," (taken from the ADFG/USFWS 2008 Yukon River Summer Salmon Fishery News Release #14, dated June 22, 2008), and, in the lower river districts, the mesh size was reduced to a maximum of 6-inch stretch mesh in order to conserve Chinook salmon; and

RESOLUTION 08-10-14
-PAGE 2-

WHEREAS By the end of the 2008 season, it was determined that the total Yukon River run was approximately 151,000 chinook salmon (36% below the most recent 5-year average) and was not enough to satisfy all of the historical needs, including Subsistence; and

WHEREAS Since 2001 to date, the minimum number of chinook salmon intercepted and wasted by the Bering Sea Pollock fishery is over 450,000, most notably the 2007 record high bycatch amount of 122,000; and

WHEREAS In the meantime, the Bering Sea Pollock fishery continues to fish without any regulatory restrictions, further endangering our future chinook salmon resources and our ability to meet our subsistence and small scale in-river commercial fishery needs; and

WHEREAS At their June meeting in Kodiak, the North Pacific Fishery Management Council (NPFMC) and the National Marine Fisheries Service (NMFS determined that the NPFMC would likely not take final action regulating bycatch in the pollock fishery until April 2009, and that the regulations will probably not be implemented until the start of the 2011 Pollock fishery season; and

WHEREAS Subsistence and commercial chinook users cannot wait until 2011 for effective management measures to be implemented, for fear of another season such as 2007, where 120,000+ Chinook salmon were wasted in the Bering Sea Pollock fishery, and for additional years of no commercial fishing and going without meeting subsistence needs.

NOW THEREFORE BE IT RESOLVED THAT the Association of Village Council Presidents requests that the NPFMC and the NMFS take action, through emergency authority, to regulate the 2009 Bering Sea pollock fishery, and to implement permanent regulations applicable for the 2010 pollock fishery, and that such regulations restrict the chinook bycatch so as to ensure the conservation and rebuilding of Western Alaska chinook salmon stocks and to ensure and prioritize the restoration of thriving subsistence and commercial chinook salmon fisheries in Western Alaska.

BE IT FURTHER RESOLVED THAT the Association of Village Council Presidents recommends a hard cap of no more than 30,000 chinook salmon be put in place in order to further protect our fully utilized salmon stocks.

ADOPTED by the Association of Village Council Presidents during its Forty-fourth Annual Convention held at Bethel, Alaska, this 9th day of October 2008, with a duly constituted quorum of delegates.

CERTIFIED:

Raymond J. Watson, Chairman

Myron P. Naneng, Sr., President

C44

From Doug Karlberg <douglaskarlberg@yahoo.com>
Sent Monday, February 23, 2009 1:19 pm
To salmonbycatcheis@noaa.gov
Subject Chinook salmon bycatch EIS
Attachments Final governor Denby Loyd.pdf 468K

Reviewer,

I am a 37 year commercial fisherman. I am also involved in a small village salmon processing plant in Kaltag, Alaska.

I have attached a Microsoft Word document that is included to further flesh out the record.

I have reviewed your EIS and found it deficient in a couple of areas.

First, if I assume that the goal of the Council is to reduce salmon bycatch, then the Council should look at its own records at the bycatch rates for the CDQ groups. To ignore their clear success at reducing bycatch over the last 15 years, is irresponsible. CDQ groups have operated under hard salmon caps and have produced an admirable record of how to fish pollock cleanly, while still obtaining their goal of pollock quota. This pheonomena is too relevant to not highlight this and and quantify it properly, which this document does not do well.

Clearly, by any measure of "your" CDQ bycatch data, one has to wonder why the Council has not noticed this before. From the data one clear and inarguable method of reducing salmon bycatch, is to tranfer additional pollock quota to the CDQ groups. This would certainly be in line with promotion of clean fishing, and penalizing dirty fishing.

Second, the economic impact analysis id deficient as the impacts of salmon which have the opportunity to spawn return in larger numbers that recognized by your economic analysis. Salmon allowed to spawn multiply at an exponential rate, which is the foundation of all salmon fisheries, and cannot be ignored. Any analysis of this exponential increase availible to salmon that are unharvested and allowed to spawn, will increase the economic impact to coastal communities which have a long historical dependance on these resources.

The Council hs tried exotic measures to reduce this bycatch in the past, which have failed. Hard quotas are the only assured method with a proven track record that is successful.

Any hard quotas should have the following priorites:

1) Escapement
2) Protection of those who are the long term historical dependant users of this salmon resource.

There is simply no defendable rational excuse for the in-river users being on hard quotas, and the trawlers being on unlimited quotas. This clearly places the whole burden of conservation on the backs of those who have successfully managed this resource for eons, from the backs of those who have drug their feet from participating in conservation of these magnificent salmon, until we find ourselves now in a crisis. This crisis could have been addressed previously without any where near the economic pain that it requires today, but the blame for this can be found directly in the prior behavior of the trawl industry.

The villages did not cause this crisis.

If the salmon bycatch quota has to go to zero, then so be it. The trawlers fishing practices got themselves into this predicament, and the trawlers should have to bear the burden of their own actions. This is what accountability means. To place this burden upon the backs of the villagers is clearly inequitable, and inhumane.

Racism has long been practiced in the North Pacific by both the seafood processing industry, and the predessesor of the NMFS, the Bureau of Fisheries. To not recognize this simple fact in the Environmental Justice Section of this EIS is frankly an embarrassment. This is not a proceedural failure, but a moral failure. I don't believe for one second that this "oversight" is a coincidence. Neither will the public believe this a coincidence.

This practice of racism is not debatable. The Bureau of Fisheries kept the Aleuts as slaves on the Pribilovs, which is right in the middle of this billion dollar resource, for over 100 years.

Twenty year ago today the US Supreme Court rendered these words about the salmon processing industry, which many of the pollock participants also are involved in:

"The harshness of these results is well demonstrated by the facts of this case. The salmon industry as described by this record takes us back to a kind of overt and institutionalized discrimination we have not dealt with in years: a total residential and work environment organized on principles of racial stratification and segregation, which, as JUSTICE STEVENS points out, resembles a plantation economy. This industry long has been characterized by a taste for discrimination of the old-fashioned sort: a preference for hiring nonwhites to fill its lowest level positions, on the condition ...

... that they stay there. "

This racial stratification still occurs under this Council's watch. It is still going on, but the Council tries to ignore this racial discrimination practiced by the seafood processing industry. The foot notes to your own EIS proves that this racial discrimination continues, with nary a word from the Council, -- except higher quotas to those corporations practicing racial discrimination.

This long term stripping of the villages or their resources has gone unabated, with the sole exception of the CDQ program. The CDQ program has not been without its problems, but in the larger picture, the CDQ program has brought more economic develeopment, real opportunities for employment, than any other program in the long sordid history of the seafood processing industry. The CDQ's with 10% of the Bering Sea quotas has done more in less than ten years, then the other 90% has done in 90 years.

How can any American with a straight face defend this history and also defend giving Japan and Norway more fishing quotas than the local villages.

The question before the Council is not a fisheries management question. It is not a political question. It is a moral question, with serious political consequences.

The integrity of NOAA, NMFS, and the Council are at stake.

Here are a couple of examples of how people argue moral questions. See if any of this sounds familiar.

Negative Stereotyping

Discourse often involves sweeping generalizations about members of the other group. People in moral conflicts tend to invidiously categorize and denounce the personalities, intelligence, and social manners of those with whom they disagree. They may form negative stereotypes and attribute moral depravity or other negative characteristics to those who violate their cultural expectations, while they ignore their own vices and foibles, perceiving their own group to be entirely *virtuous*. This is what social psychologists call the *attribution error.*

Effects of Moral Conflict

Not surprisingly, moral conflict often has harmful effects. Participants in moral conflict often behave immorally, even according to their own standards of behavior, because they believe the actions of their enemies force them to do so. If a group is regarded as morally depraved, its members may come to be regarded as less than human and undeserving of humane treatment. The demonization or dehumanization of one's opponent that often occurs in moral conflict paves the way for hateful action and violence. It often leads to human rights violations or even attempts at genocide, as parties may come to believe that the capitulation or elimination of the other group is the only way to resolve the conflict.

Any of these arguments sound familiar??

Is the stripping of salmon resources away from the villages economic genocide??

My last comment is that with the suicide rate for Native Alaskans rising to the epidemic point, this simple fact should be added to your Environmental Justice Section of this EIS. This continually rising suicide rate is simply unacceptable, and one of the clear solutions is real economic opportunity. The CDQ's have finally provided this. Expand them. The continual stripping of resources from Native Alaskan's, by the rich and powerful; by campaign contributions, has to stop, as this has been widely recognized by various experts as the root cause of much of this suicide.

C44

Doug Karlberg

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Bellingham, WA 98227

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